CHLORIDE CONTROL AND IRRIGATION MANAGEMENT: A GIS INTEGRATED APPROACH TO ECONOMIC FEASIBILITY FOR COTTON

By

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ECONOMIC FEASIBILITY FOR COTTON

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Abstract:
This study estimates the net agricultural benefits of preventing nearly 500 tons of salt per day, sufficient to preclude irrigation or potable water use, from entering the Elm Fork of the Red River near the Texas border in far western Oklahoma. The project has the potential to bring irrigation to part of an additional 50,000 acres of irrigable land located along the Elm and North Fork rivers in Southwest Oklahoma. This study describes the incorporation of recent advances in GIS, crop simulation models, econometrics, and dynamic optimization into the agricultural benefit-cost analysis of chloride or salinity reduction. GIS was used to identify the area and spatial distribution of irrigable soils in sections of land within prescribed distances from a watercourse. It was then possible to determine the areas that could be irrigated with a specific type of irrigation system such as a center pivot or a traveling reel. The overall economic feasibility analysis consists of two cotton prices, three salinity levels and three levels of rainfalls. GIS allows determination of areas of each soil type than would be irrigated by individual systems along with well to pivot distances. Dynamic optimization over a 50-year period provides location specific estimates of producer profits along with changes in soil salinity and crop yield. The results show that lower salinity (irrigation water EC) and higher price increases the yields and hence the net incremental benefits. The results range from $ 5 million (2.2 dS/m and $ 0.54 cotton price) to $ 100 million (0.9 EC and $ 0.7 cotton price) for the average rainfall scenario. The results are highly sensitive to changes in the salinity, rainfall and cotton price. Optimal irrigation water applied per acre was affected mainly by the salinity and cotton price.

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CHAPTER – I

INTRODUCTION

Background

Chloride or salinity control has become a somewhat ordinary phenomenon in irrigated agriculture over the past few decades in different parts of the world. Dinar and Knapp (1986) suggested, “Irrigation with saline water is a major concern in many parts of the world.” Chloride control or removal of salt from water enhances the opportunity of using the land and water resources that were previously unused or unavailable for human needs. This dissertation covers part of a project funded by the United States Army Corps of Engineers (USACE) that deals with chloride control and salinity management as well as potential for building a new reservoir along the North Fork of the Red River in Southwestern Oklahoma.

The Red River Chloride Area VI project potentially affects five counties in Southwest Oklahoma. These counties (Harmon, Greer, Jackson, Kiowa, and Tillman), are shown in Figure 1. We begin with a review of historical trends in crop production and planted acres over the past four decades. The historical data provides an idea of what the trends in agriculture have been over the last four decades and a guideline for the future of agriculture in the study area. Since cotton is one of the major irrigated crops in the study region, we will focus on the crop history of cotton in the region.

Chloride Control

The entire project involves the estimation of agricultural benefits from a proposed project that would prevent up to 500 tons of salt per day from entering the Elm Fork of the Red River near the Texas border in far western Oklahoma. Salt content is measured by Total Dissolved Salt (TDS) and Electrical Conductivity (EC). Based on the recent years' water quality samples data (USGS, 2011) we find that the salt loading makes the EC level of nearly 35 dS/m at the control point. EC values over 3 dS/m can affect the growth of many crops (D.W.Westcott, 1976). EC levels, however, gradually decline to some extent as we go further down the stream in the North Fork of the Red River with addition of water from other sources such as Elk Creek. Addition of less saline water may reduce the concentration of TDS to some extent. The current EC level at Lake Altus that goes into the Altus-Lugert Irrigation district is measured approximately 2.2 dS/m (USGS, 2012). This has lead to some reduction in yields and problem of salt build up over a long period of time (Buchanan, 2010).

There is a proposed point where the Salton, Robinson, and Kaiser Canyons join the Elm Fork of the Red River west of highway 30 in Harmon County Oklahoma. The chloride removal would increase quality of water in the Elm Fork of the Red River below the control point. The USGS gage on the Elm fork at the control point has recorded average annual flows of approximately 31,000 acre-feet with a standard deviation of 16,600 acre-feet. The chloride control would remove up to 80 percent of the estimated 510 tons of chlorides per day. The amount of surface water affected by the current salt loading increases to an average of 226,704 acre feet near the confluence of the North Fork and Red Rivers. The potential agricultural areas that would benefit are shown in the Figure 1.

The basic concept and procedures followed in the project are somewhat similar to those used in the Wichita River Basin Reevaluation of the Red River Control Project (USACE, 2009). The Wichita River Basin project suggests that there are net public benefits from reducing the salt loading along branches of the Red River in Oklahoma (USACE, 2009). The 1967 report by the Oklahoma Water Resources Board identified an additional 19,000 acres in Greer, Jackson, and Tillman Counties that could potentially be irrigated if additional water were available (OWRB, 1967).

Geographical Information System (GIS) software was used to identify 50,000 acres of potentially irrigable soils [NRCS classes(I, IIe, IIw, IIIe, IIIw) with 10-meter slopes less than three percent] in sections adjacent to or transversed by the Elm and North Forks of the Red River (Figure 1). In addition, the existing Altus-Lugert Irrigation District could use more water and develop additional land within the district that is currently not irrigated due to lack of water. If the salt content of the Elm and North Fork Rivers was reduced sufficiently, it may be possible to construct the proposed Cable Mountain Reservoir on the North Fork to capture up to 110 thousand acre-feet annually (BREC, 2005). Expert opinion by Tom Buchanan, manager (Aug, 2010) of the Altus-Lugert Irrigation District suggested nearly 130,000 acres worth of land can be irrigated compared to the current 45,000 acres. A recent study by the Bureau of Reclamation (BREC, 2005) estimates the capacity of the existing Altus-Lugert Reservoir will be reduced by 60 percent by 2050 which would reduce irrigation in the district. Although a later study (BREC, 2007) showed a little less siltation, the water levels at the Altus dam have reduced over the years (Buchanan, 2012). The drought in Oklahoma in 2011 and 2012 has reduced reservoir levels to below capacity making it impossible to irrigate at all (Buchanan, 2012).

Outline

This dissertation covers a cadastral section-by-section approach to estimating potential benefits from additional irrigation. Following the determination of the irrigable soils within a section, the next step is to determine the economic feasibility of irrigation development. For each type of irrigation system (pivot, traveling reel, subsurface drip), we have to determine the area that of each soil type that can be irrigated. Low-pressure pivots and flood irrigation are the most common irrigation systems in the Altus irrigation district. However, drip irrigation has been adopted by some farmers in the recent years. In addition to system costs, crop response functions under saline conditions are also required.

This study design compares the use and economic benefits from two sprinkler irrigation systems, center pivot and traveling reel along the Elm and North Fork rivers. The relative advantage of either system depends on the shape and size of irrigable soils in each field. Two cotton lint prices, 70 cents/lb and 54 cents/lb, were used in optimization. Two different levels of low and high salinity in the irrigation water are considered. The optimization process allowed changes in soil salinity over time on a soil type basis. Increased soil salinity reduces yields and the total number of profitable acres under either type of irrigation.

The study considers the effects of changes in total water use by the cotton crop. Total water use includes the rainfall and irrigation water. Ten 50-year random rainfall scenarios were generated by Mittleset and Storm (2012). These were used for average, above average and below average rainfall over the next 50 years in the optimization. The averages were calculated for seasonal and non-seasonal rainfall from the randomly generated weather (Mittleset and Storm, 2012). The above and below average weather scenario were generated assuming a deviation of average rainfall by 10 per cent from the raverage historical rainfall (Mittleset and Storm, 2012). These averages of the seasonal and non-seasonal rainfalls were used in the optimization.

The estimation of net benefits from center pivot irrigation and travelling reel irrigation system were handled separately. Details on each irrigation type are discussed in separate components the methodology section. The physical characteristics of each individual field, slope and shape of irrigable soils, mix of soil types and size of the land parcel play important role in determining the type of irrigation to use on an individual field. The first approach was to determine the areas that can be irrigated under center pivot irrigation, one of the two possible irrigation systems. This is done by using the GIS shape files that provide the information about the area and spatial distribution of soils in each section. The decision maker has to determine whether to irrigate or not, and then which irrigation techniques to implement on each section of land.

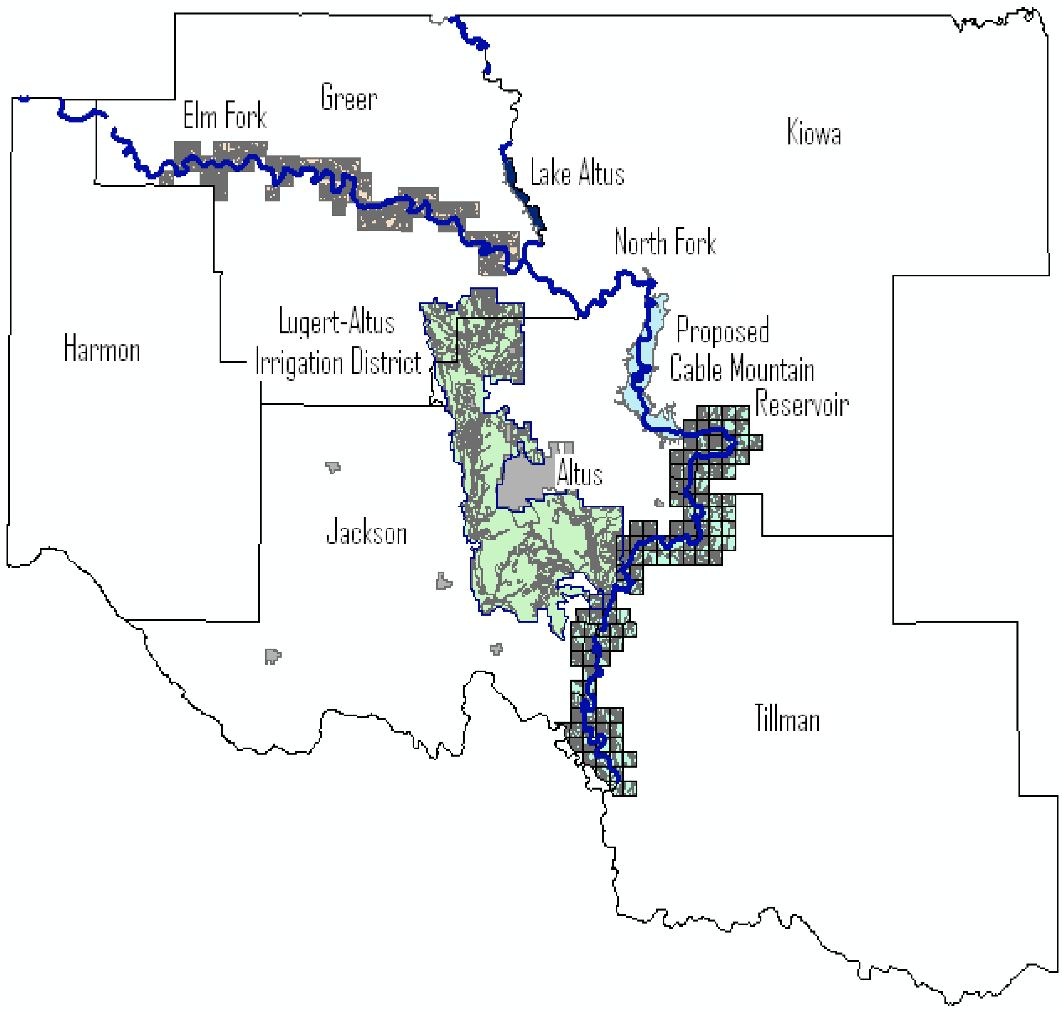


Figure 1. Potential Irrigable land, Altus-Lugert Irrigation district and the proposed new reservoir

The traveling gun or traveling hard hose reel sprinkler is capable of operation on irregularly shaped contiguous areas. The economic feasibility of establishing a traveling reel irrigation system depends the area and the number of sets or times the system is repositioned and the length of pipe (assumed to be buried in this study), and the pumping head necessary to irrigate an irregularly shaped area or polygon of irrigable soils.

Crop History

Irrigated Cotton Yields and Area Harvested In the region

Figure 2 shows yields of irrigated cotton have also been increasing since the 1970's but show a greater increase in the 2001 to 2009 period as compared the 1973 to 1995 period. Buchanan (2010) attributed the increase in cotton yields to eradication of the boll weevil and the adoption of genetically modified cotton varieties.

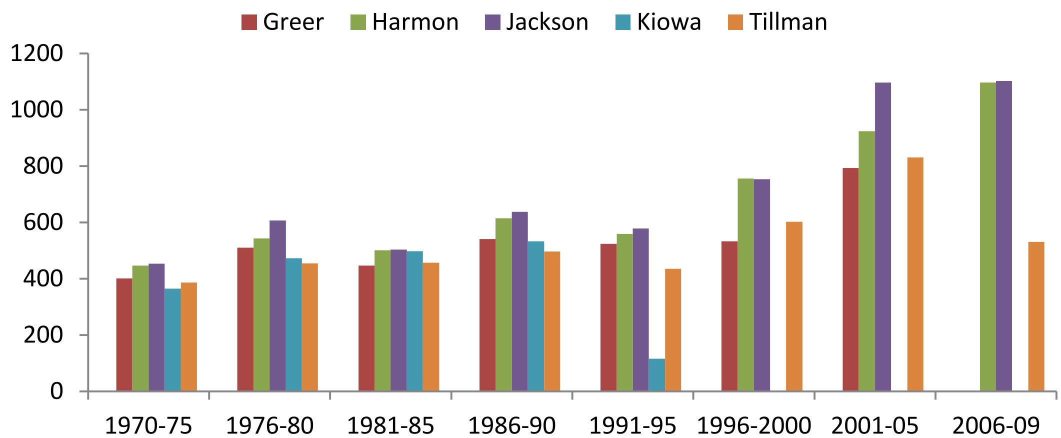


Figure 2. Average County-level Yields of Irrigated Cotton for every 5-yr period in the study area

Table 1 indicates the greatest area of irrigated cotton is in Jackson County. The harvested acres of irrigated cotton have declined in Greer, Kiowa, and Tillman Counties while increasing slightly in Jackson County. Irrigated cotton was no longer reported in Kiowa County after 1996.

Table 1. Average harvested acres and yields of irrigated cotton by county for each 5-year period

	Average harvested acres of Irrigated Cotton					Average Yields (Pounds) of Irrigated Cotton				
	Greer	Harmon	Jackson	Kiowa	Tillman	Greer	Harmon	Jackson	Kiowa	Tillman
1971-75	2,544	7,070	16,562	1,848	4,990	400	447	453	364	386
1976-80	6,100	15,920	34,220	5,220	20,030	510	543	607	472	454
1981-85	5,160	14,460	40,680	3,080	18,140	446	501	503	497	457
1986-90	4,186	17,220	44,720	2,544	15,970	541	615	638	532	497
1991-95	2,780	16,600	40,620	100	4,160	523	559	578	115	435
1996-00	1,780	14,000	41,620	(D)	4,220	533	755	753	(D)	603
2001-05	3,020	12,940	44,360	(D)	8,300	793	924	1,096	(D)	830
2006-09	(D)	11,950	44,667	(D)	14,500	(D)	1,097	1,103	(D)	530

*(D) indicates the data are withheld from disclosure by the source

Means and Trends in County Irrigated Cotton Yields

Mean county level dry land cotton yields (Table 2), per harvested acre vary between 524 and 584 lbs per acre. The maximum county average dry land cotton yields in single years have exceeded 1,000 pounds in all counties and have reached 1,500 lbs in Jackson County. The county level standard deviations in dry land cotton yields vary between 204 and 270 lbs per acre. That would place the coefficient of variation for dry land cotton yields in the 40 percent range.

Table 2. Minimum, Mean, Maximum, and Standard Deviation of annual dry land and irrigated Cotton by county from 1973-2009

County		**Dry land (lbs/ac)**			**Irrigated (lbs/ac)**			
	Min.	Mean	Max	St.Dev.	Min.	Mean	Max	St.Dev.
Greer	224	524	1,071	224.2	377	1,183	2,000	377.5
Harmon	271	574	1,429	270.8	448	1,320	2,372	447.5
Jackson	277	584	1,500	276.7	506	1,418	2,362	505.9
Kiowa	205	542	1,020	204.8	241	1,032	1,760	240.8
Tillman	230	547	1,090	229.8	361	1,122	2,069	361.0

We can use the available data for analysis and future predictions using the mathematical programming model. In most cases, the net change in net profit would be positively related to changes in inputs, which indicate there may not be too many outliers. Hence, we can use the data for any statistical analysis and hypothesis testing.

Dry land Cotton Yields and Area Harvested by County

The yield data for different counties varies the most from 2005-2009. The figures and tables below show the differences among the mean five-year county yields for the cotton for every 5 years. Figure 3 shows that Jackson County has the highest average dry land yields for most periods followed by Harmon County.

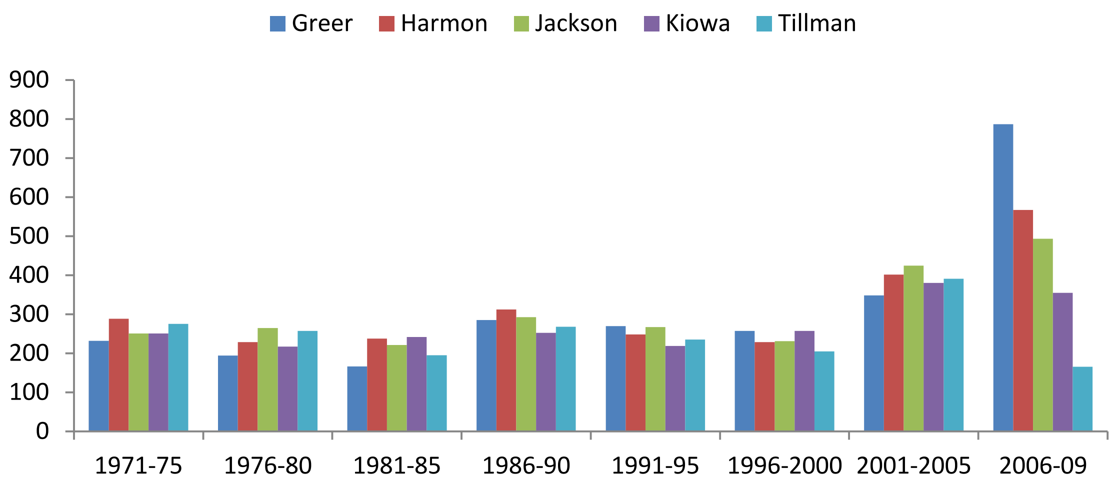


Figure 3. Average county yields for non-irrigated Cotton for each 5 years.

Figure 3 shows there has been a large increase in dry land cotton yields in the period from 2001-2009 in all counties except Tillman. However, Table 3 indicates there is a downward trend in the harvested acres in the region. Although there is increase in acres and yields in Greer County over the period of 2006-09, overall, the total acreage in the region has decreased considerably from the 70's, 80's and early 90's.

Table 3. Average county level acres harvested and yields of dry-land Cotton from 1971 to 2009 by 5-year period by county

	Average harvested acres of Non-irrigated Cotton					Average Yields (Pounds) of Non-Irrigated Cotton				
	Greer	Harmon	Jackson	Kiowa	Tillman	Greer	Harmon	Jackson	Kiowa	Tillman
1971-75	26,930	23,280	30,268	48,226	53,850	231	288	251	250	275
1976-80	22,380	19,180	20,060	50,780	87,990	194	229	264	217	257
1981-85	16,260	14,380	10,840	45,140	97,210	166	237	221	241	195
1986-90	12,164	7,340	5,960	40,806	91,250	285	312	293	252	267
1991-95	11,160	7,120	16,620	38,860	89,960	269	248	267	218	235
1996-00	3,220	5,500	11,180	13,740	21,080	257	228	230	257	205
2001-05	2,100	7,300	11,440	7,240	46,600	348	401	424	380	390
2006-09	6,400	2,800	10,267	7,785	(D)	787	567	493	354	(D)

Source: National Agricultural Statistics Service (NASS), USDA. (D) indicates Information withheld by the source

In the period of 2006-09, the acreage of harvested dry land cotton is reduced by more than 50% in Harmon and Kiowa Counties when compared to period of 1991-95. The acreage has dropped almost 50% in Greer and Tillman counties for the same period. In Jackson County, the drop is almost $1/3^{rd}$ from the early 90's.

Means and Trends in County Irrigated and Dry land Cotton Yields

Mean county level dry land cotton yields per harvested acre (Table 4), vary between 524 and 584 lbs per acre. The maximum county averages of dryland cotton yields have exceeded 1,000 pounds in all counties and have reached 1,500 lbs in Jackson County. The standard deviations of yields at county levels in dryland cotton yields vary between 204 and 270 lbs per acre. That would place the coefficient of variation for dryland cotton yields in the 40 percent range.

Table 4. Minimum, Mean, Maximum and Standard Deviation of annual dryland and irrigated Cotton by county from 1973-2005

County	Dryland (lbs/ac)				Irrigated (lbs/ac)			
	Min.	Mean	Max	St. Dev.	Min.	Mean	Max	St. Dev.
Greer	224	524	1,071	224.2	377	1,183	2,000	377.5
Harmon	271	574	1,429	270.8	448	1,320	2,372	447.5
Jackson	277	584	1,500	276.7	506	1,418	2,362	505.9
Kiowa	205	542	1,020	204.8	241	1,032	1,760	240.8
Tillman	230	547	1,090	229.8	361	1,122	2,069	361.0

Table 5. Linear regression analysis of annual county dryland and irrigated Cotton yields to test for significance of a linear yield trend

County	**Dryland Cotton**					**Irrigated Cotton**				
	Con-stant[a]	Yield Trend	t value of trend	St. Dev. of Reg	R^2	Cons tant	Yield Trend	t value of trend	St. Dev. of Reg	R^2
	Pounds lint/acre					Pounds lint/acre				
Greer	369.1	9.4	2.59*	14.39	0.17	846.7	20.8	3.63*	17.92	0.30
Harmon	437.5	8.0	1.68	16.23	0.08	814.3	29.8	4.73*	18.61	0.42
Jackson	456.3	7.8	1.65	16.42	0.08	903.2	31.2	4.40*	20.13	0.38
Kiowa	426.0	7.0	2.05*	13.98	0.12	898.9	14.0	1.55	15.24	0.12
Tillman	486.3	3.7	0.91	15.18	0.03	789.0	20.2	3.79*	17.45	0.31

[a] Constant and yield trend are in pounds per harvested acre * indicates values significantly different from zero at the five percent level.

Figure 2 indicated that irrigated cotton yields were increasing in the major cotton producing counties while both yields and harvested acres declined in Kiowa County. Table 5 shows tests for individual county intercepts and yield trends for dry land and irrigated cotton yields. Significant positive trends were found for irrigated cotton in all but Kiowa County. However, only Kiowa and Greer Counties have shown significantly positive trends for dry-land cotton yields.

Objectives

The primary objective of this project is to determine the net social benefits from irrigation development for the region, within 1-2 miles, along the Elm and North Forks of the Red River. Calculating the net profits of each individual section of land will provide the detailed level of accuracy that is important in the project due to water being a scarce resource.

Some of the specific objectives were:

1. Determine the optimal demand of desalinized water from the Elm and North Fork Rivers by producers with irrigable soils along the Elm and North Forks of the Red River
2. Determine the most profitable type of irrigation system, pivot or traveling reel, for each section of land.
3. Develop a multi period non-linear model to evaluate net benefits over 50-year period for each individual section of land.
4. Determine the sensitivity to irrigation to cotton prices, salinity and rainfall
5. Summarize results for optimal water use and net agricultural benefits for 50-year period that would lead to overall social benefits for Southwest Oklahoma.

Hypotheses

The objectives listed above can only be achieved by empirical answers to some of the basic questions. Based on the objective there are some important hypotheses to test for satisfying the objectives. Some of these hypotheses to test (or questions to answer) empirically are listed below.

1. Long-run net returns from irrigated cotton exceed the dry land returns over the projected 50-year period
2. A ten percent shift in rainfall below or above average impacts the net returns considerably to cotton producers.
3. Cotton price impacts the producer's decision to invest in the irrigation system buying or replacement (e.g cotton lint price of 54 cents/lb compared to 70 cents/lb)

Empirical solutions are used to satisfy the above objectives and determine the future course of action for the USACE. This would also provide a case study for chloride control and salinity management studies in a sense that a ground level and soil specific yield, revenue and cost estimation leading to more accurate results compared to the previous studies.

Data

GIS data used included the NRCS SURGO soil data and USGS 10-meter elevation data. Potentially irrigable soils were defined as those non-saline soils with an NRCS irrigation capabilities I, II, III with 10-meter slopes of less than three percent. Subclasses "e" and "w" were included. In addition, daily weather temperature and precipitation data for the period from 1950 through 2010 from the NOAA COOP stations were used. We also used daily Oklahoma Mesonet weather data, which includes wind speed, solar radiation, and relative humidity from 1994 through 2010. USDA data on land use and land cover for Oklahoma along with annual NRCS one-meter photo data were used to identify crop areas.

Secondary data were available in the form of county level yields (National Agricultural Statistics Services, 1970-2009), yield variety trials, fixed and variable costs of irrigation (National Cotton Council, 2010) and cotton budgets (Oklahoma State University Cotton Budgets, 2010). The secondary yield data were used to validate the simulated yields. Information on costs of irrigation supplies was provided by Schumacher Irrigation, LLC and Nelson Irrigation, LLC. Cotton prices received by farmers are used from sources such as National Cotton Council and Economic Research Service, USDA. A list of equipment required is in the appendix in Table I-3.

Water flow data are another important variable among the factors determining the crop response to salinity and water. Figures 4 and 5 show the historical water flows at the Carl Gauge and Headrick gauge respectively. The flow is higher in the months of May and June but relatively lowers in July and August which suggests a requirement of developing sources such as a well and pipeline for irrigation purposes. This will ensure the availability of water to areas along the Elm and North Forks for the irrigation season i.e. July and August.

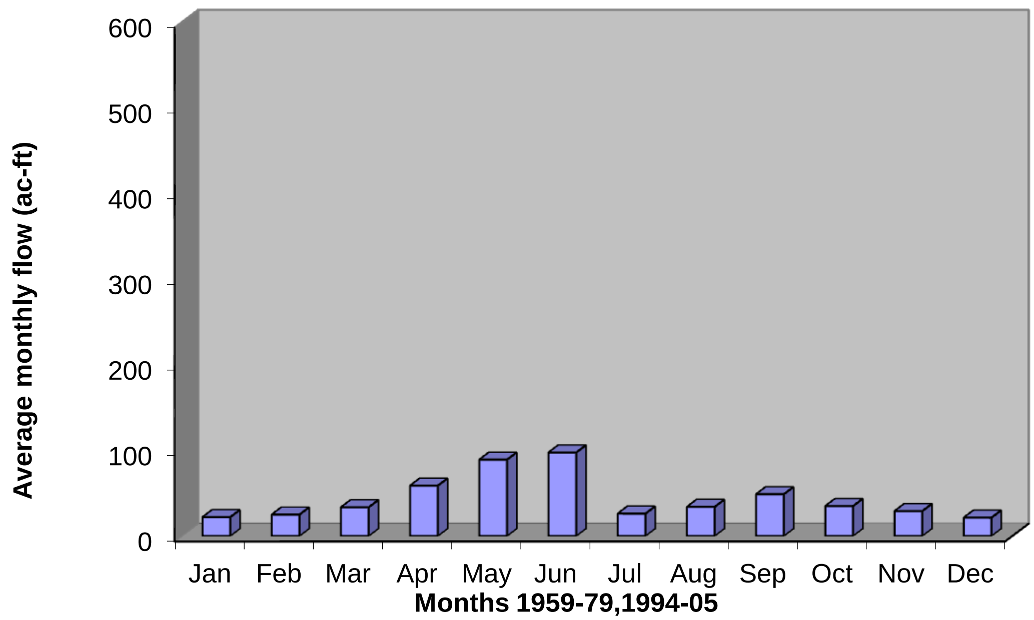


Figure 4. Average monthly flows at Carl Gauge on the Elm Fork of the Red River

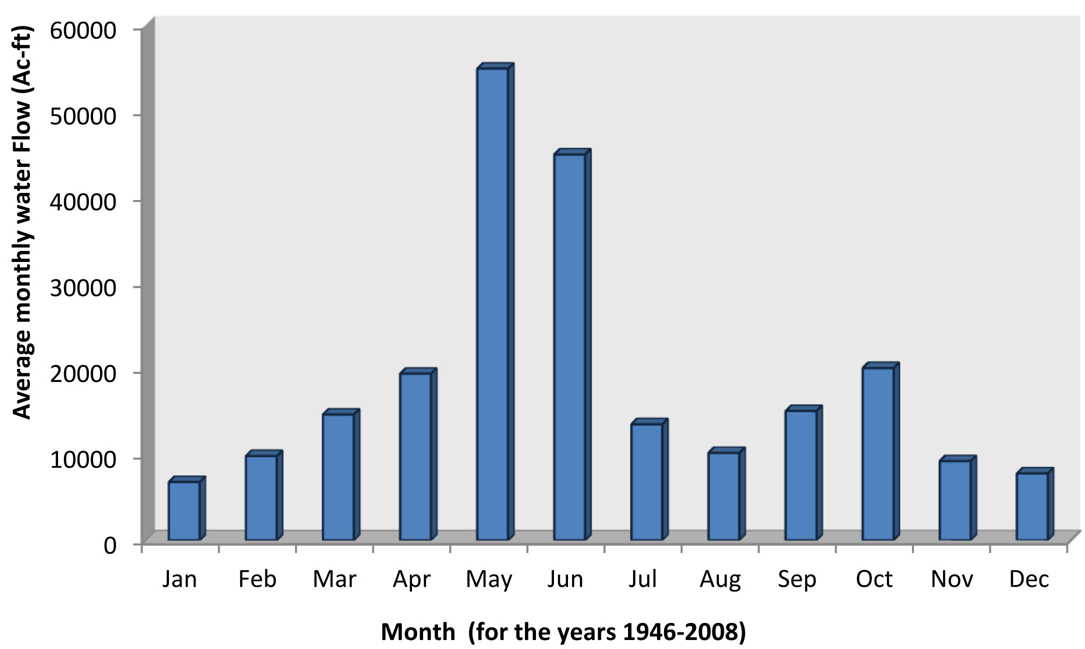


Figure 5. Average monthly water flows at Headrick Gauge on the North Fork of the Red River

CHAPTER – II

LITERATURE REVIEW

Chloride Control

The basic concept and procedures followed in the project have a few similarities to the Wichita River Basin Reevaluation of the Red River Control Project (USACE, 2009). The Wichita River Basin Project in North Texas has shown a great reduction in chloride content over the years. The Wichita River Basin project suggests that there are net public benefits from reducing the salt loading along branches of the Red River in Oklahoma (USACE, 2009).

Use of Geographical Information System (GIS) technology has not been extensively used in the study of chloride control. The recently completed project on Wichita River Basin Reevaluation (United State Army corps of Engineers, 2007) of the Red River Control Project suggests that there is a huge prospect of achieving greater economic benefits to the society. A major differences in this project compared to the Wichita River Basin Reevaluation is the potential for building a reservoir at the Cable Mountain near the Altus irrigation district.

A recent hydrology report on salinity abatement on the Red River (USACE, 2011) provides the guideline for calculation of EC at Elm and North Forks based on historical data. The report provides the information that is useful for EC estimation at the Carl

Gauge. The report suggests that current daily chloride load would be cut by 423 tons/day from nearly 500 tons/day with the project. The report also indicates the reduction in the water flow by 2 ac-ft/day from 73 ac-ft per day to 71 ac-ft per day. Total dissolved solids (TDS) would be reduced by approximately 70 percent, reducing it from 1,063 to 319 tons per day. The report (USACE, 2011) also indicates 'Annual Upper Red River Irrigation Requirements' by counties. The report predicts approximately 8,000 acres of land would require irrigation in Greer County, requiring about 9,500 acre-feet of water out of Elm Fork. A further 7,000 acres will require irrigation out of the North Fork in Jackson and Kiowa Counties needing approximately 8,200 acre-feet of water. These forecasts are in addition to the areas currently irrigated including Lugert-Altus Irrigation District.

Salt accumulation

Salt accumulation occurs in the soil due to the accumulation of soluble salts that are in the water used for irrigation. An acre-foot of water with an EC of 1 dS/m adds about 0.87 tons of salt in the soil. When water is used by crop or evaporated, the salt remains in the soil and accumulates over time. This salt causes the root zone salinity to increase. Yaron and Bresler (1970) found that a combination of water quality and quantity play a key role in efficient crop production. They (Yaron and Bresler, 1970) derived combinations of quantity and quality with various irrigation levels and water EC using a linear programming model that lead to variation in yields. Empirically, estimates of marginal rate of substitution of salinity were compared with cost of the ratio between salinity and irrigation quantity. The only limitation of their study was that they did not have any information on cost. However, they provided solid empirical estimates for the quantity and quality ratios for irrigation water and concluded that increase in the quantity of water dilutes the salt concentration to increase the permissible amount of salinity over time. The yield function (Choi, 2011) used in this study depends on the soil salinity and water quantity. The major difference from Yaron and Bresler (1970) is that we are using a non-linear programming model with a 'modified quadratic' yield function (Choi, 2011).

Another major component of the research is the use simulation models. The Erosion Productivity Impact Calculator (EPIC) simulation yield data were used (Choi, 2011) to develop yield response function for individual soil type. Choi (2011) developed the yield response functions to water (rainfall + irrigation) and soil salinity. EPIC simulates yield based on different physiological components like rainfall, temperature, soil EC and irrigation for each soil type. Ko et al (2009) have shown the effective use of simulation models like EPIC for irrigation in cotton and maize. Calibration and validation results of Ko et al (2009) have shown a reasonable agreement between simulated and actual yields of cotton and maize. Based on discussions with Buchanan (2010) cotton was considered as the main irrigated crop in the region because it has salt resistance level up to soil EC level of 7.7 dS/m (Dinar & Knapp 1986). Several studies have found that in spite of occasional overestimation problem, EPIC provides good results (Bryant et al., 1995; Ko et al., 2009). They have found that EPIC usually works well on the average conditions of simulation but tends to overestimate yields of wheat in extreme weather conditions like drought or excessive rainfall.

Jongsan Choi (2011) has cited several studies from Datta *et al* (1991), Kiani and Abbasi (2009) and Dinar et al (1998) that justify the use of EPIC simulations for crop response to salinity and water quantity. All of these studies used various yields functions, which were used to find optimal combination of salinity, rainfall and irrigation water.

Choi et al (2012) developed a 'modified quadratic' yield response function for various soil types that can be used for the non-linear programming model used in this study.

Irrigation management

Another objective is to determine the optimal level of irrigation. Kumar et al. (1992) offered a useful conceptual framework for determining the economic feasibility on sprinkler irrigation. Kumar et al. (1992) developed a cost effective irrigation model for center pivot and side-roll sprinkler that considers all the basics of irrigation, energy and labor costs. This study is an extension in that land slopes, the size and shapes of the irrigable acres and soil types are also considered. The decisions regarding investment, labor, energy costs and quantity or irrigation are based on the soil and water salinity, shape and size of irrigable acres on a section of land and quality of available irrigation water.

An important component of this study is to determine optimal allocation of water to manage salinity in the red river area. Dinar and Knapp (1986) provide the background knowledge and basic structure of management practices along with dynamic optimization of water use in their paper. The polygons which are determined by use of Geographical Information Systems (GIS), can give more precise estimates of irrigable soils than the have been available in previous studies. Furrow irrigation is convenient for irrigating with adequate river water; drip is more efficient (Mateos et al., 1991). This can be an important factor for an optimization problem of river water use.

Irrigation Cost

Costs involved with irrigation are another major component in the economic feasibility study. Different university extension newsletters serve as useful references for the investment costs, equipment costs and enterprise budgets i.e. variable input costs (Sahs, 2009; Mc Adams, 2007). Sahs (2009) focuses on enterprise budgets and management practices to use the farm inputs efficiently.

Mc Adams (2007) developed a cost assessment based on travelling reel equipment. A travelling reel may be useful more often than other types of irrigation systems in our study because there are many irregular shaped polygons that might be irrigated as part of the project. Keller (2011) provides basic guidelines for the sprinkler irrigation using travelling reel on relatively smaller parcels of land where a full or half circle pivot is not profitable to operate.

Irrigation energy costs differ from one section to another as the different shaped polygons and different soil types may require different quantity of water. Pacey and Lamm (2004) developed a spreadsheet program that incorporates the details regarding the calculation of energy costs. Their program includes irrigation by diesel, natural gas, electricity and propane. The program helps determine the energy cost and allows easy comparison among irrigation systems by different sources of fuel. The model for Pacey and Lamm (2004) works perfectly on a individual field with fixed size or shape.

Keller and Bliesner (1990) provide detailed information on operating and maintaining sprinkler irrigation systems. These serve as guidelines to set up the quarter mile pivots and travelling reels for the irrigation. The wetted diameter for the traveling sprinkler irrigation was adjusted downward because of average daily wind speeds in the Altus area. The Altus Mesonet average daily wind speed during July and August from 1994 through 2010 was 9.27 mph. Interpolation from Table 13.1 in Keller and Bliesner

(1990) for a wind speed between 9 and 10 mph, indicated the wetted diameter should be reduced by 62 percent.

Another factor to be considered for reducing long-term salt accumulation in the soil is leaching. A leaching fraction is the amount of excess irrigation water used to leach the salt down to reduce the root zone salinity in long run (Hanson, 1993). Blaine Hanson (1993), Irrigation and Drainage specialist at University of California, explains, "Leaching is applying irrigation water in excess of the soil moisture depletion level to remove salts in the root zone. The excess water flows down through the root zone, carrying salts with it."

Drainage and Leaching are the most common practices used to avoid long-term salt build-up in soil (FAO, 1994). Water for leaching can be applied with the irrigation water either during the crop season or in the off-season. Off-season application would reduce the possibility of water logging condition, which can be a cause of salt accumulation in soil. This study has considered off-season leaching by applying the same water quality that is used for irrigation i.e. EC of 2.2 dS/m or higher. A water quantity of 0.3 ac-ft per acre with an EC of 2.2 dS/m would add 0.57 tons of salt per application. However, additional water leach the salt below the root zone, reducing the ratio of total salt over total water at the planting day of next season, and hence reduce the yield loss in the long run.

CHAPTER – III

METHODOLOGY

Economic feasibility under Center Pivot Irrigation

This part evaluates the profitability of establishing center pivot irrigation on each individual section of land. It is assumed that center pivot will triumph over the traveling reel sprinkler on larger fields due to the higher efficiency and lower capital cost per acre.

GIS Methods

The areas of irrigable soils (USDA-NRCS, 2010) were overlaid on NRCS photo maps (USDA-NRCS, 2088). 124 full and partial pivot circles were drawn, using the 'buffer' tool in ArcMap, around areas or clusters of irrigable soils in the sections along the Elm and North Fork Rivers. The total number of pivot circles that could be developed along the Elm and North Forks were 44 and 80 respectively. These circles for the pivots were drawn to avoid crossing of gullies, roadways, buildings, and other obstacles. Small areas or clusters of less than 10 acres of irrigable soils were ignored. The polygons with PI soils (Irrigation capability, class I-III and slopes < 3 percent), were overlaid on a USDA 1-meter photomap. The photomap was used to avoid physical obstacles such as roads, gullies, buildings that are not shown on the soils and elevation maps.

Each individual field selected for center pivot irrigation may contain more than one type of soils. The optimal amount of irrigation would therefore depend on the characteristics of all soil types covered by the pivot. The full area was divided into Elm Fork and North Fork of Red River. Forty-four pivot fields were drawn along the Elm Fork. As we move along the North Fork of the Red River, we get more irrigable soils clustered together. Eighty pivot fields were identified for center pivot irrigation along the North Fork. The total area covered under these pivot fields are 4,489 and 8,201 acres respectively along the Elm and North Forks.

Each pivot field contained up to 124 acres. Some partial circles were also evaluated. All of these full and partial circles are drawn using GIS and are based on clusters of irrigable acres. It is still necessary to use aerial photographs to assure the absence of any physical hazards (some examples: roads, gullies, railway tracks, buildings etc) that make it difficult or impossible to use pivot irrigation. Figure 6 shows an example of an aerial photo view that can be enlarged to insure the absence of physical hazards when drawing irrigation circles in GIS.

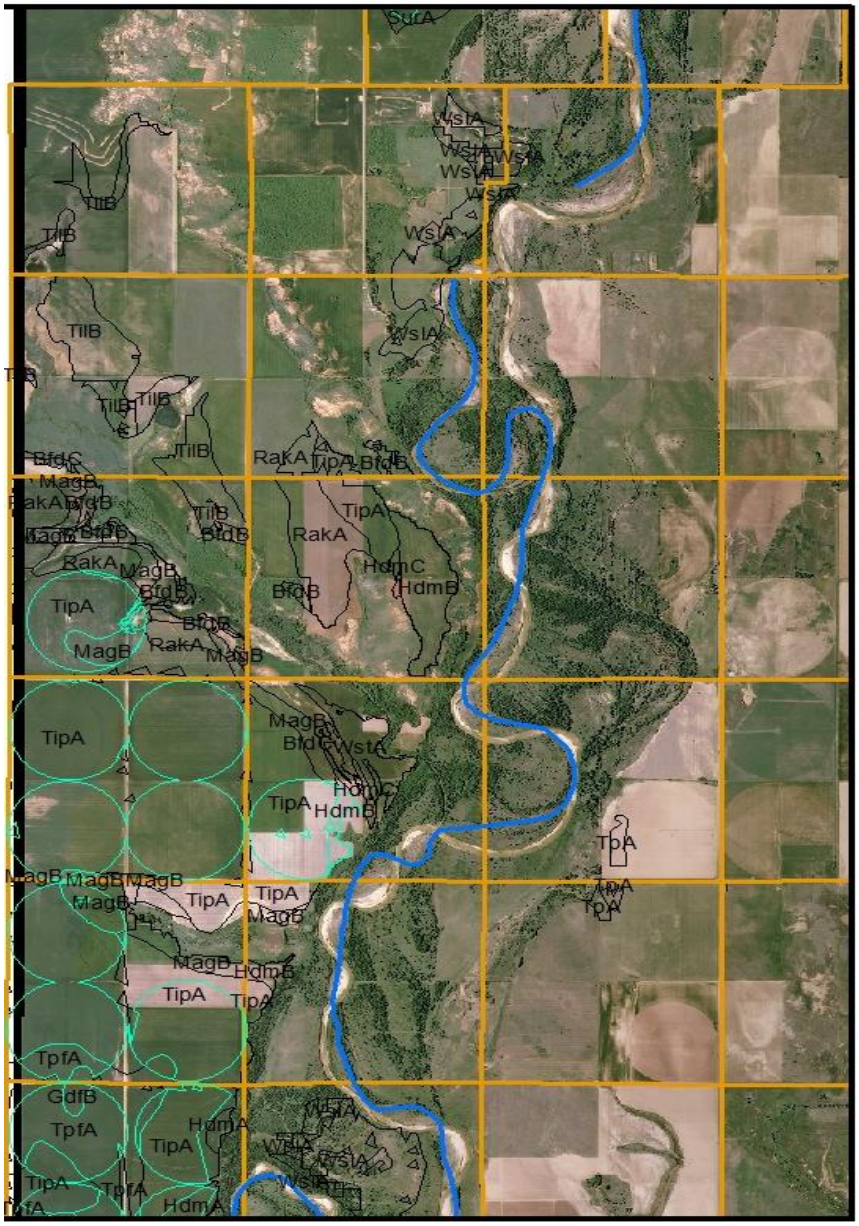


Figure 6. Example of an aerial photomap showing pivot circles and ground view

These details help achieve the more precise estimates of irrigation potential of a particular piece of land as opposed to traditional methods which were mainly based on total acres of land for use of a center pivot. Figure 7 shows some examples of potential sections of land where sufficient irrigable acres are available to allow full or partial center pivot circles.

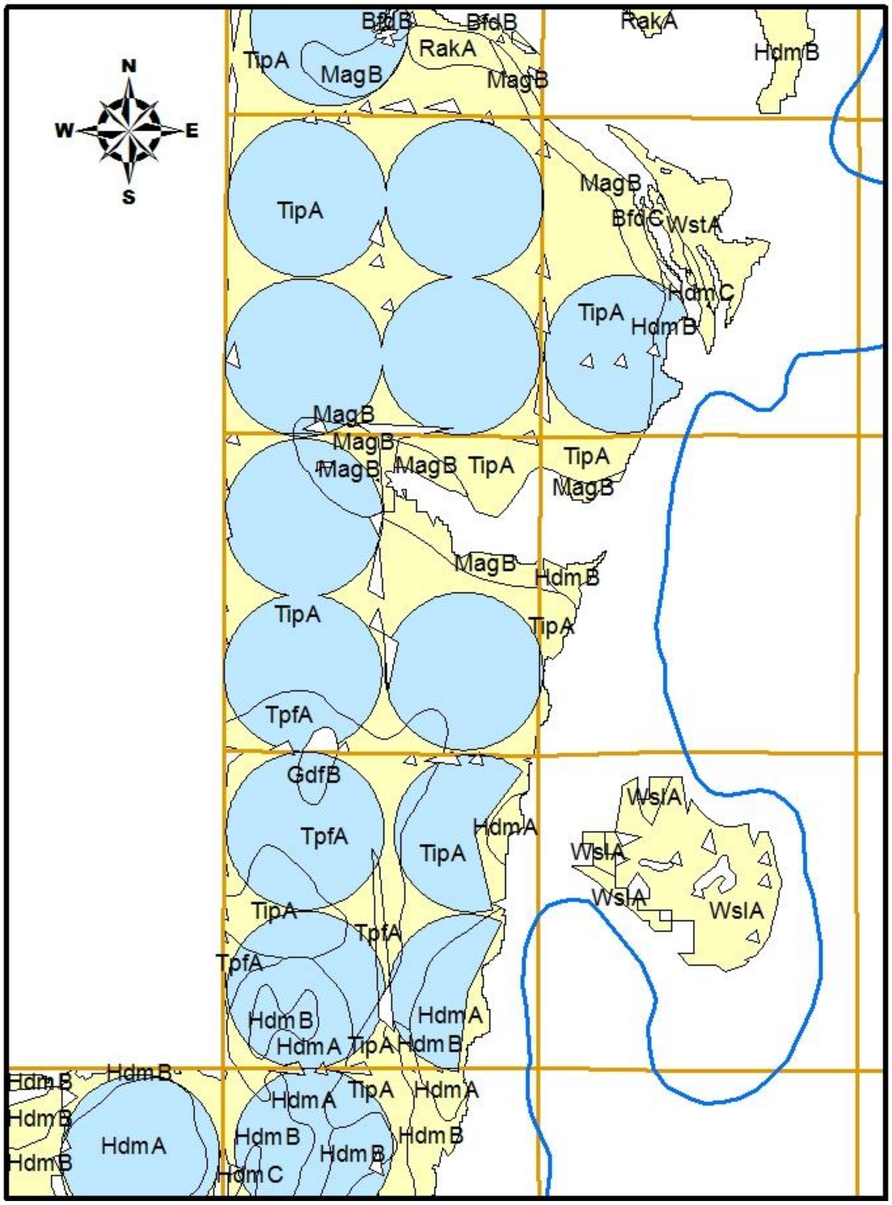


Figure 7. Example of sections with different soil types for center pivot along North Fork

Profit Maximization and Yield Response Functions

The overall objective is to determine the maximum profit for each individual producer to obtain highest net agricultural benefits in the region. The net incremental benefits from agriculture plays a part in net social benefits, as increased acres in crop production will lead to increase in sales of crop inputs, labor and supply. As discussed before, harvested acres of dry land cotton have decreased over the years and it becomes essential to look for viable options.

The overall objective of the project is to determine net benefits of growing irrigated cotton over a period of 50 years in the study region with reduced surface water salinity. It is similar to a classic profit maximization problem using a non-linear programming model. A producer's expected profit maximization equation from irrigating a group of soils with a single irrigation system can be expressed as:

$$\max_{q_t} E(\pi) = \sum_{s=1}^{n} \{A_s \sum_{t=1}^{50} \frac{1}{(1+r)^t} \left(P\, Y_{st}(q_t) - R(q_t) * C_{st}(q_t)\right)\} \quad (1)$$

where, P is the price of cotton received by farmer ($/lb), Y_{st} is expected cotton yield (lint) in lbs/acre with irrigation quantity q_t on soil type s (s=1,…, n) on soil *s* in year *t*, *R* is the vector of inputs associated with irrigation level q_t on all soil types, A_s is the acreage of soil type s to be irrigated, C_{st} is the vector of total variable costs, other than irrigation, associated with growing cotton on with soil type *s*. The number of irrigable soils n differs for each section of land and varies from system to system.

Due to the complex nature of irrigation management under saline conditions, a typical quadratic yield function does not show the desired concavity or convexity. Hence, a modified version of a quadratic function was used to determine the yield response function (Choi, 2011). The interaction term of the quadratic function was expressed as a ratio of total salt divided by total water as shown in the function. This allows us to interpret the relationship between irrigation water and salinity clearly. The modified quadratic yield function for an individual soil type is:

$$\mathrm{Y_{st}} = \mathrm{a_0} + \mathrm{a_1 W_{st}} + \mathrm{a_2 S_{st}} + \mathrm{a_3 NR_{st}} + \mathrm{a_4 W_t^2} + \mathrm{a_5 S_{st}^2} + \mathrm{a_6} \frac{\mathrm{S_{st}}}{\mathrm{W_{st}}} \quad (2)$$

Where, W_{st} is the total water (i.e. sum of irrigation and rainfall) applied (ac-feet), S_{st} is the salt concentration of irrigation water (tons/ac-ft). (EC = 0.9, 2.2, 3), $\frac{S_{st}}{W_{st}}$ is the amount of total salt (soil irrigation) divided by the total amount of water (irrigation plus rainfall) per acre, NR_t is the precipitation in the non-growing season (feet).

EPIC simulation and Dynamic Optimization for areas irrigated by Center Pivot

EPIC simulations (Choi et al, 2011) were used to generate the data used for estimation of crop yield response to irrigation and salinity. The study region along the Elm and North Forks contained many quarter sections of land that could be fully or partially irrigated using center pivots. Out of potentially 50,000 total acres in the study region, we identified nearly 12,300 acres that can be irrigated under the center pivot.

Figure 8. Comparison of irrigable soils outlined from two sections along the Elm and North Fork Rivers.

Figure 8 compares the distribution of irrigable soils in two different 640-acre sections. The irrigable soils in the section on the left are widely scattered while the section on the right could be partially irrigated with irregularly placed pivots. Each section may have a cluster of irrigable soils in a section that allows one to use a quarter mile center pivot.

The response function of crop yield to applied irrigation and soil salinity is an important factor in an optimization model concerning irrigation or irrigation systems with water salinity (Feinerman, 1993). Response functions were also estimated in studies by Dinar and Knapp (1986), Datta (1998), Kiani, Dinar et al (1991), and Abbasi (2009). In this study, EPIC was used simulate the response of cotton yields to different levels of irrigation and water quality for each major irrigable soil type. The Erosion Productivity Impact Calculator (EPIC) simulation data were also calibrated to the actual irrigated cotton yields in the region. The primary reason for choosing cotton over other crops for EPIC simulations was that cotton is one of the major irrigated crops in the region with salt resistance up to Electrical Conductivity (EC) level of 7.7 dS/m.

The outputs of the EPIC simulations were used to estimate the cotton yield and soil salinity response functions. The estimated response functions for each soil type can be incorporated into an economic decision model to determine optimal long-term profit maximizing level of irrigation water for any given level of salt concentration of irrigation water and soil salinity. The non-linear dynamic programming model contains a carry-over function for soil salinity, seasonal and non-seasonal rainfall, pumping cost of irrigation and fixed costs of center pivot system.

In the non-linear 50-year programming model, the information regarding the beginning soil salt level, salt from water, rainfall of growing and non-growing season were obtained from actual soil sampling (Banks et al, 2010) and from historical weather data. The daily weather data were also used in EPIC simulations. Since we are considering the establishment of irrigation systems on potentially irrigable land, capital or fixed costs play a role in irrigation decision. The irrigation well is a onetime cost but the power sources and irrigation systems have to be replaced at the end of their respective economic lives over the 50-year planning period.

Response Function Coefficients for Yield and Soil Salinity

The estimated regression coefficients for each soil type used in NPV estimation (1-3) above are shown in Tables 10 and 11 below. The logic and estimation of these coefficients is described in the technical appendix by Choi et al. (2012). As described in the technical appendix, the equations were estimated by EPIC simulations for the major soil types in the study area. A detailed discussion about the complete list of soils and their functions and parameter estimates is available in the dissertation of Jongsan Choi (2011).

Table 6. Estimated regression coefficients for yield of Cotton lint to rainfall, irrigation, soil salinity and irrigation salinity by soil type

Soil Name	Abbreviation	Intercept	Total Water Applied	Total Salinity	Winter Rainfall	(Total Water Applied)^2	(Total Salinity)^2	(Total Salinity / Total Water Applied)
Tipton	TipA, TtA	-524.38	940.09	1.6022	112.39	-101.98	-1.4344	7.3683
Madge	MagB, MdgB	-506.5	934.13	-1.5346	98.8585	-102.05	-1.5414	13.6835
Roark	RakA	-608.54	984.12	-9.5391	109.09	-108.47	-1.0853	22.8326
Spur loam	SurA	-453.18	889.81	-5.6511	102.58	-93.998	-1.6271	14.5933
Spur clay	SpurA	-593.76	982.9	-0.086	113.44	-109.05	-1.309	11.4911
Tillman clay loam	TillA	625.82	333.04	-15.127	74.39	-30.399	-0.5315	4.5628
Frankirk	FraB	-661.72	1003.36	-9.8095	118.1	-109.98	-1.1999	22.427
Hardemon	HaB, HdmA	-172.27	733.06	0.5949	62.93	-80.732	-2.6511	6.0391
Lawton	LwtA,LwtB	-647.27	1007.96	-4.7276	107.89	-112.73	-1.1186	21.377
Westill	WslA, WtlB	540.69	352.4	-5.6377	68.968	-34.243	-0.7469	3.9715
Abilene	ArnC	-701.52	1052.92	-5.7208	107.77	-119.45	-0.9133	21.2446
Burford	BfdB	-574.03	965.56	-12.127	127.51	-104.57	-0.7261	17.4225
Carey silt	CaB, CbD	-593.59	938.83	-6.8587	144.36	-96.018	-1.2517	5.2844
Grandfiled	GdfB, GfGB, GlGB, GlsD	-204.83	764.17	4.4835	60.62	-86.276	-2.4267	4.1244
Tipton sandy laom	TtA, TtB	-744.73	1049.98	-12.288	122.35	-115.86	-1.3562	27.9303

Source: Choi et al. (2012)

Table 7. Estimated regression coefficients for harvest date and planting date total soil salt in response to irrigation and the salinity of the irrigation water

		Soil Salinity at Harvest					Soil Salinity at Planting		
Soil Name	Abbreviation	Intercept	Irrigat-ion water	Amount of Salt in Irrigation water	Soil Salinity at Planting Day	Growing Season Rainfall	Inter-cept	Soil Salinity at Harvest in Previous Year	Non-Growing Season Precipita-tion
Tipton	TipA, TtA	2.6418	-0.4781	0.7049	0.898	-1.3373	1.2914	0.9149	-1.7457
Madge	MagB, MdgB	2.4821	-0.4519	0.7292	0.8899	-1.2609	1.247	0.9139	-1.7148
Roark	RakA	2.7933	-0.5622	0.7039	0.9164	-1.3277	1.3664	0.9339	-1.8512
spur loam	SurA	2.4821	-0.4519	0.7292	0.8899	-1.2609	1.247	0.9139	-1.7148
spur clay	SpurA	2.6866	-0.4853	0.7046	0.9018	-1.3533	1.2706	0.9216	-1.7321
tillman clay loam	TillA	2.9271	-0.6801	0.696	0.9311	-1.2572	1.3701	0.9494	-1.8865
Frankirk	FraB	2.4821	-0.4519	0.7292	0.8899	-1.2609	1.247	0.9139	-1.7148
Hardemon	HaB, HdmA	1.8523	-0.3885	0.7539	0.8515	-0.9316	1.0541	0.8711	-1.4912
Lawton	LwtA,LwtB	2.7261	-0.5362	0.6988	0.9169	-1.317	1.3195	0.934	-1.8106
Westill	WslA, WtlB	2.5408	-0.5276	0.6854	0.9369	-1.1868	1.2526	0.9499	-1.7693
Abilene	ArnC	3.1533	-0.658	0.6997	0.9182	-1.4716	1.4122	0.9378	-1.9137
Burford	BfdB	3.2036	-0.6683	0.654	0.9349	-1.461	1.3692	0.9503	-1.8581
carey silt	CaB, CbD	2.9288	-0.536	0.6418	0.9072	-1.4389	1.2368	0.926	-1.6985
grandfiled	GdfB, GfGB, GlGB, GlsD	1.9014	-0.3805	0.7578	0.8424	-0.977	1.1058	0.8705	-1.5774
tipton sandy laom	TtA, TtB	2.309	-0.4691	0.7274	0.9048	-1.1015	1.3754	0.9165	-1.8673

Net Present Value Estimation

The net present value for a 50-year period is calculated for each individual parcel of land or pivot circle i.e. each circle drawn using ArcGIS. The circles in figures 7 and 8 represent irrigation circles for which the net present values are calculated. The Net Present Value (NPV) is calculated using the formula,

$$\max_{\text{irr}} \text{NPV} = \sum_{s=1}^{n} A_s \sum_{t=1}^{50} \frac{1}{(1+r)^t} \quad (P * Y_{st} - IC_{st} \cdot Irr_t - OVC_t) \qquad (3)$$

Subject to,

$$Y_{st} = a_{0s} + a_{1s}W_{st} + a_{2s}TS_{st} + a_{3s}NR_{st} + a_{4s}W_{st}^2 + a_{5s}TS_{st}^2 + a_{6s}\frac{S_{st}}{W_{st}} \qquad (4)$$

$$Sh_{st} = b_{0s} + b_{1s}Irr_{st} + b_{2s}IrrEC_{st} + b_{3s}Sp_{st} + b_{4s}Rg_{st}W_{st} \qquad (5)$$

$$W_{st} = (Rg_{st} + Irr_{st}) \qquad (6)$$

$$TS_{st} = (S_{st} + IrrEC_{st}) \qquad (7)$$

$$Sp_{st} = c_{0s} + c_{1s}Sh_{s,t-1} + c_{2s}Rw_{st-1} \qquad (8)$$

where, Y_{st} is yield (lbs/acre) in soil year *t*, A_s is the acreage of a soil type *s* in the individual irrigation circles (number of soils differ for each pivot circle), *P* is the price of cotton lint ($/lb), W_{st} is the total water applied i.e. sum of growing season rainfall and irrigation, TS_{st} is the total salt i.e. sum of salt in soil and salt in irrigation water, Sh_{st} is soil salt at harvest year *t*, Irr_t is irrigation water applied which is one quantity applied to all soils in a pivot area, $IrrEC_{st}$ is salt applied with irrigation water in soil *s* in year *t*, Sp_{st} is soil salt at planting, Rg_{st} is growing season rainfall, Sp_{st} is soil salt at planting, S_{ht-1} is soil salt at previous harvest, R_{wt-1} is non-season (winter) rainfall, C_{irr} is the irrigation cost ($/acre-feet), OVC_t is the operation cost and, *r* is discount rate, *s* is the soil type.

The NPV is maximized by optimization over all the soils with same irrigation quantity. The term Irr_t in equation (3) implies the quantity of irrigation for the year. Subscript *s* is removed for the rainfall and irrigation water terms, as they are a single quantity for all the soils across a pivot area. The Excel Solver is used to maximize the NPV by selecting a single quantity of water applied to all soils for each year within a pivot circle.

The NPV for a pivot circle is estimated as an acre weighted average of the NPV's for each of the soils covered by the pivot. For example, suppose a pivot circle has three different soils, 50 acres of Tipton loam, 40 acres of Madge and 34 acres of Roark soil. The sum of the NPV for each soil type multiplied by their respective acres would provide the total returns for the individual pivot field. Calculation of NPV for individual soils estimated using equations 3 to 8, can be added up for the final weighted yields for that irrigation circle (or piece of land). Estimates of net revenue over a 50-year period can then be used to estimate NPV at a discount rate of 4 percent (Natural Resource Conservation service, 2011).

An essential element in the cost benefit analysis is the difference between returns with and without the project. As rainfall is the only source of water available to the crop we are assuming no effect of salinity on the dry land yields and net returns for the without project estimates. Once net returns from dry land cotton are subtracted from the net returns of irrigated cotton, we find the net agricultural benefits from adopting irrigation practices.

Variable and Fixed Costs

The total costs that are subtracted for the net social benefits are divided in to two parts. Variable costs include inputs costs (minus the revenue from the cottonseed), pumping costs, labor and interest on non-irrigation equipment. These costs are subtracted as a part of the profit maximization problem with irrigation as a choice variable. Oklahoma State University's enterprise budgets (2010) are used for all other variable costs that are involved in cotton production. Total other variable costs (OVC), besides irrigation, were $ 434 per acre per year. Fixed costs, revenue from seeds, machinery costs were excluded from the budget when calculating the OVC for optimization.

Estimation of the Pumping Costs

The total pumping costs depend on the pumping head and pressure at which the water is applied using a center pivot. The depth of irrigation well is the total head of the water applied. A standard low-pressure pivot was assumed operating with a 35 psi pressure at the pivot point and 15 psi pressure at the nozzle.

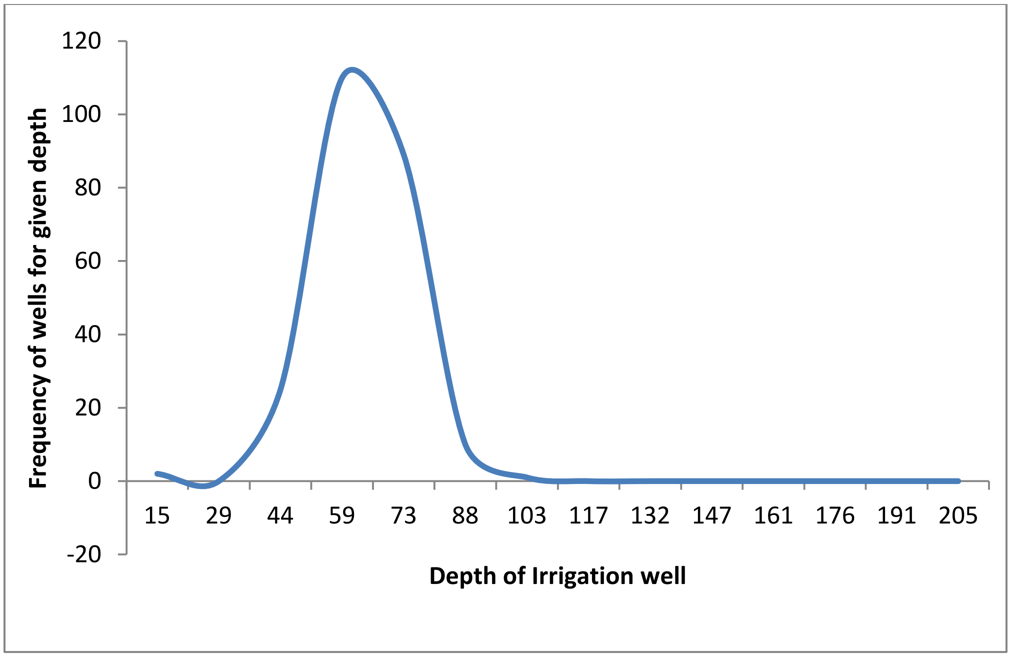


Figure 9. Frequency distribution for depth of existing irrigation wells along the Elm and North Forks encouraging the development of 100 feet deep wells along the river

Figure 9 above shows the distribution of the well depth of the of 237 irrigation wells along the Elm and North Forks. GIS tools were used and an intersection of the wells with the sections was taken. The mean of the depth of the wells was 59 feet with standard deviation of 16 feet. The frequency distribution above shows that majority of the wells are within the 29 and 88 feet depth that encourages us to believe that 100 feet well depth along the river would be sufficient for the purposes of irrigation within 2 miles of the Elm and North Forks. The total dynamic head will vary for each field based on the distance from the river.

Since the distance from the river varies for each individual pivots, so does the cost of pumping water from the river to the pivot field. There is a considerable amount of pressure drop for each pivot based on distance from river. Cost of pumping an acre-foot of water per acre was calculated using Hazen Williams Formula for pressure drop below:

$$P_d = 4.52 \frac{q^{1.85}}{(c^{1.85} d^{4.8655})} \qquad (11)$$

Where, P_d is pressure drop (psi/ft pipe), c is design or friction coefficient determined for the type of pipe, q is the flow rate (gallons per minute), d is inside diameter (inches) of the pipe.

The pressure drop, depending on the distance varies from 11 to 20 psi. i.e. the required pumping pressure to operate a pivot at 35 psi ranges from 36 to 55 psi. This range will vary for each scenario as the number of feasible pivot acres vary. Pivot efficiency considered at 85 percent is included in the pumping cost. For every ac-ft of water applied, 1.17 ac-ft must be pumped. For example, if a field requires 1 ac-ft of water per acre, we would need to pump 1.17 ac-ft to achieve the desired level of irrigation water quantity. The cost of pumping was adjusted so that the cost of 1 ac-ft irrigation would be cost of irrigating 1 ac-ft multiplied by 1.17.

Table 8 shows the average pumping costs per acre for three different rainfall levels, two irrigation water EC's and two cotton lint prices. The cost of pumping water was calculated using the irrigation energy costs model (Pacey and Lamm, 2004) with a low pressure pivots using 35 psi and natural gas as the source of energy with a pump efficiency of 80%. Natural gas was considered as the readily available and the least expensive fuel for pumping. The two cotton lint prices used are 70 cents/lb (National Cotton Council, 2010) and 54 cents/lb (Economic Research Service, 2011). The price 70 cents/lb represents the prices published by National Cotton Council at cotton.org under the list of 'prices received by farmers' (2010). The 54 cents/lb price is the marginalized cotton price published by the Economic Research Service (ERS) of the USDA.

Table 8. Average irrigation costs per acre with two irrigation water EC's, two Cotton prices and three rainfall scenarios

Average Irrigation cost per Acre along the Elm Fork				
		Irrigation Cost/Ac ($/ac-ft)		
Irrigation Water EC (dS/m)	Cotton Price ($/lb)	10% Decrease in Rainfall	Average Rainfall	10% Increase in Rainfall
2.2	0.54	50.3	48.9	49.5
0.9	0.54	69.5	66.9	65.3
2.2	0.70	54.3	54.8	55.2
0.9	0.70	80.0	76.9	75.0
Average Irrigation cost per Acre along the North Fork				
		Irrigation Cost/Ac ($/ac-ft)		
2.2	0.54	54.2	48.9	48.2
0.9	0.54	69.2	66.0	64.0
2.2	0.70	53.5	53.0	53.4
0.9	0.70	78.5	75.3	73.4

A summary of the fixed costs shown in table 9 include the buying of pivots, costs of wells, pumps, motor etc. Table 8 shows the summary statistics costs per acre for all 4,489 acres along the Elm Fork and 8,201 acres along the North Fork. These costs are subtracted after from the maximized NPV estimated over 50-year period. The pivots were replaced every 17 years. The annual amortized cost of a pivot is nearly $ 3,600 per year. The present value of the 50-year for the annual cost for a period of 50 years is $ 79,000. The cost of a pump, with a 20,000 hour of life span, is calculated based on annual usage. On a pivot, operating at 600 gallons per minute applying approximately 17 acre-inches of water per year on average would likely last 10-12 years. The capital costs of pumps were discounted at 4% assuming that one would need to buy a pump every 10 years. The costs of buying pumps are a part of the fixed costs subtracted from estimated NPV of net revenue from irrigated cotton. Present values of all amortized fixed costs, at 4% over 50 years, were subtracted from the NPV calculated from optimization over variable costs with irrigation development.

Table 9. Summary of fixed costs per acre and distance from river for center pivot irrigation

	Elm Fork (4,489 acres)		**North Fork (8,201 acres)**	
	Pipe Length(ft)	Capital cost ($/Ac)	Pipe Length(ft)	Capital cost ($/Ac)
Mean	3,703	112	6,162	131
Maximum	8,046	150	12,707	262
Minimum	886	87	262	71
Std Dev	2,036	18	2,606	37
Median	3,260	108	6,344	123

The cost for purchase and installation for different sizes of PVC pipe, from 8 to 12 inches in diameter, were estimated for each pivot field. Mossman et al. (2009) was used to estimate the cost of buying a new pipe, excavation and backfilling. The costs of trenching for larger and smaller pipelines are different. Total earthwork cost was calculated as a sum of trenching, backfilling, and packing costs (Ghimire *et al*, 2012).

Leaching in the Off-Season

A leaching fraction is the amount of excess irrigation water used to leach the salt down to reduce the root zone salinity in long run (Hanson, 1993). Blaine Hanson (1993), Irrigation and Drainage specialist at University of California, explains in *Drought Tips*, "Leaching is applying irrigation water in excess of the soil moisture depletion level to remove salts in the root zone. The excess water flows down through the root zone, carrying salts with it."

The leaching fraction is a useful tool in achieving lower salt accumulation in the soil over the long run. Applying leaching water in the off-season will reduce the soil salinity at the planting day of the next season. It was assumed that a 4 inches or 0.3 ac-ft would be added before the season. A water quantity of 0.3 ac-ft per acre with an EC of 2.2 dS/m would add 0.57 tons of salt per application. This quantity goes up to 0.78 tons for an EC of 3.0. Since, higher salinity causes to reduce the yields faster, we have added the leaching water for the scenarios of average and 10% below average rainfalls with water EC of 2.2 dS/m and 3 dS/m. The leaching was incorporated by modifying the salinity carry over equation.

The soil salinity at planting day is modified as follows,

$$Sp_{st} = c_{0s} + c_{1s}Sh_{s,t-1} + c_{2s}(Rw_{t-1} + LF) \qquad (3.1)$$

The variable, LF is the quantity of water applied for leaching in the off-season. Sp_{st} is the soil salinity at the planting day in year t, $Sh_{s,t-1}$ is the soil salinity at harvesting day in previous year t-1 and $Rw_{t-1}$is the off season rainfall.

The total salt variable will also change in the optimization equations. Total salt will be

$$TS_{st} = (S_{st} + IrrEC_{st} + IrrEC_{st} * LF) \qquad (3.2)$$

Where $IrrEC_{st}$ is the salt added by an acre-foot of water application at a given *EC, LF* is the quantity of water applied for leaching (0.3 ac-ft per acre).

The quantity of 0.3 ac-ft for leaching fraction was approximated by using the Figure 1 of ‘Drought Tips, 92-16’ authored by Hanson (1993). The graph indicates that a 30% leaching would be sufficient if the water EC ranges between 2.2 and 3 dS/m; with cotton crop’s tolerance of root zone salinity at EC 7.7 dS/m (FAO, 1994).

Irrigation by Traveling Reel Sprinkler

The objective in this part is to describe the methods used to estimate the portion of the study area along the Elm and North Fork Rivers that could be economically irrigated with a traveling reel sprinkler system. The study area consists of sections transversed by or adjacent to sections transversed by the Elm or North Fork Rivers in southwest Oklahoma.

As reported previously, there were 50,500 acres of irrigable soils in sections transversed by or adjacent to sections transversed by the Elm and North Fork Rivers as estimated by GIS methods (Tongco *et al,* 2011). However, the quantity and spatial distribution of irrigable soils in each section required special processing to determine number of acres, the capital required, and the net benefits from irrigation water in each section. The traveling gun or traveling hard hose reel sprinkler is capable of operation on irregularly shaped contiguous areas. The economic feasibility of establishing a traveling reel irrigation system depends on the area and the number of sets or times the system is repositioned and the length of pipe (assumed to be buried in this study), and the pumping head necessary to irrigate an irregularly shaped area or polygon of irrigable soils.

GIS Methods

The areas of irrigable soils (USDA-NRCS, 2010) were overlaid on NRCS photo-maps (USDA-NRCS, 2088). Polygons were hand drawn around areas or clusters of irrigable soils in each of the 300 sections along the Elm and North Fork Rivers. As an example, section 22-T6N-R24W is shown in Figure 10 below. In Figure 10, the polygons with PI soils (Irrigation capability I-III and slopes < 3 percent), are overlaid on a USDA 1-meter photo map. The photo map was used to avoid physical obstacles such as roads, gullies, buildings which are not shown on the soils and elevation maps.

The next step was to overlay an 80-meter fishnet grid over the study area and to intersect it with the PI soil polygons. An intersection of the polygons drawn around the irrigable soils with the 80 square meter (1.58 acres) fishnet gave a series of 80-meter grids representing irrigable soils as shown below. The shape file formed by the intersection was saved to disk. The 80-meter grids are outlined within the PI soil polygons in Figure 10. The area within each of the grids was recalculated. The elevation of each 80-meter polygon was obtained by loading the ESRI shape file into a second program Global Mapper. In Global Mapper, the shape file was over laid on a 10-meter USGS elevation file. The Global Mapper program has a feature that allows easy appending of the elevation and map coordinates to features in a shape file.

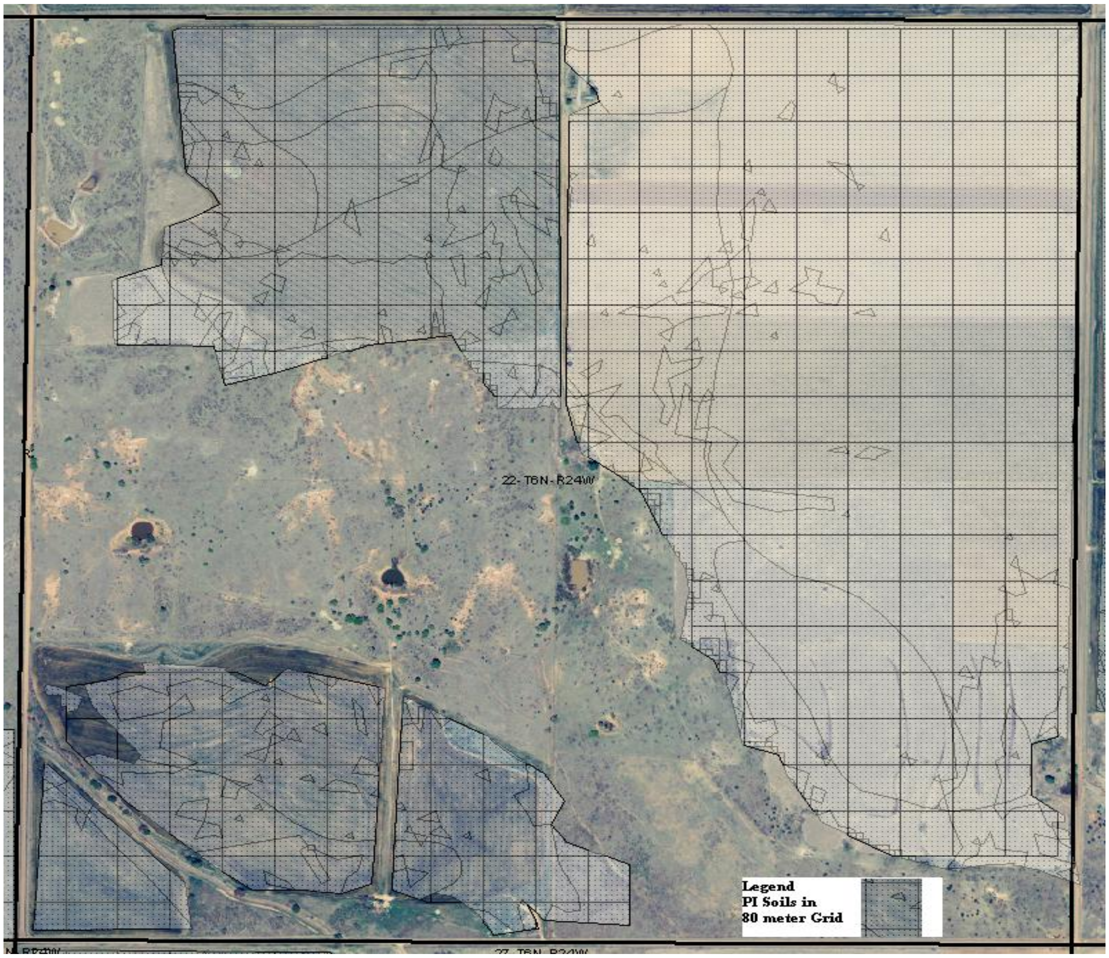


Figure 10. Eighty-Meter grids overlaid on potentially irrigable soils with slopes less than three percent on a section of land as the first step in measuring areas coverable with a Traveling Reel irrigation system

Well and Pipe Locations

Two scenarios were used depending on whether the irrigable parcel was within a section transversed by the river or were located in a section that was adjacent to a land section transversed by the river.

Case One: Case one is illustrated in Figure 11 where irrigable polygons are located in a section transversed by the river. The well is located in the alluvial plain next to the river. The wells on each side of the river were located so that more than one polygon could be served by the well. The length of the pipeline from the well to each polygon, along with the change in elevation between the well and the centroid of each polygon was used in calculating the variable pumping cost.

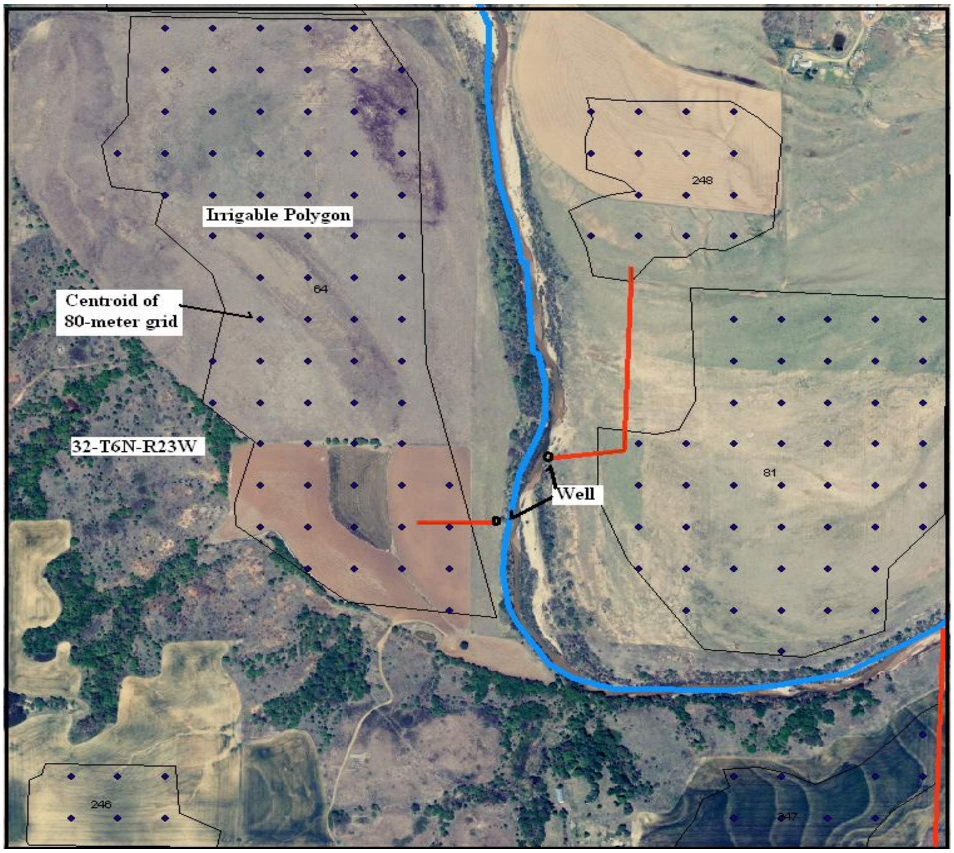


Figure 11. Example of well location and pipes to irrigable polygons overlaid on a photomap in a section transversed by the River

Case Two: Case two is illustrated in Figure 12. The Polygon(s) was located in a section adjacent to a section transversed by the Elm or North Fork Rivers. The main effect was that the wells were assumed located near the intersection of the public right of way and the Elm and North Fork Rivers. Pipeline routes then followed the public right of way until they reached the section of land where the irrigable polygons were located. The distance and change in elevation from the well to the polygon were used in estimating the capital cost and the variable cost of irrigation.

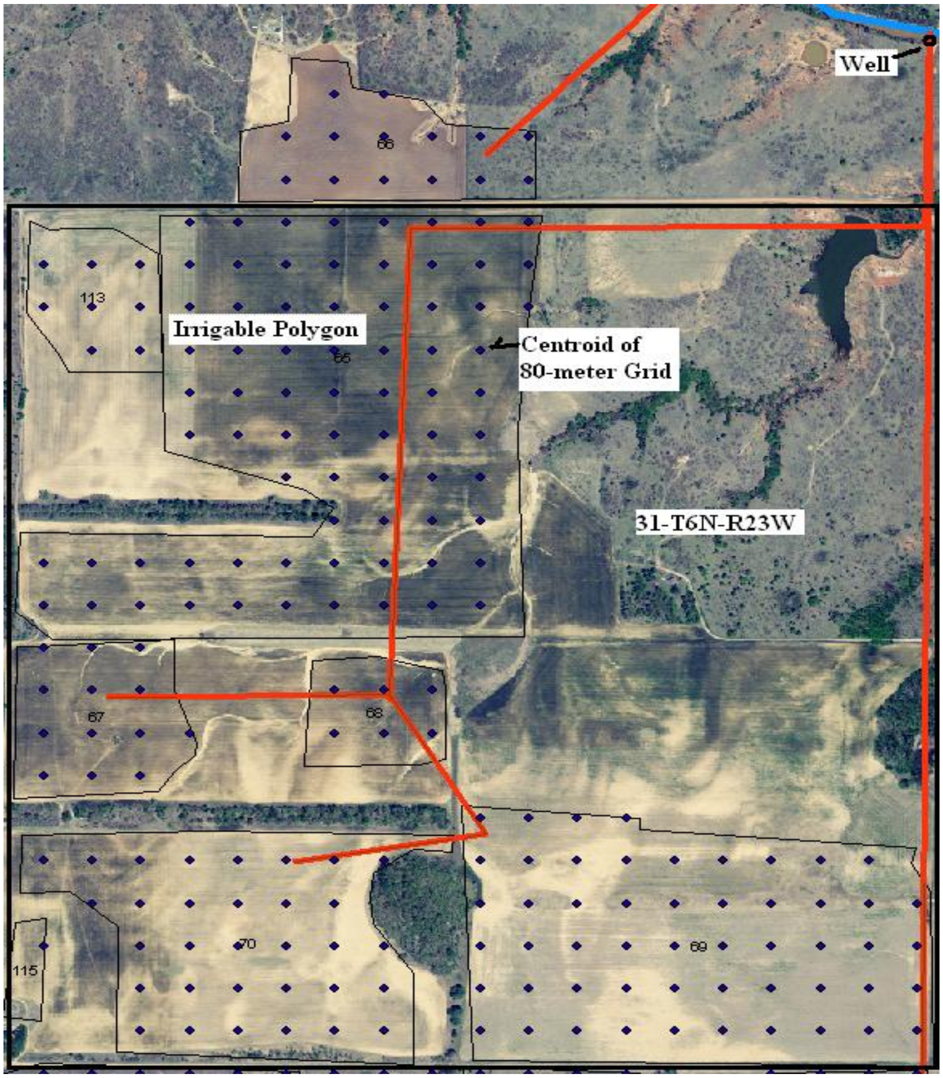


Figure 12. Example of well location and pipe layout to irrigable polygons for a section adjacent to a section that is transversed by the river

Configuration Polygons for Irrigation with a Traveling Reel Sprinkler

It was assumed the producer would use a hard hose traveling reel with a 1,320-foot five-inch diameter hard hose which allows coverage of the effective wetted strip up to ¼ mile long by up to 80 meters (243 feet) wide. The width of the strip depends on the pressure, gpm, nozzle size, and nozzle angle. While there are large numbers of possible sizes of traveling reel sprinklers, a single large system model with a 400-600 GPM capacity was used for the economic analysis.

The general design of a hose drawn traveling reel system with 1,320 feet travel lanes with 80 meter or 262 foot travel widths is shown below in Figure 13. Several points that need to be considered in the operation of a hose drawn traveler are illustrated in the diagram below. The adjustments made to the radius of the wetted irrigation circles are outlined at the right of Figure 13. First, the wetted diameter must be adjusted for wind speed. The average July and August wind speed as recorded by the Altus MESONET (Oklahoma Climate Survey, 2010) station from 1994-2011 was 9.27 mph. The effective wetted diameter was reduced to 62 percent (Keller, 1990). A second point is that an adjustment must be made in the irrigated circle to keep the traveler path dry. This means the sprinkler does not make a complete circle. A 320 degree area was assumed. In addition, consideration must be given to the starting and ending points of travel. In this study, the starting point is assumed to be at the end of the tow path. The ending point (EP) is given by Keller (1990) as EP = (2/3)R where R is the radius of the wind adjusted wetted diameter. The application rate must be calculated upon the solid portions of the wetted circles shown below in Figure 5 and adjusted travel distances illustrated.

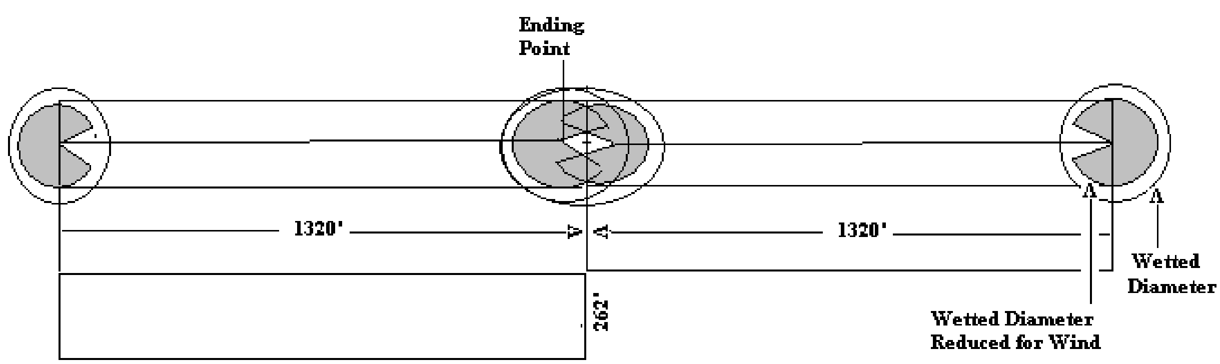


Figure 13. Illustration towpath, wetted diameter, wind speed adjustments, and travel length.

Determination of Most Efficient and Practical Irrigation Pattern

One problem is to examine odd shaped areas and determine the most efficient pattern for irrigating an area. Figure 14 shows an analysis of weather to select a north-south or east-west orientation for the travel lanes in a single irrigable polygon. The numbers in each of the grids in Figure 14 are the acres in that grid. The size of the grid was trimmed to exclude non-irrigable soils. Each travel lane is 80 meters wide and can extend up to 1,320 feet in length. A single set could cover up to five contiguous 80-meter grids. Each additional parallel path required an additional 80 meters of lateral pipe. It is assumed one hour is required to reset the traveler after it reaches the end of each path. The time required to set up for another path was assumed one hour regardless of whether the next path is in the opposite direction or a move 80 meters parallel to the current path. If two paths can be completed from each point on the required lateral then less capital cost is required for each irrigated acre. Possible paths containing only one or two contiguous grids were ignored. The method used, was to write a VBA macro to compare whether having a north-south infield with east-west travel paths or having an east-west lateral with north-south traveler paths would be the most profitable. The nature of the results is illustrated in Figure 14.

In a panel of Figure 14, a north-south lateral is tested. With the north-south lateral, there are 14 paths for the traveling reel that could be served by 560 meters of (7x80m) underground lateral pipes in the field. These 14 paths would cover 82.4 acres. Thus, 14 hours of labor are required per irrigation application. The east-west lateral (panel b) would serve 12 sprinkler paths and would be 640 meters (8x80) in length. The configuration in panel A is the most economical. The method is designed to serve as an approximation and is not totally accurate. For example, if the lateral were placed between grids 4 and 5 rather than between grid rows 5 and 6, more area could be covered with the same total labor and capital.

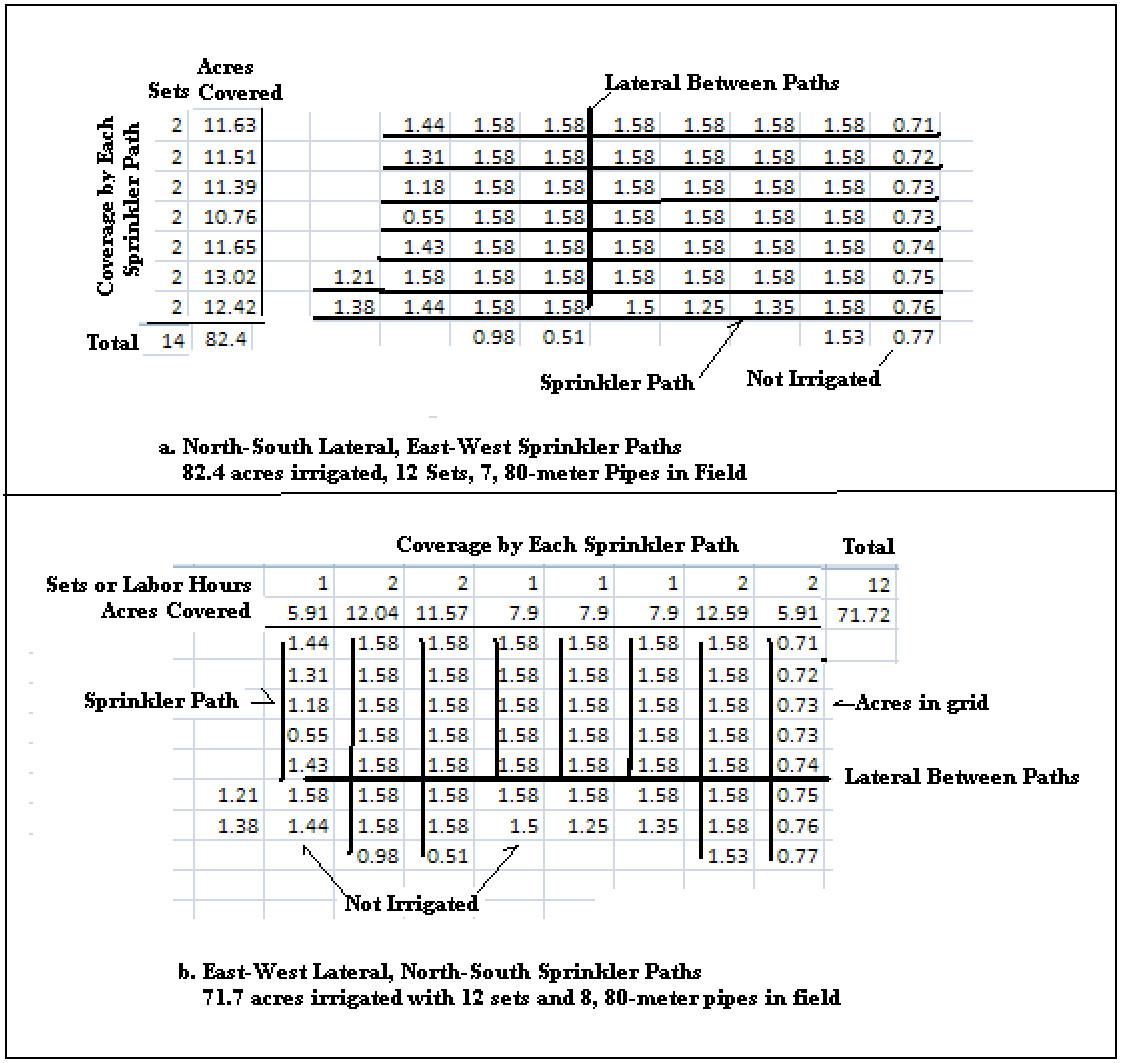


Figure 14. Comparison of acres irrigated, number of sets, sprinkler paths and labor required between an East-West and North-South lateral on an irregular shaped field.

Configuration of the Model Traveling Reel Sprinkler

The relationship between nozzle diameter, GPM and pressure was taken from by the Midwest Planning Manual (MPMS, 1999). The relationship is GPM = Cd (29.83) d^2 $PSI^{.5}$, where Cd is an adjustment coefficient between 0.95 and 1.00, PSI is pressure in pounds per square inch, and d is nozzle diameter in inches. For this study, operating pressures and welted diameters were based on published values for the models 150T and 200T Nelson Big Gun Systems (Nelson, 2012). For these systems, a value of .95 for the parameter Cd was adequate. For this study, the equation was reorganized as

$$PSI = \frac{GPM}{(28.837d^2)^2}$$

The relation between the predicted and actual pressure is shown in Figure 15 below.

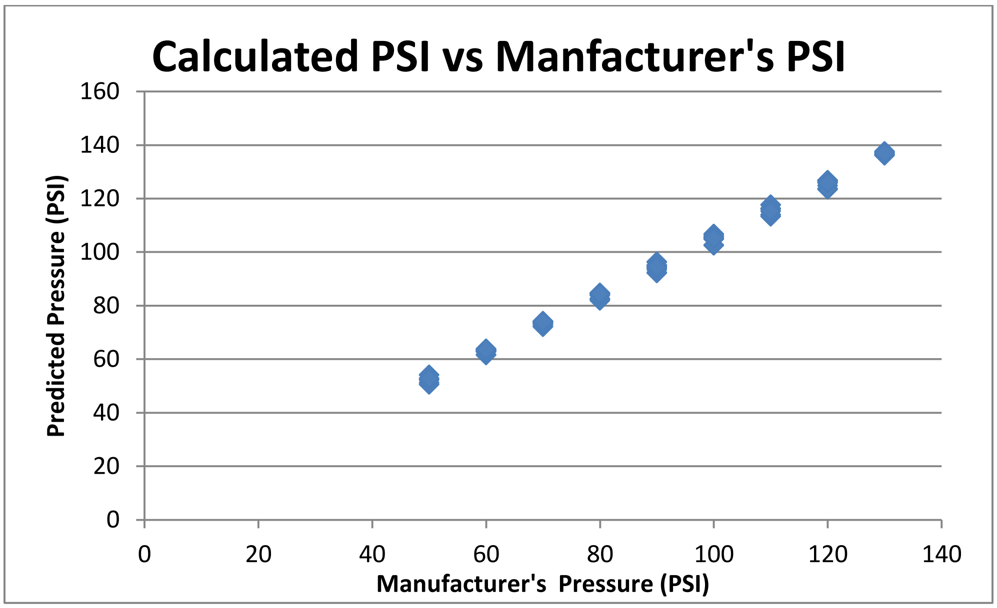


Figure 15. Relation between predicted and actual nozzle pressure from published data from manufacture’s data for Nelson Big Gun Models 150T and 200T

Multiple regressions were then used to establish the relation between wetted diameter, GPM, and PSI based on published data (Nelson, 2012). Data from models that provided for discharges between 400 and 500 gpm, with pressures between 50 and 110 PSI, and produced wetted diameters between 260 and 350 feet. The regression model was

Wd =19.12 Dmd + 1.33PSI + 247.34 Nzd + 0.104 GPM + .00015 GPM^2 -0.164 Dzn * GPM, (10.53) (25.63) (54.27) (3.06) (7.82) (7.31)

AdjR^2=.99

Where Wd is the wetted diameter in feet,

Dmd is a zero-one dummy variable which = 1 for the 200T model,

PSI is the pressure in pounds per square inch,

Nzd is the nozzle diameter in inches,

GPM is the discharge in gallons per minute, and

t values in are shown in parenthesis.

The wetted diameter is then adjusted downward because of average daily wind speeds in the Altus area. The Altus Mesonet average daily wind speed during July and August from 1994 through 2010 was 9.27 mph. Interpolation from Table 13.1 in Keller and Bliesner (1990) , for a wind speed between 9 and 10 mph, indicated the wetted diameter should be reduced by 62 percent.

Variable Pumping Cost

The formula for brake horse power required (Keller and Bliesner, 1990) was given as,

BHP = GPM*HD /(3990*Pe*Me) ,

where BHP is brake horsepower,

GPM is gallons per minute,

HD is head in feet,

Pe is pump efficiency, assumed to be 70 percent, and

Me is motor efficiency, assumed to be 90 percent for an electric motor.

Total head (in feet) is equal to the pumping lift plus change in elevation + head loss in the transmission pipe. The head loss in the transmission pipe is given by the Hazen Williams formula .

$$Hd = [10.51(GPM/C)^{1.85} / D^{4.8}] * Len,$$

where GPM is gallons per minute,

C is the friction coefficient (150 for PVC pipe),

D is the inside pipe diameter in inches, and

Len is the length of pipe in feet.

Maximum Annual Irrigable Area: The determination of the area that could be fully irrigated was based on Banks (2008) who recommended the system replace between .25-.40 inches per day during the period when the cotton was 75-118 days old. The recommendation was to apply 1.25-2.1 inches every 6-7 days from July through mid August.

Table 10. Example of coefficients used for the Traveling Reel irrigation system

Configuration of Traveling Reel Sprinkler with an 80 Meter Wetted Diameter under 9.3 MPH Wind Speed	
Item	Value
GPM	473.00
Application Efficiency	0.75
Nozzle Diameter (inches)	1.40
Predicted PSI [a]	63.18
Predicted Wetted diameter (ft) [b]	422.58
Wind Speed (mph)	9.27
Wind Width Adjustment Factor [c]	0.62
Desired Wetted Diameter (80 meters) ft	262.00
Wetted Diameter Adj. for Wind	262.00
Application Rate (inches/hr)	0.301
Desired Application (inches) [d]	2.10
Hours Required	6.98
Travel Speed (ft/hour)	60.51
Hours / 1320 ft Path	21.8
Acres/day	12.8
Acres/7 day cycle	89.6

[a] With Equation 1
[b] With Equation 2
[c] Interpolation from Keller and Bliesner (1990), Table 13.3.
[d] From Banks (2009)

According to the above equation, a system with 472 gpm would result in an effective wetted diameter of 80 meters or 262 feet with 63 PSI. The estimated travel speed is 60.5 feet per hour, which would allow irrigation of approximately 12.8 acres per day. Following Banks, (2008) a 6 to 7 day irrigation cycle would allow coverage of 77 to 90 acres in the average year.

Multiple Step Optimizations

The optimization (estimation of the maximum discounted benefits) that could be obtained from well and pipeline that served all or portion of several polygons in a section was done individually by polygons served by a single well and pipeline. Figure 16 illustrates an example section containing eight polygons of irrigable soils, any combination of which might be irrigated from a well and pipeline.

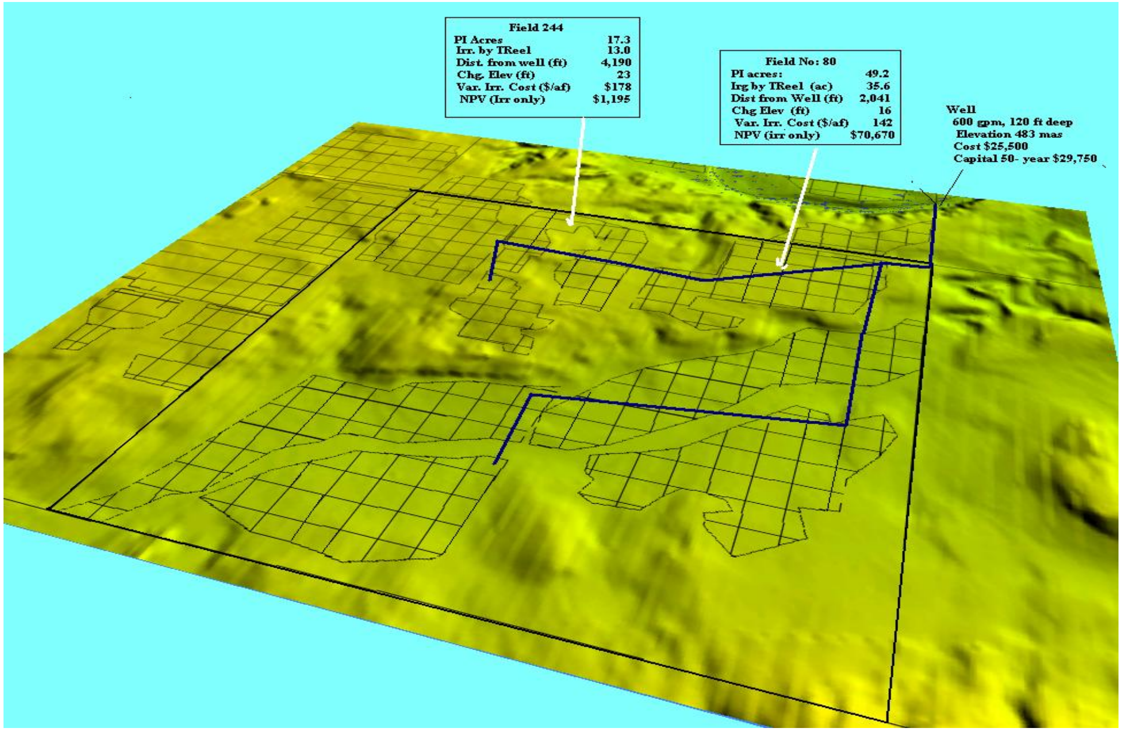


Figure 16. Section of land with irrigable soil polygons on an elevation map in 80-meter grids and a potential pipeline from the irrigation well on the alluvial plain of the river to each polygon of irrigable soils with 50-year net present values of irrigation revenues less variable production costs for each polygon

The steps taken are outlined below and then discussed in more detail. The steps were:

1. Estimate the 50 year discounted returns over variable irrigation costs for each polygon by multi-period nonlinear programming.
2. Use mixed Integer Programming (MIP) to determine the most profitable area and combination of polygons that could be linked by infield pipelines.

Step One. In step one, the individual soil types within each individual polygon were determined by intersecting the polygon with the SURGO soil data set. The soils were assigned to one of the 15 soil types for which response functions had been estimated by Choi (2012). In that study, Choi (2012) estimated three dynamic equations to predict

i. The cotton yield subject to the soil type, the amount and salinity of applied irrigation water, and the amount of salinity in the soil each year.

ii. The amount of salinity in the soil at planting given the previous year's level of soil salinity, irrigation water, rainfall, and salt applied with the irrigation water.

The general form of the soil specific response function and the independent variable are given below. The algebraic function for the irrigated yield of cotton on soil type s in year t is

$$Y_{st} = a_0 + a_1 W_{st} + a_2 TS_{st} + a_3 R_{pt} + a_4 W_t^2 + a_5 TS_{st}^2 + a_6 \frac{TS_{st}}{W_{st}} \quad (2.1)$$

where $W_{st} = (R_{gt} + Ir_{st})$, and $TS_{st} = (S_{spt} + Ir_{EC})$,

Y_{st} is yield (lbs/acre) on soil types in year *t*,

W_{st} is the total water applied in year t (i.e. sum of growing season rainfall R_{gt} and irrigation Ir_{st}),

TS_{st} is the total salt, the sum of salt in soil at planting (S_{spt}) and salt added through irrigation water Ir_{EC}

R_{pt} is total rainfall received from the last harvest until planting

(Ir_{EC}) is the amount of salt added with irrigation water Ir_{st}

Two equations were estimated to link current salt in the soil to previous levels of salt and the amount of salt added through irrigation. Equation (2) estimates the amount of salt in the soil at harvest and equation (3) estimates the amount of salt in the soil at planting in year t+1. These equations were

$$Sh_{st} = b_0 + b_1 Ir_{st} + b_2 Ir_{ECt} + b_3 Sp_{st} + b_4 R_{gt} W_{st} \quad (2.2)$$

$$S_{pt+1} = c_0 + c_1 S_{sht} + c_2 R_{wt} \quad (2.3)$$

Sp_{st+1} is soil salt at the next seasons planting for soil s,

Sh_{st} is the amount of in soil s at harvest

Ir_{st} is the amount of irrigation applied to soils *s* in year *t*

Rg_t is the amount of growing season rainfall received, and

Rw_t is the amount of winter rainfall received.

Response Function Coefficients for Yield and Soil Salinity

The estimated regression coefficients for each soil type used in equations (1-3) above are shown in Tables 6 and 7 earlier. The logic and estimation of these coefficients is described in the technical appendix by Choi et al. (2012). As described in the technical appendix, the equations were estimated by EPIC simulations for the major soil types in the study area.

Profit Maximizing Level of Irrigation and Salinity Management for a PI Polygon

The objective in the nonlinear optimization in step one was to solve for the single amount of irrigation water (with a specified level of salinity) in each of 60 years that would maximize the soil type acreage weighted NPV of returns over variable irrigation costs. That is single application rate is used on all soils in a polygon.

$$\max_{\text{Irrt}} \text{NPV} = \sum_{s=1}^{n} A_s \sum_{t=1}^{T} \frac{1}{(1+r)^t} \{P \cdot Y_{st} - C_{irr} \cdot Irr_t - C_o\}$$

Where As is the acreage of soil types

P is the price of cotton lint

Y_{st} is the yield of cotton on soils in year t

C_{irr} is the cost of an acre foot of irrigation water,

Irr_t is the amount of irrigation applied in year t, and

C_o are constant variable costs for irrigation.

The yield on each soil type for each year is subject to equations (2.2) and (3.2) above. The amount of irrigation may change from year to year in response to soil salinity. A 60-year period was chosen for the optimization because it was noticed that during the last five years of a planning horizon the optimization program found it optimal to apply more water and allow salt to build up because the optimization assumes there was no production or value beyond the planning period. Only the discounted value for the first 50 years was recorded and used in the next step. Other values recorded from this stop included losses from leaching of soil salt and nitrates.

Table 11 and Figure 17 below illustrate the nature of the results obtained from the nonlinear optimization. There are NPV_s from five acreage-weighted polygons, each solved separately. All of the polygons in Table 11 are supplied from a single well and pipeline leading to polygon 1. The NPV of each polygon ranges from $31 to $117 thousand in value and from 32 to 152 acres in size. Assume the traveling reel is capable of irrigating 80 acres in a season. Which of the polygons should be irrigated and which should be ignored? A spatial arrangement of the polygons and the additional capital cost of all possible pipelines linking the five polygons is shown in Figure 17.

Table 11. Example Net Present Value of irrigation returns less the variable irrigation costs for a section with five irrigable polygons

Polygon	Acres	NPV of Gross Irrigation. Benefits from Polygon [a]
		$000
1	64.3	$ 65
2	129.1	$ 66
3	36.8	$ 39
4	151.8	$ 117
5	32.0	$ 31
[a] Only the Capital for Cost of Underground Pipe in Each Polygon has been Subtracted		

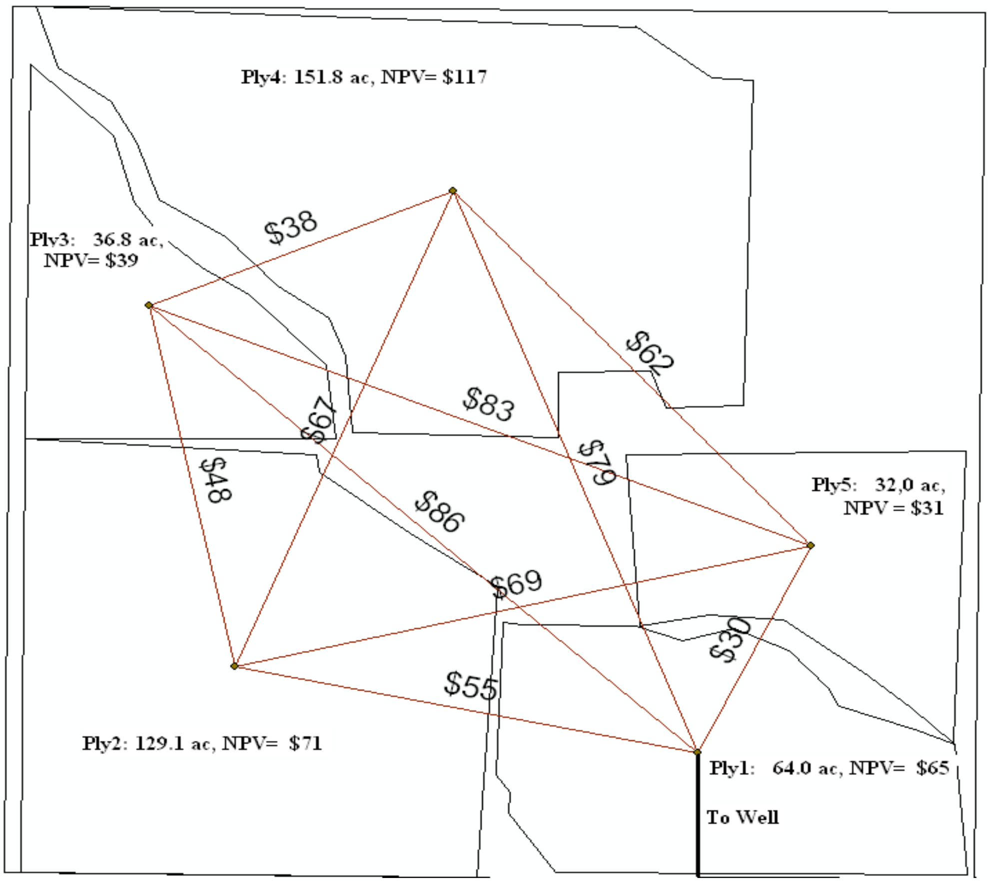


Figure 17. Example section with five irrigable polygons with acres and net present value less the capital cost of infield pipe and the cost of possible additional pipeline between polygon controls to irrigate more acreage than available in the first polygon.

In Figure 17, polygon 1 with 60 acres can be irrigated and the $63,000 collected with no additional investment. However, since the traveling reel sprinkler is capable of irrigating 80 acres the question is which, if any, of the possible pipeline investment should be undertaken? For example, a $55,000 or a $30,000 investment would allow irrigation of parts of polygon 2 and 5 respectively. It is conceivable that polygon 1 should be ignored and that irrigation choices be made among the remaining polygons. The solution to the problem of which polygons to irrigate and which additional pipelines to use, can be obtained using mixed integer programming. A tableau setup for the general solution of sections with five irrigable polygons is given below in Table 11.

In the tableau in Table 12, the NPVs of each of the five polygons are entered in the objective function row for variables Plyg1-Plyg5 respectively. These 5 activities are non-integer but bounded between 0and 1. There is a coefficient of 1 in the respective rows Pipe2 through Pipe5 below the respective variables Plyg2 through Plyg5. The right hand side value for these rows is 0. Thus, the net present value associated with Ply2 through Plyg5 cannot be obtained unless specific pipeline investments are made.

The remaining variables in the tableau in Table 11 represent investments in pipelines that connect polygons in a specific. All of these variables are defined as 0-1 integer variables. Activity P12 represents connecting polygons 1 and 2 with a pipeline at a cost of $55,000. Activity P123 connects polygon Plyg1 to Plyg2 and Plyg2 to Plyg3 at a cost of 103 thousand dollars.

.

Table 12. Mixed Integer Programming tableau to determine which of the five irrigable polygons to irrigate in two segments

Item	Activity Name		Plyg1	Plyg2	Plyg3	Plyg4	Plyg5	P12	P13	P14	P15
	Activity Level		1	1	1	1	1	1	1	1	1
	Objective	-1901	65	66	39	117	41	-55	-86	-79	-30
	RHS	Qt used									
Tot. Irig. Acres	80	402.7	60	129.1	36.8	151.8	25				
Pipe to Pg2	0	-7		1				-1			
Pipe to Pg3	0	-9			1				-1		
Pipe to Pg4	0	-9				1				-1	
Pipe to Pg5	0	-9					1				-1

Activity Name	P123	P143	P124	P134	P125	P135	P145	P1234	P1235	P1435	P1245	P1345	P12345
Activity Level	1	1	1	1	1	1	1	1	1	1	1	1	1
Objective	-103	-117	-122	-124	-124	-169	-141	-141	-186	-179	-184	-186	-203
Tot. Irig. Acres													
Pipe to Pg2	-1		-1		-1			-1	-1		-1		-1
Pipe to Pg3	-1	-1		-1		-1		-1	-1	-1		-1	-1
Pipe to Pg4		-1	-1	-1			-1	-1		-1	-1	-1	-1
Pipe to Pg5					-1	-1	-1	-1	-1	-1	-1	-1	-1

The MIP solution to the problem shown in Table 13 below indicates it is optimal to irrigate all of polygon 1 and 80 percent of polygon 5 by building pipeline from pipeline from polygon 1 to polygon 5. The NPV is $67.8 thousand dollars. In this case, there is only a slight gain from building the pipeline from Plyg1 to Plyg2 as the gain from 80% of polygon 5 is only .8*$41 - $30 = $2.8 thousand dollars.

Table 13. Optimal solution to the MIP problem shown in Table 12 with 80 acres irrigated and construction of a pipeline connecting polygons 1 and 5

			Plyg1	Plyg2	Plyg3	Plyg4	Plyg5	P12	P13	P14	P15
		Level	1	0	0	0	0.8	0	0	0	1
Objective Value		67.8	65	66	39	117	41	-55	-86	-79	-30
	RHS	Qt used									
Acres	80	80	60	129.1	36.8	151.8	25				
P2	0	0		1				-1			
P3	0	0			1				-1		
P4	0	0				1				-1	
P5	0	-0.2					1				-1

The next-to-final step is to subtract the present value of the capital cost to drill the well, construct the pipeline from the well to polygon 1, and purchase (and replace) the traveling reel sprinkler every 10 years over a 50 year period. The cost estimate for this section, which is adjacent to a section that is transversed by the river, is $227,000, which greatly exceeds the optimal $67,800 (Table 13) from irrigation over the returns less the cost of the pipe in the field. One would conclude it is not economically viable to establish traveling reel sprinkler irrigation on this section with the cotton price of $0.54 and EC levels (2.2 ds/m) assumed in the analysis.

The final step is to subtract the 50-year NPV from growing dryland cotton rather than irrigated cotton. The focus of the analysis is the future with and without irrigation.

The assumption is that dryland cotton would be the main crop grown without chloride reduction. The dryland cotton budget (derived from the OSU Enterprise Budgets, 2010) is contained in Appendix Table I-1. The annual net return from an acre of dryland cotton at the cotton prices of $.54 and $.70 per pound of lint are $2.95 and $82.95 respectively for average rainfall condition. With a four percent discount rate, the respective per acre 50-year NPVs would be $64 and $1,782 for cotton lint prices of $0.54 and $0.70 per pound. The values of $64 and $1,782 were subtracted from the 50-year Irrigation NPVs. Irrigation development would not be economically viable unless the 50-year NPV from irrigation was less the NPV from dryland cotton.

CHAPTER – IV

FINDINGS

Total agricultural net benefits depend on many factors like the cost of production, input costs, weather, soil response to water and salinity, acres of irrigable soils in individual fields etc. Returns from fields irrigated using pivots and travelling gun vary a lot due to factors like efficiency, investment costs in irrigation equipments, distance from river and cost of pumping water from river to the field.

The full matrix of returns above the dry land returns and fixed costs vary according to the salinity and cotton price. Estimated returns are categorized by four different EC levels that describe the salt contents and by the weather scenarios. Average rainfall is considered as the base scenario whereas the 10 percent above and 10 percent below average rainfall scenarios are used for sensitivity analysis. A marginal cotton price $ 0.54 per lb of lint was considered for the first step of returns for the federal water projects. The higher price of $ 0.70 per lb of lint (National Cotton Council, 2010) was used for sensitivity analysis.

Figure 18 below shows an example of the optimization result (Choi et al, 2012). The effect of salinity on the cotton yields over time is shown for the average rainfall scenario. The solid line shows the accumulation of salt over time. The cotton yield (dotted line) declines as the soil salinity increases until reaching a steady state.

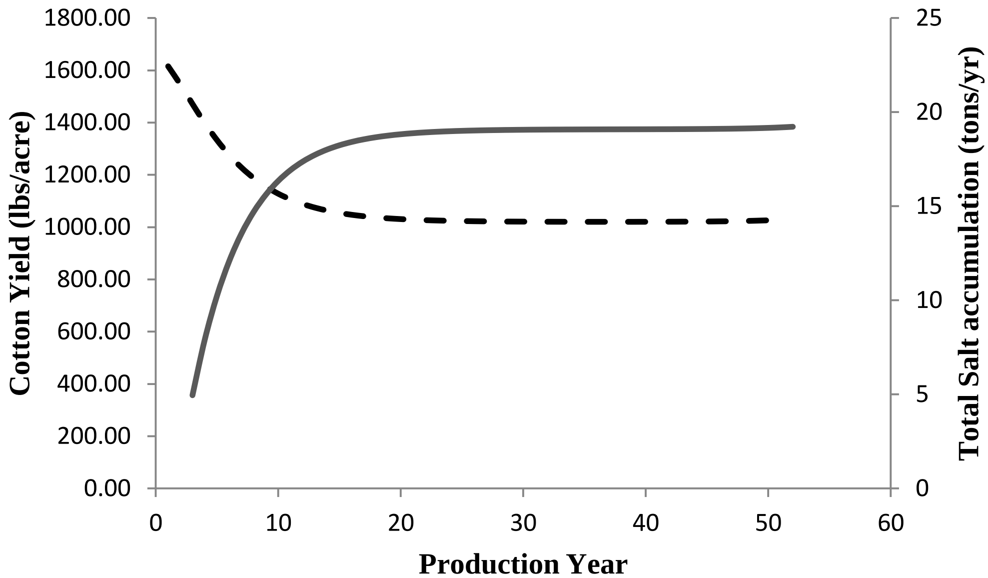


Figure 18. Effect of salt accumulation on yields over the years in Tipton loam soil

Dry land Returns

It was important to see whether the net incremental benefits from irrigation exceed the dryland returns in the long run. The Oklahoma State University enterprise budget (2010) that was used to estimate the costs per acre of dryland cotton is in Table I-1 in the Appendix-I. The values of operating inputs are assumed to be on average per acre costs. The yields and cotton prices are not used from the budgets. The average cotton yield was 500 lbs/acres for the average weather scenario. The yields for the ten percent below and ten percent above average rainfalls are predicted by Mittleset and Storm's (2012). A reduction in yields, by 6%, with ten percent below average rainfall, was predicted by Mittleset and Storm (2012). The predicted yields (Mittleset and Storm, 2012) also improved by eight percent with ten percent increase in rainfall.

Table 14. Annual profits per acre and 50-year present values of dry land Cotton returns for Elm and North Fork with center pivot irrigation

Annual Profits per Acre for various rainfall scenarios		
	Cotton Price: 54 cents/lb	*Cotton Price: 70 cents/lb*
Annual Profit per Acre at below Average Rainfall	-	62
Annual Profit per Acre at Average Rainfall	3	83
Annual Profit per Acre at above Average Rainfall	25	111

50-year Present Value	**Net Returns**	
	Cotton Price: 54 cents/lb	*Cotton Price: 70 cents/lb*
PV at 10% below Average Rainfall	0	1,331
PV at Average Rainfall	64	1,782
PV at 10% above Average Rainfall	527	2,383

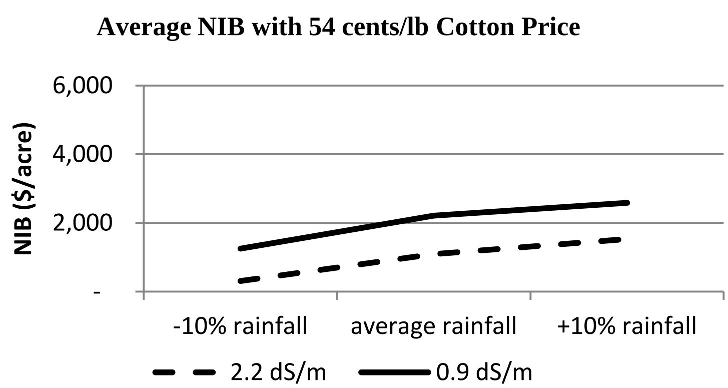
The dry land yields and projected net returns are in table 12 above shows the expected returns using the averages of the most recent dry land cotton yields (NASS, 2005-2010) of the Greer, Jackson and Tillman County. At the price of 54 cents/lb, there is a low return per acre. The returns for the ten percent below and above rainfalls are based on adjusted yields. Present value (PV) of the annual returns over a 50-year period is given in the appendix Table 13 for all three rainfalls and the two cotton prices used i.e. 54 cents/lb and 70 cents/lb.

Net Returns under Center Pivot Irrigation

The individual returns for all profitable pivots are in the Appendix Tables CP 1 to CP 24, which cover two cotton prices, three rainfalls levels and two irrigation water EC's. Majority of the results for the irrigated cotton show that the higher the number of acres in a pivot (i.e. the closer to operating a full circle) the more likely it is to be profitable in long term. The lower NPV's are attributed to the partial circles as well as to the presence of soils with more clay that are susceptible to salinity. The fields that use less water tend to have lower NPV's due to soil characteristics.

Returns for Center Pivot Irrigation development for average, below average and above average rainfalls

NPV estimation at two cotton prices of 54 cents/lb and 70 cents/lb show different marginal rate of returns to rainfall water. Figure 19 shows that the decrease in the marginal rate of returns to rainfall, when rainfall decreases by ten percent, is greater than the increase in the marginal rate of returns to rainfall when rainfall increases by ten percent. This result is consistent for both cotton prices of 54 cents/lb and 70 cent/lb.



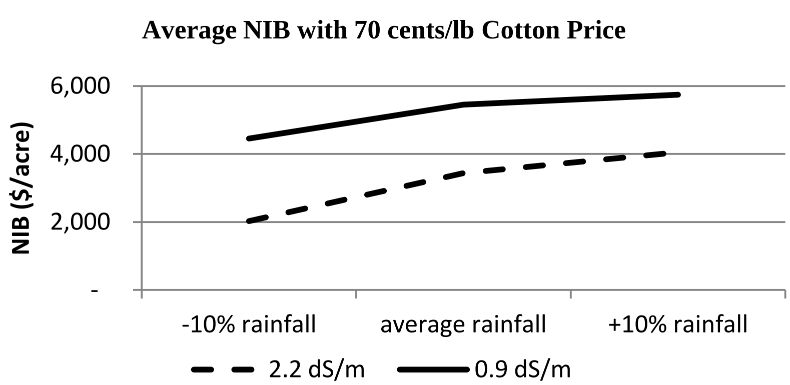


Figure 19. Average NIB of the profitable area near the Elm Fork with three rainfall levels, two EC's and two Cotton prices

The areas along the North Fork (Figure 20) show a different marginal rate of returns to rainfall with two cotton lint prices. Figure 20 show that when the EC of irrigation water drops to 0.9, the improvement in average returns per acre is greater with more rainfall compared to the reduction in average returns per acre, with lower rainfall.

The marginal returns to rainfall are higher for cotton price of 54 cents/lb and EC of 0.9 dS/m. The marginal returns to rainfall drop for the cotton price of 70 cents/lb when rainfall is increased by 10 percent with EC of 0.9 dS/m.

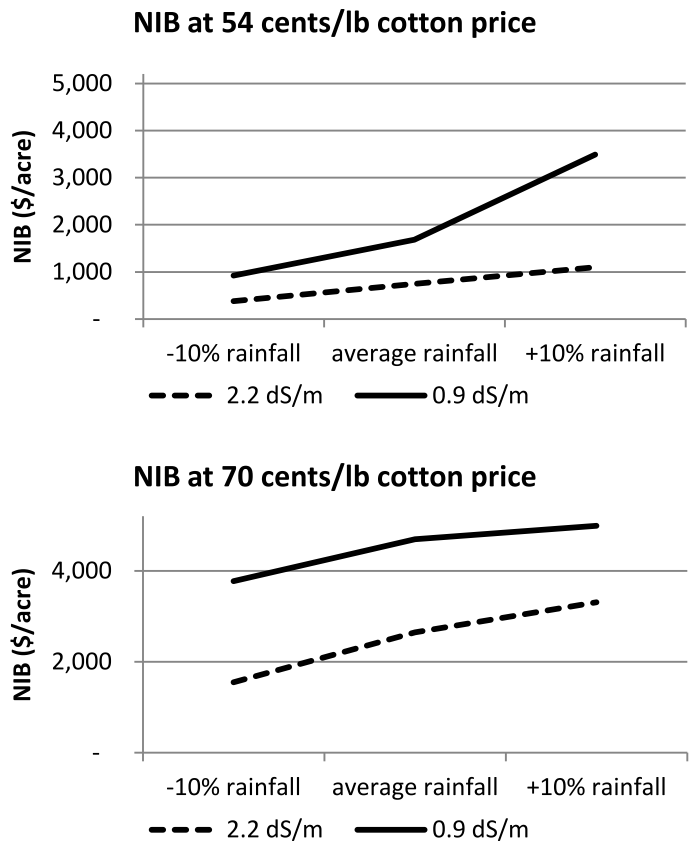


Figure 20. A comparison of the Net Incremental Benefits with two Cotton prices, for the area near the Elm Fork with three rainfalls, two irrigation water EC's

Returns with Marginalized Cotton Price of 54 cents/lb

Table 15. Returns with two irrigation water EC's, Cotton price of 54 cents/lb and average rainfall along the Elm Fork[a]

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	5,242	10,350
NIB above Dry land ($ 000)	4,963	10,066
Economically Feasible Acres	4,363	4,435
Average Irrigation water quantity (acre-feet/acre)	0.96	1.31
Average of NIB per acre ($/acre)	1,091	2,213

[a]Abbreviation used: NIB is Net Incremental Benefits

Results in table 15 show there is less than a 100-acre increase in the number of acres that could be profitability irrigated with 54 cents/lb cotton by reducing the EC level from 2.2 to 0.9 dS/m. However, the reduction in salinity from 2.2 to 0.9 dS/m increases total NIB from $4,963 to $10,066 thousand dollars and from $1,091 to $1,213 per acre. With higher salinity level, (2.2 dS/m) the optimal average irrigation rate was 0.96 ac-ft per acre and was 1.31 af-ft when the EC was 0.9 dS/m.

Table 16. Returns under two irrigation water EC's, Cotton price of 54 cents/lb and average rainfall along the North Fork[a]

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	4,934	14,282
NIB above Dry land ($ 000)	4,551	13,777
Economically Feasible Acres	5,925	7,841
Average Irrigation water quantity (acre-feet/acre)	0.96	1.29
Average of NIB per acre ($/acre)	747	1,685

[a]Abbreviation used: NIB is Net Incremental Benefits

Table 16 shows the results along the North Fork for two water EC levels and 54 cent/lb cotton price. The total NPV, after subtracting dry land returns and investment costs, would be $ 4.5 million after developing 5,925 acres for irrigation with an EC of 2.2 dS/m. The number of profitable fields and acres increase from 5,925 to 7,841 as the salinity drops to an EC of 0.9 dS/m. The fields that are not profitable are primarily due to the nature of the soil while one is because of the reduced acres. For example, a field with 62 acres where only half circle of a pivot can be operated would have twice the fixed cost that would reduce the overall benefits.

Results under Center Pivot Irrigation with Ten Percent above Average Rainfall

The above average weather scenario is the case where we assume that the average rainfall improves by 10 percent. A higher quantity of rainfall would reduce salt build up in the soil and hence increase the yields and profits over time. Although the probability of above average weather scenario would be less as we look at the historical weather data, one cannot rule out the possibility. The rainfall data for a period of 1994-2008 show a higher than average historical rainfall in Oklahoma (Mesonet Weather data, 1994-2008).

Table 17. Returns along the Elm Fork with two water EC's, ten percent above average rainfall and Cotton price 54 cents/lb[a]

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	9,368	14,073
NIB above Dry land ($ 000)	7,031	11,714
Economically Feasible Acres	4,435	4,435
Irrigation water application rate (acre-feet/acre)	0.97	1.28
Net Incremental Benefits ($) per acre	1,531	2,585

[a]Abbreviation used: NIB is Net Incremental Benefits

Table 17 above shows the summary of the economically feasible pivots along the sections of the Elm Fork of the Red River. If the EC of the irrigation water was 2.2 dS/m, the net benefits from pivot irrigation development would exceed over $ 7 million along the Elm Fork in the Greer County. If the EC of the irrigation water were 0.9 dS/m, NIB would increase by 70 percent to more than $ 11.7 million. The water application per acre would also increase with decreased salinity to 1.28 af-ac. Per acre NIB would increase to $ 2,585 per acre

Table 18. Returns under various irrigation water EC's for above average rainfall along the North Fork with Cotton price of 54 cents/lb[a]

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	12,152	33,279
NIB above Dry land ($ 000)	8,173	28,957
Economically Feasible Acres	7,182	8,201
Irrigation water application rate (acre-feet/acre)	0.94	1.25
Net Incremental Benefits ($) per acre	1,097	3,491

[a]Abbreviation used: NIB is Net Incremental Benefits

Table 18 shows the summary of results along the North Fork of the Red River when the cotton lint is 54 cents/lb. Results are similar to the Elm Fork in terms of marginal returns to rainfall for the given two EC's. The net incremental benefits are over $ 8 million with the price of 54 cents/lb when the water EC is 2.2 dS/m. When the salinity drops to water EC of 0.9 dS/m, the NIB per acre increase by 318 percent. The overall NIB over the 50-year period increased 354 percent, when the EC dropped to 0.9 dS/m.

Results under below average rainfall and cotton lint price 54 cents/lb

Table 19. Returns along the Elm Fork for ten percent below average rainfall, 54 cents/lb Cotton price and two water EC levels

	EC 2.2 dS/m	EC 0.9 dS/m
NIB[a] above Dry land ($ 000)	406	5,651
Economically Feasible Acres	1,280	4,363
Irrigation water application rate (acre-feet/acre)	0.99	1.36
Net Incremental Benefits ($) per acre	310	1,246

[a]Abbreviation used: NIB is Net Incremental Benefits

Table 19 shows the results for the area along the Elm Fork in Greer County, with cotton lint price of 54 cents/lb and a ten percent reduction in average rainfall. All benefits from irrigation development were above dryland. The results with higher water EC of 2.2 dS/m are not very encouraging, with NPV of $ 406,000 for 1,280 profitable acres at a lowly $ 310 per acre benefits. The NIB/acre improved by 400 percent as the EC dropped to 0.9 dS/m. With a lower EC, the NPV exceed $ 5 million and total feasible acres along the Elm Fork increase to 4,363, which is an improvement by 241 percent from EC of 2.2 dS/m.

Table 20. Returns along the North Fork with two water EC's, ten percent below average rainfall and Cotton price of 54 cents/lb

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	461	6,318
NIB[a] above Dry land ($ 000)	461	6,318
Economically Feasible Acres	1,214	6,546
Irrigation water application rate (acre-feet/acre)	1.06	1.36
Net Incremental Benefits ($) per acre	381	922

[a]Abbreviation used: NIB is Net Incremental Benefits

As we can see in table 20, the effect of change in EC is similar for the area along the North Fork to to the Elm Fork. The NPV are 13 times more with the reduction in the salinity from EC 2.2 dS/m to 0.9 dS/m. The NIB/acre is just over 922, which is relatively lower for the average rainfall and 0.9 dS/m EC. Total feasible acres increase by 439 percent with reduction in salinity.

Returns with Cotton Lint Price of $ 0.70/lb

As a part of sensitivity analysis, NPV calculation was done with a price of $ 0.70/lb, which was the price of crop-year (National Cotton Council, 2010) for lint. The comparisons of results, for two cotton prices, were shown in figures 19 and 20 previously.

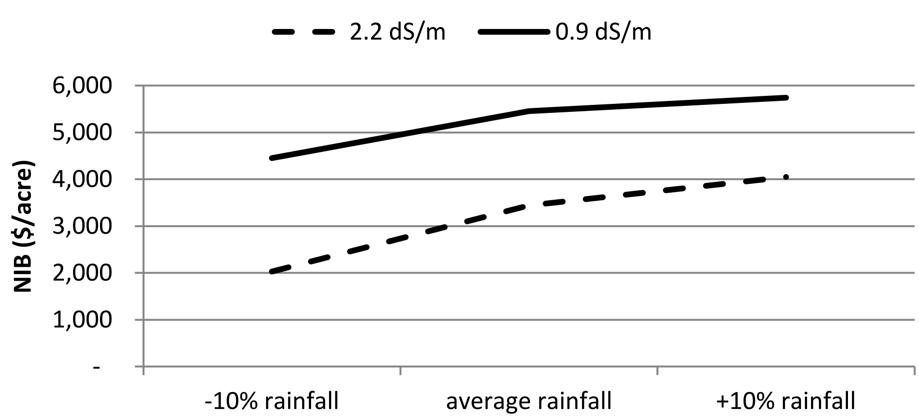


Figure 21. NPV along Elm Fork under Various Salinity and Weather Scenario at Cotton Price of 0.70 cents/lb

Figures 21 show the results along the Elm and North Forks under various scenarios of irrigation water EC's and rainfall. We see decreasing marginal rate of returns to rainfall as the NIB per acre are affected more by the decrease in the rainfall as compared to the increase in the rainfall.

Returns with cotton price of 70 cents/lb and Average Rainfall for center pivot irrigation

Table 21. Returns under average rainfall along the Elm Fork with Cotton price of $0.70/lb

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	23,795	32,856
NIB[a] above Dry land ($ 000)	15,795	24,857
Economically Feasible Acres	4,489	4,489
Irrigation water application rate (acre-feet/acre)	1.07	1.51
Net Incremental Benefits ($) per acre	3,441	5,457

[a]Abbreviation used: NIB is Net Incremental Benefits

As one would expect, we can see from table 21, we see an increase in the total NPV, NIB per acre and the water applied per acre as the EC goes down. The number of profitable acres does not change with the higher price. The net incremental benefits per acre increased, by 60 percent with a reduction in salinity.

When compared to the results with the marginal price of 54 cents/lb, we find that a 30 percent increase in cotton price improves the net incremental benefits per acre by 216 percent for the EC 2.2 dS/m. For the lower EC of 0.9 dS/m, the increase in net benefits per acre is 147 percent at the cotton price of 70 cents/lb. All 4,489 acres along the elm fork are profitable with the higher cotton price.

Table 22. Returns under average rainfall along the North Fork with Cotton price of $0.70/lb

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	36,902	54,115
NIB[a] above Dry land ($ 000)	22,298	39,501
Economically Feasible Acres	8,128	8,201
Irrigation water application rate (acre-feet/acre)	1.04	1.47
Net Incremental Benefits ($) per acre	2,649	4,700

[a]Abbreviation used: NIB is Net Incremental Benefits

Table 22 shows the results under the average rainfall along the North Fork with cotton price of 79 cents/lb. The overall net incremental benefits and NIB per acre increase by 77 percent as the EC drops from 2.2 dS/m to 0.9 dS/m. With the higher cotton price of 70 cents/lb the increase in profitable acres is less than 100. For the 8,201 feasible the net benefits exceed $ 39 million, which is 77 percent from $ 22 million at 2.2 dS/m water EC.

A comparison with the results at 54 cents/lb cotton price show that NIB per acre increased by 254 percent and 179 percent respectively, for the EC of 2.2 dS/m and 0.9 dS/m. The total NPV improves by 390 percent and 187 percent respectively, with an increase of 30 percent in cotton price.

Returns with Cotton price of 70 cents/lb and ten percent above average rainfall

Table 23. Returns along the Elm Fork under two water EC's, ten percent above average rainfall and cotton price of $0.70/lb

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	29,224	36,839
NIB above Dry land ($ 000)	18,526	26,141
Economically Feasible Acres	4,489	4,489
Irrigation water application rate (acre-feet/acre)	1.08	1.47
Net Incremental Benefits ($) per acre	4,050	5,743

[a]Abbreviation used: NIB is Net Incremental Benefits

The highest benefits are obtained with a price of 70 cents/lb of lint and ten percent increase in average rainfall. The above average rainfall scenarios provide the greatest returns with all EC levels. The marginal returns along the Elm and North Forks are similar for a given EC when the rainfall increases by ten percent. As the EC goes down the NPV increases, along with the optimal water quantity applied per acre.

Increasing the cotton price from 54 cents/lb to 70 cents/lb for the average rainfall increased net incremental benefits per acre by 165 and 122 percent along the Elm Fork with water EC 2.2 and 0.9 dS/m respectively (Table 23). The change along the North Fork is greater, for the EC level of 2.2 dS/m, with 243 percent increase in net benefits (Table 24). For the EC 0.9 dS/m, the total net benefits exceed $ 41 million at nearly $ 5,000 per acre.

Table 24. Returns along the North Fork under two water EC's, ten percent above average rainfall and Cotton price of $0.70/lb[a]

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	47,589	61,512
NIB above Dry land ($ 000)	28,046	41,965
Economically Feasible Acres	8,201	8,201
Irrigation water application rate (acre-feet/acre)	1.05	1.44
Net Incremental Benefits ($) per acre	3,309	4,995

[a]Abbreviation used: NIB is Net Incremental Benefits

Results with ten percent below average rainfall and cotton price 70 cents/lb

Table 25. Returns under below Average Weather along the North Fork with Cotton price of $0.70/lb[a]

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	15,184	26,323
NIB above Dry land ($ 000)	9,230	20,349
Economically Feasible Acres	4,435	4,489
Irrigation water application rate (acre-feet/acre)	1.07	1.57
Net Incremental Benefits ($) per acre	2,027	4,452

[a]Abbreviation used: NIB is Net Incremental Benefits

The situation with below average rainfall and the irrigation water EC at 2.2 dS/m was the least favorable condition with the cotton price of 54 cents/lb. However, with 70 cents/lb cotton lint the number of feasible acres is 4,435. We also find net benefits of $ 2,027 per acre yielding $ 9.2 million in NPV. The NIB per acre more than doubled and the water application rate per acre is up by 50 percent with the lower EC. With the irrigation water EC of 0.9 dS/m constant, a change in the cotton price from $0.54 to $ 0.70 per pound improved the net incremental benefits by 260 percent.

Table 26. Returns with Below Average Rainfall, along the North Fork, and a cotton price of $0.70/lb

	EC 2.2 dS/m	EC 0.9 dS/m
Irrigated Cotton NPV ($ 000)	22,999	42,748
NIB[a] above Dry land ($ 000)	12,388	31,832
Economically Feasible Acres	7,760	8,201
Irrigation water application rate (acre-feet/acre)	1.05	1.54
Net Incremental Benefits ($) per acre	1,548	3,771

[a]Abbreviation used: NIB is Net Incremental Benefits

The results along the North Fork show a similar trend with the higher cotton price of 70 cents/lb. NPV above dryland exceed $ 31 million, which is nearly 4 times greater than NPV with the cotton price of 54 cents/lb and water EC 0.9 dS/m. The number of profitable acres is more than 500 percent higher with NIB per acre improving by 300 percent.

The results for the average and below average rainfall scenarios with the two cotton prices and EC of 2.2 dS/m were also used to find the leaching effect. A comparison was drawn between the results with and without leaching. The leaching is the additional irrigation water applied in the off-season to reduce the salt accumulation over time.

Optimal Water Use under center pivot Irrigation

Optimal quantity of water for the three different rainfall scenarios does not vary greatly for given water EC and cotton price. Figure 22 shows that there is not a huge difference in water application rate per acre along the Elm and North Forks with pivot irrigation. The total water quantity will vary in terms of total water required for each scenario depending on the total profitable acres.

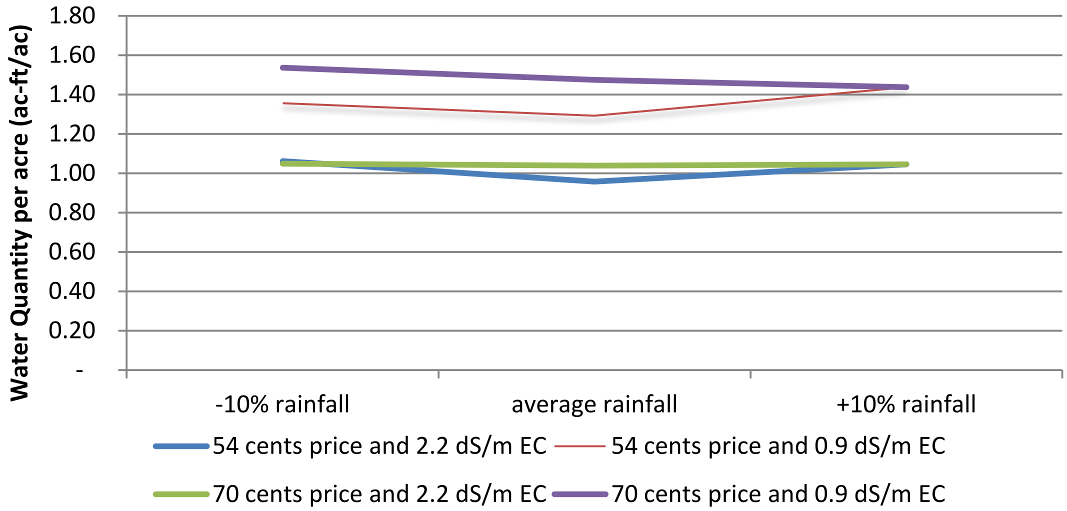


Figure 22. Optimal water quantity per acre for two water EC's, two cotton prices and three different rainfalls for areas along the North Fork

Results with Leaching Under Center Pivot Irrigation

Table L-1 shows the results of applying leaching water of 0.3 ac-ft per acre in the off-season with cotton price of 54 cents/lb, two irrigation water EC's of 2.2 dS/m and 3 dS/m for average and below average rainfalls. As expected, with higher irrigation water EC, the number of feasible acres decreases for both rainfall scenarios. With average rainfall, the total profitable acres decrease only by 331 acres. The net incremental benefits per acre under average rainfall are reduced by 48 percent. Under the below average rainfall, an increase in salinity has a huge impact as it was only profitable to develop 488 acres, compared to 2,587 at EC of 2.2 dS/m. This is a decline of 81%. The net incremental benefits per acre are lower when compared to average rainfall scenario, at 424 and 319 per acre, respectively, which is a drop of 25% from EC 2.2 dS/m.

Table L- 1. Results under Center Pivot Irrigation along the Elm Fork with Off-season Leaching of 0.3 ac-ft per acre with two rainfalls, two water EC's and cotton price 54 cents/lb.

	Water EC 2.2 dS/m		**Water EC 3.0 dS/m**	
	Average Rainfall	10% below Ave Rainfall	Average Rainfall	10% below Ave Rainfall
NPV from Irrigation ($ 000)	6,695	1,302	3,394	200
NIB[a] above Dry land ($ 000)	6,411	1,130	3,127	155
Economically Feasible Acres	4,435	2,587	4,104	488
Irrigation water quantity (acft/ac)	1.03	1.03	0.79	0.85
NIB per Acre ($)	1,389	424	727	319

[a.] Abbreviation used: NIB is Net Incremental Benefits per acre.

Results in table L-1 compared with the results without leaching shows the impact of additional water in the off-season. The results for average rainfall condition show, that compared to results without leaching, there were an additional 72 acres i.e. one more pivot field was profitable. There was an increase of 27% in net incremental benefits (NIB) per acre and a 29% increase in total NPV for the 50-year period compared to results without leaching. For the ten percent below average rainfall case, this increase in NIB goes up by 72% while the total NPV increases from $ 406,000 to $ 1.3 million, an increase of 250 percent. The total profitable acres with leaching and 10% below average rainfall condition are doubled from 1,280 to 2,587 from the same situation without leaching.

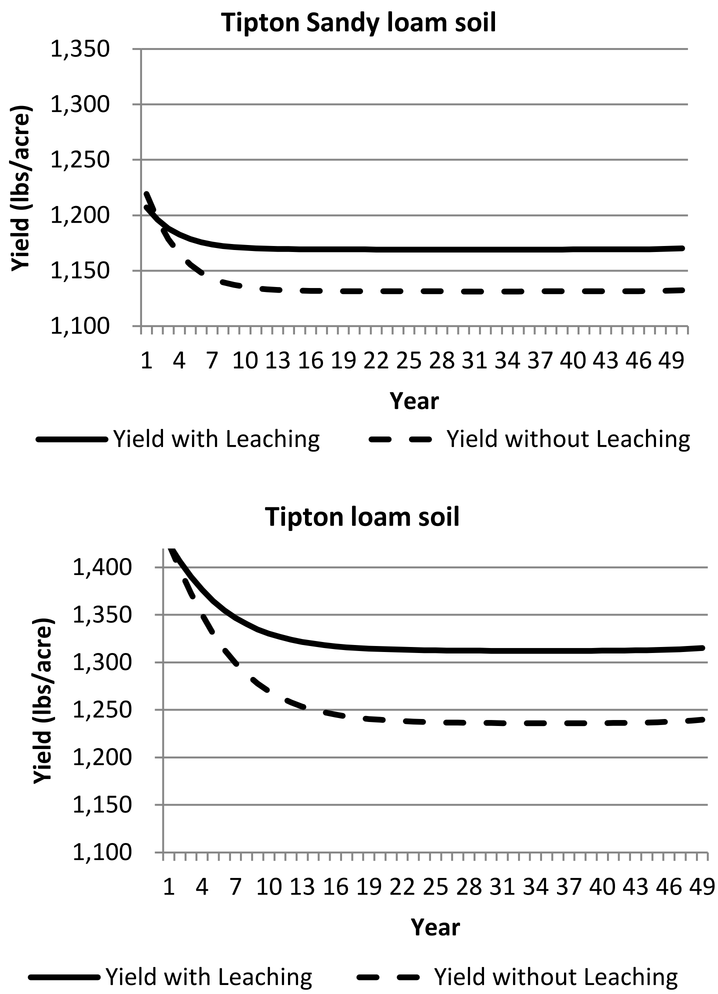


Figure 23. The difference in yields Tipton loam (bottom) and Tipton fine sandy loam soil (top), with and without leaching, when optimized at 54 cents/lb cotton price, water EC of 2.2 dS/m and Average Rainfall

Figure 23 above shows a comparison of results for loam and fine sandy loam soils with and without leaching. With leaching in the off-season, there is an improvement in the yields and a reduction in salt accumulation over the years. Tipton fine sandy loam soil has slightly lower productivity with an average yield of 1,172 lbs/acre compared to Tipton loam soil that produces average yield of 1,325 lbs/acre. However, the relative yield loss due to salinity is lower in sandy soil because of more natural leaching capacity. Leaching reduces the salt accumulation and hence the average long-run yield loss is only 34 lbs/acre compared to 66 lbs/acre without leaching. Figure 24 shows the comparisons of salt accumulation over the 50-year period for the two soils.

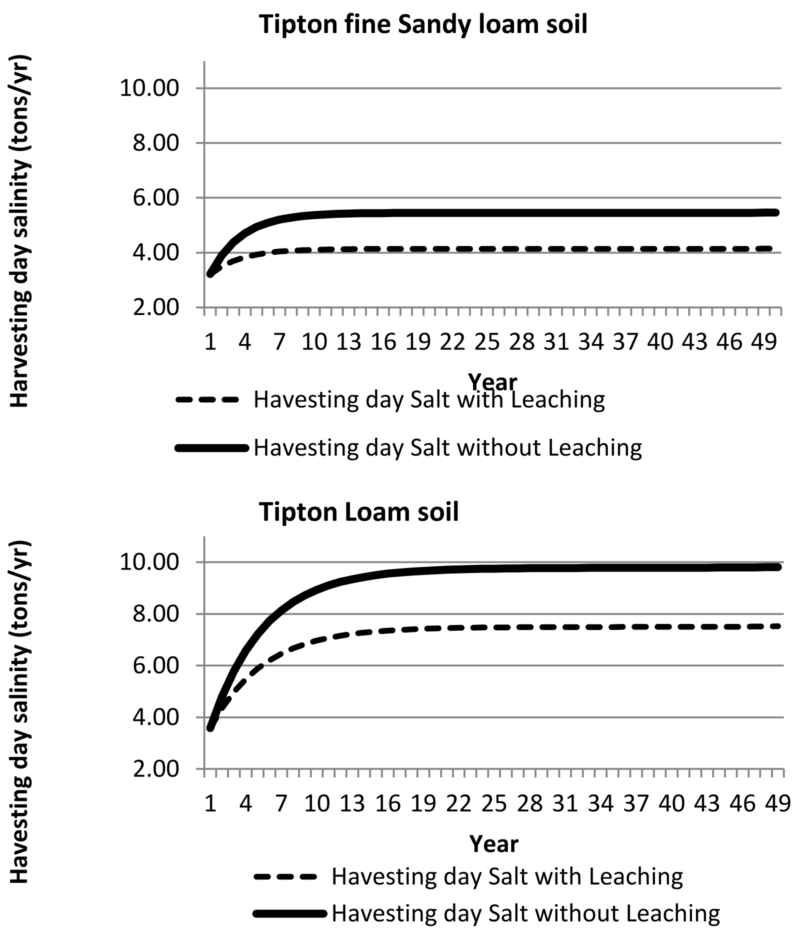


Figure 24. The difference in Salinity build up for Tipton loam (bottom) and Tipton fine sandy loam soil (top), with and without leaching, when optimized at 54 cents/lb cotton price, water EC of 2.2 dS/m and Average Rainfall

The overall center pivot irrigation results with a cotton price of 70 cents/lb are shown in table L-2. With the higher price, the area of profitable acres does not decrease with an increase in the salinity of irrigation water EC from 2.2 dS/m to 3.0 dS/m with average rainfall. With below average rainfall, the number of profitable acres decrease by 72, nearly 1 percent. The NIB per acre decreased by 28% under average rainfall and by 53% under below average rainfall when salinity increased.

Table L- 2. Results under center pivot irrigation along the Elm Fork with pre-plant Leaching of 0.3 ac-ft per acre with two rainfalls, two water EC's and Cotton price 70 cents/lb.

	Water EC 2.2 dS/m		**Water EC 3 dS/m**	
	Average Rainfall	10% below Ave Rainfall	Average Rainfall	10% below Ave Rainfall
NPV from Irrigation ($ 000)	27,098	19,201	21,758	13,100
NIB[a] above Dry land	19,099	11,204	13,758	5,185
Economically Feasible Acres	4,489	4,435	4,489	4,363
Irrigation water quantity(acft/ac)	1.16	1.15	0.88	0.86
NIB per Acre ($)	4,178	2,475	2,990	1,147

[a] Abbreviation used: NIB is Net Incremental Benefits per acre.

In comparison with the results without leaching, there is an increase in total NPV over the 50-year period as well as the net incremental benefits per acre. For the case with an irrigation water EC of 2.2 dS/m and average rainfall, the NPV and net incremental benefits per acre increase by 21 percent. The NIB per acre increases by 57 percent under the scenario of 10 percent below average rainfall. A summary of the results, with and without leaching, for area along the Elm Fork is shown in Table L-3.

Table L- 3. Summary of Results for Profitable Area along the Elm Fork, including off-season Leaching, with two Cotton Prices, Two Irrigation Water EC's and Three Rainfall Levels

Irri Water EC (dS/m)	Cotton Price ($/lb)	Rainfall Level	Off-season Leaching	NPV from Irrig. ($000)	NIB ($000) above Dry-land	Econ. Feas. Acres	Opt Irri. Quantity (acft/ac)	NIB[a] per Acre ($)
2.2	0.54	Average	Yes	6,695	6,411	4,435	1.03	1,389
2.2	0.54	Average	No	5,242	4,963	4,363	0.96	1,091
2.2	0.54	10 % Less	Yes	1,302	1,130	2,587	1.03	424
2.2	0.54	10 % Less	No	406	324	1,280	0.99	246
2.2	0.54	10% Higher	No	12,152	8,173	7,182	0.94	1,097
2.2	0.70	Average	Yes	27,098	19,099	4,489	1.16	4,178
2.2	0.70	Average	No	23,795	15,795	4,489	1.07	3,441
2.2	0.70	10 % Less	Yes	19,201	11,204	4,435	1.15	2,475
2.2	0.70	10 % Less	No	15,184	7,229	4,435	1.07	1,576
2.2	0.70	10% Higher	No	47,589	28,046	8,201	1.05	3,309
0.9	0.70	Average	No	10,350	10,066	4,435	1.31	2,213
0.9	0.70	10 % Less	No	5,651	5,651	4,363	1.36	1,246
0.9	0.70	10% Higher	No	14,073	11,714	4,435	1.28	2,585
0.9	0.70	Average	No	32,856	24,857	4,489	1.51	5,457
0.9	0.70	10 % Less	No	26,323	20,349	4,489	1.57	4,452
0.9	0.70	10% Higher	No	36,839	26,141	4,489	1.47	5,743

[a]Abbreviation used: NIB is Net Incremental Benefits, Irrig. is Irrigation , Econ. Feas. Acres is Economically feasible acres

Leaching effects along the North Fork

Table L-4 presents the results of applying additional of 0.3 ac-ft of water per acre in the off-season along the North Fork. The table L-3 shows the summary for the cotton price of 54 cents/lb, two different water EC's of 2.2 dS/m and 3 dS/m and two rainfall scenarios i.e. average and below average rainfalls. As the EC of the irrigation water increases, the number of feasible acres decreases under both rainfall scenarios. Nearly half of the pivot acres are feasible with leaching for a higher salinity at water EC of 3 dS/m.

Table L- 4. Results under Center Pivot Irrigation along the North Fork with Off-season Leaching of 0.3 ac-ft per acre with two rainfalls, two water EC's and cotton price 54 cents/lb.

Item	Irrigation Water EC 2.2 dS/m		Irrigation Water EC 3 dS/m	
	Average Rainfall	10% below Ave Rainfall	Average Rainfall	10% below Ave Rainfall
NPV from Irrigation ($ 000)	7,155	1,128	2,844	33
NIB[a] above Dry land ($ 000)	6,709	991	2,576	14
Economically Feasible Acres	6,908	2,055	4,073	124
Irrigation water quantity (ac-ft)	1.00	1.05	0.79	0.91
NIB per Acre ($) per acre	934	465	607	113

a. Abbreviation used: NIB is Net Incremental Benefits per acre.

Table L-6 compares the results with and without leaching for the given two rainfall scenarios and water EC level of 2.2 dS/m for the profitable area along the North Fork. A comparison with the case of average rainfall shows that without the off-season leaching, there are an additional 983 profitable acres, which is an addition of 17%. There is an increase of 25% in net incremental benefits (NIB) per acre and 47% increase in total NPV for the 50-year period. For the ten percent below average rainfall case, the net benefits per acre increase by 32%. The total increase in NPV was from $ 461,000 to $ 1.1 million, adding another 158% of agricultural benefits due to leaching in the off-season. The total acres that were profitable with leaching, for the 10% below average rainfall condition, were 88% higher from 1,094 to 2,055.

The summary of results with center pivot irrigation for the cotton price of 70 cents/lb, are shown in table L-5. With the higher price, the number of profitable acres is reduced slightly from 8,201 to 8,057 with an increase in salinity (from EC of 2.2 dS/m to 3 dS/m). In case of 10 percent below rainfall this decrease in acres is higher with only 5,123 acres profitable at EC of 3 dS/m, dropping 35% from 7,849 at EC of 2.2 dS/m. Net per acre benefits decrease by 35% with average rainfall and 49% with below average rainfall as the EC goes up.

Table L- 5. Results under Center Pivot Irrigation along the North Fork with Off-season Leaching of 0.3 ac-ft per acre with two rainfalls, two water EC's and cotton price 70 cents/lb

Item	Irrigation Water EC 2.2 dS/m		Irrigation Water EC 3 dS/m	
	Average Rainfall	10% below Ave Rainfall	Average Rainfall	10% below Ave Rainfall
NPV from Irrigation ($ 000)	41,401	28,286	31,877	17,643
NIB[a] above Dry land ($ 000)	26,787	13,876	17,325	4,571
Economically Feasible Acres	8,201	7,849	8,057	5,123
Irrigation water quantity (ac-ft)	1.11	1.12	0.84	0.82
NIB per Acre ($) per acre	3,155	1,705	2,060	871

a. Abbreviation used: NIB is Net Incremental Benefits per acre.

In comparison with the results without leaching (Table L-5), there is an increase in total NPV and NIB per acre over the 50-year period. For the irrigation water EC level of 2.2 dS/m and average rainfall, the NPV and net incremental benefits per acre increase by 21 percent. The per acre net incremental benefits increased by 57 percent, if the rainfall decreased by 10 percent, as compared to non-leaching case. The total number of pivots and acres feasible are the increased with leaching.

A summary comparison of results with and without leaching along the Elm and North Forks for the average and below average rainfall conditions is shown in Table L-6. Full lists of results of individual pivot fields with leaching are in Appendix Tables CP 33 to CP 40 in the Appendix-II.

Table L- 6. Summary of Results for the profitable area along the Elm Fork, including Leaching, with two Cotton prices, two irrigation water EC's and three rainfall levels[a]

Irri Wa. EC (dS/m)	Cotton Price ($/lb)	Rainfall Level	Off-season Leaching	NPV from Irri. ($000)	NIB ($000) above Dry-land	Econ. Feas. Acres	Opt Irri. Quantity (acft/ac)	NIB per Acre ($)
2.2	54	Average	Yes	7,155	6,709	6,908	1.00	934
2.2	54	Average	No	4,934	4,551	5,925	0.96	747
2.2	54	10 % Less	Yes	1,128	991	2,055	1.05	465
2.2	54	10 % Less	No	461	384	1,094	1.06	353
2.2	54	10% Higher	No	14,282	13,777	7,841	1.29	1,685
2.2	70	Average	Yes	41,401	26,787	8,201	1.11	3,155
2.2	70	Average	No	36,902	22,298	8,128	1.04	2,649
2.2	70	10 % Less	Yes	28,286	13,876	7,849	1.12	1,705
2.2	70	10 % Less	No	22,999	8,972	7,307	1.05	1,190
2.2	70	10% Higher	No	54,115	39,501	8,201	1.47	4,700
0.9	54	Average	No	14,282	13,777	7,841	1.29	1,685
0.9	54	10 % Less	No	6,318	6,318	6,546	1.36	922
0.9	54	10% Higher	No	33,279	28,957	8,201	1.25	3,491
0.9	70	Average	No	54,115	39,501	8,201	1.47	4,700
0.9	70	10 % Less	No	42,748	31,832	8,201	1.54	3,771
0.9	70	10% Higher	No	61,512	41,965	8,201	1.44	4,995

[a]Abbreviations used: NIB is Net Incremental Benefits, Opt Irri. Quant. is the optimal irrigation quantity applied per acre, Irri. Wa. EC is the irrigation water EC

Results from Economic Feasibility of Traveling Sprinkler Irrigation Following Chloride Control

The initial results from the from the NPV optimization of irrigation investment and application to 876 irrigable areas or polygons over a 50 year period served by 345 possible wells were obtained using two cotton prices in combination with two EC values for the river. The two cotton prices shown in Table 30 below were $0.54and $0.70 per pound of cotton lint. A precise estimate of the EC of the Elm and North Fork Rivers after salt remediation in Harmon County was unknown. The EC values of 0.9 and 2.2 dS/m for water in the Elm Fork and North Rivers were used. However, the traveling reel system is subject to high evaporation losses in which a portion of the water leaving the sprinkler nozzle is lost before it reaches the ground leaving a more saline application. Thus, the EC values were adjusted upward from 0.9 to 1.05 dS/m and from 2.2 to 2.62 dS/m.

The results in Table 27 indicate there would be little incentive to expand irrigation with a cotton price of $.54 and if the water in the river were 2.2 dS/m or higher. The analysis identified less than 1,200 (1,144) acres where it would be profitable to establish a well, lay the necessary pipeline, and purchase the traveling reel sprinkler. The net present value (before subtracting the value of dryland cotton production) is $472 thousand. After subtracting dryland returns, the NPV of incremental benefits decline to 401 thousand or $360 per acre.

Table 27. Summary of estimated area irrigated and Net Present Value from irrigation within the section buffer along the Elm and North Fork rivers with two Cotton prices and two EC levels following Chloride Abatement[a]

Item	Unit	Price and Electrical Conductivity			
Price Cotton	$/lb lint	0.54	0.54	0.7	0.70
Elec. Cond pre Irr.	dS/m	2.20	0.90	2.20	0.90
Elec. Cond post Irr.	dS/m	2.62	1.05	2.62	1.05
Econ. Feas. Area	Acres	1,114	9,078	7,874	11,969
Irrigation Rate	ac-ft/ac	1.0	2.0	1.0	2.1
Ave. TDH	Feet	397	422	434	450
Ave. Yield	lbs/acre	949	1,414	1,033	1,432
Ave. Pmp. Cost	$/ac-ft	84	90	92	94
PV of Irrigation	$000	2,279	34,161	40,068	98,352
Pv of Capital	$000	1,807	17,752	15,044	28,902
NPV Irrigation	$000	472	16,409	25,024	69,450
NIB	$000	401	7,743	10,993	23,522
NIB/ac	dol./ac	360	888	1,396	1,694
Salt Return	Tons	1,002	28,919	8,975	47,329
Nitrogen Return	Tons	5	15	47	25

[a]Abbreviations used: Elec. Cond pre Irr. is the Electrical Conductivity before Irrigation, Elec. Cond post Irr. is the Electrical Conductivity after irrigation, Econ. Feas. Area is the Economically Feasible area for irrigation, NIB is the Net Incremental Benefits, ac is acres, ac-ft/ac is the acre-feet of water applied per acre, Ave. Pmp. Cost is the average pumping cost of applying an acre-foot of water.

If the price of cotton remained at $0.54 per pound of lint but the EC of the rivers declined to .9 dS/m (1.05 after application), the number of acres that could yield net incremental benefits with a traveling reel sprinkler could increase to 9,078. The increase in the average yield from 949 to 1,414 pounds of lint per acre from a lowering of the EC level in the irrigation water application from 2.62 to 1.05 dS/m is because of less salt accumulation in the soil. The present value of capital for the 50-year period would increase 18.8 million and the total NPV was estimated to be 16.4 million. The NPV of NIB is 7.7 million or $888 per acre.

If the price of cotton increased to $0.70 per pound and the EC of the Elm and North Fork Rivers both decreased to 2.2 dS/m, the number of profitably, irrigated acres would increase to 7,874 acres from 1,114 with $0.54 cotton. Finally, with cotton price of $0.70/lb and an EC of .9 dS/m before application and 1.05 dS/m after application, the area of profitable irrigation with the traveling reel system would increase to 11,969 acres and the 50-year NPV of NIB per acre would average $1,694. The estimated yield of 1,438 pounds of lint per acre for the $0.70 cotton is slightly higher than the 1,414 pounds with $0.54 cotton.

Results if the Price of Cotton Lint was $0.54 and the Electrical Conductivity in the River were 2.2 dS/m.

There were only 1,114 acres (Table 28), where it was profitable to irrigate if the cotton price were $.52 per pound and the EC of Water in the Elm and North Fork Rivers was 2.2 or 2.62 after Application from Traveling Reel Sprinkler System. The NPV of NIB averaged $360per acre, the average yield as 949 pounds per acre. All of the irrigated polygons were in Greer County except for 86 acres in Jackson County.

Table 28. Area Economically Feasible to Irrigate by Traveling Sprinkler along Elm and North Fork Rivers with Cotton Price at $0.54per Pound, Electrical Conductivity of irrigation water 2.2 dS/m before and 2.62 dS/m after Application.[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	All Counties
Econ. Irr. Area	Acres	1,028	86	-	-	1,114
Irrigation Rate	ac. Ft./yr	1.0	1.0	-	-	1.0
Ave. TDH	Feet	398	393	-	-	397
Ave. Yield	lbs/acre	932	1,141	-	-	949
Ave. Pmp. Cost	$/ac. Ft	84	87	-	-	84
PV of Irrigation	thos. dol.	2,109	170	-	-	2,279
Pv of Capital	thos. dol.	1,675	132	-	-	1,807
NPV Irrigation	thos. dol.	434	38	-	-	472
NPV NIB	thos. dol.	368	33	-	-	401
NPV NIB/ac	dol./ac	358	380	-	-	360
Salt Return	Tons	943	59	-	-	1,002
Nitrogen Return	Tons	5	*	-	-	5

[a] Abbreviations Used: * less than .5 ton, af/ac is acre feet per acre, TDH is total dynamic head, Irrigation Cost is variable cost to pump one acre foot, Net Irrigation PV is discounted value irrigation benefits before subtraction of capital cost, PV Capital is discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen Returned are 50-year average annual salt and nitrogen lost from the soil profile from the irrigated area.

[a] Fifty-year NPV dryland return of $54 has not been subtracted

The more detailed results in Appendix Table 31 indicate there were only 14 sections where irrigation development would be profitable with a traveling reel system if cotton prices were $.54 and the EC of the river were 2.2 dS/m (2.62 after application). Average yields in theses 14 sections varied from 637 to 1171 pounds per acre.

Results If Cotton Lint was $0.54 per Pound and the Electrical Conductivity was 0.9 dS/m in the Elm and North Fork Rivers

The results in Table 29 show there would be a very large increase the area irrigated and the profitability if the salinity of the river could be lowered to as much as 0.9 dSm. If the EC of the river were reduced to an EC value of 0.9 dS/m, the number of acres irrigated would increase from 1,114 to 9,078 and the NPV would increase to 16.4 million dollars. The average NPV per irrigated acre would increase to $2,054. Table 29 below indicates these areas are well distributed along both the Elm and North Fork Rivers in Greer, Jackson, Kiowa, and Tillman Counties.

The more detailed results (Appendix Table 2) indicate there were 136 sections where investments could occur. The average yield was 1,629 and the range was from less than 1,000 pounds to 1,659 pounds. The NPVs ranged from $6 to $4,766 per acre.

Table 29. Economically feasible area for irrigation by Traveling Sprinkler by county along the Elm and North Fork Rivers with Cotton price at $0.54/lb and Electrical Conductivity of irrigation water 0.9 before and 1.05 dS/m after application[a]

		County				
Item	Unit	Greer	Jackson	Kiowa	Tillman	Grand Total
Econ. Feas. Area	Acres	5,369	2,450	400	863	9,083
Ave. Irrigation	af/ac	1.93	2.04	2.10	1.99	1.98
Ave. TDH	Feet	423	398	402	440	416
Ave Yield	Lbs lint/ac	1,358	1,520	1,549	1,498	1,427
Irrigation Cost	$/af	6,370	3,161	528	1,139	11,198
Irrigation PV	($000)	19,105	10,311	1,847	3,009	34,272
PV Capital	($000)	10,047	5,110	795	1,795	17,747
PV Net Irrigation	($000)	9,059	5,201	1,052	1,214	16,525
NPV NIB	($000)	8,715	5,044	1,026	1,158	15,944
NPV NIB/acre	$	1,619	1,886	2,429	1,337	1,707
Salt Returned	tons/yr	5,671	3,281	474	758	10,184
Nitrogen Ret.	tons/yr	26	16	2	4	48

a Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation Cost is variable cost to pump one acre foot, Net Irrigation PV is discounted value irrigation benefits before subtraction of capital cost, PV Capital is discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen Returned are 50-year average annual salt and nitrogen lost from the soil profile from the irrigated area.

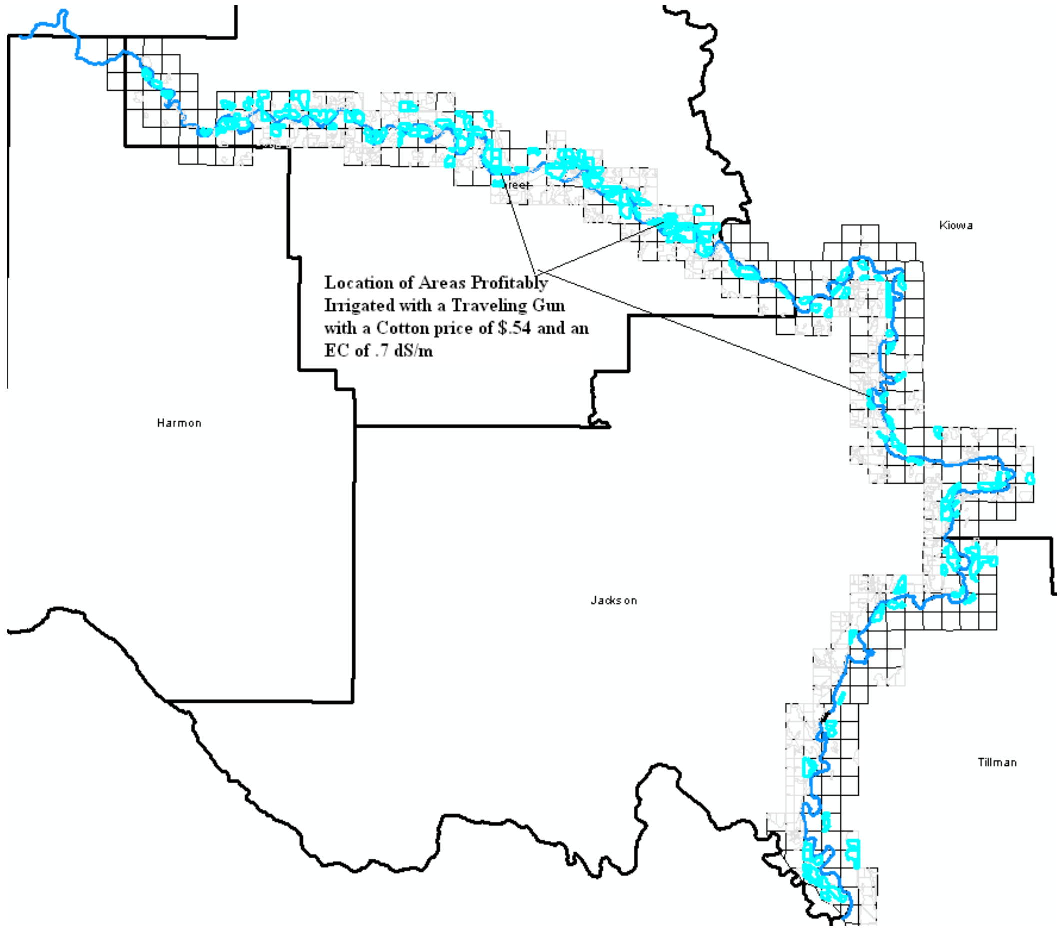


Figure 25. Location of areas that could profitably be irrigated with a Cotton price of $0.54 per pound if the EC of the Elm and North Fork Rivers were reduced to 0.9 dS/m

Results with $0.70 Cotton Lint and Electrical Conductivity at 2.2 dS/m

Table 30 shows that if the salinity or EC in the Elm and North Fork Rivers were reduced to 2.2 dS/m and the cotton price was $0.70 per pound of lint, it would be profitable to develop 7,874 acres for irrigation along the Elm and North Fork Rivers. With the EC of the river at 2.2 dS/m, a $0.16 increase in the price of cotton would increase the economically feasible irrigable area by more than 7,000 acres over that shown in Table 29 above. Most of the irrigated area would be in Greer County with smaller amounts in Jackson, Kiowa and Tillman Counties. The average irrigated yield of cotton is estimated to 1,400 pounds per acre.

Table 30. Area economically feasible to Irrigate by Traveling Sprinkler along Elm and North Fork Rivers with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m before and 2.62 dS/m after application[a]

Item	**Unit**	**County**				
County		Greer	Jackson	Kiowa	Tillman	Total
Econ. Irr. Area	acres	4,894	1,749	627	603	7,874
Irrigation Rate	af/yr	0.95	1.09	1.10	1.14	1.02
Ave. TDH	Feet	443	408	399	478	434
Ave. Yield	lbs/acre	996	1,087	1,076	1,131	1,033
Ave. Pmp. Cost	$/ac. Ft	93	90	88	102	92
PV of Irrigation	dol.	24,830	8,995	3,210	3,032	40,068
Pv of Capital	dol.	9,317	3,381	1,173	1,173	15,044
NPV Irrigation	dol.	15,513	5,614	2,037	1,859	25,024
NPV NIB	dol.	6,791	2,498	919	784	10,993
NPV NIB/ac	dol./ac	1,388	1,429	1,465	1,299	1,396
Salt Return	Tons/yr	5,061	2,437	801	676	8,975
Nitrogen Return	Tons/yr	27	13	4	3	47

[a] Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation Cost is variable cost to pump one acre foot, Net Irrigation PV is discounted value irrigation benefits before subtraction of capital cost, PV Capital is discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen Returned are 50-year average annual salt and nitrogen lost from the soil profile from the irrigated area

Results with $0.70 Cotton Lint and Electrical Conductivity at .9 dS/m and 1.05 dS/m before and After Application.

As anticipated the greatest number of acres, the highest irrigation application rate, and the highest yields were obtained with the highest cotton price ($0.70 per pound) and the lowest salinity level (0.9 ds/m) in the river. The 50-year NPV from irrigation was 69 million. The estimated 50-year PV of NIB from irrigation development with the traveling reel at $1,694 was nearly 15 times greater than the NPV with the lowest cotton price and highest EC following chloride control.

Table 31. Area Economically Feasible to Irrigate by Traveling Sprinkler along Elm and North Fork Rivers with Cotton Price at $0.70 per Pound, Electrical Conductivity of irrigation water .9 dS/m before and 1.05 dS/m after application.[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Econ. Feas. Area	acres	7,150	2,819	744	1,103	11,816
Ave. Irrigation	af/ac	2.07	2.17	2.16	2.09	2.11
Ave. TDH	feet	438	410	451	494	437
Ave Yield	Lbs lint/ac	1,390	1,523	1,528	1,511	1,441
Irrigation Cost	dollars/af	91	90	95	104	92
Irrigation PV	($ 000)	57,247	25,342	6,503	7,975	97,067
PV Capital	($ 000)	17,300	6,620	2,059	2,649	28,628
PV Net Irrigation	($ 000)	39,947	18,722	4,444	5,327	68,439
PV NIB	($ 000)	27,205	13,699	3,118	3,362	47,383
PV NIV/acre	$	3,597	4,607	4,021	3,230	3,839
Salt Returned	tons/yr	10,125	4,359	959	996	16,439
Nitrogen Ret	tons/yr	49	22	5	5	81

[a] Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation Cost is variable cost to pump one acre foot, Net Irrigation PV is discounted value irrigation benefits before subtraction of capital cost, PV Capital is discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen Returned are 50-year average annual salt and nitrogen lost from the soil profile from the irrigated area.

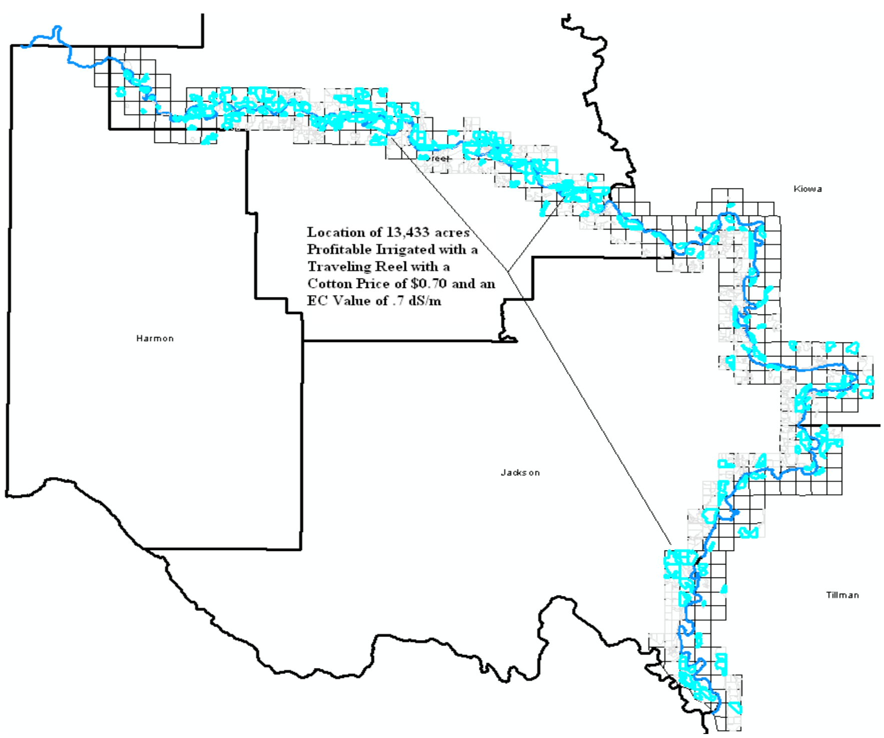


Figure 26. Location of areas that could be profitably irrigated with a Traveling Reel if the Cotton price were $0.70 per pound and the EC in the river were 0.9 dS/m.

Results of Irrigation with Traveling Sprinkler under above and below average Rainfalls

Irrigation under Ten Percent more rainfall scenario is the case when the optimization model was analyzed assuming above average rainfall. Mean of 10 random + 10%, 50-year weather, rainfall scenarios was calculated for seasonal and off-seasonal rainfall. Average rainfall for growing season was 1.57 ac-ft for growing season and 0.75 ac-ft for non-growing season. A 50-year optimization was conducted for two different EC values and cotton prices of 54 cents/lb and 70 cents/lb. The two EC values were 1.05 and 2.62 after application. EC values are considered as the after irrigation values due to the water loss through evaporation and wind.

Results under Traveling Sprinkler Irrigation with EC value of 0.9/1.05 dS/m before irrigation/after irrigation and Cotton price $ 0.54/lb with above average rainfall

Table 32 presents the summary of the results under traveling sprinkler irrigation with starting EC values of 1.05 after irrigation and cotton lint price at 54 cents/lb. More than 10,000 acres of land are profitable with an average water use of 1.9 ac-ft per acre of land. Greer County has the most acres whereas Jackson County has the highest average yields of cotton lint along with lowest cost of irrigation per acre-foot of water.

Table 32. Result summary for individual County under Traveling Reel irrigation for economically feasible acres with 1.05 dS/m EC and 54 cents/lb cotton lint price under ten percent more rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Economically Feasible Acres	Acres	6,138	2,500	538	951	10,127
Ave Irrigation Rate	af/ac	1.82	2.01	2.00	1.90	1.89
Ave TDH	Feet	430	396	435	445	423
Ave Cotton Lint Yield	lbs/ac	1,513	1,584	1,594	1,556	1,540
Irrigation Cost	$/ac-ft	94	88	95	96	92
PV irrigation	($000)	24,486	12,356	2,776	3,751	43,369
PV Capital	($000)	12,288	5,372	1,344	1,980	20,984
NPV Irrigation	($000)	12,198	6,984	1,432	1,771	22,385
NIB	($000)	11,805	6,824	1,398	1,710	21,737
NIB/Ac	$	1,846	2,514	2,298	1,851	2,048
Salt	Tons	6,005	3,300	654	741	10,700
Nitrogen	Kg	34,397	17,753	3,658	4,630	60,438

[a] Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area

The majority of the Greer County areas are along the Elm Fork of the Red river where the water flows are lower than along the North Fork. Net incremental benefits over dry land for a 50-year period are little over $ 21 million for 10,000 profitable acres. Average NPV per acre is $ 2,048 with Jackson County having the highest values, as expected with the highest yields per acre, which exceed $ 2,500 per acre.

Results under Traveling Sprinkler Irrigation with EC value of 2.2 before/2.62 dS/m after irrigation and cotton price $ 0.54/lb with Ten Percent more rainfall

Table 33 presents the summary of the results under traveling sprinkler irrigation with starting EC values of 2.62 dS/m after irrigation and cotton lint price at 54 cents/lb. As one would expect with increase in the salinity the economically feasible acres would reduce. There is a decrease in the average irrigation rate, which drops below 1 acre-foot, at

0.92 ac-ft per acre of land. Net incremental benefits over dry land for a 50-year period are little over $ 4 million for six and half thousand profitable acres.

Table 33. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres with 2.62 dS/m water EC and 54 cents/lb cotton lint price under a ten percent increase in rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Economically Feasible Acres	Acres	4,027	1,749	372	405	6,553
Ave Irrigation Rate	af/ac	0.86	1.02	1.04	0.98	0.92
Ave TDH	Feet	419	398	414	452	415
Ave Cotton Lint Yield	lbs/ac	1,168	1,182	1,195	1,184	1,174
Irrigation Cost	$/ac-ft	92	88	91	97	91
PV irrigation	($000)	9,745	4,383	974	953	16,055
PV Capital	($000)	6,949	2,955	673	715	11,292
NPV Irrigation	($000)	2,796	1,428	301	239	4,763
NPV NIB	($000)	2,538	1,316	277	213	4,344
NPV NIB/Ac	$	627	740	732	539	658
Salt	Tons/yr	3,425	2,238	394	411	6,468
Nitrogen	Tons/yr	37	21	4	3	66

a Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area

Results under Traveling Sprinkler Irrigation with EC value of 0.9/1.05 before irrigation/after irrigation and cotton price $ 0.70/lb with Ten Percent higher rainfall

Table 34 shows the results for four counties for traveling reel irrigation with EC value of 1.05 and cotton lint price of 70 cents/lb. With higher price, we see increase in feasible acres and in average irrigation rate. The average irrigation increased to greater than two acre-feet per acre of land of cotton. For the 12607 profitable acres, we have nearly $ 57 million net incremental benefits for the 50-year period. The average NPV per acre is 4,382 with Jackson County being the highest at $ 5,183 per acre.

Table 34. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres at 1.05 EC and 70 cents/lb cotton lint price under ten percent more rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Economically Feasible Acres	Acres	7,473	2,949	838	1,348	12,607
Ave Irrigation Rate	af/ac	1.99	2.09	2.07	1.97	2.02
Ave TDH	Feet	442	415	462	513	444
Ave Cotton Lint Yield	lbs/ac	1,528	1,575	1,592	1,553	1,546
Irrigation Cost	$/ac-ft	96	91	99	108	96
PV irrigation	($000)	64,319	28,718	7,613	10,616	111,267
PV Capital	($000)	18,490	7,231	2,289	3,401	31,411
NPV Irrigation	($000)	45,829	21,487	5,324	7,215	79,856
NPV NIB	($000)	32,513	16,232	3,831	4,813	57,390
NPV NIB/Ac	$/acre	4,119	5,183	4,619	3,826	4,382
Salt return	Tons/yr	10,179	4,278	847	1,016	16,320
Nitrogen return	Tons/yr	64	27	6	7	104

Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area

Results under Traveling Sprinkler Irrigation with EC value of 2.2 before/2.62 after irrigation and cotton price $ 0.70/lb with Ten Percent more rainfall

Table 35 contains a four-county summary for the traveling reel irrigation when the EC value of the water is 2.2 before irrigation and 2.62 after irrigation and the price of cotton lint is 70 cents/lb. the increase in salinity leads to lower rate of irrigation per acre as well as lower feasible acres. The Net Present Value per acre is reduced to $ 2,148 per acre. The average irrigation is also reduced due to high salinity making it almost 1 ac-ft per acre of land. For the 9,856 profitable acres, total net incremental benefits exceed $ 22 million for the 50-year period. Jackson County has the highest returns per acre at $ 2,229 per acre although Kiowa County had slightly higher average yield of cotton lint at 1,202 lbs per acre.

Table 35. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres at 2.62 EC and 70 cents/lb cotton lint price under ten percent increase in rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Ave/ Total
Feasible Acres	Acres	5,907	2,633	538	778	9,856
Ave Irrigation Rate	af/ac	0.95	1.08	1.11	1.07	1.00
Ave TDH	Feet	436	413	435	447	430
Ave Cotton Lint Yield	lbs/ac	1,181	1,192	1,202	1,196	1,186
Irrigation Cost	$/ac-ft	95	91	95	97	94
PV irrigation	($ 000)	36,107	16,982	3,660	4,787	61,535
PV Capital	($000)	12,518	5,910	1,344	1,670	21,441
NPV Irrigation	($000)	23,589	11,072	2,316	3,117	40,094
NPV NIB	($000)	13,062	6,381	1,357	1,730	22,531
NPV NIB/Ac	$	2,099	2,229	2,217	2,168	2,148
Salt	Tons/yr	7,142	3,999	714	792	12,647
Nitrogen	Tons/yr	71	39	8	7	126

a Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area

Results under Ten Percent less Rainfall for Traveling Reel Sprinkler Irrigation

Irrigation under the “-10” weather scenario is the case when the model was used to determine profitability if the average annual rainfall dropped by 10 percent. The mean of 10 random 50-year daily rainfalls was used for seasonal and off-season rainfall. The average rainfall for growing season was 1.29 ac-ft for growing season and 0.61 ac-ft for non-growing season under the scenario. The 50-year optimization was obtained for each of the two starting EC values of 1.05 dS/m and 2.62 dS/m. Optimization was obtained using cotton prices of 54 cents/lb and 70 cents/lb.

Results under Traveling Sprinkler Irrigation with EC value of 0.9/1.05 dS/m before irrigation/after irrigation and cotton price $ 0.54/lb with Ten Percent less rainfall

Irrigation with a lower rainfall leads to a high salt build-up over time resulting into lower average yields over the 50-year period. Results in Table 36 show the significance of rainfall as we have 7,441 feasible acres; yielding $ 8.5 million in net incremental benefits despite the average yields of over 1400 lbs/acre and average irrigation rate of over 2.12 ac-ft per acre. Higher irrigation rate per acre can be attributed to low EC of 1.05. Net present value per acre over dry land cotton was the lowest in Greer and Tillman Counties.

Table 36. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres at 1.05 EC and 54 cents/lb Cotton Lint Price under ten percent less rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Econ. Feas. Acres	Acres	4,391	2,030	401	619	7,441
Ave Irrigation Rate	af/ac	2.09	2.17	2.22	2.10	2.12
Ave TDH	Feet	409	397	402	429	407
Ave Cotton Yield	lbs/ac	1,420	1,452	1,480	1,435	1,434
Irrigation Cost	$/ac-ft	90	88	89	93	90
PV irrigation	($000)	12,365	6,851	1,446	1,682	22,344
PV Capital	($000)	7,678	3,683	795	1,127	13,283
NPV Irrigation	($000)	4,687	3,168	651	555	9,061
NPV NIB	($000)	4,406	3,038	625	515	8,585
NPV NIB/Ac	$	1,015	1,442	1,428	850	1,144
Salt	Tons/yr	4,820	2,576	481	581	8,458
Nitrogen	Tons/yr	24	14	2	3	44

a Abbreviations Used: Econ. Feas. Acres is Economically Feasible Acres that are irrigated, af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area

Results under Traveling Sprinkler Irrigation with EC value of 2.2 before/2.62 after irrigation and cotton price $ 0.54/lb with Ten Percent less rainfall

Table 37 contains the summary of the results under traveling sprinkler irrigation with water EC values of 2.62 after irrigation and a cotton lint price of 54 cents/lb. The empty table indicates that there is absolutely no incentive in investing for a well and pipe development and traveling reel equipment. The results of the optimization model after deducting the fixed costs show none of the acres profitable over a 50-year period. The result is consistent with the average weather scenario at the 2.62 dS/m EC and 54 cents/lb cotton lint price where we found that barely 1,100 acres were profitable and hence it was not advisable. As one would expect with increase in the salinity the yields would be lower and salt build up will be higher and hence nothing is profitable over the capital costs.

Table 37. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres at 2.62 dS/m and 54 cents/lb cotton lint price under ten percent less rainfall

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Economically Feasible Acres	Acres	0	0	0	0	0

Results under Traveling Sprinkler Irrigation with EC value of 0.9/1.05 dS/m before irrigation/after irrigation and cotton price $ 0.70/lb with below average rainfall

Table 37 shows the results for four counties for traveling reel irrigation with EC value of 1.05 and cotton lint price of 70 cents/lb. With the price, there is increase in profitable acres and average irrigation application rate as compared to the price of 54 cents/lb. The average irrigation increased to greater than two acre-feet per acre of land of cotton.

Table 38. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres for water EC 1.05 dS/m and 70 cents/lb cotton lint price with ten percent less rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Economically Feasible Acres	Acres	6,804	2,718	579	1,037	11,138
Ave Irrigation Rate	af/ac	2.19	2.31	2.37	2.29	2.24
Ave TDH	Feet	433	404	421	451	426
Ave Cotton Lint Yield	lbs/ac	1,423	1,466	1,487	1,470	1,442
Irrigation Cost	$/ac-ft	9,974	3,832	1,014	1,362	16,182
PV irrigation	($000)	47,721	21,831	4,994	6,891	81,438
PV Capital	($000)	15,628	6,201	1,600	2,192	25,621
NPV Irrigation	($000)	32,093	15,630	3,395	4,700	55,817
NPV NIB	($000)	19,967	10,786	2,363	2,852	35,969
NPV NIB/Ac	$	2,743	3,731	3,491	2,926	3,049
Salt	Tons/yr	1,794	877	73	74	2,818
Nitrogen	Tons/yr	25	12	1	1	39

[a] Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area.

For the 11,138 profitable acres, net incremental benefits over the 50-year period exceed $ 35 million. The average NPV per acre is $3049 with Jackson County being the highest $3731. Average irrigation rate is 2.24 ac-ft per acre with the highest being in Kiowa County at 2.37 ac-ft per acre of land.

Results under Traveling Sprinkler Irrigation with EC value of 2.2/2.62 dS/m before irrigation/after irrigation and cotton price $ 0.70/lb with below average rainfall

Table 39 presents results for four counties for traveling reel irrigation with EC value of 2.62 and cotton lint price of 70 cents/lb. We find that with higher salinity and lower rainfall, the salt builds up would be faster and leads to lower yields in a long run. Hence, we see the lower profitable acres with EC of 2.62 dS/m even though we have a high price of 70 cents/lb when compared to EC of 1.05 dS/m after irrigation.

Table 39. Summary of results for individual County under Traveling Reel irrigation for economically feasible acres with 1.05 dS/m EC and 70 cents/lb cotton lint price with ten percent less rainfall[a]

Item	Unit	County				
		Greer	Jackson	Kiowa	Tillman	Total/Ave
Economically Feasible Area	Acres	1,600	713	86	74	2,474
Ave Irrigation Rate	af/ac	1.01	1.12	1.20	1.10	1.05
Ave TDH	Feet	417	389	393	415	408
Ave Cotton Lint Yield	lbs/ac	996	970	1,029	1,025	990
Irrigation Cost	$/ac-ft	91	86	87	91	90
PV irrigation	($000)	6,529	2,662	360	323	9,874
PV Capital	($000)	2,767	1,159	123	138	4,187
NPV Irrigation	($000)	3,761	1,504	237	185	5,687
NPV NIB	($000)	910	233	84	52	1,278
NPV NIB/Ac	$	589	319	971	704	527
Salt	Tons/yr	1,794	877	73	74	2,818
Nitrogen	Kg/yr	22,708	10,911	880	521	35,020

a Abbreviations Used: af/ac is acre feet per acre, TDH is total dynamic head, Irrigation cost is the variable cost of pumping an acre-foot water, PV Irrigation is discounted value of irrigation benefits before subtraction of capital cost, PV capital is the discounted value of 50 year investment cost, NIB is net incremental benefits from irrigation over dryland cotton benefits, Salt and Nitrogen are sum of 50 year averages of Salt and Nitrogen kg/ac lost from the soil profile from the irrigated area

The total profitable acres have decreased, including the NIB per acre reduced to just $ 527 per acre. Kiowa County has the highest NPV per acre at $ 971. The yields are lower compared to other scenarios falling below 1,000 lbs/acre. The average irrigation rate per acre is 1.05. Net incremental benefits for 2,474 profitable acres are just over $ 5.6 million.

Returns where Pivots and Traveling Reel Overlap

Table 40 shows the results of sections where traveling reel was overlapped by pivot fields. A close observation of individual fields shows that the net incremental benefits per acre were higher with pivots for all the cases. This is attributed to the size of the pivot fields as well as lower fixed costs per acre.

Table 40. Summary of the results of sections where both pivot and traveling reel irrigation development was profitable

Travelling Reel results overlapped by Pivots with Ten percent Increase in Rainfall			
EC (dS/m)	Cotton Price (cents/lb)	Acres cancelled by pivots	NPV ($ 000) from Traveling Reel
2.2	54	1,821	1,074
0.9	54	3,076	5,061
2.2	70	2,544	5,211
0.9	70	4,037	5,372
Travelling Reel results overlapped by Pivots with Average Rainfall			
2.2	54	-	-
0.9	54	2,740	3,222
2.2	70	2,154	2,771
0.9	70	3,516	11,055
Travelling Reel results overlapped by Pivots with ten percent Decrease in Rainfall			
2.2	54	-	-
0.9	54	1,956	2,110
2.2	70	730	412
0.9	70	3,365	8,076

As an example, the results for the section '14-T5N-R21W' is discussed. The section had 86 acres that could be irrigated using traveling reel sprinkler. It was observed that a full-circle pivot could be operated and hence one would be able to irrigate 122 acres using pivot irrigation development yielding $ 817,000 in NPV compared to the $ 257,000 that traveling reel irrigation would have earned by irrigating 86 acres. The development of pivot irrigation is cheaper, overall, as it would achieve higher efficiency and lower fixed cost per acre. Table 41 below summarizes the final NPV and feasible acres over the 50-year period with two water EC's, two cotton prices and three rainfall scenarios used in the study.

Table 41. Summary of NPV and profitable acres under traveling reel irrigation after subtracting the acres overlapped by pivots, with two water EC's, two Cotton prices and three different rainfalls

Results with Ten Percent Increase in Rainfall			
EC (dS/m)	Cotton Price (cents/lb)	Feasible Acres	Final NPV($000)
2.2	54	4,732	3,270
0.9	54	7,051	16,676
2.2	70	7,312	17,320
0.9	70	8,570	52,018
Results with Average Rainfall			
2.2	54	1,114	401
0.9	54	6,343	12,722
2.2	70	5,721	8,222
0.9	70	8,300	36,328
Results with Ten Percent Decrease in Rainfall			
2.2	54	-	-
0.9	54	5,485	6,475
2.2	70	1,744	866
0.9	70	7,773	27,893

The actual feasible acres that will be cancelled from the 'net incremental benefits from traveling reel', due to the pivot area overlap, range between 26 and 32 percent for different rainfall scenarios. The reduction in NPV varies greatly from 9 percent to 30 percent. When the irrigation water EC is low at 0.9 dS/m, we find that there is a higher number of acres that overlap the pivot fields. The reduction in net incremental benefits is greater for the lower EC at all prices and rainfall scenarios. For the irrigation water conductivity of 2.2 dS/m and cotton price of 54 cents/lb, we have zero net benefits from the traveling reel irrigation when the rainfall decreases by ten percent. The only benefits with the given scenario are from pivot irrigation development, which is also lower in comparison to average rainfall.

Net Agricultural Benefits

The net incremental benefits shown in Table 42 indicate that overall agricultural benefits to cotton producers vary greatly. For an average rainfall, the net agricultural benefits range between $5 million and $ 120 million depending on the irrigation water EC and cotton price. We can see that the results are not very encouraging with lower cotton price of 54 cents/lb and higher salinity when the rainfall decreases by ten percent. For the higher rainfall scenario, we find the best results as expected.

Table 42. Summary of Results for overall Net Incremental Benefits and feasible acres from irrigation with Center Pivot and Traveling Reel Irrigation[a]

Irri Water Ec (dS/m)	Cotton Price (cents/lb)	Pivots NIB ($000)	Pivot Acres	Reel NIB ($000)	Reel Acres	Total NIB ($000)	Total Acres	NIB/Ac ($/Ac)
Results with Ten Percent Decrease in Rainfall								
3.0	54.0	$169	612	0	0	$ 169	612	$276
3.0	70.0	$9,756	9,486	0	0	$ 9,756	9,486	$1,028
2.2	54.0	$2,121	4,642	0	0	$ 2,121	4,642	$457
2.2	70.0	$25,080	12,284	$ 866	1,744	$ 25,946	14,028	$1,850
0.9	54.0	$11,969	10,909	$ 6,475	5,485	$ 18,444	16,394	$1,125
0.9	70.0	$52,181	12,690	$ 27,893	7,773	**$ 80,074**	**20,463**	$3,913
Results with Average Rainfall								
3.0	54.0	$ 5,703	8,177	0	0	$ 5,703	8,177	$697
3.0	70.0	$ 31,083	12,546	0	0	$ 31,083	12,546	$2,478
2.2	54.0	$ 13,120	11,343	$ 401	1,114	$ 13,521	12,457	$1,085
2.2	70.0	$ 45,886	12,690	$ 8,222	5,721	$ 54,108	18,411	$2,939
0.9	54.0	$ 23,843	12,276	$ 12,722	6,343	$ 36,565	18,619	$1,964
0.9	70.0	$ 64,357	12,690	$ 36,328	8,300	**$ 100,685**	**20,990**	$4,797
Results with Ten Percent Increase in Rainfall								
2.2	54.0	$ 20,808	12,276	$ 3,270	4,732	$ 24,078	17,008	$1,416
2.2	70.0	$ 67,547	12,690	$ 17,320	7,312	$ 84,867	20,002	$4,243
0.9	54.0	$ 40,670	12,636	$ 16,676	7,051	$ 57,346	19,687	$2,913
0.9	70.0	$ 68,106	12,690	$ 52,018	8,570	**$ 120,124**	**21,260**	$5,650

[a]Abbreviation used: NIB is the Net Incremental Benefits, Ac is acres

CHAPTER - V

CONCLUSIONS

The annual water flow measurements on average at Carl and Hedrick gauge are nearly 32,000 and 226,000 acre-feet. This means on average there would be plenty of water available for irrigation if timing were not a problem. However, there will be a need for storage of water for producers as the major water flow is during the months of May and June whereas the requirement of irrigation is generally in July-August. We have already discussed the fixed costs that are subtracted for wells, pipeline, pumps and equipment. These play an essential role in determining the overall benefits as one has to consider wells and pumps for making the water available when needed.

The results are sensitive to any changes in the rainfall, prices and irrigation water EC. Rainfall is an important factor is in the optimization. The total water used by the optimization model varies, as expected, with different levels of EC, prices and weather. It is important to note that unlike the general case where lower rainfall leads to higher irrigation requirement, we see an opposite reaction in the optimization due to salinity i.e. when there is below average rainfall; model does not apply a higher quantity of water on a per acre basis. When we have higher rainfall, the model estimates greater yields & NPV and applies more quantity of water. This relates with the irrigation water EC and salinity build up over the years. When rainfall is less, salt build up is more and hence less irrigation water is applied and vice-versa.

There are nearly 4,500 acres along the Elm Fork and 8,200 along the North Fork for potential center pivot irrigation. Additionally, there were thousands of acres evaluated for irrigation with a traveling sprinkler system. These would complement (not substitute) the 12,690 acres that were identified for pivot irrigation.

The results under both pivot and traveling sprinkler irrigation show we find majority of the profitable area in Greer County, along the Elm Fork, under traveling sprinkler. Contrary to that, we only had about 4,489 acres that can potentially be irrigated using center pivots (partial and full circles), whereas there were 8,201 acres that could be potentially irrigated under center pivot are along the North Fork i.e. Tillman and Jackson counties. Any area of the traveling sprinkler fishnet that is overlapped by the pivot circles in the GIS were excluded when calculating overall benefits from the project, as pivots would triumph over traveling reel. This is due to the higher capital cost and lower efficiency that leads to higher EC after application in traveling reel. Although the feasible acres from traveling reel irrigation are reduced, it is important to emphasize the fact that those acres will be irrigated using pivots and would earn greater net benefits. This adds to the overall benefits that can be achieved by the total acres feasible and profitable along with net present value over the 50-year period.

A major difference between this and prior studies is that center pivot irrigation was only considered based on the total acres available and not based on soil characteristics. In addition, previous studies did not consider soil specific yield response functions in estimating NPV for individual fields. Hence, soil characteristics were ignored for individual fields. The major advantage of using GIS, soil profiles and aerial photographs for economic optimization problem is that there is more information available regarding the soils in the individual sections. The use of GIS for economic feasibility on a field specific level using individual soil type is a new phenomenon. Once we know the sizes and shapes of irrigable fields, one can precisely fit irrigation circles and determine the right kind of equipment to be used i.e. center pivot, travelling gun etc.

One of the limitations in the study is that management practices are considered the same for each pivot circle. Since historical data were used in simulation model, we have used the budgets for operating costs based on the historically used conventional tillage. An individual producer may prefer to use other management practices, which may differ. This could change the costs of operation and hence the estimates of economic feasibility may different. One can use this study as a base and can so one's own economic feasibility analysis for a particular type of management practices.

Another limitation is the unpredictability of weather. Although we have used rainfalls from randomly generated weather scenarios, the unpredictability of the weather can change the overall impact. The averages from the below average, above average and average rainfalls from randomly generated weather scenarios were used as closest possible representatives of the future 50 year weather.

This dissertation only covers part of the overall net benefits and cost analysis that can be derived from the chloride control project. The costs for chloride abatement would also be a part of the overall benefit-cost analysis. The previous estimates done by the Army Corps of Engineers (1976) suggest that the cost of removing 420 tons per day would cost from $ 850,000 to $ 1.4 million per year as per the 1974 estimates (USACE, 1976). The value of the abatement in 2012 would be 409 percent compared to 1974 based on the inflation calculator (Dollar Times, 2012. The 50-year present value for these values range from $ 63 million to $ 104 million. The total benefits from the project could exceed the costs mentioned above once the regional impact analysis is done. The regional impact analysis could include the revenues generated by the people in the region that are affiliated with crop production inputs, irrigation supplies, labor etc. the overall benefits from the irrigation project could also include benefits from additional irrigation in the areas of Lugert-Altus irrigation district and Tillman terrace.

Overall, the potential for increased irrigation with the Red River Chloride project will be a step towards the future.

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Appendices

Appendix-I

Table I- 1. Dry Land Cotton Budget for Elm and North Fork sections under average, below average and above average rainfall conditions

Dry land Cotton Budget for Elm and North Fork			Below Average Rainfall	Average Rainfall	Above Average Rainfall
PRODUCTION	Units	Price	$/Acre	$/Acre	$/Acre
Cotton Lint	Lbs	0.54	253.8	270.0	291.6
Cotton Seed	Cwt	4.77	26.5	26.5	26.5
Total Receipts			280.32	296.5	318.1
OPERATING INPUTS	Units	Price	$/Acre	$/Acre	$/Acre
Seed	Acre	$ 12.76	12.8	12.8	12.8
Fertilizer	Acre	$ 20.44	20.4	20.4	20.4
Pesticide	Acre	$ 27.12	27.1	27.1	27.1
Growth Regulators/Harvest Aids	Acre	$ 7.52	7.5	7.5	7.5
Crop Insurance	Acre	$ 9.91	9.9	9.9	9.9
Annual Operating Capital	Dollars	$ 0.08	6.1	6.1	6.1
Machinery Labor	Hrs.	$ 8.00	16.2	16.2	16.2
Machinery Fuel, Lube, Repairs	Acre	$ 92.04	92.0	92.0	92.0
Ginning/Processing	Acre	$ 37.61	37.6	37.6	37.6
Other Expense	Acre	$ 16.02	16.0	16.0	16.0
Total Operating Costs			245.8	245.8	245.8
Returns Above Total Operating Costs			(219.2)	50.8	72.4
FIXED COSTS	Units	Rate	$/Acre	$/Acre	$/Acre
Depreciation, Interest	$/value Dollars	0.085	47.8	47.8	47.8
Total Fixed Costs			47.8	47.8	47.8
Total Costs (Operating + Fixed):			293.6	293.6	293.6
Returns Above All Specified Costs			(13.25)	3.0	24.6

Source: Oklahoma State University Enterprise Budget for Cotton

Table I- 2. List of Variable costs per acre for Irrigated Cotton along the Elm and North Forks

OPERATING INPUTS	**$/Acre**
Seed	$ 21.2
Fertilizer	$ 60.0
Pesticide	$ 41.6
Growth Regulators/Harvest Aids	$ 28.9
Crop Insurance	$ 9.9
Annual Operating Capital	$ 11.2
Machinery Labor	$ 21.1
Irrigation Labor	$ 1.5
Machinery Fuel, Lube, Repairs	$ 107.2
Ginning/Processing	$ 110.3
Other Expense	$ 21.3
Total Variable Costs	$ $434.20

Source: Oklahoma State University Enterprise Budget, 2010

Table I- 3. Capital costs involved in Center Pivot Irrigation

Equipment/Operation		**Cost**
Well (120ft deep, 12 ft diameter)	$	10,500
Pump (600 gpm)	$	7,398
Column Pipe	$	7,563
Centre Pivot Sprinkler System (low pressure)	$	45,000
Diesel Motor	$	12,370
Natural Gas Motor	$	9,900
Electric Motor	$	8,049

Sources: Roger Sahs (OSU Enterprise Budget), Schumacher Irrigation

Appendix – II
Returns along the Elm Fork with Center Pivot Irrigation

II-a. Results under Center Pivot Irrigation along the Elm Fork:

Table CP 1. Economically feasible area under Irrigation by Center Pivot along the Elm Fork with Cotton price at $0.54per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T5N-R21W	20	4	16	62	1.04	257
32-T5N-R20W	25	4	21	65	0.71	324
22-T6N-R23W	50	7	43	116	0.96	367
36-T6N-R22W	65	8	57	123	0.93	463
4-T5N-R22W	45	5	40	81	0.98	495
23-T6N-R24W	65	7	57	115	0.81	498
10-T5N-R21W	39	4	35	67	1.04	522
14-T5N-R22W	85	7	77	116	1.04	667
11-T5N-R22W	49	4	45	66	0.92	677
22-T5N-R21W	90	8	83	120	0.95	688
16-T5N-R22W	85	7	78	113	1.04	693
5-T5N-R21W	48	4	44	62	1.10	710
14-T5N-R22W	107	8	100	123	1.01	810
36-T6N-R22W	102	7	94	116	0.84	813
11-T5N-R22W	79	5	73	84	0.82	874
20-T5N-R20W	71	5	66	75	1.06	882
8-T5N-R21W	83	5	77	85	0.72	910
10-T5N-R21W	72	5	67	73	1.04	922
22-T6N-R24W	122	8	114	122	0.91	933
23-T5N-R21W	83	5	78	82	0.81	948
25-T6N-R24W	87	5	82	77	0.96	1,064
13-T5N-R22W	141	8	133	121	1.03	1,102
19-T5N-R20W	146	8	138	122	1.05	1,129
30-T6N-R24W	144	8	137	121	0.85	1,129
14-T5N-R21W	153	8	145	122	1.03	1,188
4-T5N-R22W	155	8	147	121	0.94	1,214
36-T6N-R23W	112	6	107	87	0.93	1,224
7-T5N-R21W	132	6	126	101	0.81	1,246
10-T5N-R21W	161	8	153	121	1.06	1,264

Table CP 1 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
4-T5N-R22W	139	7	132	102	0.98	1,298
30-T5N-R20W	176	8	169	121	0.70	1,393
11-T5N-R21W	182	8	174	122	1.05	1,425
12-T5N-R22W	186	8	178	123	0.85	1,444
36-T6N-R23W	188	8	180	121	0.87	1,490
31-T6N-R22W	204	8	197	123	0.97	1,598
25-T6N-R23W	159	6	153	94	1.10	1,629
5-T5N-R21W	210	8	202	123	0.98	1,644
26-T6N-R23W	155	6	149	90	1.10	1,656
16-T5N-R22W	216	8	208	118	1.07	1,766
24-T5N-R21W	253	8	245	124	1.06	1,978
29-T5N-R20W	275	8	267	122	1.10	2,190
26-T6N-R23W	284	8	276	121	1.09	2,279

Table CP 2. Economically feasible area under irrigation by Center pivot along the Elm Fork with 0.9 dS/m water EC, 54 cents/lb cotton price and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$436	$ 128	$ 308	72	1.52	4,272
29-T5N-R20W	$1,055	$ 217	$ 837	122	1.60	6,862
19-T5N-R20W	$934	$ 217	$ 717	122	1.59	5,873
14-T5N-R21W	$946	$ 217	$ 729	122	1.59	5,973
10-T5N-R21W	$932	$ 216	$ 716	121	1.59	5,917
11-T5N-R21W	$967	$ 217	$ 750	122	1.59	6,144
10-T5N-R21W	$542	$ 130	$ 412	73	1.58	5,638
5-T5N-R21W	$420	$ 110	$ 310	62	1.59	4,994
13-T5N-R22W	$928	$ 216	$ 712	121	1.58	5,884
12-T5N-R22W	$918	$ 219	$ 699	123	1.42	5,681
14-T5N-R22W	$835	$ 207	$ 628	116	1.58	5,413
16-T5N-R22W	$974	$ 210	$ 764	118	1.59	6,474
25-T6N-R23W	$760	$ 168	$ 592	94	1.60	6,300
26-T6N-R23W	$1,056	$ 216	$ 840	121	1.60	6,942
26-T6N-R23W	$730	$ 160	$ 569	90	1.60	6,326
16-T5N-R22W	$817	$ 201	$ 616	113	1.59	5,450
32-T5N-R20W	$378	$ 116	$ 262	65	1.26	4,037
20-T5N-R20W	$546	$ 134	$ 412	75	1.58	5,497
9-T5N-R21W	$260	$ 96	$ 164	54	1.59	3,032
10-T5N-R21W	$468	$ 119	$ 349	67	1.58	5,202
30-T5N-R20W	$842	$ 216	$ 627	121	1.27	5,181
24-T5N-R21W	$1,046	$ 221	$ 825	124	1.59	6,657
23-T5N-R21W	$552	$ 146	$ 406	82	1.36	4,953
22-T5N-R21W	$828	$ 214	$ 614	120	1.51	5,118
8-T5N-R21W	$556	$ 151	$ 404	85	1.29	4,755
5-T5N-R21W	$444	$ 110	$ 334	62	1.60	5,380
5-T5N-R21W	$946	$ 219	$ 727	123	1.50	5,908
36-T6N-R22W	$795	$ 207	$ 588	116	1.42	5,069
36-T6N-R22W	$819	$ 219	$ 600	123	1.49	4,878
4-T5N-R22W	$915	$ 216	$ 699	121	1.52	5,780
4-T5N-R22W	$795	$ 182	$ 613	102	1.56	6,008
4-T5N-R22W	$566	$ 144	$ 422	81	1.56	5,206
31-T6N-R22W	$990	$ 219	$ 771	123	1.55	6,269
36-T6N-R23W	$915	$ 216	$ 700	121	1.44	5,784

Table CP 2 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
22-T6N-R23W	$717	$ 207	$ 510	116	1.46	4,401
23-T6N-R24W	$684	$ 205	$ 479	115	1.32	4,163
22-T6N-R24W	$813	$ 217	$ 596	122	1.42	4,884
25-T6N-R24W	$577	$ 137	$ 440	77	1.54	5,710
30-T6N-R24W	$835	$ 216	$ 620	121	1.39	5,120
14-T5N-R22W	$911	$ 219	$ 692	123	1.58	5,626
36-T6N-R23W	$655	$ 155	$ 500	87	1.51	5,747
7-T5N-R21W	$721	$ 180	$ 541	101	1.38	5,357
11-T5N-R22W	$460	$ 118	$ 343	66	1.50	5,190
11-T5N-R22W	$573	$ 150	$ 423	84	1.40	5,039

Table CP 3. Economically feasible area under Irrigation by Center Pivot along the Elm Fork with Cotton price at $0.54per Pound, Electrical Conductivity of irrigation water 2.2 dS/m before and 2.62 dS/m after application and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$293	$ 128	$ 164	72	1.10	2,282
29-T5N-R20W	$823	$ 217	$ 605	122	1.22	4,960
19-T5N-R20W	$672	$ 217	$ 454	122	1.17	3,723
14-T5N-R21W	$668	$ 217	$ 450	122	1.15	3,690
10-T5N-R21W	$684	$ 216	$ 468	121	1.18	3,867
11-T5N-R21W	$707	$ 217	$ 490	122	1.17	4,015
10-T5N-R21W	$382	$ 130	$ 252	73	1.16	3,454
5-T5N-R21W	$285	$ 110	$ 174	62	1.16	2,814
13-T5N-R22W	$651	$ 216	$ 436	121	1.14	3,602
12-T5N-R22W	$675	$ 219	$ 456	123	0.95	3,706
14-T5N-R22W	$573	$ 207	$ 366	116	1.15	3,157
16-T5N-R22W	$733	$ 210	$ 523	118	1.19	4,433
25-T6N-R23W	$581	$ 168	$ 413	94	1.22	4,398
26-T6N-R23W	$825	$ 216	$ 609	121	1.21	5,035
26-T6N-R23W	$559	$ 160	$ 398	90	1.22	4,424
16-T5N-R22W	$560	$ 201	$ 359	113	1.16	3,177
32-T5N-R20W	$278	$ 116	$ 162	65	0.81	2,489
20-T5N-R20W	$401	$ 134	$ 267	75	1.18	3,561
9-T5N-R21W	$156	$ 96	$ 59	54	1.20	1,102
10-T5N-R21W	$322	$ 119	$ 203	67	1.15	3,025
30-T5N-R20W	$644	$ 216	$ 428	121	0.80	3,537
24-T5N-R21W	$794	$ 221	$ 573	124	1.18	4,625
23-T5N-R21W	$409	$ 146	$ 263	82	0.92	3,209
22-T5N-R21W	$578	$ 214	$ 364	120	1.05	3,037
8-T5N-R21W	$412	$ 151	$ 261	85	0.81	3,068
5-T5N-R21W	$326	$ 110	$ 216	62	1.22	3,478
5-T5N-R21W	$724	$ 219	$ 505	123	1.10	4,106
36-T6N-R22W	$559	$ 207	$ 352	116	0.95	3,036
36-T6N-R22W	$558	$ 219	$ 339	123	1.04	2,754
4-T5N-R22W	$647	$ 216	$ 432	121	1.05	3,568
4-T5N-R22W	$560	$ 182	$ 379	102	1.09	3,712
4-T5N-R22W	$380	$ 144	$ 236	81	1.09	2,910
31-T6N-R22W	$711	$ 219	$ 492	123	1.07	3,999

Table CP 3 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
36-T6N-R23W	$672	$ 216	$ 456	121	0.97	3,770
22-T6N-R23W	$523	$ 207	$ 317	116	1.07	2,729
23-T6N-R24W	$504	$ 205	$ 299	115	0.91	2,600
22-T6N-R24W	$603	$ 217	$ 386	122	1.01	3,161
25-T6N-R24W	$403	$ 137	$ 266	77	1.07	3,456
30-T6N-R24W	$618	$ 216	$ 402	121	0.95	3,324
14-T5N-R22W	$616	$ 219	$ 397	123	1.13	3,229
36-T6N-R23W	$466	$ 155	$ 311	87	1.03	3,575
7-T5N-R21W	$531	$ 180	$ 351	101	0.91	3,472
11-T5N-R22W	$317	$ 118	$ 200	66	1.03	3,025
11-T5N-R22W	$411	$ 150	$ 262	84	0.93	3,115

Table CP 4. Economically feasible area irrigation by Center Pivot along the Elm Fork with Cotton Price at $0.54per Pound, Electrical Conductivity of irrigation water 0.9 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$436	$ 128	$ 308	72	1.52	4,272
29-T5N-R20W	$1,055	$ 217	$ 837	122	1.60	6,862
19-T5N-R20W	$934	$ 217	$ 717	122	1.59	5,873
14-T5N-R21W	$946	$ 217	$ 729	122	1.59	5,973
10-T5N-R21W	$932	$ 216	$ 716	121	1.59	5,917
11-T5N-R21W	$967	$ 217	$ 750	122	1.59	6,144
10-T5N-R21W	$542	$ 130	$ 412	73	1.58	5,638
5-T5N-R21W	$420	$ 110	$ 310	62	1.59	4,994
13-T5N-R22W	$928	$ 216	$ 712	121	1.58	5,884
12-T5N-R22W	$918	$ 219	$ 699	123	1.42	5,681
14-T5N-R22W	$835	$ 207	$ 628	116	1.58	5,413
16-T5N-R22W	$974	$ 210	$ 764	118	1.59	6,474
25-T6N-R23W	$760	$ 168	$ 592	94	1.60	6,300
26-T6N-R23W	$1,056	$ 216	$ 840	121	1.60	6,942
26-T6N-R23W	$730	$ 160	$ 569	90	1.60	6,326
16-T5N-R22W	$817	$ 201	$ 616	113	1.59	5,450
32-T5N-R20W	$378	$ 116	$ 262	65	1.26	4,037
20-T5N-R20W	$546	$ 134	$ 412	75	1.58	5,497
9-T5N-R21W	$260	$ 96	$ 164	54	1.59	3,032
10-T5N-R21W	$468	$ 119	$ 349	67	1.58	5,202
30-T5N-R20W	$842	$ 216	$ 627	121	1.27	5,181
24-T5N-R21W	$1,046	$ 221	$ 825	124	1.59	6,657
23-T5N-R21W	$552	$ 146	$ 406	82	1.36	4,953
22-T5N-R21W	$828	$ 214	$ 614	120	1.51	5,118
8-T5N-R21W	$556	$ 151	$ 404	85	1.29	4,755
5-T5N-R21W	$444	$ 110	$ 334	62	1.60	5,380
5-T5N-R21W	$946	$ 219	$ 727	123	1.50	5,908
36-T6N-R22W	$795	$ 207	$ 588	116	1.42	5,069
36-T6N-R22W	$819	$ 219	$ 600	123	1.49	4,878
4-T5N-R22W	$915	$ 216	$ 699	121	1.52	5,780
4-T5N-R22W	$795	$ 182	$ 613	102	1.56	6,008
4-T5N-R22W	$566	$ 144	$ 422	81	1.56	5,206
31-T6N-R22W	$990	$ 219	$ 771	123	1.55	6,269
36-T6N-R23W	$915	$ 216	$ 700	121	1.44	5,784

Table CP 4 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
22-T6N-R23W	$717	$ 207	$ 510	116	1.46	4,401
23-T6N-R24W	$684	$ 205	$ 479	115	1.32	4,163
22-T6N-R24W	$813	$ 217	$ 596	122	1.42	4,884
25-T6N-R24W	$577	$ 137	$ 440	77	1.54	5,710
30-T6N-R24W	$835	$ 216	$ 620	121	1.39	5,120
14-T5N-R22W	$911	$ 219	$ 692	123	1.58	5,626
36-T6N-R23W	$655	$ 155	$ 500	87	1.51	5,747
7-T5N-R21W	$721	$ 180	$ 541	101	1.38	5,357
11-T5N-R22W	$460	$ 118	$ 343	66	1.50	5,190
11-T5N-R22W	$573	$ 150	$ 423	84	1.40	5,039

Table CP 5. Economically feasible area irrigation by Center pivot along the Elm Fork with Cotton price at $0.54per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$60	$ 38	$ 22	72	0.99	307
29-T5N-R20W	$392	$ 64	$ 327	122	1.10	2,682
19-T5N-R20W	$267	$ 64	$ 203	122	1.06	1,664
14-T5N-R21W	$277	$ 64	$ 213	122	1.04	1,747
10-T5N-R21W	$279	$ 64	$ 215	121	1.07	1,780
11-T5N-R21W	$302	$ 64	$ 238	122	1.05	1,949
10-T5N-R21W	$145	$ 38	$ 107	73	1.05	1,463
5-T5N-R21W	$82	$ 33	$ 49	62	1.05	792
13-T5N-R22W	$262	$ 64	$ 198	121	1.03	1,635
12-T5N-R22W	$297	$ 65	$ 232	123	0.86	1,884
14-T5N-R22W	$201	$ 61	$ 140	116	1.04	1,210
16-T5N-R22W	$331	$ 62	$ 269	118	1.07	2,280
25-T6N-R23W	$249	$ 50	$ 199	94	1.10	2,121
26-T6N-R23W	$399	$ 64	$ 335	121	1.09	2,769
26-T6N-R23W	$241	$ 47	$ 193	90	1.10	2,148
16-T5N-R22W	$200	$ 60	$ 140	113	1.04	1,240
32-T5N-R20W	$77	$ 34	$ 43	65	0.74	656
20-T5N-R20W	$141	$ 40	$ 102	75	1.07	1,355
10-T5N-R21W	$106	$ 35	$ 70	67	1.04	1,050
30-T5N-R20W	$275	$ 64	$ 211	121	0.72	1,745
24-T5N-R21W	$373	$ 65	$ 308	124	1.06	2,482
23-T5N-R21W	$154	$ 43	$ 110	82	0.83	1,345
22-T5N-R21W	$200	$ 63	$ 136	120	0.96	1,136
8-T5N-R21W	$153	$ 45	$ 108	85	0.74	1,276
5-T5N-R21W	$107	$ 33	$ 75	62	1.10	1,202
5-T5N-R21W	$316	$ 65	$ 251	123	0.99	2,039
36-T6N-R22W	$211	$ 61	$ 150	116	0.86	1,291
36-T6N-R22W	$181	$ 65	$ 116	123	0.94	947
4-T5N-R22W	$272	$ 64	$ 208	121	0.95	1,723
4-T5N-R22W	$239	$ 54	$ 186	102	0.99	1,819
4-T5N-R22W	$125	$ 43	$ 82	81	0.99	1,017
31-T6N-R22W	$325	$ 65	$ 260	123	0.98	2,113
36-T6N-R23W	$298	$ 64	$ 235	121	0.88	1,939
22-T6N-R23W	$144	$ 61	$ 83	116	0.96	716

Table CP 5 (continued)

23-T6N-R24W	$148	$ 61	$ 87	115	0.82	759
22-T6N-R24W	$217	$ 64	$ 153	122	0.91	1,253
25-T6N-R24W	$162	$ 41	$ 121	77	0.97	1,575
30-T6N-R24W	$243	$ 64	$ 180	121	0.86	1,485
14-T5N-R22W	$236	$ 65	$ 171	123	1.02	1,389
36-T6N-R23W	$195	$ 46	$ 149	87	0.94	1,715
7-T5N-R21W	$221	$ 53	$ 168	101	0.82	1,663
11-T5N-R22W	$112	$ 35	$ 77	66	0.94	1,166
11-T5N-R22W	$154	$ 44	$ 109	84	0.84	1,302

Table CP 6. Economically feasible area irrigation by Center Pivot along the Elm Fork with Cotton price at $0.54per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$135	$ 38	$ 97	72	1.29	1,345
29-T5N-R20W	$507	$ 64	$ 443	122	1.36	3,629
19-T5N-R20W	$404	$ 64	$ 340	122	1.36	2,783
14-T5N-R21W	$425	$ 64	$ 361	122	1.36	2,959
10-T5N-R21W	$406	$ 64	$ 342	121	1.36	2,829
11-T5N-R21W	$437	$ 64	$ 373	122	1.35	3,056
10-T5N-R21W	$228	$ 38	$ 190	73	1.36	2,603
5-T5N-R21W	$153	$ 33	$ 120	62	1.35	1,934
13-T5N-R22W	$409	$ 64	$ 345	121	1.36	2,855
12-T5N-R22W	$425	$ 65	$ 360	123	1.20	2,929
14-T5N-R22W	$342	$ 61	$ 281	116	1.36	2,418
16-T5N-R22W	$454	$ 62	$ 392	118	1.36	3,323
25-T6N-R23W	$338	$ 50	$ 288	94	1.36	3,068
26-T6N-R23W	$514	$ 64	$ 450	121	1.36	3,719
26-T6N-R23W	$326	$ 47	$ 278	90	1.36	3,094
16-T5N-R22W	$338	$ 60	$ 279	113	1.36	2,466
32-T5N-R20W	$129	$ 34	$ 95	65	1.05	1,463
20-T5N-R20W	$214	$ 40	$ 175	75	1.35	2,330
9-T5N-R21W	$22	$ 28	$ -			
10-T5N-R21W	$183	$ 35	$ 147	67	1.35	2,199
30-T5N-R20W	$380	$ 64	$ 316	121	1.05	2,613
24-T5N-R21W	$502	$ 65	$ 437	124	1.35	3,521
23-T5N-R21W	$228	$ 43	$ 185	82	1.14	2,253
22-T5N-R21W	$331	$ 63	$ 267	120	1.28	2,229
8-T5N-R21W	$229	$ 45	$ 184	85	1.07	2,167
5-T5N-R21W	$166	$ 33	$ 133	62	1.36	2,149
5-T5N-R21W	$428	$ 65	$ 363	123	1.27	2,952
36-T6N-R22W	$338	$ 61	$ 276	116	1.20	2,383
36-T6N-R22W	$321	$ 65	$ 256	123	1.27	2,081
4-T5N-R22W	$415	$ 64	$ 351	121	1.29	2,901
4-T5N-R22W	$364	$ 54	$ 310	102	1.33	3,038
4-T5N-R22W	$224	$ 43	$ 181	81	1.33	2,235
31-T6N-R22W	$473	$ 65	$ 408	123	1.32	3,318

Table CP 6 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
36-T6N-R23W	$427	$ 64	$ 364	121	1.22	3,004
22-T6N-R23W	$243	$ 61	$ 182	116	1.24	1,567
23-T6N-R24W	$241	$ 61	$ 180	115	1.11	1,564
22-T6N-R24W	$327	$ 64	$ 262	122	1.21	2,150
25-T6N-R24W	$254	$ 41	$ 213	77	1.31	2,771
30-T6N-R24W	$357	$ 64	$ 293	121	1.17	2,424
14-T5N-R22W	$395	$ 65	$ 330	123	1.35	2,682
36-T6N-R23W	$295	$ 46	$ 249	87	1.28	2,866
7-T5N-R21W	$322	$ 53	$ 269	101	1.16	2,660
11-T5N-R22W	$187	$ 35	$ 153	66	1.28	2,313
11-T5N-R22W	$239	$ 44	$ 195	84	1.18	2,319

Table CP 7. Economically feasible area under Irrigation by Center Pivot along the Elm Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent increase in Rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$380	$ 172	$ 208	72	1.11	2,891
29-T5N-R20W	$973	$ 291	$ 682	122	1.22	5,593
19-T5N-R20W	$829	$ 291	$ 538	122	1.18	4,413
14-T5N-R21W	$829	$ 291	$ 538	122	1.15	4,413
10-T5N-R21W	$837	$ 288	$ 548	121	1.18	4,532
11-T5N-R21W	$863	$ 291	$ 572	122	1.17	4,692
10-T5N-R21W	$477	$ 174	$ 303	73	1.16	4,154
5-T5N-R21W	$365	$ 148	$ 217	62	1.16	3,504
13-T5N-R22W	$807	$ 288	$ 519	121	1.14	4,290
12-T5N-R22W	$820	$ 293	$ 527	123	0.97	4,283
14-T5N-R22W	$724	$ 276	$ 447	116	1.15	3,857
16-T5N-R22W	$882	$ 281	$ 601	118	1.19	5,095
25-T6N-R23W	$697	$ 224	$ 473	94	1.22	5,030
26-T6N-R23W	$974	$ 288	$ 685	121	1.22	5,665
26-T6N-R23W	$670	$ 214	$ 455	90	1.22	5,056
16-T5N-R22W	$708	$ 269	$ 439	113	1.16	3,883
32-T5N-R20W	$345	$ 155	$ 190	65	0.83	2,928
20-T5N-R20W	$492	$ 179	$ 313	75	1.18	4,170
9-T5N-R21W	$221	$ 129	$ 93	54	1.20	1,714
10-T5N-R21W	$408	$ 160	$ 248	67	1.15	3,706
30-T5N-R20W	$773	$ 288	$ 484	121	0.82	4,003
24-T5N-R21W	$950	$ 295	$ 654	124	1.18	5,274
23-T5N-R21W	$501	$ 195	$ 306	82	0.94	3,731
22-T5N-R21W	$720	$ 286	$ 434	120	1.06	3,619
8-T5N-R21W	$504	$ 203	$ 302	85	0.84	3,552
5-T5N-R21W	$403	$ 148	$ 255	62	1.22	4,110
5-T5N-R21W	$861	$ 293	$ 568	123	1.10	4,616
36-T6N-R22W	$701	$ 276	$ 425	116	0.97	3,661
36-T6N-R22W	$709	$ 293	$ 416	123	1.05	3,383
4-T5N-R22W	$800	$ 288	$ 512	121	1.06	4,232
4-T5N-R22W	$691	$ 243	$ 448	102	1.09	4,392
4-T5N-R22W	$484	$ 193	$ 291	81	1.09	3,589
31-T6N-R22W	$868	$ 293	$ 574	123	1.08	4,670

Table CP 7 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
36-T6N-R23W	$816	$ 288	$ 527	121	0.99	4,357
22-T6N-R23W	$645	$ 276	$ 368	116	1.07	3,176
23-T6N-R24W	$612	$ 274	$ 338	115	0.91	2,939
22-T6N-R24W	$727	$ 291	$ 436	122	1.01	3,573
25-T6N-R24W	$501	$ 183	$ 317	77	1.08	4,123
30-T6N-R24W	$747	$ 288	$ 458	121	0.96	3,788
14-T5N-R22W	$783	$ 293	$ 489	123	1.13	3,979
36-T6N-R23W	$574	$ 207	$ 367	87	1.05	4,216
7-T5N-R21W	$647	$ 241	$ 406	101	0.93	4,021
11-T5N-R22W	$399	$ 157	$ 242	66	1.04	3,663
11-T5N-R22W	$509	$ 200	$ 309	84	0.94	3,677

Table CP 8. Economically feasible area Irrigation by Center Pivot along the Elm Fork with Cotton Price at $0.70 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$436	$ 128	$ 308	72	1.52	4,272
29-T5N-R20W	$1,055	$ 217	$ 837	122	1.60	6,862
19-T5N-R20W	$934	$ 217	$ 717	122	1.59	5,873
14-T5N-R21W	$946	$ 217	$ 729	122	1.59	5,973
10-T5N-R21W	$932	$ 216	$ 716	121	1.59	5,917
11-T5N-R21W	$967	$ 217	$ 750	122	1.59	6,144
10-T5N-R21W	$542	$ 130	$ 412	73	1.58	5,638
5-T5N-R21W	$420	$ 110	$ 310	62	1.59	4,994
13-T5N-R22W	$928	$ 216	$ 712	121	1.58	5,884
12-T5N-R22W	$918	$ 219	$ 699	123	1.42	5,681
14-T5N-R22W	$835	$ 207	$ 628	116	1.58	5,413
16-T5N-R22W	$974	$ 210	$ 764	118	1.59	6,474
25-T6N-R23W	$760	$ 168	$ 592	94	1.60	6,300
26-T6N-R23W	$1,056	$ 216	$ 840	121	1.60	6,942
26-T6N-R23W	$730	$ 160	$ 569	90	1.60	6,326
16-T5N-R22W	$817	$ 201	$ 616	113	1.59	5,450
32-T5N-R20W	$378	$ 116	$ 262	65	1.26	4,037
20-T5N-R20W	$546	$ 134	$ 412	75	1.58	5,497
9-T5N-R21W	$260	$ 96	$ 164	54	1.59	3,032
10-T5N-R21W	$468	$ 119	$ 349	67	1.58	5,202
30-T5N-R20W	$842	$ 216	$ 627	121	1.27	5,181
24-T5N-R21W	$1,046	$ 221	$ 825	124	1.59	6,657
23-T5N-R21W	$552	$ 146	$ 406	82	1.36	4,953
22-T5N-R21W	$828	$ 214	$ 614	120	1.51	5,118
8-T5N-R21W	$556	$ 151	$ 404	85	1.29	4,755
5-T5N-R21W	$444	$ 110	$ 334	62	1.60	5,380
5-T5N-R21W	$946	$ 219	$ 727	123	1.50	5,908
36-T6N-R22W	$795	$ 207	$ 588	116	1.42	5,069
36-T6N-R22W	$819	$ 219	$ 600	123	1.49	4,878
4-T5N-R22W	$915	$ 216	$ 699	121	1.52	5,780
4-T5N-R22W	$795	$ 182	$ 613	102	1.56	6,008
4-T5N-R22W	$566	$ 144	$ 422	81	1.56	5,206
31-T6N-R22W	$990	$ 219	$ 771	123	1.55	6,269

Table CP 8 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
36-T6N-R23W	$915	$ 216	$ 700	121	1.44	5,784
22-T6N-R23W	$717	$ 207	$ 510	116	1.46	4,401
23-T6N-R24W	$684	$ 205	$ 479	115	1.32	4,163
22-T6N-R24W	$813	$ 217	$ 596	122	1.42	4,884
25-T6N-R24W	$577	$ 137	$ 440	77	1.54	5,710
30-T6N-R24W	$835	$ 216	$ 620	121	1.39	5,120
14-T5N-R22W	$911	$ 219	$ 692	123	1.58	5,626
36-T6N-R23W	$655	$ 155	$ 500	87	1.51	5,747
7-T5N-R21W	$721	$ 180	$ 541	101	1.38	5,357
11-T5N-R22W	$460	$ 118	$ 343	66	1.50	5,190
11-T5N-R22W	$573	$ 150	$ 423	84	1.40	5,039

Table CP 9. Economically feasible area Irrigation by Center Pivot along the Elm Fork with Cotton price $0.54 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
26-T6N-R23W	16	0	16	90	1.10	180
25-T6N-R23W	14	0	14	94	1.10	154
16-T5N-R22W	31	0	31	118	1.07	265
26-T6N-R23W	98	0	98	121	1.10	809
30-T5N-R20W	20	0	20	121	0.68	169
36-T6N-R23W	13	0	13	121	0.85	110
29-T5N-R20W	87	0	87	122	1.10	714
12-T5N-R22W	10	0	10	123	0.83	79
5-T5N-R21W	41	0	41	123	0.99	330
31-T6N-R22W	14	0	14	123	0.96	110
24-T5N-R21W	61	0	61	124	1.06	493

Table CP 10. Economically feasible area Irrigation by Center Pivot along the Elm Fork with Cotton price $0.54 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T5N-R21W	28	0	28	62	1.45	457
5-T5N-R21W	49	0	49	62	1.46	785
32-T5N-R20W	20	0	20	65	1.11	307
11-T5N-R22W	59	0	59	66	1.35	895
10-T5N-R21W	48	0	48	67	1.44	722
10-T5N-R21W	82	0	82	73	1.45	1,118
20-T5N-R20W	75	0	75	75	1.44	995
25-T6N-R24W	101	0	101	77	1.39	1,318
4-T5N-R22W	62	0	62	81	1.41	767
23-T5N-R21W	81	0	81	82	1.21	989
11-T5N-R22W	83	0	83	84	1.24	993
8-T5N-R21W	80	0	80	85	1.13	936
36-T6N-R23W	126	0	126	87	1.36	1,444
26-T6N-R23W	156	0	156	90	1.46	1,731
25-T6N-R23W	160	0	160	94	1.46	1,704
7-T5N-R21W	136	0	136	101	1.22	1,350
4-T5N-R22W	160	0	160	102	1.41	1,570
16-T5N-R22W	104	0	104	113	1.45	922
23-T6N-R24W	69	0	69	115	1.19	603
14-T5N-R22W	104	0	104	116	1.45	895
36-T6N-R22W	110	0	110	116	1.27	947
22-T6N-R23W	52	0	52	116	1.32	444
16-T5N-R22W	225	0	225	118	1.46	1,903
22-T5N-R21W	109	0	109	120	1.36	908
10-T5N-R21W	170	0	170	121	1.45	1,404
13-T5N-R22W	164	0	164	121	1.45	1,359
26-T6N-R23W	285	0	285	121	1.46	2,359
30-T5N-R20W	170	0	170	121	1.11	1,407
4-T5N-R22W	175	0	175	121	1.37	1,442
36-T6N-R23W	200	0	200	121	1.29	1,650
30-T6N-R24W	153	0	153	121	1.25	1,266
29-T5N-R20W	276	0	276	122	1.46	2,264
19-T5N-R20W	160	0	160	122	1.45	1,311

Table CP 10 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T5N-R21W	28	0	28	62	1.45	457
14-T5N-R21W	174	0	174	122	1.45	1,424
11-T5N-R21W	196	0	196	122	1.45	1,605
22-T6N-R24W	130	0	130	122	1.29	1,069
12-T5N-R22W	195	0	195	123	1.27	1,585
5-T5N-R21W	216	0	216	123	1.36	1,756
36-T6N-R22W	82	0	82	123	1.35	667
31-T6N-R22W	229	0	229	123	1.40	1,859
14-T5N-R22W	135	0	135	123	1.45	1,094
24-T5N-R21W	263	0	263	124	1.45	2,119

Table CP 11. Economically feasible area Irrigation by Center Pivot along the Elm Fork with Cotton price $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$155	$ 96	$ 59	72	1.10	816
29-T5N-R20W	$581	$ 162	$ 418	122	1.23	3,428
19-T5N-R20W	$421	$ 162	$ 259	122	1.17	2,120
14-T5N-R21W	$412	$ 162	$ 250	122	1.15	2,047
10-T5N-R21W	$439	$ 161	$ 278	121	1.18	2,301
11-T5N-R21W	$459	$ 162	$ 297	122	1.17	2,434
10-T5N-R21W	$232	$ 97	$ 135	73	1.15	1,843
5-T5N-R21W	$158	$ 83	$ 75	62	1.16	1,215
13-T5N-R22W	$406	$ 161	$ 245	121	1.14	2,024
12-T5N-R22W	$446	$ 164	$ 283	123	0.93	2,298
14-T5N-R22W	$335	$ 154	$ 180	116	1.15	1,555
16-T5N-R22W	$495	$ 157	$ 338	118	1.20	2,865
25-T6N-R23W	$395	$ 125	$ 269	94	1.23	2,867
26-T6N-R23W	$586	$ 161	$ 425	121	1.22	3,510
26-T6N-R23W	$380	$ 120	$ 260	90	1.23	2,893
16-T5N-R22W	$328	$ 150	$ 177	113	1.16	1,570
32-T5N-R20W	$171	$ 87	$ 84	65	0.78	1,297
20-T5N-R20W	$255	$ 100	$ 156	75	1.19	2,075
10-T5N-R21W	$186	$ 89	$ 97	67	1.15	1,447
30-T5N-R20W	$440	$ 161	$ 279	121	0.77	2,307
24-T5N-R21W	$547	$ 165	$ 382	124	1.18	3,078
23-T5N-R21W	$263	$ 109	$ 154	82	0.89	1,882
22-T5N-R21W	$353	$ 160	$ 194	120	1.05	1,614
8-T5N-R21W	$267	$ 113	$ 154	85	0.78	1,809
5-T5N-R21W	$203	$ 83	$ 121	62	1.23	1,947
5-T5N-R21W	$506	$ 164	$ 342	123	1.10	2,780
36-T6N-R22W	$335	$ 154	$ 181	116	0.93	1,561
36-T6N-R22W	$320	$ 164	$ 156	123	1.03	1,267
4-T5N-R22W	$406	$ 161	$ 245	121	1.04	2,024
4-T5N-R22W	$354	$ 136	$ 218	102	1.08	2,138
4-T5N-R22W	$216	$ 108	$ 108	81	1.08	1,336
31-T6N-R22W	$464	$ 164	$ 300	123	1.07	2,438
36-T6N-R23W	$445	$ 161	$ 284	121	0.95	2,344

Table CP 11 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$155	$ 96	$ 59	72	1.10	816
29-T5N-R20W	$581	$ 162	$ 418	122	1.23	3,428
22-T6N-R23W	$330	$ 154	$ 175	116	1.08	1,511
23-T6N-R24W	$332	$ 153	$ 179	115	0.90	1,559
22-T6N-R24W	$407	$ 162	$ 245	122	1.02	2,008
25-T6N-R24W	$249	$ 102	$ 147	77	1.06	1,903
30-T6N-R24W	$414	$ 161	$ 253	121	0.94	2,088
14-T5N-R22W	$355	$ 164	$ 191	123	1.12	1,552
36-T6N-R23W	$295	$ 116	$ 180	87	1.02	2,064
7-T5N-R21W	$347	$ 134	$ 213	101	0.89	2,109
11-T5N-R22W	$188	$ 88	$ 100	66	1.02	1,518
11-T5N-R22W	$257	$ 112	$ 145	84	0.91	1,732

Table CP 12. Economically feasible area Irrigation by Center Pivot along the Elm Fork with Cotton price $0.70 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$331	$ 96	$ 236	72	1.58	3,273
29-T5N-R20W	$878	$ 162	$ 716	122	1.67	5,865
19-T5N-R20W	$747	$ 162	$ 585	122	1.66	4,795
14-T5N-R21W	$754	$ 162	$ 591	122	1.65	4,847
10-T5N-R21W	$751	$ 161	$ 590	121	1.65	4,874
11-T5N-R21W	$782	$ 162	$ 620	122	1.65	5,082
10-T5N-R21W	$429	$ 97	$ 332	73	1.65	4,549
5-T5N-R21W	$325	$ 83	$ 243	62	1.65	3,913
13-T5N-R22W	$741	$ 161	$ 580	121	1.65	4,791
12-T5N-R22W	$740	$ 164	$ 576	123	1.47	4,684
14-T5N-R22W	$653	$ 154	$ 499	116	1.65	4,298
16-T5N-R22W	$798	$ 157	$ 641	118	1.66	5,434
25-T6N-R23W	$624	$ 125	$ 499	94	1.67	5,304
26-T6N-R23W	$881	$ 161	$ 720	121	1.67	5,949
26-T6N-R23W	$599	$ 120	$ 480	90	1.67	5,330
16-T5N-R22W	$639	$ 150	$ 488	113	1.66	4,322
32-T5N-R20W	$293	$ 87	$ 207	65	1.30	3,178
20-T5N-R20W	$439	$ 100	$ 339	75	1.64	4,521
9-T5N-R21W	$182	$ 72	$ 110	54	1.65	2,034
10-T5N-R21W	$365	$ 89	$ 276	67	1.64	4,121
30-T5N-R20W	$679	$ 161	$ 518	121	1.31	4,281
24-T5N-R21W	$863	$ 165	$ 698	124	1.65	5,630
23-T5N-R21W	$438	$ 109	$ 329	82	1.41	4,015
22-T5N-R21W	$658	$ 160	$ 498	120	1.57	4,149
8-T5N-R21W	$439	$ 113	$ 326	85	1.33	3,836
5-T5N-R21W	$354	$ 83	$ 272	62	1.67	4,384
5-T5N-R21W	$784	$ 164	$ 620	123	1.56	5,039
36-T6N-R22W	$619	$ 154	$ 465	116	1.48	4,005
36-T6N-R22W	$636	$ 164	$ 472	123	1.55	3,839
4-T5N-R22W	$730	$ 161	$ 569	121	1.58	4,703
4-T5N-R22W	$638	$ 136	$ 502	102	1.62	4,924
4-T5N-R22W	$442	$ 108	$ 334	81	1.62	4,121
31-T6N-R22W	$802	$ 164	$ 639	123	1.61	5,191

Table CP 12 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$331	$ 96	$ 236	72	1.58	3,273
29-T5N-R20W	$878	$ 162	$ 716	122	1.67	5,865
36-T6N-R23W	$739	$ 161	$ 578	121	1.49	4,780
22-T6N-R23W	$571	$ 154	$ 417	116	1.52	3,592
23-T6N-R24W	$552	$ 153	$ 399	115	1.37	3,469
22-T6N-R24W	$663	$ 162	$ 501	122	1.48	4,106
25-T6N-R24W	$460	$ 102	$ 357	77	1.60	4,637
30-T6N-R24W	$678	$ 161	$ 517	121	1.44	4,271
14-T5N-R22W	$712	$ 164	$ 549	123	1.65	4,460
36-T6N-R23W	$524	$ 116	$ 408	87	1.56	4,695
7-T5N-R21W	$577	$ 134	$ 443	101	1.43	4,383
11-T5N-R22W	$361	$ 88	$ 273	66	1.56	4,140
11-T5N-R22W	$452	$ 112	$ 341	84	1.45	4,054

II-b. Results under Center Pivot Irrigation along the North Fork:

Table CP 13. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton price $0.54 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	68	8	60	122	0.30	494
2-T3N-R19W	20	5	15	71	0.59	217
28-T2N-R18W	53	6	48	86	0.60	552
31-T2N-R18W	103	8	96	122	0.67	783
29-T1N-R19W	37	8	29	122	0.71	238
3-T1N-R19W	20	7	13	116	0.79	111
5-T1S-R19W	181	8	173	124	0.80	1396
1-T1S-R20W	9	8	1	123	0.82	8
29-T2N-R18W	105	7	97	116	0.84	837
12-T1S-R20W	34	8	27	123	0.84	216
2-T2S-R20W	10	7	2	117	0.84	20
3-T3N-R19W	31	5	26	78	0.86	328
23-T4N-R19W	41	6	35	94	0.88	368
1-T2S-R20W	99	8	91	120	0.89	762
10-T3N-R19W	82	6	76	98	0.92	774
26-T3N-R19W	78	7	71	111	0.92	637
36-T1S-R20W	17	4	13	67	0.93	191
32-T2N-R18W	8	6	2	94	0.94	24
36-T1S-R20W	116	8	108	120	0.95	899
18-T1S-R19W	53	6	47	89	0.96	533
10-T3N-R19W	59	5	54	85	0.97	636
27-T2S-R19W	94	8	86	123	1.00	702
22-T2S-R19W	12	8	4	122	1.01	34
22-T2S-R19W	33	8	26	118	1.01	217
16-T1N-R19W	22	7	15	117	1.01	126
21-T1N-R19W	165	8	157	122	1.01	1,285
27-T2S-R19W	52	8	44	123	1.01	357
9-T2S-R19W	33	8	25	123	1.02	200
23-T2N-R18W	17	6	11	92	1.03	120
3-T3S-R19W	72	8	64	125	1.03	509
25-T1N-R19W	19	8	11	125	1.03	85

Table CP 13 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	68	8	60	122	0.30	494
16-T2S-R19W	74	8	66	119	1.03	556
9-T2S-R19W	22	6	15	101	1.03	153
3-T3S-R19W	82	8	74	124	1.03	597
36-T1S-R20W	124	8	117	124	1.03	940
1-T1S-R20W	104	7	97	117	1.03	826
16-T1N-R19W	115	8	107	122	1.03	875
21-T1N-R19W	245	8	237	123	1.04	1925
16-T1N-R19W	106	7	99	109	1.05	907
31-T2N-R18W	49	5	44	75	1.06	591
19-T2S-R19W	107	5	102	83	1.06	1227
18-T2S-R19W	84	5	79	77	1.06	1028
19-T1S-R19W	206	7	200	107	1.06	1,866
20-T2N-R18W	34	5	29	77	1.07	380
25-T1S-R20W	189	8	181	123	1.08	1,473
25-T1S-R20W	176	8	168	120	1.09	1,402
13-T1S-R20W	131	8	124	119	1.09	1,039
36-T1S-R20W	108	5	103	80	1.09	1,282
25-T1S-R20W	269	8	261	124	1.09	2,105
24-T1S-R20W	243	8	235	122	1.09	1,926
24-T1S-R20W	199	8	191	124	1.10	1,538
24-T1S-R20W	195	8	187	123	1.10	1,521
24-T1S-R20W	251	8	243	124	1.10	1,963
6-T2N-R17W	76	8	68	120	1.11	565

Table CP 14. Economically feasible area under irrigation by Center Pivot along the North Fork, with Cotton price at $0.54 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$335	$ 7	$ 328	107	1.38	3,066
24-T1S-R20W	$392	$ 8	$ 384	122	1.41	3,147
24-T1S-R20W	$350	$ 8	$ 342	124	1.41	2,758
25-T1S-R20W	$423	$ 8	$ 415	124	1.41	3,350
25-T1S-R20W	$323	$ 8	$ 315	120	1.40	2,628
25-T1S-R20W	$350	$ 8	$ 342	123	1.40	2,778
36-T1S-R20W	$312	$ 8	$ 304	124	1.40	2,453
36-T1S-R20W	$208	$ 5	$ 203	80	1.41	2,540
36-T1S-R20W	$262	$ 8	$ 254	120	1.29	2,120
13-T1S-R20W	$277	$ 8	$ 269	119	1.40	2,265
29-T1N-R19W	$178	$ 8	$ 170	122	1.09	1,392
16-T1N-R19W	$205	$ 7	$ 197	117	1.39	1,685
16-T1N-R19W	$293	$ 8	$ 285	122	1.40	2,337
16-T1N-R19W	$258	$ 7	$ 251	109	1.40	2,299
25-T1N-R19W	$224	$ 8	$ 216	125	1.42	1,729
31-T2N-R18W	$244	$ 8	$ 236	122	1.06	1,932
31-T2N-R18W	$171	$ 8	$ 163	122	0.79	1,340
31-T2N-R18W	$158	$ 5	$ 153	75	1.40	2,042
29-T2N-R18W	$251	$ 7	$ 244	116	1.21	2,104
20-T2N-R18W	$48	$ 5	$ 43	72	1.40	596
32-T2N-R18W	$102	$ 6	$ 96	94	1.28	1,022
23-T2N-R18W	$168	$ 6	$ 162	92	1.42	1,764
6-T2N-R17W	$288	$ 8	$ 281	120	1.49	2,338
26-T3N-R19W	$169	$ 7	$ 162	111	1.20	1,457
10-T3N-R19W	$163	$ 6	$ 157	98	1.20	1,604
10-T3N-R19W	$144	$ 5	$ 138	85	1.27	1,626
7-T3N-R18W	$129	$ 6	$ 123	100	1.49	1,229
2-T2S-R20W	$128	$ 7	$ 120	117	1.18	1,028
1-T2S-R20W	$54	$ 5	$ 49	80	1.19	611
9-T2S-R19W	$188	$ 6	$ 182	101	1.42	1,797
22-T2S-R19W	$204	$ 8	$ 196	122	1.39	1,608
22-T2S-R19W	$219	$ 8	$ 212	118	1.40	1,794
27-T2S-R19W	$248	$ 8	$ 240	123	1.40	1,953

Table CP 14 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$335	$ 7	$ 328	107	1.38	3,066
24-T1S-R20W	$392	$ 8	$ 384	122	1.41	3,147
24-T1S-R20W	$350	$ 8	$ 342	124	1.41	2,758
34-T2S-R19W	$6	$ 5	$ 1	71	1.42	19
34-T2S-R19W	$105	$ 5	$ 99	81	1.42	1,228
3-T3S-R19W	$277	$ 8	$ 269	125	1.42	2,153
26-T4N-R19W	$61	$ 4	$ 57	66	1.19	863
24-T1S-R20W	$345	$ 8	$ 337	123	1.41	2,741
24-T1S-R20W	$403	$ 8	$ 395	124	1.41	3,183
26-T1N-R19W	$127	$ 6	$ 121	92	1.42	1,313
32-T1N-R19W	$88	$ 5	$ 84	71	1.36	1,181
1-T2S-R20W	$225	$ 8	$ 218	120	1.22	1,815
36-T1S-R20W	$91	$ 4	$ 87	67	1.26	1,298
25-T1N-R19W	$61	$ 6	$ 55	89	1.42	616
3-T3N-R19W	$49	$ 4	$ 45	63	1.41	713
9-T1N-R19W	$141	$ 8	$ 133	121	1.14	1,102
3-T1N-R19W	$176	$ 7	$ 169	116	1.19	1,453
3-T1N-R19W	$104	$ 8	$ 96	122	1.11	790
34-T2N-R19W	$51	$ 8	$ 43	120	1.04	359
21-T1N-R19W	$354	$ 8	$ 346	122	1.39	2,835
1-T1S-R20W	$137	$ 8	$ 129	123	1.16	1,049
1-T1S-R20W	$277	$ 7	$ 269	117	1.40	2,302
5-T1S-R19W	$328	$ 8	$ 320	124	1.18	2,584
12-T1S-R20W	$159	$ 8	$ 151	123	1.17	1,225
18-T1S-R19W	$170	$ 6	$ 164	89	1.32	1,848
18-T2S-R19W	$185	$ 5	$ 181	77	1.40	2,344
16-T2S-R19W	$269	$ 8	$ 262	119	1.42	2,200
27-T2S-R19W	$287	$ 8	$ 279	123	1.39	2,266
3-T3S-R19W	$286	$ 8	$ 278	124	1.42	2,241
9-T2S-R19W	$234	$ 8	$ 226	123	1.42	1,839
29-T1N-R19W	$107	$ 8	$ 99	119	1.09	835
29-T1N-R19W	$51	$ 5	$ 46	82	1.23	556
21-T1N-R19W	$405	$ 8	$ 398	123	1.38	3,232
28-T2N-R18W	$128	$ 6	$ 122	86	0.97	1,422
20-T2N-R18W	$127	$ 5	$ 122	77	1.38	1,589
31-T3N-R17W	$73	$ 6	$ 68	89	1.18	760

Table CP 14 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$335	$ 7	$ 328	107	1.38	3,066
24-T1S-R20W	$392	$ 8	$ 384	122	1.41	3,147
24-T1S-R20W	$350	$ 8	$ 342	124	1.41	2,758
30-T3N-R17W	$102	$ 6	$ 96	99	1.18	970
35-T3N-R19W	$68	$ 5	$ 62	85	1.20	731
27-T3N-R19W	$31	$ 5	$ 25	82	1.20	308
3-T3N-R19W	$116	$ 5	$ 111	78	1.20	1,425
2-T3N-R19W	$85	$ 5	$ 80	71	0.97	1,126
23-T4N-R19W	$137	$ 6	$ 131	94	1.21	1,394
23-T4N-R19W	$92	$ 6	$ 86	91	1.21	943
9-T1N-R19W	$80	$ 8	$ 72	121	0.88	597
19-T2S-R19W	$216	$ 5	$ 211	83	1.40	2,540

Table CP 15. Economically feasible area under irrigation by Center Pivot along the North Fork, with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	673	191	482	107	1.18	4,504
24-T1S-R20W	786	217	569	122	1.22	4,663
24-T1S-R20W	751	221	531	124	1.22	4,278
25-T1S-R20W	819	221	598	124	1.21	4,825
25-T1S-R20W	708	214	494	120	1.21	4,114
25-T1S-R20W	726	219	507	123	1.19	4,123
36-T1S-R20W	640	221	419	124	1.14	3,378
36-T1S-R20W	462	143	319	80	1.21	3,991
36-T1S-R20W	596	214	383	120	1.05	3,189
13-T1S-R20W	659	212	447	119	1.21	3,753
29-T1N-R19W	492	217	275	122	0.80	2,254
16-T1N-R19W	502	208	294	117	1.12	2,510
16-T1N-R19W	628	217	410	122	1.15	3,362
16-T1N-R19W	572	194	378	109	1.17	3,469
25-T1N-R19W	532	223	309	125	1.13	2,476
31-T2N-R18W	569	217	352	122	0.77	2,882
31-T2N-R18W	514	217	296	122	0.36	2,429
31-T2N-R18W	370	134	236	75	1.18	3,147
29-T2N-R18W	565	207	359	116	0.95	3,091
20-T2N-R18W	259	128	130	72	1.18	1,810
32-T2N-R18W	341	168	173	94	1.05	1,845
23-T2N-R18W	395	164	231	92	1.13	2,510
6-T2N-R17W	584	214	370	120	1.25	3,083
26-T3N-R19W	523	198	325	111	1.03	2,932
35-T3N-R19W	236	141	95	79	1.03	1,203
10-T3N-R19W	475	175	300	98	1.03	3,064
10-T3N-R19W	405	151	254	85	1.07	2,988
7-T3N-R18W	376	178	197	100	1.25	1,974
2-T2S-R20W	456	208	248	117	0.94	2,117
1-T2S-R20W	280	143	137	80	0.95	1,714
9-T2S-R19W	437	180	257	101	1.13	2,544
22-T2S-R19W	509	217	292	122	1.11	2,390
22-T2S-R19W	514	210	304	118	1.11	2,574

Table CP 15 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	673	191	482	107	1.18	4,504
27-T2S-R19W	554	219	335	123	1.12	2,724
34-T2S-R19W	181	127	54	71	1.13	766
34-T2S-R19W	304	144	160	81	1.13	1,975
3-T3S-R19W	585	223	363	125	1.13	2,900
26-T4N-R19W	257	118	140	66	0.98	2,116
24-T1S-R20W	743	219	524	123	1.22	4,261
24-T1S-R20W	804	221	583	124	1.22	4,704
20-T1N-R19W	179	123	56	69	1.12	807
26-T1N-R19W	353	164	189	92	1.13	2,060
32-T1N-R19W	282	127	155	71	1.10	2,188
1-T2S-R20W	568	214	354	120	0.99	2,953
36-T1S-R20W	286	119	167	67	1.04	2,492
25-T1N-R19W	120	130	-			
25-T1N-R19W	280	159	121	89	1.13	1,363
3-T3N-R19W	237	112	125	63	1.21	1,982
9-T1N-R19W	463	216	247	121	0.88	2,044
3-T1N-R19W	463	207	257	116	0.90	2,213
3-T1N-R19W	430	217	213	122	0.85	1,746
34-T2N-R19W	371	214	157	120	0.75	1,311
21-T1N-R19W	666	217	449	122	1.13	3,677
1-T1S-R20W	478	219	259	123	0.92	2,106
1-T1S-R20W	595	208	386	117	1.14	3,300
5-T1S-R19W	666	221	445	124	0.90	3,589
12-T1S-R20W	503	219	284	123	0.93	2,308
12-T1S-R20W	122	121	1	68	0.59	19
18-T1S-R19W	412	159	253	89	1.07	2,847
18-T2S-R19W	415	137	277	77	1.17	3,602
16-T2S-R19W	563	212	351	119	1.13	2,947
27-T2S-R19W	595	219	376	123	1.11	3,053
3-T3S-R19W	591	221	370	124	1.13	2,988
9-T2S-R19W	538	219	318	123	1.13	2,589
29-T1N-R19W	410	212	198	119	0.80	1,666
29-T1N-R19W	258	146	112	82	0.95	1,364
21-T1N-R19W	770	219	551	123	1.16	4,478
35-T2N-R19W	161	127	35	71	0.86	490

Table CP 15 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	673	191	482	107	1.18	4,504
28-T2N-R18W	379	153	226	86	0.69	2,630
20-T2N-R18W	369	137	231	77	1.19	3,006
31-T3N-R17W	323	159	165	89	0.94	1,849
30-T3N-R17W	380	176	204	99	0.94	2,060
35-T3N-R19W	339	151	188	85	1.03	2,206
27-T3N-R19W	292	146	146	82	1.03	1,783
3-T3N-R19W	340	139	201	78	0.97	2,572
2-T3N-R19W	289	127	162	71	0.68	2,288
23-T4N-R19W	407	168	239	94	0.98	2,545
23-T4N-R19W	354	162	192	91	0.99	2,112
9-T1N-R19W	407	216	191	121	0.52	1,580
19-T2S-R19W	463	148	315	83	1.17	3,795

Table CP 16. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton Price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$885	$ 191	$ 695	107	1.57	6,491
24-T1S-R20W	$1,032	$ 217	$ 815	122	1.60	6,680
24-T1S-R20W	$1,001	$ 221	$ 780	124	1.60	6,294
25-T1S-R20W	$1,074	$ 221	$ 853	124	1.60	6,878
25-T1S-R20W	$951	$ 214	$ 737	120	1.59	6,140
25-T1S-R20W	$990	$ 219	$ 771	123	1.59	6,267
36-T1S-R20W	$944	$ 221	$ 724	124	1.59	5,835
36-T1S-R20W	$628	$ 143	$ 485	80	1.60	6,064
36-T1S-R20W	$839	$ 214	$ 625	120	1.48	5,208
13-T1S-R20W	$900	$ 212	$ 688	119	1.59	5,778
29-T1N-R19W	$724	$ 217	$ 506	122	1.28	4,150
16-T1N-R19W	$797	$ 208	$ 588	117	1.58	5,029
16-T1N-R19W	$917	$ 217	$ 700	122	1.59	5,738
16-T1N-R19W	$820	$ 194	$ 626	109	1.59	5,740
25-T1N-R19W	$864	$ 223	$ 641	125	1.60	5,128
31-T2N-R18W	$799	$ 217	$ 582	122	1.26	4,769
31-T2N-R18W	$687	$ 217	$ 470	122	0.97	3,851
31-T2N-R18W	$546	$ 134	$ 412	75	1.60	5,499
29-T2N-R18W	$805	$ 207	$ 599	116	1.40	5,161
20-T2N-R18W	$420	$ 128	$ 292	72	1.59	4,049
32-T2N-R18W	$497	$ 168	$ 329	94	1.46	3,501
23-T2N-R18W	$639	$ 164	$ 475	92	1.60	5,163
6-T2N-R17W	$924	$ 214	$ 710	120	1.70	5,919
26-T3N-R19W	$679	$ 198	$ 481	111	1.38	4,333
35-T3N-R19W	$356	$ 141	$ 215	79	1.40	2,723
10-T3N-R19W	$614	$ 175	$ 439	98	1.38	4,482
10-T3N-R19W	$547	$ 151	$ 395	85	1.45	4,652
7-T3N-R18W	$659	$ 178	$ 481	100	1.70	4,811
2-T2S-R20W	$654	$ 208	$ 445	117	1.35	3,805
1-T2S-R20W	$416	$ 143	$ 274	80	1.37	3,424
9-T2S-R19W	$705	$ 180	$ 525	101	1.60	5,196
22-T2S-R19W	$820	$ 217	$ 602	122	1.58	4,938
22-T2S-R19W	$815	$ 210	$ 605	118	1.58	5,128
27-T2S-R19W	$872	$ 219	$ 653	123	1.58	5,305

Table CP 16 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$885	$ 191	$ 695	107	1.57	6,491
24-T1S-R20W	$1,032	$ 217	$ 815	122	1.60	6,680
34-T2S-R19W	$369	$ 127	$ 243	71	1.60	3,418
34-T2S-R19W	$519	$ 144	$ 375	81	1.60	4,628
3-T3S-R19W	$917	$ 223	$ 694	125	1.60	5,552
26-T4N-R19W	$361	$ 118	$ 243	66	1.36	3,684
24-T1S-R20W	$991	$ 219	$ 772	123	1.60	6,277
24-T1S-R20W	$1,054	$ 221	$ 833	124	1.60	6,719
20-T1N-R19W	$352	$ 123	$ 229	69	1.58	3,323
26-T1N-R19W	$597	$ 164	$ 434	92	1.60	4,712
32-T1N-R19W	$448	$ 127	$ 321	71	1.56	4,522
1-T2S-R20W	$779	$ 214	$ 566	120	1.40	4,713
36-T1S-R20W	$410	$ 119	$ 291	67	1.45	4,336
25-T1N-R19W	$314	$ 130	$ 184	73	1.60	2,516
25-T1N-R19W	$516	$ 159	$ 357	89	1.60	4,016
3-T3N-R19W	$372	$ 112	$ 260	63	1.60	4,130
9-T1N-R19W	$694	$ 216	$ 479	121	1.33	3,955
3-T1N-R19W	$717	$ 207	$ 510	116	1.39	4,398
3-T1N-R19W	$648	$ 217	$ 431	122	1.30	3,533
34-T2N-R19W	$581	$ 214	$ 367	120	1.22	3,059
21-T1N-R19W	$972	$ 217	$ 754	122	1.58	6,184
1-T1S-R20W	$691	$ 219	$ 472	123	1.34	3,839
1-T1S-R20W	$876	$ 208	$ 667	117	1.58	5,705
5-T1S-R19W	$910	$ 221	$ 689	124	1.37	5,556
12-T1S-R20W	$711	$ 219	$ 492	123	1.35	3,998
12-T1S-R20W	$237	$ 121	$ 116	68	1.13	1,706
18-T1S-R19W	$604	$ 159	$ 445	89	1.50	5,005
18-T2S-R19W	$581	$ 137	$ 444	77	1.58	5,763
16-T2S-R19W	$878	$ 212	$ 666	119	1.60	5,600
27-T2S-R19W	$906	$ 219	$ 687	123	1.57	5,587
3-T3S-R19W	$920	$ 221	$ 699	124	1.60	5,640
9-T2S-R19W	$863	$ 219	$ 644	123	1.60	5,233
29-T1N-R19W	$640	$ 212	$ 428	119	1.28	3,595
29-T1N-R19W	$437	$ 146	$ 290	82	1.42	3,542
21-T1N-R19W	$1,034	$ 219	$ 815	123	1.57	6,625
35-T2N-R19W	$283	$ 127	$ 157	71	1.29	2,205

Table CP 16 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$885	$ 191	$ 695	107	1.57	6,491
24-T1S-R20W	$1,032	$ 217	$ 815	122	1.60	6,680
28-T2N-R18W	$505	$ 153	$ 352	86	1.15	4,091
20-T2N-R18W	$523	$ 137	$ 385	77	1.57	5,005
31-T3N-R17W	$473	$ 159	$ 315	89	1.35	3,537
30-T3N-R17W	$547	$ 176	$ 371	99	1.35	3,748
35-T3N-R19W	$458	$ 151	$ 307	85	1.38	3,608
27-T3N-R19W	$407	$ 146	$ 261	82	1.38	3,185
3-T3N-R19W	$482	$ 139	$ 343	78	1.39	4,393
2-T3N-R19W	$397	$ 127	$ 271	71	1.16	3,814
23-T4N-R19W	$568	$ 168	$ 401	94	1.39	4,264
23-T4N-R19W	$510	$ 162	$ 348	91	1.39	3,827
9-T1N-R19W	$597	$ 216	$ 382	121	1.07	3,153
19-T2S-R19W	$642	$ 148	$ 494	83	1.58	5,951

Table CP 17. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton Price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
7-T3N-R18W	82	53	29	100	1.11	291
6-T2N-R17W	231	63	168	120	1.11	1,399
24-T1S-R20W	329	65	264	124	1.10	2,129
24-T1S-R20W	325	65	260	123	1.10	2,112
24-T1S-R20W	382	65	317	124	1.10	2,554
24-T1S-R20W	371	64	307	122	1.10	2,516
25-T1S-R20W	400	65	335	124	1.09	2,702
36-T1S-R20W	193	42	151	80	1.09	1,883
13-T1S-R20W	256	63	193	119	1.09	1,624
25-T1S-R20W	302	63	238	120	1.09	1,986
25-T1S-R20W	321	65	256	123	1.08	2,080
20-T2N-R18W	113	41	72	77	1.07	936
18-T2S-R19W	167	41	127	77	1.07	1,646
19-T2S-R19W	197	44	153	83	1.06	1,842
19-T1S-R19W	316	56	259	107	1.06	2,422
31-T2N-R18W	135	40	95	75	1.06	1,266
16-T1N-R19W	226	57	169	109	1.06	1,548
21-T1N-R19W	375	65	310	123	1.05	2,518
16-T1N-R19W	252	64	187	122	1.04	1,536
1-T1S-R20W	233	62	171	117	1.04	1,463
36-T1S-R20W	263	65	197	124	1.03	1,590
25-T1N-R19W	164	66	98	125	1.03	782
16-T2S-R19W	212	63	149	119	1.03	1,253
26-T1N-R19W	82	48	34	92	1.03	366
23-T2N-R18W	124	48	75	92	1.03	817
9-T2S-R19W	139	53	86	101	1.03	850
34-T2S-R19W	65	43	23	81	1.03	281
3-T3S-R19W	217	66	151	125	1.03	1,206
3-T3S-R19W	226	65	160	124	1.03	1,294
9-T2S-R19W	175	65	110	123	1.03	894
21-T1N-R19W	305	64	241	122	1.02	1,972
16-T1N-R19W	157	62	95	117	1.02	816
27-T2S-R19W	191	65	126	123	1.02	1,028
22-T2S-R19W	166	62	104	118	1.01	878

Table CP 17 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
7-T3N-R18W	82	53	29	100	1.11	291
6-T2N-R17W	231	63	168	120	1.11	1,399
22-T2S-R19W	149	64	85	122	1.01	693
27-T2S-R19W	232	65	167	123	1.01	1,356
32-T1N-R19W	64	37	26	71	1.00	368
10-T3N-R19W	132	45	88	85	0.97	1,030
18-T1S-R19W	143	47	96	89	0.96	1,083
36-T1S-R20W	229	63	166	120	0.95	1,383
32-T2N-R18W	84	50	35	94	0.95	369
36-T1S-R20W	77	35	42	67	0.94	623
26-T3N-R19W	162	58	103	111	0.92	930
35-T3N-R19W	62	45	17	85	0.92	204
10-T3N-R19W	157	52	105	98	0.92	1,070
1-T2S-R20W	200	63	137	120	0.89	1,143
23-T4N-R19W	74	48	26	91	0.89	287
23-T4N-R19W	118	50	69	94	0.88	733
26-T4N-R19W	51	35	17	66	0.88	253
3-T3N-R19W	103	41	62	78	0.87	792
2-T2S-R20W	104	62	42	117	0.85	358
31-T3N-R17W	55	47	8	89	0.85	90
30-T3N-R17W	82	52	30	99	0.85	300
29-T2N-R18W	222	61	161	116	0.85	1,384
12-T1S-R20W	133	65	68	123	0.84	555
1-T1S-R20W	111	65	46	123	0.82	376
5-T1S-R19W	301	65	236	124	0.82	1,901
3-T1N-R19W	140	61	79	116	0.80	680
9-T1N-R19W	112	64	48	121	0.79	400
3-T1N-R19W	78	64	13	122	0.76	108
29-T1N-R19W	149	64	85	122	0.72	696
29-T1N-R19W	78	63	16	119	0.71	132
31-T2N-R18W	220	64	155	122	0.68	1,273
28-T2N-R18W	124	45	79	86	0.63	916
2-T3N-R19W	80	37	43	71	0.63	600
9-T1N-R19W	70	64	6	121	0.47	51
31-T2N-R18W	174	64	110	122	0.33	898

Table CP 18. Economically feasible area under Irrigation by Center Pivot along the North Fork with Cotton price at $0.54 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$575	$ 56	$ 519	107	1.34	$ 4,847
24-T1S-R20W	$646	$ 64	$ 581	122	1.36	$ 4,766
24-T1S-R20W	$606	$ 65	$ 540	124	1.36	$ 4,357
25-T1S-R20W	$680	$ 65	$ 615	124	1.37	$ 4,956
25-T1S-R20W	$575	$ 63	$ 512	120	1.36	$ 4,266
25-T1S-R20W	$607	$ 65	$ 543	123	1.36	$ 4,412
36-T1S-R20W	$579	$ 65	$ 513	124	1.36	$ 4,140
36-T1S-R20W	$431	$ 42	$ 388	80	1.37	$ 4,856
36-T1S-R20W	$509	$ 63	$ 445	120	1.26	$ 3,712
13-T1S-R20W	$529	$ 63	$ 466	119	1.36	$ 3,915
29-T1N-R19W	$430	$ 64	$ 366	122	1.07	$ 2,999
16-T1N-R19W	$468	$ 62	$ 406	117	1.35	$ 3,469
16-T1N-R19W	$556	$ 64	$ 492	122	1.36	$ 4,034
16-T1N-R19W	$507	$ 57	$ 450	109	1.36	$ 4,129
25-T1N-R19W	$497	$ 66	$ 431	125	1.38	$ 3,451
31-T2N-R18W	$501	$ 64	$ 436	122	1.04	$ 3,577
31-T2N-R18W	$428	$ 64	$ 363	122	0.77	$ 2,979
31-T2N-R18W	$382	$ 40	$ 343	75	1.36	$ 4,569
29-T2N-R18W	$505	$ 61	$ 444	116	1.17	$ 3,829
20-T2N-R18W	$266	$ 38	$ 228	72	1.36	$ 3,167
32-T2N-R18W	$319	$ 50	$ 269	94	1.24	$ 2,867
23-T2N-R18W	$411	$ 48	$ 363	92	1.38	$ 3,942
6-T2N-R17W	$568	$ 63	$ 504	120	1.44	$ 4,203
26-T3N-R19W	$391	$ 58	$ 333	111	1.16	$ 2,999
35-T3N-R19W	$197	$ 42	$ 155	79	1.18	$ 1,962
10-T3N-R19W	$379	$ 52	$ 327	98	1.17	$ 3,340
10-T3N-R19W	$359	$ 45	$ 314	85	1.23	$ 3,694
7-T3N-R18W	$389	$ 53	$ 336	100	1.44	$ 3,359
2-T2S-R20W	$359	$ 62	$ 297	117	1.14	$ 2,541
1-T2S-R20W	$263	$ 42	$ 221	80	1.16	$ 2,761
9-T2S-R19W	$439	$ 53	$ 386	101	1.38	$ 3,822
22-T2S-R19W	$471	$ 64	$ 406	122	1.36	$ 3,331
22-T2S-R19W	$483	$ 62	$ 420	118	1.36	$ 3,562
27-T2S-R19W	$517	$ 65	$ 452	123	1.36	$ 3,675

Table CP 18 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$575	$ 56	$ 519	107	1.34	$ 4,847
34-T2S-R19W	$230	$ 37	$ 192	71	1.38	$ 2,708
34-T2S-R19W	$338	$ 43	$ 295	81	1.38	$ 3,641
3-T3S-R19W	$550	$ 66	$ 484	125	1.38	$ 3,876
26-T4N-R19W	$260	$ 35	$ 225	66	1.15	$ 3,407
24-T1S-R20W	$600	$ 65	$ 535	123	1.36	$ 4,350
24-T1S-R20W	$658	$ 65	$ 593	124	1.36	$ 4,782
20-T1N-R19W	$223	$ 36	$ 187	69	1.35	$ 2,707
26-T1N-R19W	$370	$ 48	$ 321	92	1.38	$ 3,491
32-T1N-R19W	$305	$ 37	$ 268	71	1.33	$ 3,775
1-T2S-R20W	$462	$ 63	$ 399	120	1.18	$ 3,323
36-T1S-R20W	$296	$ 35	$ 260	67	1.23	$ 3,887
25-T1N-R19W	$166	$ 38	$ 127	73	1.38	$ 1,745
25-T1N-R19W	$301	$ 47	$ 254	89	1.38	$ 2,853
3-T3N-R19W	$261	$ 33	$ 227	63	1.37	$ 3,611
9-T1N-R19W	$391	$ 64	$ 327	121	1.11	$ 2,704
3-T1N-R19W	$434	$ 61	$ 372	116	1.16	$ 3,210
3-T1N-R19W	$349	$ 64	$ 284	122	1.08	$ 2,331
34-T2N-R19W	$298	$ 63	$ 235	120	1.01	$ 1,958
21-T1N-R19W	$621	$ 64	$ 556	122	1.35	$ 4,561
1-T1S-R20W	$376	$ 65	$ 311	123	1.13	$ 2,532
1-T1S-R20W	$535	$ 62	$ 474	117	1.36	$ 4,048
5-T1S-R19W	$582	$ 65	$ 517	124	1.15	$ 4,170
12-T1S-R20W	$394	$ 65	$ 329	123	1.14	$ 2,675
12-T1S-R20W	$153	$ 36	$ 117	68	0.92	$ 1,725
18-T1S-R19W	$399	$ 47	$ 352	89	1.28	$ 3,952
18-T2S-R19W	$406	$ 41	$ 366	77	1.36	$ 4,752
16-T2S-R19W	$537	$ 63	$ 474	119	1.38	$ 3,987
27-T2S-R19W	$554	$ 65	$ 489	123	1.35	$ 3,974
3-T3S-R19W	$558	$ 65	$ 493	124	1.38	$ 3,974
9-T2S-R19W	$505	$ 65	$ 440	123	1.38	$ 3,580
29-T1N-R19W	$359	$ 63	$ 296	119	1.06	$ 2,490
29-T1N-R19W	$277	$ 43	$ 234	82	1.20	$ 2,849
21-T1N-R19W	$662	$ 65	$ 597	123	1.34	$ 4,857
35-T2N-R19W	$174	$ 37	$ 136	71	1.08	$ 1,921
28-T2N-R18W	$345	$ 45	$ 300	86	0.94	$ 3,487

Table CP 18 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$575	$ 56	$ 519	107	1.34	$ 4,847
20-T2N-R18W	$346	$ 41	$ 305	77	1.34	$ 3,965
31-T3N-R17W	$287	$ 47	$ 240	89	1.14	$ 2,701
30-T3N-R17W	$322	$ 52	$ 270	99	1.14	$ 2,731
35-T3N-R19W	$275	$ 45	$ 230	85	1.16	$ 2,711
27-T3N-R19W	$236	$ 43	$ 193	82	1.16	$ 2,357
3-T3N-R19W	$333	$ 41	$ 292	78	1.17	$ 3,738
2-T3N-R19W	$293	$ 37	$ 256	71	0.95	$ 3,601
23-T4N-R19W	$356	$ 50	$ 306	94	1.17	$ 3,257
23-T4N-R19W	$308	$ 48	$ 260	91	1.18	$ 2,863
9-T1N-R19W	$332	$ 64	$ 268	121	0.86	$ 2,216
19-T2S-R19W	$442	$ 44	$ 398	83	1.36	$ 4,796

Table CP 19. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$814	$ 255	$ 559	107	1.18	$ 5,222
24-T1S-R20W	$952	$ 291	$ 662	122	1.22	$ 5,423
24-T1S-R20W	$920	$ 295	$ 625	124	1.22	$ 5,040
25-T1S-R20W	$989	$ 295	$ 694	124	1.22	$ 5,594
25-T1S-R20W	$870	$ 286	$ 584	120	1.21	$ 4,868
25-T1S-R20W	$896	$ 293	$ 603	123	1.20	$ 4,905
36-T1S-R20W	$818	$ 295	$ 523	124	1.14	$ 4,217
36-T1S-R20W	$572	$ 191	$ 381	80	1.21	$ 4,764
36-T1S-R20W	$744	$ 286	$ 458	120	1.05	$ 3,815
13-T1S-R20W	$820	$ 284	$ 536	119	1.21	$ 4,506
29-T1N-R19W	$639	$ 291	$ 348	122	0.82	$ 2,851
16-T1N-R19W	$677	$ 279	$ 398	117	1.13	$ 3,404
16-T1N-R19W	$805	$ 291	$ 515	122	1.16	$ 4,218
16-T1N-R19W	$728	$ 260	$ 468	109	1.18	$ 4,297
25-T1N-R19W	$720	$ 298	$ 422	125	1.13	$ 3,376
31-T2N-R18W	$720	$ 291	$ 430	122	0.79	$ 3,521
31-T2N-R18W	$652	$ 291	$ 361	122	0.39	$ 2,959
31-T2N-R18W	$480	$ 179	$ 301	75	1.18	$ 4,018
29-T2N-R18W	$717	$ 276	$ 441	116	0.96	$ 3,802
20-T2N-R18W	$361	$ 172	$ 189	72	1.18	$ 2,630
32-T2N-R18W	$439	$ 224	$ 215	94	1.06	$ 2,291
23-T2N-R18W	$533	$ 219	$ 314	92	1.13	$ 3,411
6-T2N-R17W	$785	$ 286	$ 499	120	1.25	$ 4,157
26-T3N-R19W	$631	$ 265	$ 367	111	1.03	$ 3,306
35-T3N-R19W	$317	$ 188	$ 129	79	1.03	$ 1,633
10-T3N-R19W	$571	$ 234	$ 338	98	1.03	$ 3,445
10-T3N-R19W	$500	$ 203	$ 297	85	1.07	$ 3,494
7-T3N-R18W	$543	$ 238	$ 305	100	1.25	$ 3,048
2-T2S-R20W	$578	$ 279	$ 299	117	0.94	$ 2,555
1-T2S-R20W	$364	$ 191	$ 173	80	0.96	$ 2,168
9-T2S-R19W	$589	$ 241	$ 348	101	1.13	$ 3,444
22-T2S-R19W	$686	$ 291	$ 395	122	1.12	$ 3,241
22-T2S-R19W	$686	$ 281	$ 405	118	1.12	$ 3,428

Table CP 19 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$814	$ 255	$ 559	107	1.18	$ 5,222
24-T1S-R20W	$952	$ 291	$ 662	122	1.22	$ 5,423
27-T2S-R19W	$735	$ 293	$ 442	123	1.12	$ 3,591
34-T2S-R19W	$288	$ 169	$ 118	71	1.13	$ 1,666
34-T2S-R19W	$426	$ 193	$ 233	81	1.13	$ 2,876
3-T3S-R19W	$773	$ 298	$ 475	125	1.13	$ 3,800
26-T4N-R19W	$324	$ 157	$ 167	66	0.98	$ 2,527
24-T1S-R20W	$911	$ 293	$ 618	123	1.22	$ 5,023
24-T1S-R20W	$973	$ 295	$ 678	124	1.22	$ 5,465
20-T1N-R19W	$282	$ 164	$ 117	69	1.13	$ 1,699
26-T1N-R19W	$492	$ 219	$ 272	92	1.13	$ 2,960
32-T1N-R19W	$381	$ 169	$ 212	71	1.11	$ 2,980
1-T2S-R20W	$699	$ 286	$ 413	120	0.99	$ 3,446
36-T1S-R20W	$364	$ 160	$ 204	67	1.04	$ 3,050
25-T1N-R19W	$230	$ 174	$ 56	73	1.13	$ 764
25-T1N-R19W	$414	$ 212	$ 201	89	1.13	$ 2,264
3-T3N-R19W	$322	$ 150	$ 172	63	1.20	$ 2,732
9-T1N-R19W	$608	$ 288	$ 320	121	0.89	$ 2,643
3-T1N-R19W	$619	$ 276	$ 343	116	0.91	$ 2,954
3-T1N-R19W	$567	$ 291	$ 276	122	0.86	$ 2,266
34-T2N-R19W	$508	$ 286	$ 222	120	0.76	$ 1,851
21-T1N-R19W	$848	$ 291	$ 557	122	1.13	$ 4,568
1-T1S-R20W	$611	$ 293	$ 318	123	0.92	$ 2,582
1-T1S-R20W	$761	$ 279	$ 482	117	1.14	$ 4,124
5-T1S-R19W	$823	$ 295	$ 527	124	0.92	$ 4,253
12-T1S-R20W	$631	$ 293	$ 338	123	0.94	$ 2,748
12-T1S-R20W	$202	$ 162	$ 40	68	0.62	$ 588
18-T1S-R19W	$529	$ 212	$ 317	89	1.07	$ 3,561
18-T2S-R19W	$522	$ 183	$ 339	77	1.18	$ 4,402
16-T2S-R19W	$741	$ 284	$ 458	119	1.13	$ 3,847
27-T2S-R19W	$773	$ 293	$ 479	123	1.11	$ 3,898
3-T3S-R19W	$778	$ 295	$ 482	124	1.13	$ 3,888
9-T2S-R19W	$722	$ 293	$ 429	123	1.13	$ 3,485
29-T1N-R19W	$555	$ 284	$ 272	119	0.81	$ 2,283
29-T1N-R19W	$366	$ 195	$ 171	82	0.96	$ 2,083

Table CP 19 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$814	$ 255	$ 559	107	1.18	$ 5,222
24-T1S-R20W	$952	$ 291	$ 662	122	1.22	$ 5,423
21-T1N-R19W	$938	$ 293	$ 645	123	1.16	$ 5,245
35-T2N-R19W	$238	$ 169	$ 68	71	0.87	$ 964
28-T2N-R18W	$473	$ 205	$ 268	86	0.72	$ 3,113
20-T2N-R18W	$470	$ 183	$ 287	77	1.19	$ 3,721
31-T3N-R17W	$416	$ 212	$ 204	89	0.94	$ 2,287
30-T3N-R17W	$483	$ 236	$ 247	99	0.94	$ 2,497
35-T3N-R19W	$422	$ 203	$ 219	85	1.03	$ 2,581
27-T3N-R19W	$372	$ 195	$ 177	82	1.03	$ 2,158
3-T3N-R19W	$434	$ 186	$ 248	78	0.98	$ 3,177
2-T3N-R19W	$368	$ 169	$ 199	71	0.71	$ 2,797
23-T4N-R19W	$508	$ 224	$ 284	94	0.98	$ 3,017
23-T4N-R19W	$452	$ 217	$ 235	91	0.99	$ 2,587
9-T1N-R19W	$543	$ 288	$ 255	121	0.55	$ 2,106
19-T2S-R19W	$579	$ 198	$ 381	83	1.18	$ 4,590

Table CP 20. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent increase in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$977	$ 255	$ 722	107	1.53	$ 6,748
24-T1S-R20W	$1,140	$ 291	$ 849	122	1.56	$ 6,959
24-T1S-R20W	$1,111	$ 296	$ 815	124	1.56	$ 6,574
25-T1S-R20W	$1,184	$ 296	$ 889	124	1.56	$ 7,167
25-T1S-R20W	$1,056	$ 286	$ 770	120	1.55	$ 6,417
25-T1S-R20W	$1,102	$ 293	$ 809	123	1.55	$ 6,579
36-T1S-R20W	$1,068	$ 296	$ 772	124	1.55	$ 6,228
36-T1S-R20W	$699	$ 191	$ 509	80	1.56	$ 6,359
36-T1S-R20W	$939	$ 286	$ 653	120	1.44	$ 5,442
13-T1S-R20W	$1,004	$ 284	$ 721	119	1.55	$ 6,056
29-T1N-R19W	$833	$ 291	$ 542	122	1.25	$ 4,445
16-T1N-R19W	$916	$ 279	$ 637	117	1.54	$ 5,447
16-T1N-R19W	$1,037	$ 291	$ 746	122	1.55	$ 6,115
16-T1N-R19W	$923	$ 260	$ 664	109	1.55	$ 6,089
25-T1N-R19W	$995	$ 298	$ 697	125	1.56	$ 5,578
31-T2N-R18W	$915	$ 291	$ 624	122	1.23	$ 5,113
31-T2N-R18W	$804	$ 291	$ 513	122	0.95	$ 4,209
31-T2N-R18W	$620	$ 179	$ 442	75	1.56	$ 5,890
29-T2N-R18W	$915	$ 276	$ 639	116	1.37	$ 5,508
20-T2N-R18W	$488	$ 172	$ 316	72	1.55	$ 4,388
32-T2N-R18W	$563	$ 224	$ 339	94	1.42	$ 3,603
23-T2N-R18W	$736	$ 219	$ 516	92	1.56	$ 5,612
6-T2N-R17W	$1,062	$ 286	$ 776	120	1.65	$ 6,464
26-T3N-R19W	$751	$ 265	$ 486	111	1.34	$ 4,379
35-T3N-R19W	$410	$ 188	$ 222	79	1.36	$ 2,810
10-T3N-R19W	$678	$ 234	$ 444	98	1.34	$ 4,534
10-T3N-R19W	$611	$ 203	$ 408	85	1.41	$ 4,801
7-T3N-R18W	$774	$ 238	$ 536	100	1.65	$ 5,356
2-T2S-R20W	$736	$ 279	$ 458	117	1.32	$ 3,910
1-T2S-R20W	$474	$ 191	$ 283	80	1.33	$ 3,539
9-T2S-R19W	$811	$ 241	$ 570	101	1.56	$ 5,646
22-T2S-R19W	$944	$ 291	$ 653	122	1.54	$ 5,352
22-T2S-R19W	$935	$ 281	$ 654	118	1.54	$ 5,543

Table CP 20 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$977	$ 255	$ 722	107	1.53	$ 6,748
24-T1S-R20W	$1,140	$ 291	$ 849	122	1.56	$ 6,959
27-T2S-R19W	$998	$ 293	$ 705	123	1.55	$ 5,730
34-T2S-R19W	$444	$ 169	$ 275	71	1.56	$ 3,868
34-T2S-R19W	$604	$ 193	$ 411	81	1.56	$ 5,077
3-T3S-R19W	$1,048	$ 298	$ 750	125	1.56	$ 6,002
26-T4N-R19W	$406	$ 157	$ 248	66	1.33	$ 3,764
24-T1S-R20W	$1,100	$ 293	$ 806	123	1.56	$ 6,557
24-T1S-R20W	$1,163	$ 296	$ 868	124	1.56	$ 6,999
20-T1N-R19W	$422	$ 164	$ 258	69	1.54	$ 3,739
26-T1N-R19W	$694	$ 219	$ 475	92	1.56	$ 5,162
32-T1N-R19W	$514	$ 169	$ 345	71	1.52	$ 4,860
1-T2S-R20W	$868	$ 286	$ 582	120	1.36	$ 4,850
36-T1S-R20W	$462	$ 160	$ 302	67	1.41	$ 4,510
25-T1N-R19W	$390	$ 174	$ 216	73	1.56	$ 2,965
25-T1N-R19W	$610	$ 212	$ 397	89	1.56	$ 4,465
3-T3N-R19W	$433	$ 150	$ 282	63	1.56	$ 4,482
9-T1N-R19W	$800	$ 288	$ 511	121	1.30	$ 4,227
3-T1N-R19W	$832	$ 276	$ 555	116	1.35	$ 4,786
3-T1N-R19W	$748	$ 291	$ 457	122	1.26	$ 3,745
34-T2N-R19W	$685	$ 286	$ 399	120	1.19	$ 3,322
21-T1N-R19W	$1,096	$ 291	$ 805	122	1.54	$ 6,598
1-T1S-R20W	$784	$ 293	$ 491	123	1.31	$ 3,989
1-T1S-R20W	$990	$ 279	$ 711	117	1.55	$ 6,078
5-T1S-R19W	$1,021	$ 296	$ 725	124	1.34	$ 5,848
12-T1S-R20W	$798	$ 293	$ 505	123	1.32	$ 4,107
12-T1S-R20W	$301	$ 162	$ 138	68	1.10	$ 2,037
18-T1S-R19W	$684	$ 212	$ 471	89	1.47	$ 5,297
18-T2S-R19W	$651	$ 184	$ 468	77	1.54	$ 6,076
16-T2S-R19W	$1,003	$ 284	$ 720	119	1.56	$ 6,049
27-T2S-R19W	$1,031	$ 293	$ 737	123	1.54	$ 5,995
3-T3S-R19W	$1,051	$ 296	$ 755	124	1.56	$ 6,090
9-T2S-R19W	$992	$ 293	$ 699	123	1.56	$ 5,680
29-T1N-R19W	$749	$ 284	$ 465	119	1.25	$ 3,910
29-T1N-R19W	$514	$ 195	$ 319	82	1.39	$ 3,889
21-T1N-R19W	$1,145	$ 293	$ 852	123	1.53	$ 6,928

Table CP 20 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$977	$ 255	$ 722	107	1.53	$ 6,748
24-T1S-R20W	$1,140	$ 291	$ 849	122	1.56	$ 6,959
35-T2N-R19W	$338	$ 169	$ 168	71	1.26	$ 2,372
28-T2N-R18W	$574	$ 205	$ 369	86	1.12	$ 4,289
20-T2N-R18W	$590	$ 184	$ 407	77	1.53	$ 5,282
31-T3N-R17W	$536	$ 212	$ 324	89	1.32	$ 3,643
30-T3N-R17W	$617	$ 236	$ 381	99	1.32	$ 3,853
35-T3N-R19W	$513	$ 203	$ 311	85	1.34	$ 3,654
27-T3N-R19W	$460	$ 195	$ 265	82	1.34	$ 3,231
3-T3N-R19W	$548	$ 186	$ 362	78	1.36	$ 4,644
2-T3N-R19W	$456	$ 169	$ 287	71	1.13	$ 4,036
23-T4N-R19W	$636	$ 224	$ 412	94	1.35	$ 4,386
23-T4N-R19W	$576	$ 217	$ 359	91	1.36	$ 3,950
9-T1N-R19W	$708	$ 288	$ 419	121	1.04	$ 3,466
19-T2S-R19W	$718	$ 198	$ 520	83	1.54	$ 6,262

Table CP 21. Economically feasible area under irrigation by Center Pivot along the North Fork, with Cotton price at $0.54 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T1S-R19W	24	-	24	124	0.78	194
21-T1N-R19W	72	-	72	123	1.05	585
19-T1S-R19W	60	-	60	107	1.07	563
25-T1S-R20W	14	-	14	123	1.08	113
25-T1S-R20W	7	-	7	120	1.09	62
25-T1S-R20W	93	-	93	124	1.10	750
24-T1S-R20W	70	-	70	122	1.10	577
24-T1S-R20W	21	-	21	123	1.11	171
24-T1S-R20W	76	-	76	124	1.11	613
24-T1S-R20W	23	-	23	124	1.11	187

Table CP 22. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton price at $0.54 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
6-T2N-R17W	125	-	125	120	1.55	1,040
9-T2S-R19W	65	-	65	101	1.47	639
23-T2N-R18W	56	-	56	92	1.47	606
3-T3S-R19W	124	-	124	125	1.47	995
3-T3S-R19W	134	-	134	124	1.47	1,083
34-T2S-R19W	6	-	6	81	1.47	71
25-T1N-R19W	71	-	71	125	1.47	571
16-T2S-R19W	124	-	124	119	1.47	1,042
26-T1N-R19W	14	-	14	92	1.47	155
9-T2S-R19W	84	-	84	123	1.47	684
36-T1S-R20W	120	-	120	80	1.46	1,497
25-T1S-R20W	286	-	286	124	1.46	2,310
24-T1S-R20W	214	-	214	124	1.46	1,725
24-T1S-R20W	267	-	267	124	1.46	2,151
24-T1S-R20W	210	-	210	123	1.46	1,709
24-T1S-R20W	258	-	258	122	1.46	2,115
31-T2N-R18W	69	-	69	75	1.46	915
25-T1S-R20W	212	-	212	123	1.46	1,725
13-T1S-R20W	147	-	147	119	1.46	1,238
25-T1S-R20W	192	-	192	120	1.46	1,601
16-T1N-R19W	132	-	132	109	1.46	1,213
18-T2S-R19W	99	-	99	77	1.46	1,286
36-T1S-R20W	167	-	167	124	1.45	1,345
27-T2S-R19W	101	-	101	123	1.45	822
1-T1S-R20W	142	-	142	117	1.45	1,210
19-T2S-R19W	123	-	123	83	1.45	1,485
16-T1N-R19W	150	-	150	122	1.45	1,228
22-T2S-R19W	79	-	79	118	1.45	673
22-T2S-R19W	60	-	60	122	1.45	489
21-T1N-R19W	207	-	207	122	1.45	1,697
16-T1N-R19W	64	-	64	117	1.45	543
27-T2S-R19W	142	-	142	123	1.44	1,152
20-T2N-R18W	44	-	44	77	1.44	576

Table CP 22 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
6-T2N-R17W	125	-	125	120	1.55	1,040
21-T1N-R19W	270	-	270	123	1.43	2,193
19-T1S-R19W	221	-	221	107	1.43	2,066
32-T1N-R19W	9	-	9	71	1.41	121
18-T1S-R19W	75	-	75	89	1.37	845
36-T1S-R20W	142	-	142	120	1.34	1,183
32-T2N-R18W	22	-	22	94	1.33	233
10-T3N-R19W	66	-	66	85	1.32	774
36-T1S-R20W	28	-	28	67	1.31	417
1-T2S-R20W	118	-	118	120	1.27	985
23-T4N-R19W	12	-	12	91	1.26	127
23-T4N-R19W	55	-	55	94	1.25	580
29-T2N-R18W	125	-	125	116	1.25	1,079
10-T3N-R19W	84	-	84	98	1.25	858
26-T3N-R19W	79	-	79	111	1.25	715
3-T3N-R19W	38	-	38	78	1.25	486
26-T4N-R19W	6	-	6	66	1.23	96
3-T1N-R19W	46	-	46	116	1.23	400
2-T2S-R20W	28	-	28	117	1.22	240
30-T3N-R17W	18	-	18	99	1.22	183
5-T1S-R19W	199	-	199	124	1.22	1,606
12-T1S-R20W	53	-	53	123	1.22	435
1-T1S-R20W	28	-	28	123	1.20	224
9-T1N-R19W	20	-	20	121	1.19	168
29-T1N-R19W	55	-	55	122	1.13	452
31-T2N-R18W	116	-	116	122	1.10	949
2-T3N-R19W	18	-	18	71	1.00	252
28-T2N-R18W	49	-	49	86	0.99	569
31-T2N-R18W	50	-	50	122	0.81	413

Table CP 23. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T1N-R19W	119	109	10	82	0.95	117
20-T2N-R18W	124	96	28	72	1.18	390
3-T3N-R19W	126	84	42	63	1.23	662
35-T3N-R19W	128	105	22	79	1.05	285
34-T2S-R19W	148	108	40	81	1.14	498
32-T1N-R19W	152	95	58	71	1.10	811
7-T3N-R18W	156	133	23	100	1.26	228
1-T2S-R20W	168	106	62	80	0.96	771
26-T4N-R19W	169	88	81	66	0.99	1,225
26-T1N-R19W	176	122	54	92	1.14	583
36-T1S-R20W	183	89	94	67	1.05	1,407
27-T3N-R19W	185	109	76	82	1.04	931
2-T3N-R19W	187	95	93	71	0.65	1,306
34-T2N-R19W	197	160	37	120	0.74	309
31-T3N-R17W	201	118	83	89	0.95	930
32-T2N-R18W	211	125	86	94	1.06	911
3-T3N-R19W	217	104	113	78	0.96	1,450
23-T2N-R18W	218	122	95	92	1.14	1,033
31-T2N-R18W	225	100	125	75	1.19	1,666
23-T4N-R19W	225	121	104	91	0.99	1,139
29-T1N-R19W	226	158	67	119	0.79	565
35-T3N-R19W	228	113	115	85	1.04	1,354
20-T2N-R18W	234	102	132	77	1.20	1,711
9-T1N-R19W	237	161	76	121	0.50	630
9-T2S-R19W	242	134	108	101	1.14	1,067
30-T3N-R17W	245	132	113	99	0.95	1,140
3-T1N-R19W	254	162	92	122	0.85	750
28-T2N-R18W	259	114	144	86	0.66	1,679
18-T1S-R19W	259	118	141	89	1.07	1,579
3-T1N-R19W	265	154	110	116	0.89	949
18-T2S-R19W	272	102	170	77	1.18	2,208
23-T4N-R19W	273	125	148	94	0.99	1,576
16-T1N-R19W	275	156	120	117	1.12	1,022

Table CP 23 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T1N-R19W	119	109	10	82	0.95	117
9-T1N-R19W	276	161	115	121	0.87	950
22-T2S-R19W	281	162	118	122	1.12	971
10-T3N-R19W	281	113	168	85	1.09	1,974
25-T1N-R19W	291	166	125	125	1.14	999
22-T2S-R19W	293	157	136	118	1.12	1,153
2-T2S-R20W	296	156	140	117	0.95	1,197
9-T2S-R19W	301	164	137	123	1.14	1,116
1-T1S-R20W	305	164	141	123	0.92	1,145
29-T1N-R19W	306	162	144	122	0.80	1,176
19-T2S-R19W	310	110	200	83	1.18	2,406
36-T1S-R20W	316	106	209	80	1.22	2,615
6-T2N-R17W	320	160	160	120	1.26	1,337
27-T2S-R19W	322	164	158	123	1.13	1,287
16-T2S-R19W	333	158	175	119	1.14	1,470
12-T1S-R20W	334	164	171	123	0.94	1,386
3-T3S-R19W	344	166	178	125	1.14	1,423
31-T2N-R18W	345	162	182	122	0.32	1,496
10-T3N-R19W	347	130	216	98	1.04	2,205
3-T3S-R19W	352	165	187	124	1.14	1,511
27-T2S-R19W	366	164	202	123	1.12	1,643
16-T1N-R19W	368	145	222	109	1.18	2,041
29-T2N-R18W	369	154	215	116	0.95	1,850
31-T2N-R18W	377	162	214	122	0.76	1,755
1-T1S-R20W	378	156	222	117	1.15	1,900
26-T3N-R19W	379	148	231	111	1.04	2,080
1-T2S-R20W	395	160	235	120	0.99	1,957
16-T1N-R19W	395	162	233	122	1.16	1,909
36-T1S-R20W	403	160	244	120	1.06	2,029
36-T1S-R20W	409	165	243	124	1.15	1,964
21-T1N-R19W	430	162	267	122	1.13	2,192
13-T1S-R20W	444	158	285	119	1.22	2,399
5-T1S-R19W	462	165	297	124	0.88	2,395
19-T1S-R19W	485	142	342	107	1.19	3,199
25-T1S-R20W	491	160	331	120	1.22	2,761
25-T1S-R20W	501	164	338	123	1.21	2,744

Table CP 23 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T1N-R19W	119	109	10	82	0.95	117
24-T1S-R20W	520	164	356	123	1.23	2,895
24-T1S-R20W	526	165	361	124	1.23	2,912
21-T1N-R19W	548	164	384	123	1.17	3,122
24-T1S-R20W	565	162	402	122	1.23	3,298
24-T1S-R20W	579	165	414	124	1.23	3,338
25-T1S-R20W	593	165	428	124	1.23	3,453

Table CP 24. Economically feasible area under irrigation by Center Pivot along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 0.9 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$738	$ 142	$ 596	107	1.64	5,569
24-T1S-R20W	$860	$ 162	$ 698	122	1.67	5,718
24-T1S-R20W	$826	$ 165	$ 661	124	1.67	5,331
25-T1S-R20W	$897	$ 165	$ 732	124	1.67	5,906
25-T1S-R20W	$782	$ 160	$ 622	120	1.66	5,184
25-T1S-R20W	$813	$ 164	$ 649	123	1.66	5,276
36-T1S-R20W	$756	$ 165	$ 591	124	1.65	4,766
36-T1S-R20W	$513	$ 106	$ 407	80	1.67	5,087
36-T1S-R20W	$683	$ 160	$ 523	120	1.54	4,360
13-T1S-R20W	$732	$ 158	$ 574	119	1.66	4,822
29-T1N-R19W	$563	$ 162	$ 400	122	1.34	3,280
16-T1N-R19W	$614	$ 156	$ 458	117	1.65	3,916
16-T1N-R19W	$732	$ 162	$ 570	122	1.66	4,670
16-T1N-R19W	$658	$ 145	$ 513	109	1.66	4,704
25-T1N-R19W	$665	$ 166	$ 499	125	1.67	3,993
31-T2N-R18W	$631	$ 162	$ 468	122	1.31	3,838
31-T2N-R18W	$525	$ 162	$ 363	122	1.00	2,976
31-T2N-R18W	$431	$ 100	$ 331	75	1.67	4,410
29-T2N-R18W	$640	$ 154	$ 486	116	1.46	4,186
20-T2N-R18W	$313	$ 96	$ 218	72	1.66	3,022
32-T2N-R18W	$393	$ 125	$ 268	94	1.53	2,846
23-T2N-R18W	$493	$ 122	$ 371	92	1.67	4,028
6-T2N-R17W	$712	$ 160	$ 553	120	1.77	4,605
26-T3N-R19W	$564	$ 148	$ 416	111	1.44	3,746
35-T3N-R19W	$269	$ 105	$ 164	79	1.46	2,079
10-T3N-R19W	$512	$ 130	$ 381	98	1.44	3,889
10-T3N-R19W	$446	$ 113	$ 333	85	1.51	3,920
7-T3N-R18W	$483	$ 133	$ 350	100	1.77	3,497
2-T2S-R20W	$524	$ 156	$ 368	117	1.41	3,149
1-T2S-R20W	$327	$ 106	$ 220	80	1.43	2,751
9-T2S-R19W	$545	$ 134	$ 410	101	1.67	4,061
22-T2S-R19W	$632	$ 162	$ 470	122	1.64	3,853
22-T2S-R19W	$634	$ 157	$ 477	118	1.64	4,040
27-T2S-R19W	$681	$ 164	$ 517	123	1.65	4,204

Table CP 24 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$738	$ 142	$ 596	107	1.64	5,569
24-T1S-R20W	$860	$ 162	$ 698	122	1.67	5,718
34-T2S-R19W	$257	$ 95	$ 162	71	1.67	2,283
34-T2S-R19W	$391	$ 108	$ 283	81	1.67	3,492
3-T3S-R19W	$719	$ 166	$ 552	125	1.67	4,417
26-T4N-R19W	$290	$ 88	$ 202	66	1.42	3,058
24-T1S-R20W	$817	$ 164	$ 654	123	1.67	5,315
24-T1S-R20W	$879	$ 165	$ 714	124	1.67	5,757
20-T1N-R19W	$244	$ 92	$ 153	69	1.65	2,212
26-T1N-R19W	$452	$ 122	$ 329	92	1.67	3,577
32-T1N-R19W	$344	$ 95	$ 249	71	1.62	3,510
1-T2S-R20W	$640	$ 160	$ 480	120	1.46	4,003
36-T1S-R20W	$328	$ 89	$ 239	67	1.51	3,563
25-T1N-R19W	$198	$ 97	$ 101	73	1.67	1,381
25-T1N-R19W	$375	$ 118	$ 256	89	1.67	2,880
3-T3N-R19W	$280	$ 84	$ 196	63	1.67	3,107
9-T1N-R19W	$536	$ 161	$ 375	121	1.39	3,097
3-T1N-R19W	$547	$ 154	$ 393	116	1.44	3,384
3-T1N-R19W	$499	$ 162	$ 337	122	1.35	2,760
34-T2N-R19W	$429	$ 160	$ 269	120	1.27	2,242
21-T1N-R19W	$782	$ 162	$ 619	122	1.65	5,075
1-T1S-R20W	$549	$ 164	$ 385	123	1.39	3,130
1-T1S-R20W	$701	$ 156	$ 545	117	1.65	4,658
5-T1S-R19W	$740	$ 165	$ 575	124	1.42	4,636
12-T1S-R20W	$574	$ 164	$ 411	123	1.41	3,337
12-T1S-R20W	$147	$ 91	$ 56	68	1.17	826
18-T1S-R19W	$481	$ 118	$ 362	89	1.57	4,070
18-T2S-R19W	$469	$ 102	$ 367	77	1.66	4,765
16-T2S-R19W	$690	$ 158	$ 531	119	1.67	4,464
27-T2S-R19W	$718	$ 164	$ 554	123	1.64	4,508
3-T3S-R19W	$724	$ 165	$ 559	124	1.67	4,505
9-T2S-R19W	$668	$ 164	$ 504	123	1.67	4,101
29-T1N-R19W	$480	$ 158	$ 321	119	1.34	2,701
29-T1N-R19W	$320	$ 109	$ 211	82	1.48	2,569
21-T1N-R19W	$859	$ 164	$ 695	123	1.64	5,649
35-T2N-R19W	$200	$ 95	$ 106	71	1.35	1,488

Table CP 24 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$738	$ 142	$ 596	107	1.64	5,569
24-T1S-R20W	$860	$ 162	$ 698	122	1.67	5,718
28-T2N-R18W	$400	$ 114	$ 286	86	1.19	3,326
20-T2N-R18W	$416	$ 102	$ 313	77	1.64	4,065
31-T3N-R17W	$375	$ 118	$ 256	89	1.41	2,881
30-T3N-R17W	$438	$ 132	$ 306	99	1.41	3,091
35-T3N-R19W	$370	$ 113	$ 257	85	1.44	3,020
27-T3N-R19W	$322	$ 109	$ 213	82	1.44	2,597
3-T3N-R19W	$379	$ 104	$ 276	78	1.45	3,533
2-T3N-R19W	$309	$ 95	$ 214	71	1.19	3,017
23-T4N-R19W	$461	$ 125	$ 336	94	1.45	3,575
23-T4N-R19W	$406	$ 121	$ 285	91	1.45	3,136
9-T1N-R19W	$441	$ 161	$ 280	121	1.11	2,312
19-T2S-R19W	$522	$ 110	$ 411	83	1.65	4,957

II-c. Results along the Elm and North Forks with Leaching in the off-season with Center Pivot Irrigation

Table CP 25. Economically feasible area under irrigation by Center Pivot, with pre-plantation leaching, along the Elm Fork with Cotton Price at $0.54 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and an average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T5N-R20W	309	8	302	122	1.16	2,472
25-T6N-R23W	186	6	180	94	1.16	1,910
26-T6N-R23W	180	6	174	90	1.16	1,937
5-T5N-R21W	65	4	61	62	1.16	991
26-T6N-R23W	317	8	310	121	1.16	2,559
10-T5N-R21W	205	8	197	121	1.14	1,631
16-T5N-R22W	255	8	247	118	1.14	2,096
24-T5N-R21W	293	8	285	124	1.13	2,296
20-T5N-R20W	91	5	87	75	1.13	1,154
19-T5N-R20W	191	8	183	122	1.13	1,501
10-T5N-R21W	102	5	97	73	1.12	1,330
11-T5N-R21W	225	8	218	122	1.12	1,784
5-T5N-R21W	43	4	39	62	1.11	636
16-T5N-R22W	130	7	123	113	1.11	1,086
10-T5N-R21W	65	4	61	67	1.11	904
14-T5N-R21W	204	8	196	122	1.11	1,610
14-T5N-R22W	130	7	123	116	1.11	1,058
13-T5N-R22W	186	8	179	121	1.10	1,476
14-T5N-R22W	165	8	157	123	1.09	1,275
5-T4N-R20W	19	5	14	72	1.06	68
4-T5N-R22W	173	7	167	102	1.04	1,635
4-T5N-R22W	73	5	67	81	1.04	832
5-T5N-R21W	235	8	228	123	1.04	1,850
31-T6N-R22W	246	8	238	123	1.03	1,936
25-T6N-R24W	113	5	108	77	1.03	1,402
22-T6N-R23W	73	7	66	116	1.01	569
4-T5N-R22W	200	8	192	121	1.01	1,590
22-T5N-R21W	122	8	115	120	1.01	955
36-T6N-R22W	112	8	104	123	1.00	847
36-T6N-R23W	142	6	136	87	0.99	1,566

Table CP 25 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T5N-R20W	309	8	302	122	1.16	2,472
11-T5N-R22W	71	4	67	66	0.99	1,019
22-T6N-R24W	139	8	131	122	0.95	1,075
36-T6N-R23W	229	8	222	121	0.93	1,831
36-T6N-R22W	153	7	146	116	0.92	1,257
12-T5N-R22W	228	8	220	123	0.91	1,790
30-T6N-R24W	173	8	165	121	0.90	1,363
11-T5N-R22W	108	5	103	84	0.89	1,224
23-T5N-R21W	113	5	107	82	0.89	1,311
7-T5N-R21W	168	6	161	101	0.87	1,596
23-T6N-R24W	81	7	74	115	0.85	640
32-T5N-R20W	48	4	43	65	0.78	667
8-T5N-R21W	113	5	108	85	0.78	1,266
30-T5N-R20W	219	8	211	121	0.76	1,743

Table CP 26. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton Price at $0.54 per pound, Electrical Conductivity of irrigation water 3.0 dS/m and an average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
30-T5N-R20W	158	8	150	121	0.55	1,241
8-T5N-R21W	69	5	64	85	0.56	748
32-T5N-R20W	16	4	12	65	0.57	185
23-T6N-R24W	15	7	7	115	0.64	65
7-T5N-R21W	105	6	99	101	0.64	978
11-T5N-R22W	54	5	49	84	0.66	584
23-T5N-R21W	65	5	60	82	0.66	732
30-T6N-R24W	95	8	87	121	0.67	721
12-T5N-R22W	146	8	138	123	0.68	1,123
36-T6N-R22W	76	7	68	116	0.68	589
36-T6N-R23W	146	8	138	121	0.70	1,140
22-T6N-R24W	57	8	49	122	0.73	405
11-T5N-R22W	21	4	16	66	0.75	249
36-T6N-R23W	74	6	69	87	0.75	792
36-T6N-R22W	19	8	11	123	0.76	90
4-T5N-R22W	105	8	97	121	0.77	800
22-T5N-R21W	29	8	21	120	0.77	177
25-T6N-R24W	50	5	45	77	0.78	581
31-T6N-R22W	144	8	136	123	0.79	1,106
4-T5N-R22W	87	7	81	102	0.79	790
5-T5N-R21W	146	8	138	123	0.81	1,121
14-T5N-R22W	57	8	49	123	0.84	398
13-T5N-R22W	81	8	74	121	0.86	608
14-T5N-R21W	99	8	91	122	0.86	748
14-T5N-R22W	31	7	24	116	0.87	206
10-T5N-R21W	9	4	5	67	0.87	71
16-T5N-R22W	33	7	26	113	0.87	229
10-T5N-R21W	41	5	36	73	0.88	493
11-T5N-R21W	123	8	116	122	0.88	948
19-T5N-R20W	88	8	80	122	0.89	658
24-T5N-R21W	191	8	183	124	0.89	1,476
20-T5N-R20W	32	5	27	75	0.90	357
16-T5N-R22W	157	8	150	118	0.90	1,270

Table CP 26 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
30-T5N-R20W	158	8	150	121	0.55	1,241
8-T5N-R21W	69	5	64	85	0.56	748
10-T5N-R21W	107	8	99	121	0.90	820
26-T6N-R23W	220	8	212	121	0.92	1,754
5-T5N-R21W	15	4	11	62	0.93	185
26-T6N-R23W	108	6	102	90	0.93	1,130
25-T6N-R23W	110	6	104	94	0.93	1,104
29-T5N-R20W	211	8	203	122	0.93	1,665

Table CP 27. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$336	$ 128	$ 208	72	1.19	2,890
29-T5N-R20W	$884	$ 217	$ 667	122	1.30	5,467
19-T5N-R20W	$749	$ 217	$ 531	122	1.26	4,355
14-T5N-R21W	$753	$ 217	$ 536	122	1.24	4,392
10-T5N-R21W	$760	$ 216	$ 544	121	1.27	4,497
11-T5N-R21W	$782	$ 217	$ 565	122	1.25	4,629
10-T5N-R21W	$432	$ 130	$ 302	73	1.25	4,141
5-T5N-R21W	$325	$ 110	$ 214	62	1.25	3,455
13-T5N-R22W	$728	$ 216	$ 513	121	1.23	4,237
12-T5N-R22W	$747	$ 219	$ 527	123	1.03	4,287
14-T5N-R22W	$649	$ 207	$ 442	116	1.24	3,814
16-T5N-R22W	$801	$ 210	$ 591	118	1.27	5,007
25-T6N-R23W	$629	$ 168	$ 461	94	1.30	4,905
26-T6N-R23W	$886	$ 216	$ 670	121	1.29	5,540
26-T6N-R23W	$604	$ 160	$ 444	90	1.30	4,931
16-T5N-R22W	$635	$ 201	$ 434	113	1.24	3,837
32-T5N-R20W	$314	$ 116	$ 198	65	0.90	3,054
20-T5N-R20W	$438	$ 134	$ 304	75	1.26	4,055
9-T5N-R21W	$182	$ 96	$ 85	54	1.28	1,579
10-T5N-R21W	$365	$ 119	$ 246	67	1.24	3,671
30-T5N-R20W	$713	$ 216	$ 497	121	0.88	4,108
24-T5N-R21W	$863	$ 221	$ 642	124	1.26	5,181
23-T5N-R21W	$459	$ 146	$ 313	82	1.01	3,813
22-T5N-R21W	$636	$ 214	$ 422	120	1.13	3,515
8-T5N-R21W	$462	$ 151	$ 310	85	0.90	3,650
5-T5N-R21W	$358	$ 110	$ 247	62	1.30	3,984
5-T5N-R21W	$773	$ 219	$ 553	123	1.16	4,499
36-T6N-R22W	$642	$ 207	$ 435	116	1.04	3,753
36-T6N-R22W	$637	$ 219	$ 417	123	1.12	3,394
4-T5N-R22W	$724	$ 216	$ 508	121	1.14	4,199
4-T5N-R22W	$620	$ 182	$ 438	102	1.17	4,292
4-T5N-R22W	$427	$ 144	$ 283	81	1.17	3,489
31-T6N-R22W	$782	$ 219	$ 563	123	1.16	4,579

Table CP 27 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$336	$ 128	$ 208	72	1.19	2,890
29-T5N-R20W	$884	$ 217	$ 667	122	1.30	5,467
36-T6N-R23W	$741	$ 216	$ 526	121	1.05	4,344
22-T6N-R23W	$568	$ 207	$ 361	116	1.14	3,112
23-T6N-R24W	$537	$ 205	$ 332	115	0.96	2,888
22-T6N-R24W	$639	$ 217	$ 422	122	1.07	3,457
25-T6N-R24W	$448	$ 137	$ 311	77	1.15	4,037
30-T6N-R24W	$669	$ 216	$ 453	121	1.01	3,744
14-T5N-R22W	$710	$ 219	$ 491	123	1.22	3,990
36-T6N-R23W	$517	$ 155	$ 362	87	1.12	4,157
7-T5N-R21W	$590	$ 180	$ 410	101	0.99	4,055
11-T5N-R22W	$356	$ 118	$ 238	66	1.11	3,607
11-T5N-R22W	$460	$ 150	$ 311	84	1.01	3,699

Table CP 28. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 3.0 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$252	$ 128	$ 123	72	0.91	1,712
29-T5N-R20W	$730	$ 217	$ 512	122	1.02	4,199
19-T5N-R20W	$588	$ 217	$ 371	122	0.97	3,039
14-T5N-R21W	$590	$ 217	$ 372	122	0.95	3,051
10-T5N-R21W	$606	$ 216	$ 390	121	0.99	3,226
11-T5N-R21W	$623	$ 217	$ 405	122	0.97	3,323
10-T5N-R21W	$337	$ 130	$ 207	73	0.97	2,834
5-T5N-R21W	$243	$ 110	$ 133	62	0.96	2,139
13-T5N-R22W	$565	$ 216	$ 350	121	0.94	2,891
12-T5N-R22W	$618	$ 219	$ 398	123	0.75	3,239
14-T5N-R22W	$495	$ 207	$ 289	116	0.95	2,488
16-T5N-R22W	$648	$ 210	$ 438	118	0.99	3,713
25-T6N-R23W	$509	$ 168	$ 342	94	1.02	3,637
26-T6N-R23W	$733	$ 216	$ 517	121	1.02	4,274
26-T6N-R23W	$490	$ 160	$ 330	90	1.02	3,663
16-T5N-R22W	$485	$ 201	$ 283	113	0.96	2,506
32-T5N-R20W	$264	$ 116	$ 148	65	0.64	2,284
20-T5N-R20W	$344	$ 134	$ 210	75	0.98	2,803
9-T5N-R21W	$114	$ 96	$ 18	54	1.00	326
10-T5N-R21W	$278	$ 119	$ 159	67	0.96	2,373
30-T5N-R20W	$616	$ 216	$ 401	121	0.62	3,313
24-T5N-R21W	$704	$ 221	$ 483	124	0.98	3,897
23-T5N-R21W	$383	$ 146	$ 237	82	0.74	2,894
22-T5N-R21W	$490	$ 214	$ 276	120	0.84	2,302
8-T5N-R21W	$392	$ 151	$ 240	85	0.63	2,828
5-T5N-R21W	$279	$ 110	$ 168	62	1.02	2,717
5-T5N-R21W	$632	$ 219	$ 413	123	0.89	3,355
36-T6N-R22W	$520	$ 207	$ 314	116	0.76	2,703
36-T6N-R22W	$491	$ 219	$ 272	123	0.84	2,212
4-T5N-R22W	$575	$ 216	$ 359	121	0.84	2,968
4-T5N-R22W	$486	$ 182	$ 304	102	0.87	2,979
4-T5N-R22W	$321	$ 144	$ 176	81	0.87	2,176
31-T6N-R22W	$624	$ 219	$ 404	123	0.86	3,289

Table CP 28 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	$252	$ 128	$ 123	72	0.91	1,712
29-T5N-R20W	$730	$ 217	$ 512	122	1.02	4,199
36-T6N-R23W	$610	$ 216	$ 395	121	0.77	3,261
22-T6N-R23W	$445	$ 207	$ 238	116	0.87	2,053
23-T6N-R24W	$433	$ 205	$ 228	115	0.70	1,985
22-T6N-R24W	$511	$ 217	$ 294	122	0.80	2,408
25-T6N-R24W	$350	$ 137	$ 212	77	0.86	2,760
30-T6N-R24W	$547	$ 216	$ 331	121	0.74	2,738
14-T5N-R22W	$543	$ 219	$ 323	123	0.93	2,629
36-T6N-R23W	$412	$ 155	$ 257	87	0.83	2,950
7-T5N-R21W	$491	$ 180	$ 311	101	0.71	3,080
11-T5N-R22W	$276	$ 118	$ 159	66	0.82	2,405
11-T5N-R22W	$376	$ 150	$ 226	84	0.73	2,693

Table CP 29. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton price at $0.54 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
25-T6N-R24W	$5	$ -	$ 5	77	1.03	59
23-T5N-R21W	$13	$ -	$ 13	82	0.87	157
11-T5N-R22W	$2	$ -	$ 2	84	0.88	18
8-T5N-R21W	$14	$ -	$ 14	85	0.76	161
36-T6N-R23W	$22	$ -	$ 22	87	0.99	257
26-T6N-R23W	$54	$ -	$ 54	90	1.17	605
25-T6N-R23W	$54	$ -	$ 54	94	1.17	579
7-T5N-R21W	$41	$ -	$ 41	101	0.86	407
4-T5N-R22W	$28	$ -	$ 28	102	1.04	274
16-T5N-R22W	$88	$ -	$ 88	118	1.15	744
13-T5N-R22W	$13	$ -	$ 13	121	1.11	108
30-T6N-R24W	$29	$ -	$ 29	121	0.90	239
4-T5N-R22W	$32	$ -	$ 32	121	1.01	260
10-T5N-R21W	$35	$ -	$ 35	121	1.15	289
36-T6N-R23W	$71	$ -	$ 71	121	0.92	589
30-T5N-R20W	$80	$ -	$ 80	121	0.75	658
26-T6N-R23W	$149	$ -	$ 149	121	1.17	1,231
19-T5N-R20W	$16	$ -	$ 16	122	1.13	128
14-T5N-R21W	$26	$ -	$ 26	122	1.11	213
11-T5N-R21W	$52	$ -	$ 52	122	1.13	424
29-T5N-R20W	$139	$ -	$ 139	122	1.17	1,139
12-T5N-R22W	$69	$ -	$ 69	123	0.90	564
31-T6N-R22W	$72	$ -	$ 72	123	1.03	586
5-T5N-R21W	$81	$ -	$ 81	123	1.05	654
24-T5N-R21W	$119	$ -	$ 119	124	1.14	956

Table CP 30. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton Price at $0.54 per pound, Electrical Conductivity of irrigation water 3 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
30-T5N-R20W	31	-	31	121	0.56	258
12-T5N-R22W	1	-	1	123	0.69	10
36-T6N-R23W	2	-	2	121	0.71	13
5-T5N-R21W	6	-	6	123	0.84	45
24-T5N-R21W	33	-	33	124	0.92	262
16-T5N-R22W	5	-	5	118	0.93	45
26-T6N-R23W	67	-	67	121	0.95	552
29-T5N-R20W	56	-	56	122	0.96	458
Sum/Average	200		200	973	0.82	205

Table CP 31. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	211	128	82	72	1.19	1,142
29-T5N-R20W	663	217	446	122	1.31	3,654
19-T5N-R20W	520	217	303	122	1.27	2,481
14-T5N-R21W	520	217	303	122	1.24	2,482
10-T5N-R21W	538	216	322	121	1.28	2,664
11-T5N-R21W	555	217	338	122	1.26	2,771
10-T5N-R21W	296	130	165	73	1.26	2,266
5-T5N-R21W	209	110	98	62	1.25	1,583
13-T5N-R22W	502	216	287	121	1.24	2,369
12-T5N-R22W	537	219	318	123	1.02	2,586
14-T5N-R22W	431	207	224	116	1.24	1,930
16-T5N-R22W	584	210	373	118	1.28	3,163
25-T6N-R23W	458	168	291	94	1.31	3,091
26-T6N-R23W	667	216	452	121	1.31	3,732
26-T6N-R23W	441	160	281	90	1.31	3,118
16-T5N-R22W	421	201	220	113	1.25	1,945
32-T5N-R20W	218	116	102	65	0.88	1,574
20-T5N-R20W	304	134	171	75	1.27	2,276
10-T5N-R21W	241	119	122	67	1.25	1,816
30-T5N-R20W	528	216	313	121	0.86	2,585
24-T5N-R21W	637	221	416	124	1.27	3,353
23-T5N-R21W	327	146	181	82	0.99	2,206
22-T5N-R21W	427	214	214	120	1.13	1,780
8-T5N-R21W	330	151	179	85	0.87	2,100
5-T5N-R21W	245	110	135	62	1.31	2,172
5-T5N-R21W	571	219	352	123	1.17	2,859
36-T6N-R22W	440	207	233	116	1.03	2,008
36-T6N-R22W	419	219	200	123	1.12	1,623
4-T5N-R22W	502	216	287	121	1.13	2,369
4-T5N-R22W	429	182	247	102	1.17	2,423
4-T5N-R22W	276	144	131	81	1.17	1,621
31-T6N-R22W	554	219	335	123	1.15	2,724
36-T6N-R23W	533	216	318	121	1.04	2,624

Table CP 31 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
5-T4N-R20W	211	128	82	72	1.19	1,142
29-T5N-R20W	663	217	446	122	1.31	3,654
22-T6N-R23W	389	207	182	116	1.15	1,568
23-T6N-R24W	377	205	172	115	0.96	1,497
22-T6N-R24W	456	217	238	122	1.08	1,952
25-T6N-R24W	306	137	169	77	1.15	2,189
30-T6N-R24W	480	216	264	121	1.01	2,185
14-T5N-R22W	471	219	252	123	1.22	2,050
36-T6N-R23W	360	155	205	87	1.11	2,353
7-T5N-R21W	422	180	242	101	0.98	2,400
11-T5N-R22W	237	118	119	66	1.11	1,806
11-T5N-R22W	320	150	170	84	1.00	2,023
Total/Average	18,351	7,903	10,448	4,435	1.15	2,305

Table CP 32. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the Elm Fork with Cotton Price at $0.70 per pound, Electrical Conductivity of irrigation water 3.0 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T5N-R20W	$481	$ 217	$ 263	122	1.01	2,160
19-T5N-R20W	$335	$ 217	$ 117	122	0.95	961
14-T5N-R21W	$333	$ 217	$ 116	122	0.93	950
10-T5N-R21W	$360	$ 216	$ 144	121	0.97	1,192
11-T5N-R21W	$372	$ 217	$ 154	122	0.95	1,265
10-T5N-R21W	$186	$ 130	$ 56	73	0.94	765
5-T5N-R21W	$115	$ 110	$ 4	62	0.94	70
13-T5N-R22W	$318	$ 216	$ 102	121	0.93	842
12-T5N-R22W	$393	$ 219	$ 173	123	0.72	1,410
14-T5N-R22W	$256	$ 207	$ 49	116	0.93	423
16-T5N-R22W	$406	$ 210	$ 195	118	0.98	1,657
25-T6N-R23W	$318	$ 168	$ 150	94	1.01	1,598
26-T6N-R23W	$487	$ 216	$ 271	121	1.00	2,243
26-T6N-R23W	$307	$ 160	$ 146	90	1.01	1,624
16-T5N-R22W	$250	$ 201	$ 49	113	0.94	434
32-T5N-R20W	$162	$ 116	$ 46	65	0.60	711
20-T5N-R20W	$195	$ 134	$ 61	75	0.97	817
10-T5N-R21W	$142	$ 119	$ 22	67	0.93	332
30-T5N-R20W	$422	$ 216	$ 206	121	0.57	1,702
24-T5N-R21W	$452	$ 221	$ 231	124	0.96	1,860
23-T5N-R21W	$242	$ 146	$ 96	82	0.70	1,168
22-T5N-R21W	$263	$ 214	$ 49	120	0.82	406
8-T5N-R21W	$252	$ 151	$ 101	85	0.59	1,187
5-T5N-R21W	$153	$ 110	$ 42	62	1.01	679
5-T5N-R21W	$408	$ 219	$ 189	123	0.88	1,534
36-T6N-R22W	$303	$ 207	$ 97	116	0.72	834
36-T6N-R22W	$255	$ 219	$ 36	123	0.81	290
4-T5N-R22W	$335	$ 216	$ 119	121	0.82	983
4-T5N-R22W	$278	$ 182	$ 96	102	0.85	942
4-T5N-R22W	$156	$ 144	$ 11	81	0.85	139
31-T6N-R22W	$375	$ 219	$ 156	123	0.84	1,268
36-T6N-R23W	$386	$ 216	$ 170	121	0.74	1,407
22-T6N-R23W	$247	$ 207	$ 40	116	0.86	344

Table CP 32 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
29-T5N-R20W	$481	$ 217	$ 263	122	1.01	2,160
23-T6N-R24W	$259	$ 205	$ 54	115	0.69	470
22-T6N-R24W	$310	$ 217	$ 93	122	0.79	759
25-T6N-R24W	$195	$ 137	$ 58	77	0.83	749
30-T6N-R24W	$343	$ 216	$ 127	121	0.72	1,049
14-T5N-R22W	$282	$ 219	$ 63	123	0.90	511
36-T6N-R23W	$241	$ 155	$ 86	87	0.80	993
7-T5N-R21W	$312	$ 180	$ 132	101	0.68	1,310
11-T5N-R22W	$148	$ 118	$ 30	66	0.79	453
11-T5N-R22W	$225	$ 150	$ 75	84	0.69	897
Total/Ave	12,252	7,775	4,477	4,363	0.85	985

Table CP 33. Economically feasible area under Irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton price at $0.54 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
6-T2N-R17W	$133	$ 8	$ 125	120	1.18	1,044
24-T1S-R20W	$231	$ 8	$ 223	123	1.16	1,810
24-T1S-R20W	$287	$ 8	$ 279	124	1.16	2,252
24-T1S-R20W	$234	$ 8	$ 227	124	1.16	1,827
24-T1S-R20W	$278	$ 8	$ 270	122	1.16	2,215
25-T1S-R20W	$306	$ 8	$ 298	124	1.16	2,404
36-T1S-R20W	$132	$ 5	$ 127	80	1.16	1,587
13-T1S-R20W	$165	$ 8	$ 158	119	1.15	1,326
25-T1S-R20W	$210	$ 8	$ 203	120	1.15	1,688
25-T1S-R20W	$229	$ 8	$ 221	123	1.14	1,795
18-T2S-R19W	$114	$ 5	$ 109	77	1.14	1,411
19-T2S-R19W	$139	$ 5	$ 133	83	1.14	1,606
20-T2N-R18W	$54	$ 5	$ 49	77	1.13	635
16-T1N-R19W	$148	$ 7	$ 141	109	1.13	1,294
31-T2N-R18W	$81	$ 5	$ 77	75	1.12	1,020
19-T1S-R19W	$234	$ 7	$ 228	107	1.12	2,127
16-T1N-R19W	$167	$ 8	$ 159	122	1.11	1,302
21-T1N-R19W	$285	$ 8	$ 277	123	1.11	2,249
1-T1S-R20W	$149	$ 7	$ 141	117	1.11	1,209
23-T2N-R18W	$59	$ 6	$ 54	92	1.11	582
26-T1N-R19W	$18	$ 6	$ 12	92	1.11	131
9-T2S-R19W	$69	$ 6	$ 62	101	1.11	615
16-T2S-R19W	$129	$ 8	$ 121	119	1.11	1,018
3-T3S-R19W	$139	$ 8	$ 131	124	1.11	1,059
25-T1N-R19W	$76	$ 8	$ 68	125	1.11	547
34-T2S-R19W	$9	$ 5	$ 4	81	1.11	46
3-T3S-R19W	$129	$ 8	$ 121	125	1.11	971
36-T1S-R20W	$175	$ 8	$ 167	124	1.10	1,345
9-T2S-R19W	$89	$ 8	$ 81	123	1.10	659
21-T1N-R19W	$223	$ 8	$ 215	122	1.09	1,763
16-T1N-R19W	$79	$ 7	$ 71	117	1.09	609
27-T2S-R19W	$105	$ 8	$ 97	123	1.09	791
22-T2S-R19W	$83	$ 8	$ 76	118	1.08	640

Table CP 33 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
6-T2N-R17W	$133	$ 8	$ 125	120	1.18	1,044
24-T1S-R20W	$231	$ 8	$ 223	123	1.16	1,810
22-T2S-R19W	$63	$ 8	$ 56	122	1.08	455
27-T2S-R19W	$145	$ 8	$ 137	123	1.08	1,118
32-T1N-R19W	$11	$ 5	$ 6	71	1.06	91
18-T1S-R19W	$82	$ 6	$ 76	89	1.02	856
10-T3N-R19W	$72	$ 5	$ 67	85	1.02	789
36-T1S-R20W	$143	$ 8	$ 136	120	1.00	1,131
32-T2N-R18W	$26	$ 6	$ 20	94	1.00	210
36-T1S-R20W	$29	$ 4	$ 24	67	0.98	365
26-T3N-R19W	$86	$ 7	$ 79	111	0.96	711
10-T3N-R19W	$90	$ 6	$ 83	98	0.96	850
1-T2S-R20W	$116	$ 8	$ 108	120	0.93	903
23-T4N-R19W	$10	$ 6	$ 5	91	0.93	51
23-T4N-R19W	$53	$ 6	$ 47	94	0.92	498
3-T3N-R19W	$55	$ 5	$ 50	78	0.92	636
26-T4N-R19W	$6	$ 4	$ 2	66	0.92	32
29-T2N-R18W	$155	$ 7	$ 148	116	0.90	1,273
2-T2S-R20W	$23	$ 7	$ 16	117	0.89	136
30-T3N-R17W	$14	$ 6	$ 8	99	0.89	79
12-T1S-R20W	$50	$ 8	$ 42	123	0.88	340
5-T1S-R19W	$226	$ 8	$ 218	124	0.86	1,761
1-T1S-R20W	$32	$ 8	$ 24	123	0.86	195
3-T1N-R19W	$77	$ 7	$ 69	116	0.84	599
9-T1N-R19W	$44	$ 8	$ 36	121	0.82	298
3-T1N-R19W	$8	$ 8	$ 0	122	0.79	1
29-T1N-R19W	$86	$ 8	$ 79	122	0.75	644
29-T1N-R19W	$18	$ 8	$ 11	119	0.74	90
31-T2N-R18W	$163	$ 8	$ 155	122	0.71	1,273
28-T2N-R18W	$85	$ 6	$ 79	86	0.67	921
2-T3N-R19W	$47	$ 5	$ 42	71	0.66	596
9-T1N-R19W	$30	$ 8	$ 23	121	0.48	186
31-T2N-R18W	$146	$ 8	$ 139	122	0.32	1,136
	$7,151	$442	$6,709	$6,908	1.00	934

Table CP 34. Economically Feasible Area under Irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton Price at $0.54 per Pound, Electrical Conductivity of irrigation water 3.0 dS/m and Average Rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$119	$ 8	$ 111	122	0.09	913
2-T3N-R19W	$18	$ 5	$ 14	71	0.46	193
28-T2N-R18W	$51	$ 6	$ 46	86	0.47	530
31-T2N-R18W	$101	$ 8	$ 93	122	0.48	760
29-T1N-R19W	$19	$ 8	$ 11	122	0.53	94
5-T1S-R19W	$150	$ 8	$ 142	124	0.64	1,148
29-T2N-R18W	$79	$ 7	$ 72	116	0.66	621
3-T3N-R19W	$7	$ 5	$ 2	78	0.70	27
1-T2S-R20W	$38	$ 8	$ 30	120	0.71	249
10-T3N-R19W	$33	$ 6	$ 27	98	0.76	276
26-T3N-R19W	$23	$ 7	$ 16	111	0.76	141
36-T1S-R20W	$54	$ 8	$ 46	120	0.77	387
18-T1S-R19W	$13	$ 6	$ 7	89	0.79	82
10-T3N-R19W	$17	$ 5	$ 12	85	0.80	137
27-T2S-R19W	$35	$ 8	$ 27	123	0.84	221
21-T1N-R19W	$116	$ 8	$ 108	122	0.84	883
3-T3S-R19W	$13	$ 8	$ 5	125	0.86	37
16-T2S-R19W	$18	$ 8	$ 10	119	0.86	84
3-T3S-R19W	$23	$ 8	$ 15	124	0.86	124
36-T1S-R20W	$65	$ 8	$ 57	124	0.86	457
1-T1S-R20W	$46	$ 7	$ 39	117	0.86	333
16-T1N-R19W	$61	$ 8	$ 54	122	0.87	439
21-T1N-R19W	$184	$ 8	$ 176	123	0.87	1,432
31-T2N-R18W	$16	$ 5	$ 11	75	0.88	152
16-T1N-R19W	$55	$ 7	$ 48	109	0.89	445
19-T1S-R19W	$150	$ 7	$ 143	107	0.89	1,337
19-T2S-R19W	$71	$ 5	$ 66	83	0.90	794
18-T2S-R19W	$51	$ 5	$ 46	77	0.90	597
25-T1S-R20W	$126	$ 8	$ 118	123	0.91	961
25-T1S-R20W	$113	$ 8	$ 106	120	0.92	879
13-T1S-R20W	$69	$ 8	$ 61	119	0.92	517
36-T1S-R20W	$66	$ 5	$ 61	80	0.92	764
25-T1S-R20W	$204	$ 8	$ 197	124	0.92	1,585
24-T1S-R20W	$179	$ 8	$ 171	122	0.93	1,403

Table CP 34 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$119	$ 8	$ 111	122	0.09	913
2-T3N-R19W	$18	$ 5	$ 14	71	0.46	193
24-T1S-R20W	$134	$ 8	$ 126	124	0.93	1,015
24-T1S-R20W	$131	$ 8	$ 123	123	0.93	998
24-T1S-R20W	$187	$ 8	$ 179	124	0.93	1,441

Table CP 35. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$721	$ 191	$ 531	107	1.25	4,960
24-T1S-R20W	$847	$ 217	$ 629	122	1.30	5,159
24-T1S-R20W	$813	$ 221	$ 592	124	1.30	4,775
25-T1S-R20W	$883	$ 221	$ 662	124	1.29	5,335
25-T1S-R20W	$767	$ 214	$ 553	120	1.29	4,607
25-T1S-R20W	$793	$ 219	$ 574	123	1.27	4,663
36-T1S-R20W	$720	$ 221	$ 499	124	1.22	4,028
36-T1S-R20W	$503	$ 143	$ 361	80	1.29	4,508
36-T1S-R20W	$645	$ 214	$ 431	120	1.12	3,596
13-T1S-R20W	$717	$ 212	$ 505	119	1.29	4,245
29-T1N-R19W	$566	$ 217	$ 349	122	0.86	2,861
16-T1N-R19W	$591	$ 208	$ 382	117	1.22	3,265
16-T1N-R19W	$711	$ 217	$ 493	122	1.24	4,043
16-T1N-R19W	$641	$ 194	$ 446	109	1.26	4,095
25-T1N-R19W	$623	$ 223	$ 400	125	1.22	3,204
31-T2N-R18W	$656	$ 217	$ 439	122	0.83	3,596
31-T2N-R18W	$620	$ 217	$ 402	122	0.40	3,297
31-T2N-R18W	$421	$ 134	$ 287	75	1.26	3,825
29-T2N-R18W	$642	$ 207	$ 436	116	1.03	3,756
20-T2N-R18W	$303	$ 128	$ 174	72	1.26	2,420
32-T2N-R18W	$372	$ 168	$ 204	94	1.12	2,175
23-T2N-R18W	$462	$ 164	$ 298	92	1.22	3,239
6-T2N-R17W	$673	$ 214	$ 459	120	1.33	3,823
26-T3N-R19W	$544	$ 198	$ 346	111	1.08	3,118
35-T3N-R19W	$255	$ 141	$ 114	79	1.09	1,447
10-T3N-R19W	$494	$ 175	$ 319	98	1.08	3,255
10-T3N-R19W	$431	$ 151	$ 279	85	1.14	3,287
7-T3N-R18W	$450	$ 178	$ 271	100	1.33	2,714
2-T2S-R20W	$484	$ 208	$ 275	117	0.99	2,354
1-T2S-R20W	$299	$ 143	$ 157	80	1.01	1,961
9-T2S-R19W	$510	$ 180	$ 330	101	1.22	3,272
22-T2S-R19W	$591	$ 217	$ 373	122	1.20	3,061
22-T2S-R19W	$594	$ 210	$ 383	118	1.20	3,248

Table CP 35 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$721	$ 191	$ 531	107	1.25	4,960
24-T1S-R20W	$847	$ 217	$ 629	122	1.30	5,159
27-T2S-R19W	$639	$ 219	$ 420	123	1.21	3,413
34-T2S-R19W	$233	$ 127	$ 106	71	1.22	1,494
34-T2S-R19W	$363	$ 144	$ 219	81	1.22	2,703
3-T3S-R19W	$676	$ 223	$ 454	125	1.22	3,628
26-T4N-R19W	$271	$ 118	$ 154	66	1.03	2,331
24-T1S-R20W	$804	$ 219	$ 585	123	1.30	4,758
24-T1S-R20W	$866	$ 221	$ 645	124	1.30	5,200
20-T1N-R19W	$230	$ 123	$ 107	69	1.22	1,557
26-T1N-R19W	$420	$ 164	$ 256	92	1.22	2,788
32-T1N-R19W	$321	$ 127	$ 194	71	1.18	2,736
1-T2S-R20W	$601	$ 214	$ 387	120	1.04	3,227
36-T1S-R20W	$308	$ 119	$ 189	67	1.10	2,816
25-T1N-R19W	$173	$ 130	$ 43	73	1.22	592
25-T1N-R19W	$345	$ 159	$ 186	89	1.22	2,091
3-T3N-R19W	$266	$ 112	$ 154	63	1.28	2,445
9-T1N-R19W	$530	$ 216	$ 314	121	0.94	2,597
3-T1N-R19W	$548	$ 207	$ 341	116	0.97	2,940
3-T1N-R19W	$487	$ 217	$ 269	122	0.90	2,206
34-T2N-R19W	$442	$ 214	$ 228	120	0.80	1,899
21-T1N-R19W	$757	$ 217	$ 540	122	1.22	4,426
1-T1S-R20W	$519	$ 219	$ 299	123	0.97	2,434
1-T1S-R20W	$667	$ 208	$ 459	117	1.23	3,922
5-T1S-R19W	$737	$ 221	$ 517	124	0.98	4,166
12-T1S-R20W	$533	$ 219	$ 314	123	0.99	2,555
12-T1S-R20W	$173	$ 121	$ 52	68	0.65	768
18-T1S-R19W	$459	$ 159	$ 301	89	1.14	3,378
18-T2S-R19W	$463	$ 137	$ 326	77	1.27	4,231
16-T2S-R19W	$649	$ 212	$ 437	119	1.22	3,675
27-T2S-R19W	$676	$ 219	$ 457	123	1.20	3,716
3-T3S-R19W	$682	$ 221	$ 461	124	1.22	3,716
9-T2S-R19W	$627	$ 219	$ 407	123	1.22	3,312
29-T1N-R19W	$486	$ 212	$ 274	119	0.86	2,306
29-T1N-R19W	$311	$ 146	$ 165	82	1.03	2,013
21-T1N-R19W	$836	$ 219	$ 617	123	1.24	5,018

Table CP 35 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$721	$ 191	$ 531	107	1.25	4,960
24-T1S-R20W	$847	$ 217	$ 629	122	1.30	5,159
35-T2N-R19W	$188	$ 127	$ 62	71	0.91	873
28-T2N-R18W	$428	$ 153	$ 275	86	0.77	3,194
20-T2N-R18W	$403	$ 137	$ 266	77	1.26	3,453
31-T3N-R17W	$344	$ 159	$ 186	89	0.99	2,086
30-T3N-R17W	$404	$ 176	$ 227	99	0.99	2,296
35-T3N-R19W	$355	$ 151	$ 203	85	1.08	2,393
27-T3N-R19W	$308	$ 146	$ 162	82	1.08	1,970
3-T3N-R19W	$379	$ 139	$ 240	78	1.04	3,075
2-T3N-R19W	$330	$ 127	$ 203	71	0.77	2,864
23-T4N-R19W	$431	$ 168	$ 264	94	1.03	2,804
23-T4N-R19W	$378	$ 162	$ 216	91	1.04	2,373
9-T1N-R19W	$497	$ 216	$ 282	121	0.57	2,328
19-T2S-R19W	$515	$ 148	$ 367	83	1.27	4,418
Total/Average	$41,401	$14,614	$26,787	8,201	1.11	3,155

Table CP 36. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 3.0 dS/m and average rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$588	$ 191	$ 397	107	0.98	3,714
24-T1S-R20W	$690	$ 217	$ 473	122	1.02	3,878
24-T1S-R20W	$654	$ 221	$ 433	124	1.02	3,493
25-T1S-R20W	$722	$ 221	$ 501	124	1.01	4,044
25-T1S-R20W	$613	$ 214	$ 400	120	1.01	3,330
25-T1S-R20W	$632	$ 219	$ 412	123	0.99	3,353
36-T1S-R20W	$550	$ 221	$ 329	124	0.94	2,651
36-T1S-R20W	$399	$ 143	$ 257	80	1.01	3,212
36-T1S-R20W	$506	$ 214	$ 292	120	0.84	2,432
13-T1S-R20W	$565	$ 212	$ 353	119	1.01	2,968
29-T1N-R19W	$461	$ 217	$ 244	122	0.59	1,997
16-T1N-R19W	$430	$ 208	$ 222	117	0.92	1,894
16-T1N-R19W	$546	$ 217	$ 329	122	0.95	2,695
16-T1N-R19W	$496	$ 194	$ 301	109	0.97	2,766
25-T1N-R19W	$443	$ 223	$ 220	125	0.93	1,762
31-T2N-R18W	$557	$ 217	$ 340	122	0.55	2,786
31-T2N-R18W	$576	$ 217	$ 358	122	0.13	2,937
31-T2N-R18W	$319	$ 134	$ 185	75	0.97	2,467
29-T2N-R18W	$523	$ 207	$ 317	116	0.74	2,729
20-T2N-R18W	$207	$ 128	$ 79	72	0.98	1,096
32-T2N-R18W	$280	$ 168	$ 113	94	0.84	1,201
23-T2N-R18W	$329	$ 164	$ 165	92	0.93	1,797
6-T2N-R17W	$478	$ 214	$ 264	120	1.01	2,201
26-T3N-R19W	$443	$ 198	$ 245	111	0.84	2,208
35-T3N-R19W	$179	$ 141	$ 39	79	0.84	489
10-T3N-R19W	$404	$ 175	$ 229	98	0.83	2,338
10-T3N-R19W	$343	$ 151	$ 192	85	0.88	2,254
7-T3N-R18W	$287	$ 178	$ 109	100	1.01	1,092
2-T2S-R20W	$371	$ 208	$ 162	117	0.73	1,388
1-T2S-R20W	$221	$ 143	$ 78	80	0.74	977
9-T2S-R19W	$365	$ 180	$ 185	101	0.93	1,831
22-T2S-R19W	$421	$ 217	$ 204	122	0.91	1,669
22-T2S-R19W	$429	$ 210	$ 219	118	0.91	1,854

Table CP 36 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$588	$ 191	$ 397	107	0.98	3,714
24-T1S-R20W	$690	$ 217	$ 473	122	1.02	3,878
27-T2S-R19W	$466	$ 219	$ 247	123	0.92	2,005
34-T2S-R19W	$130	$ 127	$ 4	71	0.93	53
34-T2S-R19W	$247	$ 144	$ 102	81	0.93	1,262
3-T3S-R19W	$496	$ 223	$ 273	125	0.93	2,187
26-T4N-R19W	$209	$ 118	$ 91	66	0.78	1,384
24-T1S-R20W	$647	$ 219	$ 428	123	1.02	3,476
24-T1S-R20W	$707	$ 221	$ 486	124	1.02	3,919
20-T1N-R19W	$136	$ 123	$ 13	69	0.92	187
26-T1N-R19W	$288	$ 164	$ 124	92	0.93	1,346
32-T1N-R19W	$228	$ 127	$ 101	71	0.89	1,428
1-T2S-R20W	$478	$ 214	$ 264	120	0.78	2,201
36-T1S-R20W	$235	$ 119	$ 115	67	0.83	1,721
25-T1N-R19W	$216	$ 159	$ 58	89	0.93	650
3-T3N-R19W	$186	$ 112	$ 73	63	1.01	1,167
9-T1N-R19W	$417	$ 216	$ 201	121	0.67	1,663
3-T1N-R19W	$429	$ 207	$ 222	116	0.68	1,913
3-T1N-R19W	$379	$ 217	$ 162	122	0.64	1,324
34-T2N-R19W	$350	$ 214	$ 136	120	0.54	1,132
21-T1N-R19W	$590	$ 217	$ 373	122	0.92	3,057
1-T1S-R20W	$403	$ 219	$ 184	123	0.71	1,492
1-T1S-R20W	$508	$ 208	$ 300	117	0.94	2,560
5-T1S-R19W	$617	$ 221	$ 397	124	0.70	3,198
12-T1S-R20W	$415	$ 219	$ 196	123	0.73	1,595
12-T1S-R20W	$131	$ 121	$ 10	68	0.38	151
18-T1S-R19W	$352	$ 159	$ 193	89	0.86	2,168
18-T2S-R19W	$364	$ 137	$ 227	77	0.98	2,949
16-T2S-R19W	$478	$ 212	$ 266	119	0.93	2,234
27-T2S-R19W	$506	$ 219	$ 287	123	0.91	2,331
3-T3S-R19W	$503	$ 221	$ 282	124	0.93	2,275
9-T2S-R19W	$450	$ 219	$ 231	123	0.93	1,875
29-T1N-R19W	$383	$ 212	$ 171	119	0.58	1,440
29-T1N-R19W	$222	$ 146	$ 76	82	0.74	926
21-T1N-R19W	$679	$ 219	$ 459	123	0.95	3,736
28-T2N-R18W	$374	$ 153	$ 221	86	0.53	2,565

Table CP 36 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
19-T1S-R19W	$588	$ 191	$ 397	107	0.98	3,714
24-T1S-R20W	$690	$ 217	$ 473	122	1.02	3,878
20-T2N-R18W	$307	$ 137	$ 170	77	0.99	2,210
31-T3N-R17W	$258	$ 159	$ 100	89	0.73	1,120
30-T3N-R17W	$308	$ 176	$ 132	99	0.73	1,330
35-T3N-R19W	$277	$ 151	$ 126	85	0.84	1,482
27-T3N-R19W	$233	$ 146	$ 87	82	0.84	1,059
3-T3N-R19W	$304	$ 139	$ 165	78	0.78	2,111
2-T3N-R19W	$284	$ 127	$ 157	71	0.51	2,218
23-T4N-R19W	$337	$ 168	$ 169	94	0.77	1,799
23-T4N-R19W	$286	$ 162	$ 124	91	0.78	1,364
9-T1N-R19W	$433	$ 216	$ 217	121	0.31	1,794
19-T2S-R19W	$408	$ 148	$ 261	83	0.98	3,139
Total/Ave	31,683	14,358	17,325	8,057	0.84	2,060

Table CP 37. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton Price at $0.54 per pound, Electrical Conductivity of irrigation water 3 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
21-T1N-R19W	$6	$ -	$ 6	123	0.86	51
25-T1S-R20W	$22	$ -	$ 22	124	0.91	177
24-T1S-R20W	$0	$ -	$ 0	122	0.92	1
24-T1S-R20W	$4	$ -	$ 4	124	0.92	36
Total/Ave	$33	-	$ 33	493	0.90	66

Table CP 38. Economically Feasible Area under Irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton price at $0.54 per Pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$25	$ -	$ 25	122	0.29	205
31-T2N-R18W	$24	$ -	$ 24	122	0.70	197
5-T1S-R19W	$80	$ -	$ 80	124	0.85	642
29-T2N-R18W	$13	$ -	$ 13	116	0.89	109
36-T1S-R20W	$1	$ -	$ 1	120	1.01	7
21-T1N-R19W	$52	$ -	$ 52	122	1.10	422
36-T1S-R20W	$5	$ -	$ 5	124	1.11	38
21-T1N-R19W	$123	$ -	$ 123	123	1.12	997
19-T1S-R19W	$97	$ -	$ 97	107	1.13	909
19-T2S-R19W	$28	$ -	$ 28	83	1.14	341
18-T2S-R19W	$11	$ -	$ 11	77	1.15	142
25-T1S-R20W	$64	$ -	$ 64	123	1.15	523
25-T1S-R20W	$52	$ -	$ 52	120	1.16	437
13-T1S-R20W	$9	$ -	$ 9	119	1.16	74
36-T1S-R20W	$26	$ -	$ 26	80	1.17	319
25-T1S-R20W	$141	$ -	$ 141	124	1.17	1,139
24-T1S-R20W	$117	$ -	$ 117	122	1.17	956
24-T1S-R20W	$68	$ -	$ 68	123	1.17	551
24-T1S-R20W	$123	$ -	$ 123	124	1.17	993
24-T1S-R20W	$70	$ -	$ 70	124	1.17	567
Total/Ave	$1,128	$0	$1,128	2,299	1.05	478

Table CP 39. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton Price at $0.70 per Pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$461	$ 291	$ 171	122	0.37	1,399
9-T1N-R19W	$338	$ 288	$ 49	121	0.55	408
2-T3N-R19W	$236	$ 169	$ 67	71	0.74	941
28-T2N-R18W	$317	$ 205	$ 112	86	0.75	1,304
31-T2N-R18W	$476	$ 291	$ 185	122	0.83	1,517
29-T1N-R19W	$312	$ 284	$ 29	119	0.85	240
29-T1N-R19W	$390	$ 291	$ 100	122	0.86	816
3-T1N-R19W	$319	$ 291	$ 28	122	0.91	233
9-T1N-R19W	$353	$ 288	$ 65	121	0.94	538
3-T1N-R19W	$361	$ 276	$ 84	116	0.97	727
5-T1S-R19W	$547	$ 295	$ 251	124	0.97	2,028
1-T1S-R20W	$353	$ 293	$ 60	123	0.98	488
12-T1S-R20W	$372	$ 293	$ 79	123	0.99	641
31-T3N-R17W	$228	$ 212	$ 15	89	1.00	174
30-T3N-R17W	$274	$ 236	$ 38	99	1.00	384
2-T2S-R20W	$330	$ 279	$ 52	117	1.00	441
1-T2S-R20W	$193	$ 191	$ 2	80	1.02	29
29-T2N-R18W	$458	$ 276	$ 182	116	1.03	1,569
26-T4N-R19W	$187	$ 157	$ 30	66	1.04	448
3-T3N-R19W	$264	$ 186	$ 78	78	1.04	998
23-T4N-R19W	$304	$ 224	$ 80	94	1.04	850
23-T4N-R19W	$255	$ 217	$ 38	91	1.05	416
1-T2S-R20W	$436	$ 286	$ 150	120	1.05	1,248
10-T3N-R19W	$371	$ 234	$ 138	98	1.10	1,405
27-T3N-R19W	$206	$ 195	$ 10	82	1.10	127
35-T3N-R19W	$249	$ 203	$ 47	85	1.10	550
26-T3N-R19W	$406	$ 265	$ 142	111	1.10	1,276
36-T1S-R20W	$211	$ 160	$ 51	67	1.11	760
32-T2N-R18W	$249	$ 224	$ 25	94	1.13	266
36-T1S-R20W	$462	$ 286	$ 176	120	1.13	1,467
18-T1S-R19W	$315	$ 212	$ 103	89	1.15	1,160
10-T3N-R19W	$312	$ 203	$ 110	85	1.15	1,293

Table CP 39 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$461	$ 291	$ 171	122	0.37	1,399
9-T1N-R19W	$338	$ 288	$ 49	121	0.55	408
32-T1N-R19W	$199	$ 169	$ 29	71	1.18	413
27-T2S-R19W	$460	$ 293	$ 167	123	1.21	1,354
22-T2S-R19W	$375	$ 291	$ 84	122	1.21	692
22-T2S-R19W	$385	$ 281	$ 103	118	1.21	876
27-T2S-R19W	$419	$ 293	$ 126	123	1.22	1,027
16-T1N-R19W	$379	$ 279	$ 100	117	1.22	853
21-T1N-R19W	$537	$ 291	$ 246	122	1.22	2,017
9-T2S-R19W	$403	$ 293	$ 110	123	1.23	894
3-T3S-R19W	$456	$ 295	$ 160	124	1.23	1,294
34-T2S-R19W	$216	$ 193	$ 23	81	1.23	281
3-T3S-R19W	$449	$ 298	$ 151	125	1.23	1,206
16-T2S-R19W	$433	$ 284	$ 149	119	1.23	1,253
26-T1N-R19W	$253	$ 219	$ 34	92	1.23	366
25-T1N-R19W	$396	$ 298	$ 98	125	1.23	782
23-T2N-R18W	$294	$ 219	$ 75	92	1.23	816
9-T2S-R19W	$327	$ 241	$ 86	101	1.23	850
36-T1S-R20W	$502	$ 295	$ 207	124	1.24	1,668
1-T1S-R20W	$463	$ 279	$ 184	117	1.24	1,575
16-T1N-R19W	$494	$ 291	$ 203	122	1.25	1,664
21-T1N-R19W	$628	$ 293	$ 335	123	1.25	2,726
16-T1N-R19W	$449	$ 260	$ 190	109	1.27	1,740
19-T1S-R19W	$545	$ 255	$ 290	107	1.27	2,714
19-T2S-R19W	$373	$ 198	$ 175	83	1.27	2,109
20-T2N-R18W	$177	$ 172	$ 5	72	1.27	72
31-T2N-R18W	$285	$ 179	$ 107	75	1.27	1,421
18-T2S-R19W	$331	$ 183	$ 148	77	1.28	1,917
20-T2N-R18W	$276	$ 183	$ 93	77	1.28	1,208
25-T1S-R20W	$582	$ 293	$ 289	123	1.29	2,349
25-T1S-R20W	$564	$ 286	$ 278	120	1.30	2,319
13-T1S-R20W	$516	$ 284	$ 233	119	1.30	1,957
3-T3N-R19W	$160	$ 150	$ 10	63	1.30	158
36-T1S-R20W	$367	$ 191	$ 176	80	1.30	2,200
25-T1S-R20W	$671	$ 295	$ 376	124	1.31	3,030
24-T1S-R20W	$640	$ 291	$ 349	122	1.31	2,862

Table CP 39 (continued)

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$461	$ 291	$ 171	122	0.37	1,399
9-T1N-R19W	$338	$ 288	$ 49	121	0.55	408
24-T1S-R20W	$603	$ 295	$ 307	124	1.31	2,477
24-T1S-R20W	$596	$ 293	$ 303	123	1.31	2,460
24-T1S-R20W	$655	$ 295	$ 360	124	1.31	2,902
6-T2N-R17W	$425	$ 286	$ 139	120	1.34	1,156
7-T3N-R18W	$243	$ 238	$ 5	100	1.34	47
Total/Ave	$27,071	$17,822	$9,248	7,479	1.13	1,181

Table CP 40. Economically feasible area under irrigation by Center Pivot, with off-season leaching, along the North Fork with Cotton price at $0.70 per pound, Electrical Conductivity of irrigation water 2.2 dS/m and a ten percent decrease in rainfall

Section	Irrigated Cotton NPV ($000)	Dry Land Cotton NPV ($000)	Net Returns (NPV)	Economically Feasible Acres	Irrigation water quantity (acft/ac)	NIB per acre ($/ac)
31-T2N-R18W	$419	$ 291	$ 128	122	0.07	1,050
2-T3N-R19W	$186	$ 169	$ 17	71	0.47	238
28-T2N-R18W	$258	$ 205	$ 53	86	0.48	615
31-T2N-R18W	$368	$ 291	$ 77	122	0.52	633
5-T1S-R19W	$414	$ 295	$ 118	124	0.67	954
29-T2N-R18W	$326	$ 276	$ 49	116	0.72	426
1-T2S-R20W	$296	$ 286	$ 10	120	0.77	85
10-T3N-R19W	$268	$ 234	$ 34	98	0.83	347
36-T1S-R20W	$305	$ 286	$ 19	120	0.83	155
26-T3N-R19W	$289	$ 265	$ 25	111	0.83	223
10-T3N-R19W	$212	$ 203	$ 10	85	0.87	112
21-T1N-R19W	$349	$ 291	$ 59	122	0.90	480
36-T1S-R20W	$311	$ 295	$ 15	124	0.93	124
1-T1S-R20W	$284	$ 279	$ 5	117	0.93	45
16-T1N-R19W	$307	$ 291	$ 17	122	0.93	136
21-T1N-R19W	$448	$ 293	$ 155	123	0.94	1,257
16-T1N-R19W	$284	$ 260	$ 24	109	0.95	221
19-T2S-R19W	$251	$ 198	$ 53	83	0.96	643
19-T1S-R19W	$391	$ 255	$ 136	107	0.97	1,272
18-T2S-R19W	$218	$ 183	$ 34	77	0.97	447
25-T1S-R20W	$397	$ 293	$ 104	123	0.98	842
25-T1S-R20W	$387	$ 286	$ 101	120	0.99	838
13-T1S-R20W	$340	$ 284	$ 57	119	0.99	476
36-T1S-R20W	$246	$ 191	$ 56	80	1.00	698
25-T1S-R20W	$485	$ 295	$ 190	124	1.00	1,532
24-T1S-R20W	$458	$ 291	$ 167	122	1.01	1,372
24-T1S-R20W	$412	$ 293	$ 119	123	1.01	969
24-T1S-R20W	$418	$ 295	$ 122	124	1.01	986
24-T1S-R20W	$470	$ 295	$ 175	124	1.01	1,411
Total/Ave	$9,797	$7,668	$2,129	3,218	0.85	641

Appendix III – Results of Irrigation with Traveling Reel

III-a. Results from Irrigation with Average Rainfall

Appendix Table 1. Economically Feasible Area Irrigation by Traveling Sprinkler along Elm and North Fork Rivers with Cotton Price at $0.54per Pound, Electrical Conductivity of irrigation water 2.2 dS/m before and 2.62 dS/m after application.

County	Section, Township ,Range West	Acres	Appl Rate af/ ac	TDH feet	Yield Lbs/ Ac	Pump $/af	NPV Dollars	Capital Dollars	Total Prof Dollars	NIB dollars	NIB/ac $/ac	Tot Salt Ret per Yr (tons)	Tot Nitrogen Ret per Yr (lbs)
Area in Greer County with Positive Net Incremental Benefits from Reel Irrigation													
Greer	21-6N-R25	72.9	0.8	372	1,067	74	149,665	125,204	24,461	19,795	272	50	683
Greer	36-6N-R25	68.3	0.9	372	1,098	73	157,351	126,759	30,592	26,221	384	60	785
Greer	28-6N-R24	78.0	1.1	441	800	96	179,614	135,427	44,187	39,195	502	76	643
Greer	27-6N-R23	85.9	1.0	411	1,088	90	144,869	129,429	15,440	9,942	116	100	1,186
Greer	34-6N-R23	73.9	1.1	371	1,141	77	179,560	128,632	50,928	46,198	625	78	833
Greer	5-5N-R21	85.9	1.1	441	219	95	153,861	137,738	16,123	10,625	124	60	567
Greer	6-5N-R21	83.6	0.3	421	888	84	138,314	126,818	11,496	6,146	74	(3)	461
Greer	8-5N-R21	85.1	0.9	436	782	94	154,857	126,818	28,039	22,593	265	73	708
Greer	24-5N-R21	68.6	1.1	382	637	83	174,438	134,929	39,509	35,119	512	164	1,631
Greer	25-5N-R21	79.6	0.9	377	1,008	84	135,344	126,818	8,526	3,432	43	63	529
Greer	25-5N-R21	85.0	1.1	370	1,139	78	166,004	126,818	39,186	33,746	397	64	717
Greer	30-5N-R20	75.2	1.2	368	1,171	74	211,947	126,818	85,129	80,316	1,068	83	921
Greer	3-4N-R20	86.2	1.1	393	1,130	87	163,008	122,614	40,394	34,877	405	75	709
Greer: Total or ave.		1,028.2	1.0	398	932	84	2,108,832	1,674,822	434,010	368,205	358	943	10,373
Area in Jackson County with Positive Net Incremental Benefits from Reel Irrigation													
Jackson	13-4N-R19	86.2	1.1	393	1,141	87	170,483	132,179	38,304	32,787	380	59	406
Jackson: Total or ave.		86.2	1.1	393	1,141	87	170,483	132,179	38,304	32,787	380	59	406
Grand Total or ave.		1,114.4	1.0	397	949	84	2,279,315	1,807,001	472,314	400,992	360	1,002	10,779

Appendix Table 2. Economically feasible area under Irrigation by Traveling Sprinkler along Elm and North Fork Rivers with Cotton price at $0.54 per Pound, Electrical Conductivity of irrigation water .9dS/m before and 1.05 dS/m after application.

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Area in **Greer** County with Positive Net Incremental Benefits from Reel Irrigation												
10-T5N-R22W	61	2.00	377	1,410	73	257,511	126,818	130,693	126,789	2,079	64	248
12-T4N-R20W	53	2.00	417	1,523	91	244,933	128,452	116,481	113,108	2,146	70	294
15-T5N-R21W	83	2.20	403	1,580	79	235,039	128,891	106,148	100,855	1,220	37	41
15-T5N-R21W	85	1.80	400	1,359	83	245,511	138,356	107,155	101,721	1,198	48	265
16-T5N-R21W	83	2.10	403	1,484	79	182,287	126,818	55,469	50,163	605	32	93
16-T5N-R21W	83	2.00	414	1,470	82	214,709	139,890	74,819	69,501	836	39	120
17-T6N-R25W	84	2.00	385	1,476	86	371,701	133,235	238,466	233,064	2,761	70	314
17-T6N-R25W	53	2.20	384	1,564	74	303,171	142,860	160,311	156,906	2,949	165	132
19-T6N-R24W	58	1.90	487	1,495	99	241,332	200,966	40,366	36,686	638	130	501
1-T5N-R22W	86	2.00	375	1,503	84	384,671	127,616	257,055	251,538	2,918	65	286
1-T5N-R22W	83	1.70	444	1,365	91	258,219	126,818	131,401	126,076	1,515	102	488
1-T5N-R23W	83	1.40	519	1,323	102	214,292	126,719	87,573	82,255	990	99	209
20-T5N-R20W	86	1.80	578	1,510	119	234,459	180,162	54,297	48,780	566	45	204
20-T6N-R24W	84	1.30	551	1,349	111	296,756	188,153	108,603	103,253	1,235	62	344
21-T6N-R24W	33	2.10	439	1,544	86	165,684	161,989	3,695	1,602	49	69	130
21-T6N-R25W	73	2.00	372	1,445	74	330,342	125,204	205,138	200,472	2,750	64	236
22-T5N-R21W	85	2.00	416	1,455	86	165,590	142,660	22,930	17,503	206	30	115
22-T6N-R23W	86	1.90	564	896	117	334,362	205,071	129,291	123,774	1,436	64	301
22-T6N-R24W	85	1.50	669	1,408	135	218,506	173,626	44,880	39,434	463	42	308
23-T5N-R21W	36	2.00	354	1,450	80	157,042	129,788	27,254	24,937	689	70	352
24-T5N-R21W	53	2.10	357	1,492	81	248,335	126,818	121,517	118,138	2,237	71	345
24-T5N-R21W	69	2.10	382	858	83	375,654	134,929	240,725	236,335	3,445	154	371
24-T6N-R25W	85	1.10	556	1,248	109	229,946	191,023	38,923	33,496	395	79	514

Appendix Table 2 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
25-T5N-R21W	80	2.00	377	1,360	84	334,871	126,818	208,053	202,959	2,550	66	336
25-T5N-R21W	85	2.20	370	1,578	78	392,302	126,818	265,484	260,044	3,059	61	111
25-T5N-R21W	43	2.00	368	1,479	83	193,034	126,818	66,216	63,470	1,479	70	340
25-T6N-R23W	86	2.10	416	846	91	253,253	132,239	121,014	115,497	1,340	43	158
25-T6N-R24W	50	1.90	450	1,448	97	188,915	140,169	48,746	45,565	917	63	441
25-T6N-R24W	83	1.90	395	1,357	78	228,393	133,155	95,238	89,932	1,085	42	214
25-T6N-R25W	86	2.00	407	1,513	88	248,427	128,831	119,596	114,092	1,327	43	151
26-T6N-R23W	49	2.00	377	1,501	84	229,263	130,166	99,097	95,961	1,958	70	297
26-T6N-R24W	84	2.00	420	1,479	83	136,389	129,150	7,239	1,889	23	25	77
27-T6N-R23W	86	2.10	411	1,536	90	414,444	129,429	285,016	279,518	3,254	106	353
27-T6N-R24W	82	1.80	400	1,350	77	247,562	134,670	112,892	107,670	1,319	45	223
28-T5N-R20W	82	1.70	432	1,176	94	265,194	143,158	122,036	116,762	1,417	57	362
28-T6N-R24W	78	2.10	441	1,060	96	382,129	135,427	246,702	241,710	3,099	69	254
28-T6N-R24W	84	2.00	387	1,460	79	269,299	130,047	139,252	133,863	1,590	48	178
29-T5N-R20W	86	2.10	413	222	91	172,699	126,818	45,881	40,364	468	28	93
29-T5N-R20W	86	2.00	397	600	88	311,006	126,818	184,188	178,671	2,073	127	548
29-T6N-R22W	84	1.50	585	1,358	117	191,862	139,313	52,549	47,199	565	44	401
29-T6N-R24W	62	1.90	420	1,417	92	227,635	151,986	75,649	71,655	1,148	62	365
30-T5N-R20W	75	2.20	368	1,599	74	455,854	126,818	329,036	324,223	4,311	76	71
30-T5N-R20W	84	2.00	467	1,509	92	299,323	126,818	172,505	167,123	1,987	69	179
30-T6N-R22W	85	1.40	535	1,283	106	193,956	136,961	56,995	51,587	610	40	321
30-T6N-R23W	86	1.90	388	1,396	85	265,847	126,818	139,029	133,525	1,553	52	288
30-T6N-R23W	86	2.10	392	1,535	87	340,489	126,818	213,671	208,154	2,415	125	495
30-T6N-R24W	86	1.80	391	1,386	86	232,649	126,818	105,831	100,321	1,165	90	475
31-T6N-R22W	37	2.20	378	1,574	80	207,679	130,445	77,234	74,847	2,007	74	151
31-T6N-R22W	85	1.80	493	924	100	243,800	169,063	74,737	69,316	818	82	312
32-T5N-R20W	86	2.00	419	1,490	92	304,358	126,818	177,540	172,023	1,996	84	407

Appendix Table 2 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
32-T6N-R22W	77	1.30	395	1,211	76	224,678	126,818	97,860	92,938	1,209	20	222
32-T6N-R22W	36	2.00	402	1,467	84	156,519	133,354	23,165	20,880	585	68	195
32-T6N-R23W	86	1.90	393	1,400	85	251,497	128,891	122,606	117,108	1,363	49	267
32-T6N-R23W	86	2.00	419	1,527	92	402,032	151,747	250,285	244,768	2,840	133	545
33-T6N-R23W	60	1.90	362	1,386	77	230,290	123,750	106,540	102,726	1,724	65	342
33-T6N-R23W	86	2.10	341	1,540	78	179,303	131,481	47,822	42,305	491	549	2,352
33-T6N-R24W	86	1.90	559	1,523	116	292,709	190,684	102,025	96,508	1,120	51	241
34-T6N-R23W	74	2.20	371	1,560	77	408,032	128,632	279,400	274,670	3,717	74	163
34-T6N-R23W	55	1.60	409	1,299	82	175,384	146,147	29,237	25,730	470	107	612
35-T6N-R23W	85	2.10	390	1,556	82	324,039	131,461	192,578	187,125	2,196	52	122
35-T6N-R25W	59	2.00	378	1,514	85	282,571	146,048	136,523	132,773	2,266	140	649
36-T6N-R25W	68	2.10	372	1,486	73	339,217	126,759	212,458	208,087	3,047	68	210
4-T4N-R20W	52	2.10	365	1,550	82	267,120	138,794	128,326	125,024	2,423	145	734
4-T5N-R22W	81	2.00	443	1,498	84	228,631	155,852	72,779	67,589	833	40	92
5-T5N-R21W	86	2.10	441	288	95	333,928	137,738	196,190	190,692	2,220	56	190
5-T5N-R22W	86	2.10	379	1,506	82	290,157	126,818	163,340	157,849	1,840	98	387
6-T5N-R21W	84	1.80	421	1,222	84	286,482	126,818	159,664	154,314	1,846	70	356
8-T5N-R21W	60	2.00	373	1,460	84	261,143	131,043	130,100	126,241	2,094	69	326
8-T5N-R21W	85	2.00	406	1,214	86	369,099	126,818	242,281	236,835	2,783	106	460
8-T5N-R21W	86	1.90	456	1,448	93	217,040	125,503	91,537	86,065	1,007	108	445
9-T5N-R22W	84	2.10	384	1,509	77	219,017	126,818	92,199	86,842	1,038	37	100
9-T5N-R22W	54	1.90	467	953	100	225,779	188,731	37,048	33,573	618	134	759
Grand Total/Ave	5,369	1.93	423	1358	88	19,105,351	10,046,774	9,058,579	8,714,968	1619	5,671	23,581
Area in Jackson County with Positive Net Incremental Benefits from Reel Irrigation												
11-T1N-R19W	86	2.10	368	1,534	83	354,030	128,971	225,059	219,542	2,547	58	238
11-T3N-R19W	58	2.10	362	1,546	78	314,065	129,509	184,556	180,825	3,102	148	489
12-T2S-R20W	55	2.10	426	1,542	90	270,946	214,337	56,609	53,076	962	143	454

Appendix Table 2 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
12-T4N-R19W	51	2.10	396	1,528	88	248,941	147,941	101,000	97,710	1,901	71	296
12-T4N-R19W	62	2.00	398	1,463	88	261,602	139,631	121,971	117,984	1,894	135	701
13-T4N-R19W	86	2.00	393	1,502	87	360,437	132,179	228,258	222,741	2,584	59	378
17-T4N-R19W	86	2.00	412	1,523	91	401,466	150,292	251,174	245,657	2,850	77	331
18-T2S-R19W	69	2.10	352	1,537	80	361,827	124,925	236,902	232,464	3,352	73	298
18-T4N-R19W	68	2.10	365	1,535	82	348,943	123,750	225,193	220,815	3,228	73	297
19-T1S-R19W	86	2.00	451	1,519	97	268,848	157,008	111,840	106,323	1,233	82	357
19-T2S-R19W	86	2.00	431	1,520	94	320,824	135,845	184,979	179,462	2,082	80	341
1-T1N-R19W	86	2.00	423	1,521	92	396,372	126,420	269,952	264,435	3,068	134	554
1-T2N-R18W	26	2.10	346	1,539	79	138,297	126,818	11,479	9,796	372	75	305
1-T2S-R20W	65	2.10	396	1,529	88	316,237	143,358	172,879	168,713	2,592	141	614
1-T3N-R19W	55	1.90	368	1,393	83	202,035	122,574	79,461	75,954	1,386	63	391
20-T2S-R19W	86	2.10	381	1,531	85	412,277	140,927	271,350	265,833	3,084	68	282
21-T2N-R18W	86	2.00	427	1,521	93	280,038	122,773	157,265	151,748	1,760	115	475
23-T3N-R19W	30	2.10	359	1,536	81	154,624	125,902	28,722	26,789	887	74	304
24-T3N-R19W	86	2.10	362	1,535	82	351,587	124,148	227,439	221,922	2,575	57	235
24-T4N-R19W	35	2.10	371	1,533	83	174,110	135,507	38,603	36,395	1,055	73	300
25-T4N-R19W	47	2.10	346	1,538	79	245,490	125,045	120,445	117,456	2,515	152	617
29-T2S-R19W	86	2.00	453	1,514	98	311,446	134,530	176,916	171,399	1,988	81	351
2-T1N-R19W	32	2.10	379	1,532	85	157,340	140,947	16,393	14,371	455	72	299
33-T1N-R19W	39	2.00	416	1,524	91	181,375	159,180	22,195	19,718	510	70	293
34-T2N-R18W	37	2.10	381	1,531	85	182,772	167,688	15,084	12,722	345	149	621
36-T1S-R20W	86	2.00	403	1,503	89	148,270	135,786	12,484	6,967	81	24	149
36-T3N-R18W	53	2.00	416	1,524	91	249,889	170,558	79,331	75,920	1,424	147	614
3-T4N-R19W	86	2.00	418	1,523	92	398,315	147,084	251,231	245,714	2,851	120	516
4-T2N-R18W	86	2.00	416	1,524	91	393,270	124,866	268,404	262,887	3,050	77	325
4-T4N-R19W	86	2.10	377	1,532	84	342,013	133,554	208,459	202,942	2,354	57	233

Appendix Table 2 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
5-T2S-R19W	86	2.00	414	1,524	91	402,267	154,457	247,810	242,293	2,811	125	527
8-T1S-R19W	86	2.00	408	1,525	90	235,373	151,010	84,363	78,846	915	40	167
9-T2N-R18W	86	1.90	392	1,445	87	329,212	129,110	200,102	194,585	2,257	68	520
9-T2N-R18W	29	2.10	355	1,537	81	151,441	133,813	17,628	15,746	536	154	642
9-T2S-R19W	86	2.00	537	1,543	112	248,400	222,905	25,495	19,978	232	40	245
9-T4N-R19W	86	2.00	413	1,516	91	396,943	126,958	269,985	264,468	3,068	106	462
Grand Total/Ave	2,450	2.04	398	1,520	88	10,311,322	5,110,306	5,201,016	5,044,196	1,886	3,281	14,221
Area in Kiowa County with Positive Net Incremental Benefits from Reel Irrigation												
13-T3N-R19W	58	2.10	355	1,537	81	298,799	123,610	175,189	171,503	2,977	73	299
1-T4N-R19W	29	2.10	340	1,540	78	153,979	122,235	31,744	29,888	1,031	75	308
2-T2N-R18W	86	2.10	383	1,531	85	379,931	133,414	246,517	241,000	2,796	108	443
30-T3N-R18W	56	2.10	366	1,534	83	283,696	123,491	160,205	156,615	2,792	72	299
31-T3N-R17W	85	2.10	575	1,596	114	332,941	169,641	163,300	157,854	1,855	72	165
3-T4N-R20W	86	2.10	393	1,554	87	397,268	122,614	274,654	269,137	3,122	74	363
Grand Total/Ave	400	2.10	402	1,549	88	1,846,614	795,005	1,051,609	1,025,997	2,429	474	1,877
Area in Tillman County with Positive Net Incremental Benefits from Reel Irrigation												
15-T1N-R19W	74	1.90	415	1,458	91	297,089	138,396	158,693	153,931	2,069	60	396
16-T2S-R19W	86	1.90	586	1,526	121	264,119	206,625	57,494	51,977	603	59	379
18-T2S-R19W	86	2.00	421	1,521	92	305,051	124,148	180,903	175,386	2,035	92	398
22-T2N-R18W	86	1.80	432	1,389	94	222,356	147,941	74,415	68,898	799	43	291
26-T2N-R18W	86	1.90	585	1,532	120	327,061	186,041	141,020	135,503	1,572	67	245
27-T2N-R18W	86	2.10	369	1,534	83	193,790	125,244	68,546	63,029	731	32	130
28-T2N-R18W	86	1.90	452	1,454	97	259,724	124,467	135,257	129,740	1,505	71	388
28-T2S-R19W	42	2.10	374	1,533	84	210,682	139,173	71,509	68,827	1,642	72	299
36-T2N-R19W	85	2.00	482	1,438	97	216,695	169,900	46,795	41,349	486	46	205
3-T1N-R18W	36	2.10	383	1,531	86	178,353	141,325	37,028	34,718	962	73	299
4-T1N-R18W	37	2.10	396	1,528	88	179,652	149,953	29,699	27,331	739	72	298

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
7-T2S-R19W	72	2.10	386	1,530	86	354,094	141,843	212,251	207,663	2,897	71	295
Total/Ave	863	1.99	440	1498	95	3,008,666	1,795,056	1,213,610	1158352	1,337	758	3,623

Appendix Table 3. Economically Feasible Area Irrigation by Traveling Sprinkler along Elm and North Fork Rivers with Cotton Price at $0.70 per Pound, Electrical Conductivity of irrigation water 2.2 before and 2.62 after application.

County	Section, Township, Range West	Acres	Appl af/ac	TDH feet	Yield Lbs/ ac	Pump Cost $/af	PV Irrig. dollars	PV Capital dollars	NPV Irrg. Dollars	Tot. NIB dollars	NIB/ac $/ac	Tot Salt Ret/ Yr	Lbs N Ret/Yr
Area in Greer County with Positive Net Incremental Benefits from Reel Irrigation													
Greer	10-5N-R22	61.0	0.7	377	1,020	73	339,892	126,818	213,074	104,372	1,711	61	671
Greer	12-4N-R20	52.7	1.1	417	1,073	91	283,794	128,452	155,342	61,431	1,166	53	843
Greer	15-5N-R21	82.7	1.2	403	1,169	79	288,530	128,891	159,639	12,268	148	83	496
Greer	15-5N-R21	84.9	0.6	400	975	83	346,661	138,356	208,305	57,013	672	-	424
Greer	17-6N-R25	53.2	1.2	384	1,163	74	374,365	142,860	231,505	136,703	2,570	213	2,138
Greer	17-6N-R25	84.4	1.0	385	1,039	86	439,539	133,235	306,304	155,903	1,847	84	760
Greer	19-6N-R24	57.5	1.0	487	1,107	99	333,317	200,966	132,351	29,886	520	152	1,582
Greer	1-5N-R22	86.2	1.1	375	1,079	84	458,680	127,616	331,064	177,456	2,059	86	690
Greer	1-5N-R22	83.2	0.7	444	1,028	91	406,920	126,818	280,102	131,840	1,585	39	1,136
Greer	1-5N-R23	83.1	0.6	519	1,037	102	368,441	126,719	241,722	93,638	1,127	99	1,305
Greer	20-5N-R20	86.2	1.1	578	1,148	119	367,185	180,162	187,023	33,415	388	86	517
Greer	20-6N-R24	83.6	0.7	551	1,095	111	489,108	188,153	300,955	151,980	1,818	55	831
Greer	21-6N-R25	72.9	0.9	372	1,078	74	441,069	125,204	315,865	185,957	2,551	73	729
Greer	22-6N-R23	86.2	1.2	564	712	117	524,988	205,071	319,917	166,309	1,929	78	658
Greer	22-6N-R24	85.1	1.0	669	1,138	135	451,445	173,626	277,819	126,171	1,483	82	500
Greer	23-6N-R23	86.2	1.0	701	1,148	141	435,286	250,444	184,842	31,234	362	86	554
Greer	24-5N-R21	68.6	1.2	382	642	83	472,772	134,929	337,843	215,598	3,143	195	1,715
Greer	24-5N-R21	52.8	1.0	357	1,064	81	289,433	126,818	162,615	68,525	1,298	53	739
Greer	24-6N-R25	84.8	0.4	556	1,014	109	469,259	191,023	278,236	127,122	1,499	68	1,001
Greer	25-5N-R21	85.0	1.2	370	1,149	78	460,578	126,818	333,760	182,290	2,145	85	765
Greer	25-5N-R21	42.9	1.0	368	1,050	83	227,707	126,818	100,889	24,441	570	86	772
Greer	25-5N-R21	79.6	1.0	377	1,019	84	452,472	126,818	325,654	183,807	2,309	80	557
Greer	25-6N-R23	86.2	1.2	490	162	104	336,907	132,239	204,669	51,061	592	86	431
Greer	25-6N-R24	49.7	1.0	450	1,088	97	269,992	140,169	129,823	41,258	830	50	696
Greer	25-6N-R24	82.9	0.5	395	985	78	328,456	133,155	195,302	47,574	574	-	414

Appendix Table 3 (continued)

County	Section, Township, Range West	Acres	Appl af/ac	TDH feet	Yield Lbs/ ac	Pump Cost $/af	PV Irrig. dollars	PV Capital dollars	NPV Irrg. Dollars	Tot. NIB dollars	NIB/ac $/ac	Tot Salt Ret/ Yr	Lbs N Ret/Yr
Greer	25-6N-R25	86.0	1.1	407	1,103	88	310,444	128,831	181,613	28,361	330	86	516
Greer	26-6N-R23	49.0	1.1	377	1,083	84	276,752	130,166	146,586	59,268	1,210	98	784
Greer	27-6N-R23	85.9	1.1	411	1,100	90	496,530	129,429	367,101	214,027	2,492	112	1,258
Greer	27-6N-R24	81.6	0.5	400	986	77	364,890	134,670	230,220	84,809	1,039	-	408
Greer	28-5N-R20	82.4	0.9	432	903	94	415,837	143,158	272,679	125,842	1,527	82	412
Greer	28-6N-R24	78.0	1.2	441	812	96	522,445	135,427	387,018	248,022	3,180	78	702
Greer	28-6N-R24	84.2	0.9	387	1,059	79	345,064	130,047	215,017	64,973	772	84	589
Greer	29-5N-R20	86.2	1.1	397	449	88	407,373	126,818	280,555	126,947	1,473	164	1,399
Greer	29-6N-R22	83.6	0.7	585	1,098	117	395,841	139,313	256,528	107,553	1,287	(26)	493
Greer	29-6N-R24	62.4	0.9	420	1,045	92	313,457	151,986	161,471	50,274	806	62	562
Greer	30-5N-R20	75.2	1.3	368	1,180	74	541,852	126,818	415,034	281,028	3,737	75	978
Greer	30-5N-R20	84.1	1.1	467	1,107	92	401,043	126,818	274,225	124,359	1,479	62	939
Greer	30-6N-R22	84.5	0.5	535	999	106	386,341	136,961	249,380	98,801	1,169	-	506
Greer	30-6N-R23	86.2	1.1	392	1,097	87	404,946	126,818	278,128	124,520	1,445	164	1,411
Greer	30-6N-R23	86.0	0.8	388	1,008	85	356,828	126,818	230,010	76,758	893	-	516
Greer	30-6N-R24	86.1	0.8	391	1,021	86	329,300	126,818	202,483	49,053	570	62	901
Greer	31-6N-R22	37.3	1.2	378	1,143	80	244,782	130,445	114,337	47,868	1,283	75	932
Greer	31-6N-R22	84.7	0.8	493	689	100	359,368	169,063	190,305	39,370	465	79	929
Greer	32-5N-R20	86.2	1.0	419	1,064	92	373,284	126,818	246,466	92,858	1,077	86	917
Greer	32-6N-R22	35.7	0.9	402	1,065	84	202,857	133,354	69,503	5,886	165	71	821
Greer	32-6N-R23	86.2	1.1	419	1,086	92	477,463	151,747	325,717	172,109	1,997	151	1,534
Greer	32-6N-R23	85.9	0.8	393	1,007	85	336,496	128,891	207,605	54,531	635	-	515
Greer	32-6N-R24	58.2	1.0	566	1,123	117	315,836	193,234	122,602	18,890	325	58	466
Greer	32-6N-R24	86.2	0.7	664	1,053	134	375,262	216,329	158,933	5,325	62	49	727
Greer	33-6N-R23	59.6	0.7	362	986	77	299,743	123,750	175,993	69,786	1,171	60	596
Greer	33-6N-R24	86.2	1.2	559	1,184	116	461,581	190,684	270,897	117,289	1,361	86	517
Greer	34-6N-R23	73.9	1.2	371	1,150	77	494,748	128,632	366,116	234,426	3,172	74	887
Greer	35-6N-R23	85.2	1.2	390	1,135	82	391,016	131,461	259,555	107,729	1,264	85	596
Greer	35-6N-R25	58.6	1.1	378	1,112	85	354,455	146,048	208,407	103,982	1,774	141	1,418
Greer	36-6N-R25	68.3	1.0	372	1,108	73	438,500	126,759	311,741	190,030	2,782	68	820
Greer	3-4N-R20	86.2	1.2	393	1,143	87	500,887	122,614	378,273	224,665	2,606	73	794
Greer	4-4N-R20	51.6	1.2	365	1,122	82	315,480	138,794	176,686	84,735	1,642	169	1,400
Greer	5-5N-R21	85.9	1.2	441	222	95	445,372	137,738	307,634	154,560	1,799	86	601
Greer	5-5N-R22	85.8	1.0	379	1,069	82	332,818	126,818	206,000	53,104	619	92	1,166
Greer	6-5N-R21	83.6	0.5	421	904	84	443,801	126,818	316,983	168,008	2,010	29	560

Appendix Table 3 (continued)

County	Section, Township, Range West	Acres	Appl af/ac	TDH feet	Yield Lbs/ ac	Pump Cost $/af	PV Irrig. dollars	PV Capital dollars	NPV Irrg. Dollars	Tot. NIB dollars	NIB/ac $/ac	Tot Salt Ret/ Yr	Lbs N Ret/Yr
Greer	8-5N-R21	85.1	1.0	436	791	94	505,590	126,818	378,772	227,124	2,669	85	742
Greer	8-5N-R21	85.5	0.9	456	1,042	93	281,184	125,503	155,681	3,320	39	85	1,274
Greer	8-5N-R21	60.3	0.9	373	1,028	84	311,305	131,043	180,262	72,807	1,207	60	784
Greer	8-6N-R25	81.0	0.7	401	1,017	77	313,530	131,900	181,630	37,288	460	-	486
Greer	9-5N-R22	54.3	1.1	467	734	100	329,372	188,731	140,641	43,878	808	163	1,470
Greer: Total or Ave.		4894.5	1.0	443	996	93	24,830,469	9,317,066	15,513,407	6,791,415	1,388	5,061	54,250
Area in Jackson County with Positive Net Incremental Benefits from Reel Irrigation													
Jackson	11-3N-R19	58.3	1.2	362	1,124	78	370,627	129,509	241,118	137,227	2,354	159	1,712
Jackson	12-2S-R20	55.2	1.1	426	1,108	90	325,147	214,337	110,810	12,444	225	166	1,774
Jackson	12-4N-R19	51.4	1.1	396	1,074	88	282,913	147,941	134,972	43,377	844	51	874
Jackson	12-4N-R19	62.3	1.0	398	1,062	88	331,095	139,631	191,464	80,445	1,291	149	1,358
Jackson	13-4N-R19	25.1	1.4	382	1,254	85	187,324	134,729	52,595	7,867	313	75	502
Jackson	13-4N-R19	86.2	1.2	393	1,157	87	509,543	132,179	377,364	223,756	2,596	86	431
Jackson	15-1N-R19	74.4	1.1	415	1,120	91	435,948	138,396	297,552	164,971	2,217	74	446
Jackson	17-4N-R19	86.2	1.1	412	1,074	91	464,878	150,292	314,587	160,979	1,868	86	962
Jackson	18-2S-R19	86.2	1.1	421	1,073	92	360,165	124,148	236,017	82,409	956	124	1,086
Jackson	18-2S-R19	69.3	1.1	352	1,077	80	395,992	124,925	271,067	147,485	2,127	69	902
Jackson	19-1S-R19	86.2	1.1	451	1,132	97	344,518	157,008	187,511	33,903	393	88	788
Jackson	19-2S-R19	86.2	1.1	431	1,072	94	379,695	135,845	243,850	90,242	1,047	58	950
Jackson	1-2S-R20	65.1	1.1	396	1,076	88	359,406	143,358	216,048	100,040	1,537	130	1,706
Jackson	20-2S-R19	86.2	1.1	381	1,075	85	462,276	140,927	321,349	167,741	1,946	86	776
Jackson	21-2N-R18	86.2	1.1	427	1,072	93	325,854	122,773	203,081	49,473	574	161	1,355
Jackson	28-2N-R18	86.2	1.0	452	1,055	97	355,028	124,467	230,561	76,953	893	58	720
Jackson	28-2S-R19	41.9	1.1	374	1,076	84	234,822	139,173	95,649	20,965	500	84	838
Jackson	29-2S-R19	86.2	1.0	453	1,070	98	378,015	134,530	243,485	89,877	1,043	86	1,018
Jackson	2-2N-R18	86.2	1.1	383	1,075	85	426,828	133,414	293,414	139,806	1,622	121	1,288
Jackson	36-3N-R18	53.3	1.1	416	1,073	91	289,043	170,558	118,485	23,504	441	163	1,755
Jackson	3-4N-R19	86.2	1.1	418	1,073	92	462,135	147,084	315,051	161,443	1,873	128	1,455
Jackson	4-2N-R18	86.2	1.1	416	1,073	91	455,653	124,866	330,787	177,179	2,055	86	926
Jackson	7-2S-R19	71.7	1.1	386	1,075	86	398,577	141,843	256,734	128,982	1,799	72	860
Jackson	9-2N-R18	86.2	1.0	392	1,089	87	459,889	129,110	330,779	177,171	2,055	77	741
Jackson: Total or Ave.		1,748.6	1.1	408	1,087	90	8,995,371	3,381,043	5,614,330	2,498,239	1,429	2,437	25,223
Area in Kiowa County with Positive Net Incremental Benefits from Reel Irrigation													
Kiowa	13-3N-R19	57.6	1.1	355	1,077	81	327,917	123,610	204,307	101,664	1,765	58	864
Kiowa	18-4N-R19	68.4	1.1	365	1,076	82	385,981	123,750	262,231	140,342	2,052	68	889
Kiowa	1-3N-R19	54.8	0.9	368	1,040	83	280,204	122,574	157,630	59,976	1,094	55	493

Appendix Table 3 (continued)

County	Section, Township, Range West	Acres	Appl af/ac	TDH feet	Yield Lbs/ ac	Pump Cost $/af	PV Irrig. dollars	PV Capital dollars	NPV Irrg. Dollars	Tot. NIB dollars	NIB/ac $/ac	Tot Salt Ret/ Yr	Lbs N Ret/Yr
Kiowa	24-3N-R19	86.2	1.1	362	1,077	82	387,903	124,148	263,755	110,147	1,278	86	690
Kiowa	25-4N-R19	46.7	1.1	346	1,077	79	267,430	125,045	142,385	59,166	1,267	175	1,786
Kiowa	30-3N-R18	56.1	1.1	366	1,076	83	314,415	123,491	190,924	90,954	1,621	56	842
Kiowa	31-3N-R17	85.1	1.2	575	1,099	114	398,672	169,641	229,031	77,383	909	85	936
Kiowa	4-4N-R19	86.2	1.1	377	1,076	84	382,095	133,554	248,541	94,933	1,101	86	690
Kiowa	9-4N-R19	86.2	1.1	413	1,074	91	465,279	126,958	338,321	184,713	2,143	132	1,276
Kiowa: Total or Ave.		627.3	1.1	399	1,076	88	3,209,896	1,172,771	2,037,125	919,278	1,465	801	8466
Area in Tillman County with Positive Net Incremental Benefits from Reel Irrigation													
Tillman	11-1N-R19	86.2	1.1	368	1,076	83	392,517	128,971	263,546	109,938	1,275	86	690
Tillman	16-2S-R19	86.2	1.3	586	1,235	121	466,138	206,625	259,513	105,905	1,229	62	505
Tillman	1-1N-R19	86.2	1.1	423	1,073	92	461,460	126,420	335,040	181,432	2,105	135	1,618
Tillman	22-2N-R18	86.2	0.9	432	1,065	94	346,724	147,941	198,783	45,175	524	86	345
Tillman	26-2N-R18	86.2	1.2	585	1,155	120	492,586	186,041	306,545	152,937	1,774	86	761
Tillman	5-2S-R19	86.2	1.1	414	1,073	91	464,767	154,457	310,310	156,702	1,818	135	1,491
Tillman	9-2S-R19	86.2	1.3	537	1,242	112	408,243	222,905	185,338	31,730	368	86	345
Tillman:Total or Ave.		603.4	1.1	478	1,131	102	3,032,435	1,173,360	1,859,075	783,819	1,299	676	5,755
Grand Total or Ave.		7,873.8	1.0	434	1,033	92	40,068,171	15,044,240	25,023,937	10,992,751	1,396	8,975	93,694

Appendix Table 4. Economically Feasibile Area Irrigation by Traveling Sprinkler along Elm and North Fork Rivers with Cotton Price at $0.70per Pound, Electrical Conductivity of irrigation water .9dS/m before and 1.05 dS/M after application.

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Area in Greer County with Positive Net Incremental Benefits from Reel Irrigation												
10-T5N-R22W	61	2.30	377	1,440	73	575,951	126,818	449,133	340,431	5,581	77	286
11-T4N-R20W	24	2.20	396	1,551	88	245,497	126,818	118,679	76,802	3,268	79	316
11-T5N-R22W	22	2.20	362	1,507	82	224,660	126,818	97,842	58,103	2,606	81	343
12-T4N-R20W	53	2.20	417	1,548	91	540,713	128,452	412,261	318,350	6,041	77	306
12-T5N-R22W	19	2.30	348	1,557	79	201,562	126,818	74,744	41,777	2,258	83	328
12-T5N-R22W	35	2.10	465	1,489	100	320,709	203,975	116,734	54,364	1,553	153	734
14-T5N-R21W	77	2.00	557	1,449	116	625,572	233,506	392,066	255,565	3,336	67	324

Appendix Table 4 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
15-T5N-R21W	83	2.30	403	1,600	79	478,019	128,891	349,128	201,757	2,440	41	38
15-T5N-R21W	85	2.10	400	1,396	83	601,567	138,356	463,211	311,919	3,674	59	311
15-T5N-R21W	27	2.20	441	1,535	95	264,597	159,678	104,919	57,161	2,133	166	510
16-T5N-R21W	83	2.30	403	1,510	79	396,938	126,818	270,120	122,392	1,476	37	100
16-T5N-R21W	83	2.20	414	1,498	82	475,162	139,890	335,272	187,188	2,253	44	129
16-T6N-R25W	42	1.40	438	1,238	83	305,752	186,380	119,372	44,172	1,047	68	588
17-T6N-R25W	84	2.20	385	1,502	86	831,650	133,235	698,415	548,014	6,493	77	337
17-T6N-R25W	53	2.30	384	1,583	74	608,325	142,860	465,465	370,663	6,967	183	125
18-T5N-R21W	30	1.90	494	1,422	105	244,131	177,094	67,037	13,933	468	66	570
1-T5N-R22W	86	2.20	375	1,525	84	835,758	127,616	708,142	554,534	6,433	72	308
1-T5N-R22W	83	2.00	444	1,409	91	644,927	126,818	518,109	369,847	4,445	127	564
1-T5N-R23W	83	1.80	519	1,389	102	540,031	126,719	413,312	265,228	3,192	117	236
1-T5N-R23W	81	0.60	674	1,112	124	508,632	255,605	253,027	108,507	1,338	(4)	277
20-T5N-R20W	86	2.10	578	1,557	119	593,284	180,162	413,122	259,514	3,011	52	213
20-T6N-R24W	84	1.60	551	1,417	111	710,010	188,153	521,857	372,882	4,460	75	361
21-T5N-R21W	66	1.80	637	1,401	129	476,708	244,107	232,601	114,989	1,742	121	907
21-T6N-R24W	33	2.30	439	1,570	86	351,328	161,989	189,339	131,068	4,008	78	126
21-T6N-R25W	73	2.20	372	1,469	74	718,082	125,204	592,878	462,970	6,351	74	257
21-T6N-R25W	20	2.30	350	1,587	77	232,927	126,121	106,806	70,453	3,454	84	191
22-T5N-R21W	85	2.20	416	1,484	86	376,406	142,660	233,746	82,632	974	34	127
22-T5N-R21W	24	2.30	360	1,555	82	256,172	131,960	124,212	81,800	3,437	81	318
22-T6N-R23W	86	2.10	564	925	117	808,970	205,071	603,899	450,291	5,224	74	324
22-T6N-R24W	85	1.90	669	1,483	135	659,510	173,626	485,884	334,236	3,928	57	353
23-T5N-R21W	36	2.20	354	1,474	80	350,595	129,788	220,807	156,299	4,318	78	388
23-T6N-R23W	27	2.10	540	274	113	267,301	210,053	57,248	9,134	338	77	242
23-T6N-R23W	86	1.90	701	1,491	141	633,178	250,444	382,734	229,126	2,658	62	391
23-T6N-R24W	84	1.30	565	1,293	109	394,143	180,302	213,841	64,866	776	79	349

Appendix Table 4 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
24-T5N-R21W	53	2.20	357	1,512	81	537,797	126,818	410,979	316,889	6,002	77	375
24-T5N-R21W	69	2.30	382	868	83	772,867	134,929	637,938	515,693	7,517	168	400
24-T6N-R24W	38	2.10	424	1,426	84	337,811	174,543	163,268	95,552	2,515	150	642
24-T6N-R25W	85	1.60	556	1,324	109	632,224	191,023	441,201	290,087	3,421	107	552
25-T5N-R21W	80	2.10	377	1,384	84	759,052	126,818	632,234	490,387	6,161	74	384
25-T5N-R21W	85	2.30	370	1,597	78	791,413	126,818	664,595	513,125	6,037	66	114
25-T5N-R21W	43	2.20	368	1,502	83	426,739	126,818	299,921	223,473	5,209	77	369
25-T6N-R23W	86	2.20	416	860	91	545,709	132,239	413,470	259,862	3,015	47	170
25-T6N-R24W	50	2.10	450	1,479	97	453,994	140,169	313,825	225,260	4,532	71	483
25-T6N-R24W	83	2.20	395	1,395	78	545,850	133,155	412,695	264,967	3,196	54	254
25-T6N-R25W	86	2.20	407	1,538	88	546,455	128,831	417,624	264,372	3,074	47	161
25-T6N-R25W	23	2.20	400	1,514	87	225,888	143,417	82,471	41,485	1,804	170	649
26-T6N-R23W	49	2.20	377	1,524	84	499,625	130,166	369,459	282,141	5,758	77	321
26-T6N-R23W	22	2.30	372	1,485	73	217,709	130,086	87,623	48,954	2,256	82	267
26-T6N-R24W	84	2.20	420	1,508	83	303,523	129,150	174,373	25,398	304	28	82
26-T6N-R24W	36	2.00	382	1,380	85	294,661	134,391	160,270	96,474	2,695	67	467
27-T6N-R23W	86	2.20	411	1,561	90	900,237	129,429	770,808	617,734	7,191	117	367
27-T6N-R24W	82	2.20	400	1,390	77	592,258	134,670	457,588	312,177	3,826	59	265
27-T6N-R24W	37	2.00	377	1,381	84	307,108	132,458	174,650	108,538	2,926	67	471
27-T6N-R24W	24	2.00	375	1,333	84	203,028	125,503	77,525	34,401	1,422	69	471
27-T6N-R25W	18	2.10	375	1,465	84	171,822	126,898	44,924	12,313	673	76	433
28-T5N-R20W	82	2.00	432	1,204	94	680,670	143,158	537,512	390,675	4,741	66	425
28-T6N-R24W	78	2.30	441	1,080	96	832,290	135,427	696,863	557,867	7,152	77	280
28-T6N-R24W	84	2.20	387	1,488	79	593,676	130,047	463,629	313,585	3,724	56	197
29-T5N-R20W	86	2.30	413	225	91	364,563	126,818	237,745	84,137	976	31	99
29-T5N-R20W	86	2.20	397	608	88	684,021	126,818	557,203	403,595	4,682	141	591
29-T6N-R22W	84	1.90	585	1,431	117	550,257	139,313	410,944	261,969	3,134	82	507

Appendix Table 4 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
29-T6N-R24W	62	2.10	420	1,446	92	553,149	151,986	401,163	289,966	4,647	70	413
29-T6N-R24W	40	2.00	539	1,495	113	348,367	232,470	115,897	45,152	1,137	137	787
2-T5N-R22W	68	1.10	521	1,200	98	465,493	178,528	286,965	165,433	2,426	21	265
30-T5N-R20W	75	2.40	368	1,616	74	896,172	126,818	769,354	635,348	8,449	83	70
30-T5N-R20W	84	2.20	467	1,539	92	678,064	126,818	551,246	401,380	4,773	81	173
30-T6N-R22W	85	1.80	535	1,354	106	561,684	136,961	424,723	274,144	3,244	61	384
30-T6N-R23W	86	2.10	388	1,427	85	636,144	126,818	509,326	356,074	4,140	61	330
30-T6N-R23W	86	2.20	392	1,557	87	734,560	126,818	607,742	454,134	5,268	138	527
30-T6N-R24W	20	2.30	350	1,585	77	229,729	124,128	105,601	69,605	3,446	84	202
30-T6N-R24W	86	2.10	391	1,420	86	562,310	126,818	435,492	282,062	3,276	103	543
30-T6N-R24W	30	2.10	364	1,376	79	248,569	144,155	104,414	51,667	1,746	148	895
31-T5N-R20W	42	2.10	489	1,302	101	363,990	191,879	172,111	97,267	2,316	69	378
31-T6N-R22W	37	2.30	378	1,593	80	423,061	130,445	292,616	226,147	6,063	82	156
31-T6N-R22W	85	2.10	493	959	100	578,799	169,063	409,736	258,801	3,055	95	328
32-T5N-R20W	86	2.20	419	1,516	92	697,510	126,818	570,692	417,084	4,839	93	434
32-T6N-R22W	77	1.90	395	1,281	76	578,799	126,818	451,981	314,945	4,096	51	304
32-T6N-R22W	36	2.20	402	1,494	84	349,810	133,354	216,456	152,839	4,281	78	207
32-T6N-R23W	86	2.10	393	1,431	85	601,101	128,891	472,210	319,136	3,715	57	304
32-T6N-R23W	86	2.20	419	1,552	92	886,857	151,747	735,110	581,502	6,746	147	570
32-T6N-R24W	58	1.90	566	1,459	117	474,668	193,234	281,434	177,722	3,054	61	480
32-T6N-R24W	86	1.60	664	1,357	134	543,683	216,329	327,355	173,747	2,016	74	666
33-T6N-R23W	60	2.20	362	1,417	77	536,738	123,750	412,988	306,781	5,147	76	395
33-T6N-R23W	86	2.30	341	1,557	78	403,556	131,481	272,075	118,467	1,374	608	2,478
33-T6N-R24W	86	2.10	559	1,569	116	722,103	190,684	531,419	377,811	4,383	60	267
34-T5N-R20W	24	2.20	393	1,551	87	251,214	141,923	109,291	66,523	2,772	80	316
34-T6N-R23W	74	2.30	371	1,579	77	830,596	128,632	701,964	570,274	7,717	80	172
34-T6N-R23W	18	2.30	361	1,555	82	188,225	130,644	57,581	26,396	1,508	82	316

Appendix Table 4 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
34-T6N-R23W	55	2.00	409	1,354	82	442,503	146,147	296,356	198,702	3,626	141	754
35-T5N-R21W	84	1.10	729	1,235	139	533,521	274,954	258,567	109,057	1,300	44	500
35-T6N-R23W	26	2.20	357	1,392	75	224,415	128,552	95,863	50,244	1,963	77	402
35-T6N-R23W	85	2.30	390	1,577	82	673,902	131,461	542,441	390,615	4,585	57	126
35-T6N-R23W	21	2.20	367	1,521	81	216,249	126,818	89,431	51,831	2,456	79	312
35-T6N-R25W	20	1.90	370	1,361	81	168,645	128,712	39,933	3,580	176	68	546
35-T6N-R25W	59	2.20	378	1,538	85	608,481	146,048	462,433	358,008	6,109	155	711
36-T6N-R23W	25	2.20	364	1,470	80	236,333	131,143	105,190	61,531	2,511	80	362
36-T6N-R25W	68	2.30	372	1,508	73	712,357	126,759	585,598	463,887	6,792	77	223
36-T6N-R25W	33	1.80	450	1,326	87	253,714	180,421	73,293	14,843	453	57	328
4-T4N-R20W	52	2.30	365	1,571	82	560,931	138,794	422,137	330,186	6,399	159	807
4-T5N-R22W	84	2.10	534	1,545	104	481,360	201,086	280,275	130,943	1,563	43	59
4-T5N-R22W	81	2.20	443	1,526	84	499,577	155,852	343,725	199,205	2,456	47	92
5-T5N-R21W	86	2.30	441	293	95	721,599	137,738	583,861	430,787	5,015	63	201
5-T5N-R22W	86	2.20	379	1,529	82	620,918	126,818	494,101	341,205	3,977	107	407
6-T5N-R21W	84	2.10	421	1,259	84	702,370	126,818	575,552	426,577	5,103	92	434
6-T5N-R21W	84	2.00	509	1,362	103	415,632	154,078	261,554	112,579	1,347	84	445
6-T5N-R22W	31	2.20	365	1,454	80	292,217	126,818	165,399	109,979	3,536	78	381
6-T5N-R24W	78	0.10	794	1,022	145	478,443	258,036	220,407	81,055	1,037	(17)	214
7-T5N-R21W	28	2.10	372	1,389	76	248,544	141,524	107,020	56,589	2,000	148	694
8-T5N-R21W	60	2.20	373	1,486	84	586,434	131,043	455,391	347,936	5,770	78	354
8-T5N-R21W	85	2.20	436	1,075	94	835,009	126,818	708,191	556,543	6,540	86	385
8-T5N-R21W	86	2.10	456	1,483	93	507,085	125,503	381,582	229,221	2,681	120	470
8-T6N-R25W	22	2.40	372	1,629	72	263,770	140,986	122,784	84,115	3,876	179	58
9-T5N-R22W	84	2.30	384	1,531	77	463,965	126,818	337,147	187,994	2,246	42	106
9-T5N-R22W	54	2.10	467	974	100	524,880	188,731	336,149	239,386	4,409	152	821
19-T6N-R24W	58	2.10	487	1,531	99	559,023	200,966	358,057	255,592	4,445	150	511

Appendix Table 4 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Grand Total/Ave	7,150	2.07	438	1,390	91	57,246,842	17,300,167	39,946,678	27,204,674	3,597	10,125	44,136
Area in Jackson County with Positive Net Incremental Benefits from Reel Irrigation												
11-T1N-R19W	86	2.30	368	1,554	83	746,647	128,971	617,676	464,068	5,384	63	249
11-T3N-R19W	25	2.30	355	1,556	81	265,247	127,277	137,970	94,311	3,849	81	313
11-T3N-R19W	58	2.30	362	1,565	78	644,718	129,509	515,209	411,318	7,055	162	524
12-T2S-R20W	55	2.20	426	1,567	90	584,072	214,337	369,735	271,369	4,916	158	465
12-T4N-R19W	51	2.20	396	1,551	88	538,105	147,941	390,164	298,569	5,809	78	308
12-T4N-R19W	62	2.10	398	1,489	88	596,979	139,631	457,348	346,329	5,559	149	770
13-T4N-R19W	86	2.20	393	1,530	87	802,005	132,179	669,826	516,218	5,989	65	440
13-T4N-R19W	25	2.40	382	1,612	85	278,084	134,729	143,355	98,627	3,929	75	477
17-T4N-R19W	86	2.20	412	1,547	91	884,965	150,292	734,673	581,065	6,741	85	345
18-T2S-R19W	69	2.30	352	1,556	80	753,821	124,925	628,896	505,314	7,286	79	312
18-T4N-R19W	68	2.30	365	1,555	82	735,063	123,750	611,313	489,424	7,155	79	311
19-T1S-R19W	86	2.20	451	1,551	97	611,331	157,008	454,323	300,715	3,489	91	390
19-T2S-R19W	86	2.20	431	1,546	94	724,836	135,845	588,991	435,383	5,051	88	353
1-T1N-R19W	86	2.20	423	1,547	92	879,746	126,420	753,326	599,718	6,957	146	577
1-T2N-R18W	26	2.30	346	1,557	79	287,047	126,818	160,229	113,362	4,310	81	320
1-T2N-R18W	32	2.00	376	1,381	84	263,451	147,223	116,228	59,382	1,862	140	969
1-T2S-R20W	65	2.20	396	1,552	88	682,426	143,358	539,068	423,060	6,499	156	642
1-T3N-R19W	55	2.10	368	1,418	83	482,376	122,574	359,802	262,148	4,784	70	452
20-T2S-R19W	86	2.20	383	1,553	86	880,214	140,927	739,287	585,679	6,794	143	565
21-T2N-R18W	86	2.20	427	1,547	93	621,528	122,773	498,755	345,147	4,004	125	496
22-T2N-R18W	47	1.90	500	1,416	106	371,694	180,621	191,073	108,210	2,327	63	418
23-T3N-R19W	30	2.30	359	1,555	81	325,197	125,902	199,295	145,479	4,817	80	319
24-T3N-R19W	86	2.30	362	1,555	82	738,657	124,148	614,509	460,901	5,347	62	246
24-T4N-R19W	35	2.20	371	1,554	83	368,728	135,507	233,221	171,742	4,978	79	313
25-T4N-R19W	18	2.20	397	1,551	88	184,721	151,528	33,193	1,652	93	81	319

Appendix Table 4 (continued)

Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
25-T4N-R19W	47	2.30	346	1,557	79	509,615	125,045	384,570	301,351	6,453	164	646
27-T3N-R19W	86	1.60	672	1,356	136	536,444	225,277	311,167	157,559	1,828	64	662
29-T2S-R19W	86	2.20	453	1,543	98	720,289	134,530	585,759	432,151	5,013	89	362
2-T1N-R19W	32	2.20	379	1,553	85	335,453	140,947	194,506	138,195	4,373	79	314
2-T2N-R18W	31	2.00	402	1,377	89	247,990	148,977	99,013	44,306	1,443	67	455
33-T1N-R19W	39	2.20	416	1,548	91	398,609	159,180	239,429	170,466	4,405	77	304
34-T2N-R18W	37	2.20	381	1,552	85	390,691	167,688	223,003	157,247	4,261	162	649
34-T2N-R19W	83	1.60	704	1,304	132	445,466	267,382	178,084	30,356	366	56	357
35-T5N-R19W	23	2.00	362	1,383	82	191,314	126,818	64,496	23,688	1,034	70	475
36-T1S-R20W	86	2.20	403	1,531	89	332,362	135,786	196,576	42,968	498	27	171
36-T3N-R18W	53	2.20	416	1,548	91	549,037	170,558	378,479	283,498	5,319	161	637
3-T4N-R19W	86	2.20	418	1,548	92	881,955	147,084	734,871	581,263	6,743	132	534
4-T2N-R18W	86	2.20	416	1,548	91	869,355	124,866	744,489	590,881	6,855	85	338
4-T4N-R19W	86	2.20	377	1,553	84	727,051	133,554	593,497	439,889	5,103	62	243
5-T2S-R19W	86	2.20	414	1,549	91	886,250	154,457	731,793	578,185	6,707	138	548
8-T1S-R19W	86	2.20	408	1,549	90	514,341	151,010	363,331	209,723	2,433	44	174
9-T2N-R18W	86	2.10	392	1,471	87	763,103	129,110	633,993	480,385	5,573	75	574
9-T2N-R18W	29	2.30	355	1,556	81	317,562	133,813	183,749	131,358	4,468	167	674
9-T2S-R19W	86	2.20	537	1,589	112	595,251	222,905	372,346	218,738	2,538	46	282
9-T4N-R19W	86	2.20	413	1,541	91	878,534	126,958	751,576	597,968	6,937	115	485
Grand Total/Ave	2,819	2.17	410	1,523	90	25,342,330	6,620,138	18,722,192	13,699,365	4,607	4,359	19,777
Area in Kiowa County with Positive Net Incremental Benefits from Reel Irrigation												
13-T3N-R19W	58	2.30	355	1,556	81	624,267	123,610	500,657	398,014	6,910	79	313
1-T4N-R19W	29	2.30	340	1,558	78	318,091	122,235	195,856	144,178	4,972	81	325
20-T3N-R18W	71	2.30	680	1,619	132	651,226	257,179	394,047	267,525	3,768	83	162
23-T3N-R18W	81	0.90	638	1,141	118	394,352	230,039	164,313	19,436	239	8	356
25-T3N-R19W	31	2.20	397	1,551	88	319,695	150,352	169,343	114,814	3,752	79	312

Appendix Table 4 (continued)

Section	**Acres**	**Irrigation rate (ac-ft/ac)**	**TDH (feet)**	**Yield (lbs/ac)**	**Pumping Cost ($/ac-ft)**	**NPV ($)**	**PV Capital ($)**	**NPV Irrigation ($)**	**Total NIB ($)**	**NIB per acre ($/ac)**	**Salt return (tons/yr)**	**Nit Ret (lbs/yr)**
2-T2N-R18W	86	2.20	383	1,552	85	815,314	133,414	681,900	528,292	6,129	117	463
2-T3N-R19W	19	2.20	355	1,463	81	183,705	126,878	56,827	22,256	1,147	76	442
2-T4N-R19W	35	2.00	425	1,455	93	315,800	141,066	174,734	112,008	3,182	71	555
30-T3N-R18W	56	2.30	366	1,554	83	600,329	123,491	476,838	376,868	6,718	79	313
31-T3N-R17W	85	2.40	575	1,643	114	801,400	169,641	631,759	480,111	5,642	83	139
3-T2N-R18W	22	2.30	360	1,555	82	230,998	129,050	101,948	63,635	2,960	81	327
3-T4N-R20W	86	2.30	393	1,578	87	851,459	122,614	728,845	575,237	6,673	81	396
6-T2N-R17W	85	2.40	594	1,639	117	396,249	229,322	166,927	15,279	180	41	70
Grand Total/Ave	744	2.16	451	1,528	95	6,502,885	2,058,891	4,443,994	3,117,653	4,021	959	4,173
Area in Tillman County with Positive Net Incremental Benefits from Reel Irrigation												
15-T1N-R19W	74	2.20	415	1,489	91	695,535	138,396	557,139	424,558	5,706	68	465
16-T1S-R19W	52	2.00	672	1,518	136	436,404	304,924	131,480	38,228	731	64	307
16-T2S-R19W	86	2.10	586	1,579	121	677,231	206,625	470,606	316,998	3,677	71	433
18-T2S-R19W	86	2.20	421	1,547	92	688,132	124,148	563,984	410,376	4,761	102	411
22-T2N-R18W	86	2.00	432	1,423	94	562,858	147,941	414,918	261,310	3,031	50	345
26-T1N-R19W	86	2.10	530	1,531	111	431,342	211,687	219,655	66,047	766	38	157
26-T2N-R18W	86	2.10	585	1,576	120	810,120	186,041	624,079	470,471	5,458	79	285
27-T2N-R18W	86	2.20	369	1,554	83	410,233	125,244	284,989	131,381	1,524	35	136
28-T2N-R18W	86	2.10	452	1,485	97	643,037	124,467	518,570	364,962	4,234	81	429
28-T2S-R19W	42	2.20	374	1,554	84	447,039	139,173	307,866	233,182	5,564	78	313
31-T4N-R18W	86	1.40	813	1,273	160	460,012	293,865	166,147	12,539	145	84	625
34-T2S-R19W	86	2.20	502	1,552	106	404,267	184,885	219,382	65,774	763	34	172
36-T2N-R19W	85	2.20	482	1,486	97	539,391	169,900	369,491	217,843	2,560	55	228
3-T1N-R18W	36	2.20	383	1,552	86	381,733	141,325	240,408	176,078	4,878	79	312
4-T1N-R18W	37	2.20	396	1,551	88	387,816	149,953	237,863	171,929	4,647	78	310
7-T2S-R19W	72	2.20	386	1,552	86	757,887	141,843	616,044	488,292	6,811	78	307
Grand Total/Ave	1,174	2.10	487	1,514	103	8,733,037	2,790,417	5,942,621	3,849,968	3,454	1,074	5,235

III b– Traveling Reel with Alternate Rainfall Levels

Appendix Table 1. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with above average rainfall, 1.05 dS/m EC after irrigation and 70 cents/lb Cotton Lint Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	10-T5N-R22W	61	2.10	377	1,486	84	600,362	126,818	473,544	364,842	5,981	61	941
Greer	11-T4N-R20W	24	2.20	396	1,617	88	270,686	126,818	143,868	101,991	4,340	70	829
Greer	11-T5N-R22W	22	2.20	362	1,574	82	248,285	126,818	121,467	81,728	3,665	67	983
Greer	12-T4N-R20W	53	2.20	417	1,615	91	597,440	128,452	468,988	375,077	7,117	53	814
Greer	12-T5N-R22W	86	2.10	422	1,561	92	291,505	127,914	163,592	9,984	116	-	190
Greer	12-T5N-R22W	19	2.20	348	1,623	79	221,194	126,818	94,376	61,409	3,319	74	897
Greer	12-T5N-R22W	35	2.00	465	1,548	100	354,841	203,975	150,866	88,496	2,528	134	1,909
Greer	14-T5N-R21W	77	1.90	557	1,516	116	709,898	233,506	476,392	339,891	4,437	77	844
Greer	15-T5N-R21W	86	2.20	403	1,644	89	536,097	128,891	407,206	253,598	2,942	-	190
Greer	15-T5N-R21W	86	2.00	400	1,458	88	680,426	138,356	542,070	388,462	4,507	86	950
Greer	15-T5N-R21W	27	2.10	441	1,589	95	288,897	159,678	129,219	81,461	3,040	165	1,548
Greer	16-T5N-R21W	86	2.10	403	1,559	89	449,462	126,818	322,644	169,036	1,961	-	379
Greer	16-T5N-R21W	86	2.10	414	1,547	91	537,342	139,890	397,452	243,844	2,829	86	379
Greer	16-T6N-R25W	42	1.20	438	1,269	95	327,891	186,380	141,511	66,311	1,571	57	1,695
Greer	17-T6N-R25W	84	2.20	385	1,569	86	922,326	133,235	789,091	638,690	7,567	84	930
Greer	17-T6N-R25W	53	2.20	384	1,624	86	620,317	142,860	477,457	382,655	7,193	197	750
Greer	18-T5N-R21W	30	1.90	494	1,459	105	264,184	177,094	87,090	33,986	1,140	60	1,380
Greer	19-T6N-R25W	86	1.20	773	1,334	153	437,400	254,888	182,512	28,904	335	-	571
Greer	1-T5N-R22W	86	2.20	375	1,584	84	914,271	127,616	786,655	633,047	7,344	86	761
Greer	1-T5N-R22W	86	1.90	444	1,457	96	726,165	126,818	599,347	445,739	5,171	151	1,781
Greer	1-T5N-R23W	86	1.70	520	1,428	109	604,107	126,719	477,388	323,780	3,756	85	915
Greer	1-T5N-R23W	86	0.30	675	1,131	136	605,853	255,605	350,248	196,640	2,281	-	626

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	20-T5N-R20W	86	2.00	578	1,606	119	649,903	180,162	469,741	316,133	3,667	86	571
Greer	20-T6N-R24W	86	1.50	554	1,449	115	806,612	188,153	618,459	464,851	5,393	55	935
Greer	21-T5N-R21W	66	1.70	637	1,447	129	531,490	244,107	287,383	169,771	2,572	103	2,189
Greer	21-T6N-R23W	32	2.00	622	1,583	127	304,925	243,789	61,136	4,647	147	63	628
Greer	21-T6N-R24W	33	2.10	439	1,613	95	364,326	161,989	202,337	144,066	4,406	65	505
Greer	21-T6N-R25W	73	2.10	372	1,511	84	745,768	125,204	620,564	490,656	6,731	73	802
Greer	21-T6N-R25W	20	2.20	350	1,644	80	248,971	126,121	122,850	86,497	4,240	82	584
Greer	22-T5N-R21W	86	2.10	416	1,529	91	412,391	142,660	269,731	116,123	1,347	-	379
Greer	22-T5N-R21W	24	2.20	360	1,622	82	281,497	131,960	149,537	107,125	4,501	71	840
Greer	22-T6N-R23W	86	2.10	564	1,633	117	877,158	205,071	672,087	518,479	6,015	78	915
Greer	22-T6N-R24W	86	1.80	668	1,524	135	731,483	173,626	557,857	404,249	4,690	82	926
Greer	23-T5N-R21W	36	2.20	354	1,538	80	387,504	129,788	257,716	193,208	5,337	72	1,038
Greer	23-T6N-R23W	27	2.10	540	1,636	113	291,267	210,053	81,214	33,100	1,226	81	714
Greer	23-T6N-R23W	86	1.80	701	1,532	141	701,131	250,444	450,688	297,080	3,446	70	1,067
Greer	23-T6N-R24W	86	1.10	566	1,321	117	445,936	180,302	265,634	112,026	1,300	83	919
Greer	24-T5N-R21W	53	2.20	357	1,573	81	589,194	126,818	462,376	368,286	6,975	53	930
Greer	24-T5N-R21W	69	2.20	382	1,648	85	820,098	134,929	685,169	562,924	8,206	176	1,186
Greer	24-T6N-R23W	54	1.80	701	1,510	141	459,452	352,170	107,282	10,341	190	104	1,984
Greer	24-T6N-R24W	38	2.00	424	1,478	93	362,113	174,543	187,570	119,854	3,154	133	1,967
Greer	24-T6N-R25W	86	1.40	560	1,373	116	700,668	191,023	509,646	356,038	4,130	70	1,605
Greer	25-T5N-R21W	80	2.10	377	1,523	84	821,696	126,818	694,878	553,031	6,948	80	877
Greer	25-T5N-R21W	86	2.20	370	1,649	83	860,137	126,818	733,319	579,711	6,725	86	379
Greer	25-T5N-R21W	43	2.20	368	1,565	83	470,208	126,818	343,390	266,942	6,222	86	946
Greer	25-T6N-R23W	86	2.20	416	1,635	91	588,470	132,239	456,231	302,623	3,511	86	379
Greer	25-T6N-R24W	50	2.00	450	1,529	97	496,136	140,169	355,967	267,402	5,380	50	1,206

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	25-T6N-R24W	86	2.00	395	1,447	88	630,364	133,155	497,209	343,601	3,986	86	761
Greer	25-T6N-R24W	16	2.10	381	1,550	85	172,812	138,137	34,675	5,807	358	81	1,001
Greer	25-T6N-R25W	86	2.10	407	1,593	90	595,542	128,831	466,711	313,103	3,632	86	379
Greer	25-T6N-R25W	23	2.20	400	1,571	89	245,935	143,417	102,518	61,532	2,675	163	1,947
Greer	26-T6N-R23W	49	2.20	377	1,582	84	545,925	130,166	415,759	328,441	6,703	49	864
Greer	26-T6N-R23W	18	2.10	440	1,571	95	188,440	144,673	43,767	12,047	677	71	902
Greer	26-T6N-R23W	22	2.10	372	1,533	83	227,048	130,086	96,962	58,293	2,686	87	862
Greer	26-T6N-R24W	86	2.10	420	1,556	92	339,636	129,150	210,486	56,878	660	-	190
Greer	26-T6N-R24W	36	1.90	382	1,422	85	320,027	134,391	185,636	121,840	3,403	72	1,105
Greer	27-T6N-R23W	86	2.20	411	1,623	90	987,965	129,429	858,536	704,928	8,178	113	1,118
Greer	27-T6N-R24W	86	1.90	400	1,437	88	699,975	134,670	565,305	411,697	4,776	86	950
Greer	27-T6N-R24W	37	1.90	377	1,423	84	333,364	132,458	200,906	134,794	3,633	74	1,144
Greer	27-T6N-R24W	24	2.00	375	1,432	84	220,268	125,503	94,765	51,641	2,134	73	1,120
Greer	27-T6N-R25W	18	2.10	375	1,519	84	187,999	126,898	61,101	28,490	1,557	73	1,049
Greer	28-T5N-R20W	82	1.90	432	1,446	94	741,280	143,158	598,122	451,285	5,477	82	1,089
Greer	28-T6N-R24W	78	2.20	441	1,648	96	897,092	135,427	761,665	622,669	7,983	78	860
Greer	28-T6N-R24W	86	2.10	387	1,539	86	659,573	130,047	529,526	375,918	4,361	86	571
Greer	29-T5N-R20W	86	2.20	413	1,662	91	391,978	126,818	265,160	111,552	1,294	-	190
Greer	29-T5N-R20W	86	2.20	397	1,590	88	739,453	126,818	612,635	459,027	5,325	164	1,620
Greer	29-T6N-R22W	86	1.80	588	1,473	121	621,313	139,313	482,000	328,392	3,810	53	1,517
Greer	29-T6N-R24W	62	2.00	420	1,498	92	607,215	151,986	455,229	344,032	5,513	62	963
Greer	29-T6N-R24W	40	2.00	539	1,546	113	383,888	232,470	151,418	80,673	2,032	119	1,993
Greer	2-T5N-R22W	68	0.90	521	1,227	109	506,928	178,528	328,400	206,868	3,033	-	752
Greer	30-T5N-R20W	75	2.20	368	1,661	83	925,783	126,818	798,965	664,959	8,843	75	331
Greer	30-T5N-R20W	86	2.10	465	1,589	100	719,682	126,818	592,864	439,256	5,096	62	602

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	30-T6N-R22W	86	1.70	532	1,398	111	626,726	136,961	489,765	336,157	3,900	63	1,127
Greer	30-T6N-R23W	86	2.00	388	1,488	86	706,212	126,818	579,394	425,786	4,940	86	950
Greer	30-T6N-R23W	86	2.20	392	1,620	87	804,035	126,818	677,217	523,609	6,074	153	1,354
Greer	30-T6N-R24W	20	2.20	350	1,640	80	245,404	124,128	121,276	85,280	4,222	81	624
Greer	30-T6N-R24W	86	2.00	391	1,475	87	619,510	126,818	492,692	339,084	3,934	62	1,387
Greer	30-T6N-R24W	30	2.00	364	1,427	82	270,715	144,155	126,560	73,813	2,494	133	2,374
Greer	31-T5N-R20W	42	2.00	489	1,511	104	397,649	191,879	205,770	130,926	3,117	84	1,111
Greer	31-T6N-R22W	37	2.20	378	1,646	85	448,951	130,445	318,506	252,037	6,757	75	494
Greer	31-T6N-R22W	86	1.90	493	1,529	104	640,280	169,063	471,217	317,609	3,685	79	906
Greer	32-T5N-R20W	86	2.10	419	1,578	92	770,293	126,818	643,475	489,867	5,683	86	1,107
Greer	32-T6N-R22W	77	1.50	395	1,318	88	627,977	126,818	501,159	364,123	4,735	77	1,016
Greer	32-T6N-R22W	36	2.10	402	1,549	89	375,333	133,354	241,979	178,362	4,996	71	708
Greer	32-T6N-R23W	86	2.00	393	1,493	87	668,218	128,891	539,327	385,719	4,475	86	761
Greer	32-T6N-R23W	86	2.20	419	1,617	92	976,420	151,747	824,673	671,065	7,785	151	1,523
Greer	32-T6N-R24W	58	1.90	566	1,496	117	516,526	193,234	323,292	219,580	3,773	58	1,155
Greer	32-T6N-R24W	86	1.60	664	1,397	134	603,185	216,329	386,856	233,248	2,706	49	1,711
Greer	33-T6N-R23W	33	1.30	477	1,292	102	253,706	186,360	67,346	8,896	271	33	796
Greer	33-T6N-R23W	60	2.10	362	1,480	82	587,413	123,750	463,663	357,456	5,998	60	1,182
Greer	33-T6N-R23W	86	2.20	341	1,624	78	441,002	131,481	309,521	155,913	1,809	603	6,651
Greer	33-T6N-R24W	86	2.10	559	1,615	116	787,170	190,684	596,486	442,878	5,138	86	761
Greer	34-T5N-R20W	24	2.20	393	1,618	87	276,920	141,923	134,997	92,229	3,843	72	847
Greer	34-T6N-R23W	74	2.20	371	1,626	83	871,130	128,632	742,498	610,808	8,265	74	489
Greer	34-T6N-R23W	18	2.20	361	1,622	82	206,847	130,644	76,203	45,018	2,572	70	849
Greer	34-T6N-R23W	55	1.80	409	1,399	90	479,344	146,147	333,197	235,543	4,298	119	2,141
Greer	35-T5N-R21W	86	0.90	729	1,268	146	627,107	274,954	352,153	198,545	2,303	42	1,321

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	35-T6N-R23W	26	2.00	357	1,453	81	244,187	128,552	115,635	70,016	2,735	77	1,186
Greer	35-T6N-R23W	86	2.20	390	1,629	87	733,510	131,461	602,049	448,441	5,202	86	379
Greer	35-T6N-R23W	21	2.20	367	1,572	83	233,245	126,818	106,427	68,827	3,262	84	838
Greer	35-T6N-R25W	20	1.90	370	1,403	83	181,535	128,712	52,823	16,470	807	61	1,393
Greer	35-T6N-R25W	59	2.20	378	1,591	85	659,562	146,048	513,514	409,089	6,981	141	1,836
Greer	36-T6N-R23W	25	2.20	364	1,535	82	259,080	131,143	127,937	84,278	3,440	74	1,027
Greer	36-T6N-R25W	68	2.10	372	1,549	84	733,236	126,759	606,477	484,766	7,098	68	754
Greer	36-T6N-R25W	33	1.60	450	1,367	97	271,127	180,421	90,706	32,256	983	66	1,012
Greer	4-T4N-R20W	52	2.20	365	1,630	82	611,226	138,794	472,432	380,481	7,374	158	2,196
Greer	4-T5N-R22W	86	2.00	534	1,590	112	537,540	201,086	336,454	182,846	2,121	-	190
Greer	4-T5N-R22W	86	2.10	443	1,569	96	583,885	155,852	428,033	274,425	3,184	86	379
Greer	5-T5N-R21W	86	2.20	441	1,655	95	780,022	137,738	642,284	488,676	5,669	86	571
Greer	5-T5N-R22W	86	2.20	379	1,591	85	682,223	126,818	555,405	401,797	4,661	92	1,124
Greer	6-T5N-R21W	86	2.00	527	1,552	110	792,605	126,818	665,787	512,179	5,942	86	761
Greer	6-T5N-R21W	86	1.80	510	1,482	108	467,905	154,078	313,827	160,219	1,859	58	1,307
Greer	6-T5N-R22W	31	2.10	365	1,520	82	322,046	126,818	195,228	139,808	4,495	62	1,098
Greer	7-T5N-R21W	28	1.90	372	1,441	84	270,541	141,524	129,017	78,586	2,777	141	1,995
Greer	8-T5N-R21W	60	2.20	373	1,554	84	650,660	131,043	519,617	412,162	6,835	60	930
Greer	8-T5N-R21W	86	2.10	435	1,575	95	914,032	126,818	787,214	633,606	7,350	93	1,038
Greer	8-T5N-R21W	86	2.00	456	1,541	98	562,773	125,503	437,270	283,662	3,291	85	1,235
Greer	8-T6N-R25W	22	2.20	372	1,669	84	268,022	140,986	127,036	88,367	4,072	171	547
Greer	9-T5N-R22W	86	2.20	384	1,582	86	516,878	126,818	390,060	236,452	2,743	-	379
Greer	9-T5N-R22W	54	2.10	467	1,576	100	567,808	188,731	379,077	282,314	5,199	163	2,046
Harmon	19-T6N-R24W	58	2.10	487	1,582	103	600,792	200,966	399,826	297,361	5,171	152	1,426
Jackson	11-T1N-R19W	86	2.20	368	1,621	83	820,787	128,971	691,816	538,208	6,244	86	761

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	11-T3N-R19W	25	2.20	355	1,623	81	291,287	127,277	164,010	120,351	4,912	74	864
Jackson	11-T3N-R19W	58	2.20	362	1,618	82	684,929	129,509	555,420	451,529	7,745	138	1,473
Jackson	12-T2S-R20W	55	2.20	426	1,627	93	632,633	214,337	418,296	319,930	5,796	134	1,338
Jackson	12-T4N-R19W	51	2.20	396	1,617	88	593,201	147,941	445,260	353,665	6,881	51	794
Jackson	12-T4N-R19W	62	2.10	398	1,545	88	654,538	139,631	514,907	403,888	6,483	149	1,947
Jackson	13-T4N-R19W	86	2.20	393	1,570	87	859,868	132,179	727,689	574,081	6,660	86	1,140
Jackson	13-T4N-R19W	25	2.30	382	1,650	85	295,841	134,729	161,112	116,384	4,637	75	1,272
Jackson	17-T4N-R19W	86	2.20	412	1,613	91	977,230	150,292	826,938	673,330	7,811	86	981
Jackson	18-T2S-R19W	69	2.20	352	1,623	80	827,482	124,925	702,557	578,975	8,349	69	765
Jackson	18-T4N-R19W	68	2.20	365	1,621	82	807,906	123,750	684,156	562,267	8,220	68	754
Jackson	19-T1S-R19W	86	2.20	451	1,604	97	670,109	157,008	513,101	359,493	4,170	88	961
Jackson	19-T2S-R19W	86	2.10	431	1,613	94	802,867	135,845	667,022	513,414	5,956	58	888
Jackson	1-T1N-R19W	86	2.10	423	1,614	92	972,636	126,420	846,216	692,608	8,035	135	1,539
Jackson	1-T2N-R18W	26	2.20	346	1,624	79	314,946	126,818	188,128	141,261	5,371	79	869
Jackson	1-T2N-R18W	32	1.90	376	1,423	84	286,023	147,223	138,800	81,954	2,569	124	2,249
Jackson	1-T2S-R20W	65	2.20	396	1,619	88	752,114	143,358	608,756	492,748	7,569	130	1,693
Jackson	1-T3N-R19W	55	2.00	368	1,465	83	525,201	122,574	402,627	304,973	5,565	55	1,087
Jackson	20-T1S-R19W	15	2.20	374	1,620	84	177,792	143,417	34,375	7,378	487	76	902
Jackson	20-T2S-R19W	86	2.20	383	1,619	86	969,361	140,927	828,434	674,826	7,829	148	1,477
Jackson	21-T2N-R18W	86	2.10	427	1,614	93	687,126	122,773	564,353	410,745	4,765	149	1,369
Jackson	22-T2N-R18W	47	1.90	500	1,457	106	406,050	180,621	225,429	142,566	3,066	46	1,025
Jackson	23-T3N-R19W	30	2.20	359	1,622	81	357,324	125,902	231,422	177,606	5,881	60	866
Jackson	24-T2S-R20W	26	2.00	524	1,599	110	269,629	222,188	47,441	1,483	58	77	796
Jackson	24-T3N-R19W	86	2.20	362	1,622	82	811,610	124,148	687,462	533,854	6,193	86	571
Jackson	24-T4N-R19W	35	2.20	371	1,621	83	405,520	135,507	270,013	208,534	6,044	69	838

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	25-T4N-R19W	18	2.20	397	1,617	88	203,696	151,528	52,168	20,627	1,165	71	858
Jackson	25-T4N-R19W	47	2.20	346	1,623	79	559,157	125,045	434,112	350,893	7,514	175	1,724
Jackson	27-T3N-R19W	86	1.60	672	1,390	136	591,078	225,277	365,801	212,193	2,462	62	1,684
Jackson	29-T2S-R19W	86	2.10	453	1,610	98	799,957	134,530	665,427	511,819	5,938	56	1,060
Jackson	2-T1N-R19W	32	2.20	379	1,620	85	369,205	140,947	228,258	171,947	5,441	63	836
Jackson	2-T2N-R18W	31	1.90	402	1,418	89	269,851	148,977	120,874	66,167	2,155	61	1,082
Jackson	33-T1N-R19W	39	2.20	416	1,615	91	440,256	159,180	281,076	212,113	5,481	77	853
Jackson	34-T2N-R18W	37	2.20	381	1,619	85	430,122	167,688	262,434	196,678	5,330	146	1,775
Jackson	34-T2N-R19W	86	1.40	707	1,346	142	523,621	267,382	256,239	102,631	1,191	49	1,025
Jackson	35-T5N-R19W	23	2.00	362	1,425	82	207,461	126,818	80,643	39,835	1,740	69	1,111
Jackson	36-T1S-R20W	86	2.20	403	1,575	89	358,159	135,786	222,373	68,765	798	-	379
Jackson	36-T3N-R18W	53	2.20	416	1,615	91	606,403	170,558	435,845	340,864	6,395	163	1,731
Jackson	3-T4N-R19W	86	2.10	418	1,614	92	974,766	147,084	827,682	674,074	7,820	128	1,464
Jackson	4-T2N-R18W	86	2.20	416	1,615	91	960,605	124,866	835,739	682,131	7,913	86	926
Jackson	4-T4N-R19W	86	2.20	377	1,620	84	799,961	133,554	666,407	512,799	5,949	86	571
Jackson	5-T2S-R19W	86	2.20	414	1,615	91	978,975	154,457	824,518	670,910	7,783	135	1,537
Jackson	6-T1S-R19W	86	0.80	572	1,204	118	436,046	244,785	191,261	37,653	437	-	379
Jackson	8-T1S-R19W	86	2.20	408	1,616	90	567,698	151,010	416,688	263,080	3,052	-	379
Jackson	9-T2N-R18W	86	2.00	392	1,519	87	827,782	129,110	698,672	545,064	6,323	77	1,404
Jackson	9-T2N-R18W	29	2.20	355	1,623	81	348,812	133,813	214,999	162,608	5,531	160	1,803
Jackson	9-T2S-R19W	86	2.10	537	1,627	112	641,005	222,905	418,100	264,492	3,068	86	761
Jackson	9-T4N-R19W	86	2.10	413	1,607	91	969,332	126,958	842,374	688,766	7,990	132	1,254
Kiowa	13-T3N-R19W	58	2.20	355	1,623	81	685,490	123,610	561,880	459,237	7,973	58	888
Kiowa	1-T4N-R19W	29	2.20	340	1,624	78	348,819	122,235	226,584	174,906	6,031	87	895
Kiowa	20-T3N-R18W	71	2.20	680	1,678	137	717,593	257,179	460,414	333,892	4,703	71	783

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Kiowa	23-T3N-R18W	86	0.50	639	1,164	130	502,192	230,039	272,153	118,545	1,375	-	825
Kiowa	24-T3N-R18W	86	2.20	612	1,664	125	390,218	230,179	160,039	6,431	75	-	379
Kiowa	25-T3N-R19W	31	2.20	397	1,617	88	352,498	150,352	202,146	147,617	4,824	61	809
Kiowa	2-T2N-R18W	86	2.20	383	1,619	85	897,895	133,414	764,481	610,873	7,087	121	1,303
Kiowa	2-T3N-R19W	19	2.10	355	1,515	81	200,325	126,878	73,447	38,876	2,004	78	1,069
Kiowa	2-T4N-R19W	35	2.00	425	1,500	93	342,998	141,066	201,932	139,206	3,955	70	1,318
Kiowa	30-T3N-R18W	56	2.20	366	1,621	83	660,093	123,491	536,602	436,632	7,783	56	866
Kiowa	31-T3N-R17W	86	2.30	575	1,703	119	894,629	169,641	724,988	571,380	6,629	86	761
Kiowa	3-T2N-R18W	22	2.20	360	1,622	82	253,875	129,050	124,825	86,512	4,024	86	853
Kiowa	3-T4N-R20W	86	2.20	393	1,633	87	923,298	122,614	800,684	647,076	7,507	73	1,021
Kiowa	6-T2N-R17W	86	2.30	594	1,698	122	443,208	229,322	213,886	60,278	699	-	379
Tillman	15-T1N-R19W	74	2.10	415	1,529	91	749,371	138,396	610,975	478,394	6,430	74	1,149
Tillman	16-T1S-R19W	52	1.90	672	1,578	136	490,869	304,924	185,945	92,693	1,771	52	807
Tillman	16-T2S-R19W	86	2.10	586	1,618	121	733,760	206,625	527,135	373,527	4,333	62	1,248
Tillman	18-T2S-R19W	86	2.10	421	1,613	92	762,129	124,148	637,981	484,373	5,619	124	1,155
Tillman	1-T1S-R20W	86	0.90	719	1,272	144	454,875	293,745	161,130	7,522	87	-	545
Tillman	22-T2N-R18W	86	2.00	432	1,465	94	611,078	147,941	463,137	309,529	3,591	86	761
Tillman	25-T1N-R19W	86	1.80	724	1,561	145	532,649	317,139	215,510	61,902	718	-	571
Tillman	26-T1N-R19W	86	2.00	530	1,598	111	482,239	211,687	270,552	116,944	1,357	-	379
Tillman	26-T2N-R18W	86	2.00	585	1,626	120	888,017	186,041	701,976	548,368	6,362	86	937
Tillman	27-T2N-R18W	86	2.20	369	1,621	83	451,123	125,244	325,879	172,271	1,998	-	379
Tillman	28-T2N-R18W	86	2.00	452	1,544	97	711,430	124,467	586,963	433,355	5,027	58	1,019
Tillman	28-T2S-R19W	42	2.20	374	1,620	84	491,755	139,173	352,582	277,898	6,631	84	831
Tillman	31-T4N-R18W	86	1.30	813	1,315	160	527,616	293,865	233,751	80,143	930	86	1,567
Tillman	34-T2S-R19W	86	2.10	502	1,604	106	442,951	184,885	258,066	104,458	1,212	-	379

Appendix Table 1 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Tillman	36-T2N-R19W	86	2.10	482	1,541	103	603,867	169,900	433,967	280,359	3,252	86	761
Tillman	3-T1N-R18W	36	2.20	383	1,619	86	420,327	141,325	279,002	214,672	5,947	72	875
Tillman	4-T1N-R18W	37	2.20	396	1,617	88	427,473	149,953	277,520	211,586	5,719	74	816
Tillman	7-T2S-R19W	72	2.20	386	1,619	86	834,562	141,843	692,719	564,967	7,881	72	789

AppendixTable 2. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with +10% rainfall, 2.62 dS/m EC and 70 cents/lb Cotton Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	10-T5N-R22W	61	0.70	377	1,114	84	410,394	126,818	283,576	174,874	2,867	61	1,210
Greer	12-T4N-R20W	53	1.10	417	1,189	91	370,277	128,452	241,825	147,914	2,807	53	1,627
Greer	14-T5N-R21W	77	0.80	557	1,122	116	459,764	233,506	226,258	89,757	1,172	77	1,182
Greer	15-T5N-R21W	86	1.20	403	1,272	89	369,621	128,891	240,730	87,122	1,011	86	761
Greer	15-T5N-R21W	86	0.60	400	1,076	88	452,604	138,356	314,248	160,640	1,864	-	950
Greer	16-T5N-R21W	86	1.00	403	1,178	89	300,831	126,818	174,013	20,405	237	-	761
Greer	16-T5N-R21W	86	1.00	414	1,167	91	360,050	139,890	220,160	66,552	772	-	950
Greer	16-T6N-R25W	42	0.10	438	1,066	95	294,733	186,380	108,353	33,153	786	(15)	877
Greer	17-T6N-R25W	84	1.00	385	1,152	86	572,539	133,235	439,304	288,903	3,423	84	1,488
Greer	17-T6N-R25W	53	1.20	384	1,264	86	434,699	142,860	291,839	197,037	3,704	213	3,631
Greer	19-T6N-R24W	58	1.00	487	1,209	103	411,056	200,966	210,090	107,625	1,872	152	2,939
Greer	1-T5N-R22W	86	1.10	375	1,186	84	582,355	127,616	454,739	301,131	3,493	86	1,329
Greer	1-T5N-R22W	86	0.70	444	1,119	96	518,100	126,818	391,282	237,674	2,757	39	2,068
Greer	1-T5N-R23W	86	0.60	520	1,122	109	460,054	126,719	333,335	179,727	2,085	99	2,187
Greer	20-T5N-R20W	86	1.10	578	1,252	119	458,764	180,162	278,602	124,994	1,450	86	950

Appendix Table 2 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	20-T6N-R24W	55	1.10	500	1,247	106	414,009	188,153	225,856	127,311	2,302	55	1,464
Greer	21-T5N-R21W	66	0.90	637	1,137	129	379,333	244,107	135,226	17,614	267	103	2,480
Greer	21-T6N-R24W	33	1.10	439	1,246	95	253,080	161,989	91,091	32,820	1,004	65	1,585
Greer	21-T6N-R25W	73	0.90	372	1,170	84	522,217	125,204	397,013	267,105	3,664	73	1,285
Greer	21-T6N-R25W	20	1.20	350	1,242	80	163,030	126,121	36,909	556	27	82	1,709
Greer	22-T6N-R23W	86	1.20	564	1,293	117	636,475	205,071	431,404	277,796	3,223	78	1,279
Greer	22-T6N-R24W	86	1.00	668	1,221	135	553,062	173,626	379,436	225,828	2,620	82	1,107
Greer	23-T5N-R21W	36	1.00	354	1,136	80	242,908	129,788	113,120	48,612	1,343	72	1,437
Greer	23-T6N-R23W	86	1.00	701	1,231	141	532,015	250,444	281,571	127,963	1,484	86	1,067
Greer	24-T5N-R21W	53	1.10	357	1,171	81	369,318	126,818	242,500	148,410	2,811	53	1,398
Greer	24-T5N-R21W	69	1.20	382	1,279	85	568,066	134,929	433,137	310,892	4,532	195	3,139
Greer	24-T6N-R24W	38	0.70	424	1,102	93	246,165	174,543	71,622	3,906	103	95	2,427
Greer	24-T6N-R25W	86	0.40	560	1,104	116	568,181	191,023	377,158	223,550	2,593	87	2,066
Greer	25-T5N-R21W	80	1.00	377	1,175	84	554,551	126,818	427,733	285,886	3,592	80	1,228
Greer	25-T5N-R21W	86	1.20	370	1,257	83	574,093	126,818	447,275	293,667	3,407	86	1,329
Greer	25-T5N-R21W	43	1.00	368	1,159	83	293,329	126,818	166,511	90,063	2,099	86	1,420
Greer	25-T6N-R23W	86	1.20	490	1,293	104	414,110	132,239	281,871	128,263	1,488	86	950
Greer	25-T6N-R24W	50	1.00	450	1,182	97	336,389	140,169	196,220	107,655	2,166	50	1,424
Greer	25-T6N-R24W	86	0.60	395	1,079	88	437,237	133,155	304,082	150,474	1,746	-	761
Greer	25-T6N-R25W	86	1.10	407	1,207	90	390,448	128,831	261,617	108,009	1,253	86	950
Greer	26-T6N-R23W	49	1.10	377	1,188	84	350,124	130,166	219,958	132,640	2,707	98	1,404
Greer	26-T6N-R24W	36	0.90	382	1,109	85	218,049	134,391	83,658	19,862	555	72	948
Greer	27-T6N-R23W	86	1.10	411	1,214	90	634,533	129,429	505,104	351,496	4,078	113	2,306
Greer	27-T6N-R24W	86	0.50	400	1,077	88	496,908	134,670	362,238	208,630	2,420	-	761
Greer	27-T6N-R24W	37	0.90	377	1,109	84	226,966	132,458	94,508	28,396	765	74	899

Appendix Table 2 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	28-T5N-R20W	82	0.90	432	1,127	94	510,963	143,158	367,805	220,968	2,682	82	908
Greer	28-T6N-R24W	78	1.30	441	1,290	96	630,572	135,427	495,145	356,149	4,566	78	1,376
Greer	28-T6N-R24W	86	0.90	387	1,159	86	441,393	130,047	311,346	157,738	1,830	86	950
Greer	29-T5N-R20W	86	1.10	397	1,225	88	501,117	126,818	374,299	220,691	2,560	164	2,601
Greer	29-T6N-R22W	86	1.00	675	1,236	136	442,093	139,313	302,780	149,172	1,731	86	761
Greer	29-T6N-R24W	62	1.00	420	1,138	92	396,194	151,986	244,208	133,011	2,132	62	1,100
Greer	2-T5N-R22W	68	-	521	1,061	109	476,201	178,528	297,673	176,141	2,583	-	452
Greer	30-T5N-R20W	75	1.30	368	1,285	83	637,040	126,818	510,222	376,216	5,003	75	1,658
Greer	30-T5N-R20W	86	1.10	465	1,210	100	491,489	126,818	364,672	211,064	2,449	62	1,618
Greer	30-T6N-R22W	86	0.50	532	1,084	111	479,003	136,961	342,042	188,434	2,186	-	1,076
Greer	30-T6N-R23W	86	0.80	388	1,109	86	457,051	126,818	330,233	176,625	2,049	86	950
Greer	30-T6N-R23W	86	1.10	392	1,209	87	514,836	126,818	388,018	234,410	2,719	164	2,560
Greer	30-T6N-R24W	20	1.20	350	1,241	80	160,948	124,128	36,820	824	41	81	1,693
Greer	30-T6N-R24W	86	0.80	391	1,116	87	413,454	126,818	286,636	133,028	1,543	62	1,660
Greer	31-T5N-R20W	42	0.90	489	1,150	104	278,538	191,879	86,659	11,815	281	42	1,204
Greer	31-T6N-R22W	37	1.20	378	1,252	85	298,422	130,445	167,977	101,508	2,721	75	1,645
Greer	31-T6N-R22W	86	0.80	493	1,169	104	453,266	169,063	284,203	130,595	1,515	79	1,693
Greer	32-T5N-R20W	86	1.10	419	1,172	92	483,949	126,818	357,131	203,523	2,361	86	1,808
Greer	32-T6N-R22W	36	1.00	402	1,171	89	251,517	133,354	118,163	54,546	1,528	71	1,495
Greer	32-T6N-R23W	86	0.80	393	1,109	87	432,333	128,891	303,442	149,834	1,738	-	950
Greer	32-T6N-R23W	86	1.10	419	1,200	92	615,996	151,747	464,249	310,641	3,604	151	3,000
Greer	32-T6N-R24W	58	1.00	566	1,200	117	381,106	193,234	187,872	84,160	1,446	58	1,155
Greer	32-T6N-R24W	86	0.80	664	1,131	134	462,174	216,329	245,845	92,237	1,070	49	1,711
Greer	33-T6N-R23W	60	0.70	362	1,089	82	379,927	123,750	256,177	149,970	2,516	60	1,182
Greer	33-T6N-R23W	86	1.10	341	1,194	78	287,595	131,481	156,115	2,507	29	603	12,542

Appendix Table 2 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	33-T6N-R24W	86	1.20	559	1,274	116	561,644	190,684	370,960	217,352	2,521	86	950
Greer	34-T6N-R23W	74	1.20	371	1,253	83	591,758	128,632	463,126	331,436	4,485	74	1,629
Greer	34-T6N-R23W	55	0.20	409	1,061	90	364,467	146,147	218,320	120,666	2,202	72	1,803
Greer	35-T6N-R23W	86	1.20	390	1,242	87	488,830	131,461	357,369	203,761	2,364	86	1,140
Greer	35-T6N-R25W	59	1.10	378	1,213	85	438,398	146,048	292,350	187,925	3,207	141	2,791
Greer	36-T6N-R25W	68	1.00	372	1,203	84	514,495	126,759	387,736	266,025	3,895	68	1,506
Greer	4-T4N-R20W	52	1.20	365	1,228	82	394,390	138,794	255,596	163,645	3,171	169	2,769
Greer	4-T5N-R22W	86	1.10	534	1,227	112	375,373	201,086	174,287	20,679	240	86	950
Greer	4-T5N-R22W	86	1.00	443	1,200	96	401,948	155,852	246,096	92,488	1,073	86	950
Greer	5-T5N-R21W	86	1.20	441	1,285	95	545,499	137,738	407,761	254,153	2,948	86	1,140
Greer	5-T5N-R22W	86	1.10	379	1,180	85	428,027	126,818	301,209	147,601	1,712	92	2,183
Greer	6-T5N-R21W	86	0.50	424	1,105	93	562,171	126,818	435,353	281,745	3,268	32	1,089
Greer	6-T5N-R22W	31	0.90	365	1,114	82	202,512	126,818	75,694	20,274	652	62	1,371
Greer	7-T5N-R21W	28	0.40	372	1,094	84	198,091	141,524	56,567	6,136	217	66	2,240
Greer	8-T5N-R21W	60	1.00	373	1,139	84	404,654	131,043	273,611	166,156	2,755	60	1,462
Greer	8-T5N-R21W	86	1.10	435	1,216	95	628,272	126,818	501,454	347,846	4,035	86	1,464
Greer	8-T5N-R21W	86	0.90	456	1,148	98	364,754	125,503	239,251	85,643	994	85	2,361
Greer	8-T6N-R25W	22	1.30	372	1,307	84	188,529	140,986	47,543	8,874	409	202	3,437
Greer	9-T5N-R22W	86	1.10	384	1,196	86	343,226	126,818	216,408	62,800	729	-	761
Greer	9-T5N-R22W	54	1.10	467	1,236	100	401,885	188,731	213,154	116,391	2,143	163	2,921
Jackson	11-T1N-R19W	86	1.10	368	1,192	83	507,152	128,971	378,181	224,573	2,605	86	1,329
Jackson	11-T3N-R19W	25	1.10	355	1,193	81	179,592	127,277	52,315	8,656	353	74	1,676
Jackson	11-T3N-R19W	58	1.20	362	1,229	82	451,987	129,509	322,478	218,587	3,749	159	3,131
Jackson	12-T2S-R20W	55	1.10	426	1,221	93	409,517	214,337	195,180	96,814	1,754	166	3,232
Jackson	12-T4N-R19W	51	1.10	396	1,191	88	367,406	147,941	219,465	127,870	2,488	51	1,587

Appendix Table 2 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	12-T4N-R19W	62	1.00	398	1,163	88	419,985	139,631	280,354	169,335	2,718	149	2,727
Jackson	13-T4N-R19W	86	1.20	393	1,237	87	604,136	132,179	471,957	318,349	3,693	86	950
Jackson	13-T4N-R19W	25	1.40	382	1,331	85	216,476	134,729	81,747	37,019	1,475	75	1,052
Jackson	17-T4N-R19W	86	1.10	412	1,189	91	605,825	150,292	455,533	301,925	3,503	86	1,739
Jackson	18-T2S-R19W	69	1.10	352	1,193	80	510,405	124,925	385,480	261,898	3,776	69	1,682
Jackson	18-T4N-R19W	68	1.10	365	1,193	82	498,710	123,750	374,960	253,071	3,700	68	1,658
Jackson	19-T1S-R19W	86	1.20	451	1,230	97	435,744	157,008	278,736	125,128	1,452	88	1,446
Jackson	19-T2S-R19W	86	1.10	431	1,188	94	497,925	135,845	362,081	208,473	2,418	58	1,777
Jackson	1-T1N-R19W	86	1.10	423	1,189	92	602,850	126,420	476,430	322,822	3,745	135	3,025
Jackson	1-T2N-R18W	26	1.10	346	1,194	79	194,035	126,818	67,217	20,350	774	79	1,682
Jackson	1-T2S-R20W	65	1.10	396	1,192	88	466,299	143,358	322,941	206,933	3,179	130	3,159
Jackson	1-T3N-R19W	55	0.90	368	1,126	83	347,164	122,574	224,590	126,936	2,316	55	1,087
Jackson	20-T2S-R19W	86	1.10	383	1,192	86	598,745	140,927	457,818	304,210	3,529	148	2,921
Jackson	21-T2N-R18W	86	1.10	427	1,189	93	425,731	122,773	302,958	149,350	1,733	161	2,522
Jackson	22-T2N-R18W	47	0.90	500	1,143	106	285,569	180,621	104,948	22,085	475	46	922
Jackson	23-T3N-R19W	30	1.10	359	1,193	81	220,157	125,902	94,255	40,439	1,339	91	1,598
Jackson	24-T3N-R19W	86	1.10	362	1,193	82	500,901	124,148	376,753	223,145	2,589	86	1,329
Jackson	24-T4N-R19W	35	1.10	371	1,192	83	250,492	135,507	114,985	53,506	1,551	69	1,596
Jackson	25-T4N-R19W	47	1.10	346	1,194	79	344,512	125,045	219,467	136,248	2,918	175	3,371
Jackson	27-T3N-R19W	86	0.80	672	1,141	136	461,326	225,277	236,049	82,441	956	86	1,631
Jackson	29-T2S-R19W	86	1.10	453	1,186	98	497,817	134,530	363,287	209,679	2,432	86	1,808
Jackson	2-T1N-R19W	32	1.10	379	1,192	85	228,187	140,947	87,240	30,929	979	63	1,603
Jackson	33-T1N-R19W	39	1.10	416	1,189	91	273,264	159,180	114,084	45,121	1,166	77	1,620
Jackson	34-T2N-R18W	37	1.10	381	1,192	85	265,761	167,688	98,073	32,317	876	158	3,333
Jackson	34-T2N-R19W	86	0.10	707	1,003	142	424,048	267,382	156,666	3,058	35	-	703

Appendix Table 2 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	36-T3N-R18W	53	1.10	416	1,189	91	376,514	170,558	205,956	110,975	2,082	163	3,294
Jackson	3-T4N-R19W	86	1.10	418	1,189	92	603,575	147,084	456,491	302,883	3,514	128	2,736
Jackson	4-T2N-R18W	86	1.10	416	1,189	91	594,813	124,866	469,947	316,339	3,670	86	1,662
Jackson	4-T4N-R19W	86	1.10	377	1,192	84	494,540	133,554	360,986	207,378	2,406	86	1,329
Jackson	5-T2S-R19W	86	1.10	414	1,189	91	606,264	154,457	451,807	298,199	3,459	135	2,884
Jackson	8-T1S-R19W	86	1.10	408	1,190	90	351,969	151,010	200,959	47,351	549	86	950
Jackson	9-T2N-R18W	86	1.10	392	1,179	87	564,371	129,110	435,261	281,653	3,267	77	1,614
Jackson	9-T2N-R18W	29	1.10	355	1,193	81	214,809	133,813	80,996	28,605	973	160	3,435
Jackson	9-T2S-R19W	86	1.30	537	1,320	112	479,045	222,905	256,140	102,532	1,189	86	761
Jackson	9-T4N-R19W	86	1.10	413	1,188	91	604,280	126,958	477,323	323,715	3,755	132	2,332
Kiowa	13-T3N-R19W	58	1.10	355	1,193	81	422,919	123,610	299,309	196,666	3,414	58	1,651
Kiowa	1-T4N-R19W	29	1.10	340	1,194	78	214,837	122,235	92,602	40,924	1,411	87	1,662
Kiowa	20-T3N-R18W	71	1.10	680	1,212	137	443,898	257,179	186,719	60,197	848	71	1,722
Kiowa	25-T3N-R19W	31	1.10	397	1,191	88	218,121	150,352	67,769	13,240	433	92	1,618
Kiowa	2-T2N-R18W	86	1.10	383	1,191	85	553,995	133,414	420,581	266,973	3,097	121	2,416
Kiowa	2-T4N-R19W	35	1.00	425	1,175	93	237,484	141,066	96,418	33,692	957	70	1,475
Kiowa	30-T3N-R18W	56	1.10	366	1,192	83	406,860	123,491	283,369	183,399	3,269	56	1,607
Kiowa	31-T3N-R17W	86	1.20	575	1,226	119	546,475	169,641	376,834	223,226	2,590	86	1,711
Kiowa	3-T4N-R20W	86	1.20	393	1,245	87	615,320	122,614	492,706	339,098	3,934	73	1,400
Tillman	15-T1N-R19W	74	1.10	415	1,200	91	522,696	138,396	384,300	251,719	3,383	74	983
Tillman	16-T2S-R19W	86	1.30	586	1,313	121	551,678	206,625	345,053	191,445	2,221	62	1,113
Tillman	18-T2S-R19W	86	1.10	421	1,189	92	472,321	124,148	348,173	194,565	2,257	124	2,037
Tillman	22-T2N-R18W	86	0.90	432	1,144	94	422,497	147,941	274,556	120,948	1,403	86	761
Tillman	26-T2N-R18W	86	1.20	585	1,267	120	624,363	186,041	438,322	284,714	3,303	86	1,310
Tillman	28-T2N-R18W	86	1.00	452	1,158	97	457,984	124,467	333,517	179,909	2,087	58	1,398

Appendix Table 2 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Tillman	28-T2S-R19W	42	1.10	374	1,192	84	303,843	139,173	164,670	89,986	2,147	84	1,570
Tillman	36-T2N-R19W	86	0.80	482	1,119	103	390,246	169,900	220,346	66,738	774	-	950
Tillman	3-T1N-R18W	36	1.10	383	1,191	86	259,864	141,325	118,539	54,209	1,502	72	1,592
Tillman	4-T1N-R18W	37	1.10	396	1,191	88	264,867	149,953	114,914	48,980	1,324	74	1,631
Tillman	7-T2S-R19W	72	1.10	386	1,191	86	516,528	141,843	374,685	246,933	3,444	72	1,581

Appendix Table 3. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with +10% rainfall, 2.62 dS/m EC and 54 cents/lb Cotton Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	17-T6N-R25W	53	1.10	384	1,251	86	187,303	142,860	44,443	41,038	771	205	3,433
Greer	17-T6N-R25W	84	0.90	385	1,139	86	213,535	133,235	80,300	74,898	887	84	1,303
Greer	21-T6N-R25W	73	0.80	372	1,156	84	208,977	125,204	83,773	79,107	1,085	73	1,285
Greer	24-T6N-R25W	86	0.20	560	1,069	116	224,922	191,023	33,899	28,382	329	70	1,799
Greer	25-T6N-R25W	86	1.00	407	1,194	90	151,867	128,831	23,036	17,519	203	-	761
Greer	35-T6N-R25W	59	1.00	378	1,201	85	177,723	146,048	31,675	27,925	477	141	2,661
Greer	36-T6N-R25W	68	0.90	372	1,189	84	212,402	126,759	85,643	81,272	1,190	68	1,356
Greer	22-T6N-R24W	86	0.80	668	1,177	135	181,853	173,626	8,227	2,710	31	-	917
Greer	25-T6N-R24W	86	0.40	395	1,057	88	168,416	133,155	35,262	29,745	345	-	571
Greer	27-T6N-R24W	86	0.30	400	1,053	88	195,490	134,670	60,820	55,303	642	-	571
Greer	28-T6N-R24W	86	0.80	387	1,142	86	172,325	130,047	42,278	36,761	426	-	950
Greer	28-T6N-R24W	78	1.10	441	1,273	96	262,303	135,427	126,876	121,884	1,563	78	1,204
Greer	30-T6N-R24W	86	0.70	391	1,101	87	149,891	126,818	23,073	17,556	204	62	1,592
Greer	33-T6N-R24W	86	1.00	559	1,247	116	207,873	190,684	17,189	11,672	135	86	950
Greer	22-T6N-R23W	86	1.10	564	1,266	117	244,236	205,071	39,165	33,648	390	78	1,261

Appendix Table 3 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	25-T6N-R23W	86	1.10	416	1,250	91	169,527	132,239	37,288	31,771	369	86	761
Greer	26-T6N-R23W	49	1.00	377	1,177	84	136,153	130,166	5,987	2,851	58	49	1,296
Greer	27-T6N-R23W	86	1.00	411	1,201	90	248,996	129,429	119,567	114,050	1,323	113	2,227
Greer	30-T6N-R23W	86	0.70	388	1,094	86	163,698	126,818	36,880	31,363	364	-	950
Greer	30-T6N-R23W	86	1.00	392	1,198	87	203,498	126,818	76,680	71,163	826	153	2,487
Greer	32-T6N-R23W	86	0.70	393	1,094	87	155,260	128,891	26,369	20,852	242	-	950
Greer	32-T6N-R23W	86	1.00	419	1,187	92	234,922	151,747	83,175	77,658	901	130	2,762
Greer	33-T6N-R23W	60	0.60	362	1,073	82	140,746	123,750	16,996	13,182	221	60	1,052
Greer	34-T6N-R23W	74	1.10	371	1,241	83	251,528	128,632	122,896	118,166	1,599	74	1,466
Greer	35-T6N-R23W	86	1.10	390	1,230	87	202,362	131,461	70,901	65,384	759	86	1,140
Greer	1-T5N-R23W	86	0.40	520	1,089	109	179,327	126,719	52,608	47,091	546	99	2,125
Greer	30-T6N-R22W	86	0.30	532	1,048	111	174,275	136,961	37,314	31,797	369	-	798
Greer	31-T6N-R22W	86	0.60	493	1,143	104	177,256	169,063	8,193	2,676	31	79	1,605
Greer	1-T5N-R22W	86	1.00	375	1,175	84	226,230	127,616	98,615	93,098	1,080	86	1,329
Greer	1-T5N-R22W	86	0.60	444	1,097	96	192,275	126,818	65,457	59,940	695	26	1,896
Greer	5-T5N-R22W	86	1.00	379	1,167	85	166,747	126,818	39,929	34,412	399	61	2,046
Greer	9-T5N-R22W	86	1.00	384	1,181	86	136,992	126,818	10,174	4,657	54	-	761
Greer	10-T5N-R22W	61	0.60	377	1,095	84	160,521	126,818	33,703	29,799	489	-	1,076
Greer	5-T5N-R21W	86	1.10	441	1,269	95	229,468	137,738	91,730	86,213	1,000	86	1,140
Greer	6-T5N-R21W	86	0.30	424	1,082	93	221,890	126,818	95,072	89,555	1,039	32	899
Greer	8-T5N-R21W	86	1.00	435	1,200	95	245,222	126,818	118,404	112,887	1,310	86	1,433
Greer	8-T5N-R21W	86	0.80	456	1,129	98	132,017	125,503	6,514	997	12	73	2,253
Greer	8-T5N-R21W	60	0.90	373	1,127	84	150,845	131,043	19,802	15,943	264	60	1,329
Greer	15-T5N-R21W	86	1.10	403	1,258	89	156,469	128,891	27,578	22,061	256	-	761
Greer	15-T5N-R21W	86	0.50	400	1,057	88	165,631	138,356	27,275	21,758	252	-	761
Greer	24-T5N-R21W	69	1.10	382	1,266	85	246,169	134,929	111,240	106,850	1,558	176	2,945

Appendix Table 3 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	24-T5N-R21W	53	1.00	357	1,161	81	141,936	126,818	15,118	11,739	222	53	1,281
Greer	25-T5N-R21W	80	0.90	377	1,163	84	212,964	126,818	86,146	81,052	1,018	80	1,054
Greer	25-T5N-R21W	86	1.10	370	1,246	83	245,632	126,818	118,814	113,297	1,314	86	1,329
Greer	28-T5N-R20W	82	0.80	432	1,111	94	173,902	143,158	30,744	25,470	309	82	908
Greer	29-T5N-R20W	86	1.00	397	1,211	88	200,856	126,818	74,038	68,521	795	156	2,480
Greer	30-T5N-R20W	75	1.20	368	1,274	83	281,297	126,818	154,479	149,666	1,990	75	1,493
Greer	30-T5N-R20W	86	0.90	465	1,191	100	185,933	126,818	59,115	53,598	622	62	1,482
Greer	32-T5N-R20W	86	1.00	419	1,159	92	175,037	126,818	48,219	42,702	495	49	1,618
Greer	4-T4N-R20W	52	1.10	365	1,217	82	161,026	138,794	22,232	18,930	367	169	2,606
Greer	12-T4N-R20W	53	1.00	417	1,177	91	139,104	128,452	10,652	7,279	138	53	1,510
Jackson	3-T4N-R19W	86	1.00	418	1,176	92	225,545	147,084	78,461	72,944	846	107	2,500
Jackson	4-T4N-R19W	86	1.00	377	1,181	84	193,950	133,554	60,396	54,879	637	86	1,140
Jackson	9-T4N-R19W	86	1.00	413	1,175	91	226,751	126,958	99,793	94,276	1,094	132	2,231
Jackson	12-T4N-R19W	62	0.90	398	1,150	88	154,457	139,631	14,826	10,839	174	149	2,535
Jackson	13-T4N-R19W	86	1.10	393	1,222	87	242,989	132,179	110,810	105,293	1,221	86	950
Jackson	17-T4N-R19W	86	1.00	412	1,177	91	227,718	150,292	77,426	71,909	834	86	1,550
Jackson	18-T4N-R19W	68	1.00	365	1,182	82	197,371	123,750	73,621	69,243	1,012	68	1,508
Jackson	25-T4N-R19W	47	1.10	346	1,184	79	138,480	125,045	13,435	10,446	224	158	3,126
Jackson	11-T3N-R19W	58	1.10	362	1,218	82	188,339	129,509	58,830	55,099	945	138	2,956
Jackson	24-T3N-R19W	86	1.10	362	1,183	82	198,844	124,148	74,697	69,180	803	86	1,140
Jackson	1-T1N-R19W	86	1.00	423	1,175	92	224,974	126,420	98,554	93,037	1,079	135	2,782
Jackson	11-T1N-R19W	86	1.00	368	1,182	83	200,717	128,971	71,746	66,229	768	86	1,140
Jackson	4-T2N-R18W	86	1.00	416	1,177	91	222,704	124,866	97,838	92,321	1,071	86	1,662
Jackson	9-T2N-R18W	86	1.00	392	1,167	87	211,656	129,110	82,546	77,029	894	77	1,442
Jackson	21-T2N-R18W	86	1.00	427	1,175	93	158,787	122,773	36,014	30,497	354	149	2,383
Jackson	19-T1S-R19W	86	1.00	451	1,212	97	163,233	157,008	6,225	708	8	88	1,349

Appendix Table 3 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	5-T2S-R19W	86	1.00	414	1,177	91	228,033	154,457	73,576	68,059	790	135	2,588
Jackson	18-T2S-R19W	69	1.10	352	1,184	80	204,581	124,925	79,656	75,218	1,085	69	1,530
Jackson	19-T2S-R19W	86	1.00	431	1,174	94	181,949	135,845	46,104	40,587	471	58	1,651
Jackson	20-T2S-R19W	86	1.00	381	1,181	85	234,330	140,927	93,403	87,886	1,020	86	1,329
Jackson	29-T2S-R19W	86	1.00	453	1,172	98	177,768	134,530	43,238	37,721	438	56	1,618
Jackson	1-T2S-R20W	65	1.00	396	1,180	88	180,219	143,358	36,861	32,695	502	117	2,930
Kiowa	3-T4N-R20W	86	1.10	393	1,232	87	250,580	122,614	127,966	122,449	1,421	73	1,400
Kiowa	13-T3N-R19W	58	1.10	355	1,183	81	168,975	123,610	45,365	41,679	724	58	1,523
Kiowa	30-T3N-R18W	56	1.00	366	1,182	83	159,740	123,491	36,249	32,659	582	56	1,484
Kiowa	2-T2N-R18W	86	1.00	383	1,180	85	214,052	133,414	80,638	75,121	871	121	2,227
Kiowa	31-T3N-R17W	86	1.00	575	1,197	119	180,474	169,641	10,833	5,316	62	86	1,521
Tillman	15-T1N-R19W	74	1.00	415	1,183	91	198,094	138,396	59,698	54,936	738	74	983
Tillman	26-T2N-R18W	86	1.00	585	1,241	120	227,413	186,041	41,372	35,855	416	83	1,310
Tillman	28-T2N-R18W	86	0.90	452	1,142	97	154,012	124,467	29,545	24,028	279	58	1,270
Tillman	7-T2S-R19W	72	1.00	386	1,180	86	201,219	141,843	59,376	54,788	764	72	1,422
Tillman	18-T2S-R19W	86	1.00	421	1,175	92	172,679	124,148	48,531	43,014	499	124	1,953

Appendix Table 4. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with +10% rainfall, 1.05 dS/m EC and 54 cents/lb Cotton Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	10-T5N-R22W	61	1.80	377	1,446	84	274,258	126,818	147,440	143,536	2,353	61	807
Greer	17-T6N-R25W	53	2.00	384	1,599	86	308,836	142,860	165,976	162,571	3,056	139	741
Greer	17-T6N-R25W	84	2.00	385	1,544	86	443,731	133,235	310,496	305,094	3,615	84	930
Greer	21-T6N-R25W	73	1.90	372	1,481	84	348,998	125,204	223,794	219,128	3,006	73	644
Greer	21-T6N-R25W	20	2.10	350	1,625	80	127,774	126,121	1,653	347	17	82	584
Greer	24-T6N-R25W	86	1.00	560	1,285	116	283,134	191,023	92,111	86,594	1,005	70	1,413
Greer	25-T6N-R25W	86	2.00	407	1,568	90	286,411	128,831	157,580	152,063	1,764	-	379
Greer	35-T6N-R25W	59	2.00	378	1,567	85	323,352	146,048	177,304	173,554	2,962	141	1,653
Greer	36-T6N-R25W	68	1.90	372	1,521	84	351,920	126,759	225,161	220,790	3,233	68	602
Greer	19-T6N-R24W	58	1.80	487	1,543	103	273,883	200,966	72,917	69,237	1,204	134	1,426
Greer	20-T6N-R24W	55	1.90	500	1,578	106	275,897	188,153	87,744	84,205	1,523	55	732
Greer	21-T6N-R24W	33	1.90	439	1,581	95	174,501	161,989	12,512	10,419	319	65	432
Greer	22-T6N-R24W	86	1.50	668	1,447	135	276,600	173,626	102,974	97,457	1,131	-	917
Greer	25-T6N-R24W	50	1.80	450	1,498	97	222,746	140,169	82,577	79,396	1,598	50	1,096
Greer	25-T6N-R24W	86	1.60	395	1,399	88	277,396	133,155	144,241	138,724	1,609	-	761
Greer	26-T6N-R24W	36	1.70	382	1,393	85	137,133	134,391	2,742	451	13	72	948
Greer	26-T6N-R24W	86	1.90	420	1,520	92	157,334	129,150	28,184	22,667	263	-	190
Greer	27-T6N-R24W	86	1.60	400	1,385	88	305,929	134,670	171,259	165,742	1,923	86	761
Greer	27-T6N-R24W	37	1.70	377	1,395	84	143,686	132,458	11,228	8,854	239	74	981
Greer	28-T6N-R24W	86	1.90	387	1,506	86	309,856	130,047	179,809	174,292	2,022	86	571
Greer	28-T6N-R24W	78	2.00	441	1,618	96	434,620	135,427	299,193	294,201	3,772	78	688
Greer	29-T6N-R24W	62	1.80	420	1,469	92	270,799	151,986	118,813	114,819	1,840	62	963
Greer	30-T6N-R24W	86	1.80	391	1,442	87	277,604	126,818	150,786	145,269	1,685	62	1,318

Appendix Table 4 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	30-T6N-R24W	20	2.10	350	1,621	80	125,658	124,128	1,530	237	12	81	580
Greer	32-T6N-R24W	58	1.60	566	1,445	117	205,699	193,234	12,465	8,740	150	58	1,027
Greer	33-T6N-R24W	86	1.80	559	1,570	116	345,906	190,684	155,222	149,705	1,737	86	761
Greer	22-T6N-R23W	86	1.80	564	1,586	117	390,271	205,071	185,200	179,683	2,084	78	743
Greer	23-T6N-R23W	86	1.50	701	1,452	141	259,117	250,444	8,673	3,156	37	70	877
Greer	25-T6N-R23W	86	2.00	416	1,607	91	287,652	132,239	155,413	149,896	1,739	-	379
Greer	26-T6N-R23W	49	2.00	377	1,559	84	266,149	130,166	135,983	132,847	2,711	49	756
Greer	27-T6N-R23W	86	2.00	411	1,598	90	483,106	129,429	353,677	348,160	4,039	113	1,078
Greer	30-T6N-R23W	86	1.80	388	1,456	86	320,025	126,818	193,207	187,690	2,177	86	761
Greer	30-T6N-R23W	86	2.00	392	1,596	87	395,834	126,818	269,016	263,499	3,057	142	1,305
Greer	32-T6N-R23W	86	1.80	393	1,460	87	302,734	128,891	173,843	168,326	1,953	86	761
Greer	32-T6N-R23W	86	2.00	419	1,591	92	473,368	151,747	321,621	316,104	3,667	130	1,477
Greer	33-T6N-R23W	60	1.80	362	1,446	82	269,303	123,750	145,553	141,739	2,378	60	1,052
Greer	33-T6N-R23W	86	2.10	341	1,606	78	209,221	131,481	77,740	72,223	838	517	6,272
Greer	34-T6N-R23W	55	1.40	409	1,332	90	205,755	146,147	59,608	56,101	1,024	111	1,706
Greer	34-T6N-R23W	74	2.00	371	1,604	83	437,535	128,632	308,903	304,173	4,116	74	489
Greer	35-T6N-R23W	86	2.00	390	1,606	87	364,904	131,461	233,443	227,926	2,644	86	379
Greer	1-T5N-R23W	86	1.30	520	1,354	109	254,255	126,719	127,536	122,019	1,416	70	756
Greer	29-T6N-R22W	86	1.30	588	1,393	121	243,894	139,313	104,581	99,064	1,149	26	1,036
Greer	30-T6N-R22W	86	1.20	532	1,320	111	242,764	136,961	105,803	100,286	1,163	63	988
Greer	31-T6N-R22W	86	1.60	493	1,476	104	288,226	169,063	119,163	113,646	1,318	79	906
Greer	31-T6N-R22W	37	2.10	378	1,625	85	227,185	130,445	96,740	94,353	2,530	75	494
Greer	32-T6N-R22W	77	0.90	395	1,224	88	268,865	126,818	142,047	137,125	1,783	-	509
Greer	32-T6N-R22W	36	1.90	402	1,518	89	176,051	133,354	42,697	40,412	1,132	71	631
Greer	1-T5N-R22W	86	2.00	375	1,562	84	447,171	127,616	319,555	314,038	3,643	86	761

Appendix Table 4 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	1-T5N-R22W	86	1.60	444	1,408	96	310,462	126,818	183,644	178,127	2,066	65	1,477
Greer	2-T5N-R22W	68	0.20	521	1,106	109	215,056	178,528	36,528	32,163	472	-	452
Greer	4-T5N-R22W	86	1.90	443	1,532	96	270,774	155,852	114,922	109,405	1,269	-	379
Greer	4-T5N-R22W	86	1.80	534	1,547	112	238,826	201,086	37,740	32,223	374	-	190
Greer	5-T5N-R22W	86	2.00	379	1,566	85	336,614	126,818	209,796	204,279	2,370	61	1,056
Greer	6-T5N-R22W	31	1.90	365	1,491	82	151,347	126,818	24,529	22,539	725	62	959
Greer	9-T5N-R22W	86	2.00	384	1,554	86	249,865	126,818	123,047	117,530	1,363	-	379
Greer	9-T5N-R22W	54	1.90	467	1,541	100	260,510	188,731	71,779	68,304	1,258	109	1,933
Greer	10-T5N-R22W	61	1.80	377	1,446	84	274,258	126,818	147,440	143,536	2,353	61	807
Greer	12-T5N-R22W	86	1.90	422	1,528	92	135,034	127,914	7,120	1,603	19	-	190
Greer	5-T5N-R21W	86	2.00	441	1,624	95	380,381	137,738	242,643	237,126	2,751	86	571
Greer	6-T5N-R21W	86	1.70	527	1,506	110	341,324	126,818	214,506	208,989	2,424	86	761
Greer	6-T5N-R21W	86	1.50	510	1,425	108	194,832	154,078	40,754	35,237	409	29	955
Greer	8-T5N-R21W	86	1.90	435	1,543	95	425,818	126,818	299,000	293,483	3,405	93	849
Greer	8-T5N-R21W	86	1.80	456	1,503	98	256,792	125,503	131,289	125,772	1,459	73	1,179
Greer	8-T5N-R21W	60	2.00	373	1,528	84	312,075	131,043	181,032	177,173	2,938	60	930
Greer	14-T5N-R21W	77	1.60	557	1,467	116	293,362	233,506	59,856	54,954	717	77	844
Greer	15-T5N-R21W	86	2.00	403	1,619	89	266,027	128,891	137,136	131,619	1,527	-	190
Greer	15-T5N-R21W	86	1.70	400	1,416	88	299,764	138,356	161,408	155,891	1,808	86	761
Greer	16-T5N-R21W	86	1.90	403	1,526	89	211,280	126,818	84,462	78,945	916	-	379
Greer	16-T5N-R21W	86	1.90	414	1,513	91	249,611	139,890	109,721	104,204	1,209	-	379
Greer	22-T5N-R21W	86	1.80	416	1,497	91	188,862	142,660	46,202	40,685	472	-	379
Greer	22-T5N-R21W	24	2.10	360	1,603	82	141,856	131,960	9,896	8,373	352	71	840
Greer	23-T5N-R21W	36	2.00	354	1,514	80	186,335	129,788	56,547	54,230	1,498	72	957
Greer	24-T5N-R21W	69	2.10	382	1,625	85	412,401	134,929	277,472	273,082	3,981	126	1,078

Appendix Table 4 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	24-T5N-R21W	53	2.00	357	1,552	81	289,157	126,818	162,339	158,960	3,011	53	930
Greer	25-T5N-R21W	43	2.00	368	1,543	83	227,560	126,818	100,742	97,996	2,284	86	851
Greer	25-T5N-R21W	80	1.90	377	1,498	84	385,027	126,818	258,209	253,115	3,180	80	877
Greer	25-T5N-R21W	86	2.10	370	1,628	83	437,824	126,818	311,006	305,489	3,544	86	379
Greer	20-T5N-R20W	86	1.80	578	1,560	119	280,627	180,162	100,465	94,948	1,101	-	571
Greer	28-T5N-R20W	82	1.70	432	1,412	94	313,856	143,158	170,698	165,424	2,008	82	908
Greer	29-T5N-R20W	86	2.00	397	1,562	88	355,509	126,818	228,691	223,174	2,589	156	1,396
Greer	29-T5N-R20W	86	2.00	413	1,635	91	194,802	126,818	67,984	62,467	725	-	190
Greer	30-T5N-R20W	75	2.10	368	1,640	83	474,880	126,818	348,062	343,249	4,564	75	331
Greer	30-T5N-R20W	86	1.90	465	1,553	100	327,856	126,818	201,038	195,521	2,268	62	602
Greer	32-T5N-R20W	86	1.90	419	1,552	92	362,340	126,818	235,522	230,005	2,668	49	1,107
Kiowa	3-T4N-R20W	86	2.10	393	1,609	87	454,933	122,614	332,319	326,802	3,791	73	1,021
Greer	4-T4N-R20W	52	2.10	365	1,610	82	307,229	138,794	168,435	165,133	3,200	158	1,960
Greer	11-T4N-R20W	24	2.00	396	1,595	88	133,308	126,818	6,490	4,986	212	70	829
Greer	12-T4N-R20W	53	2.00	417	1,590	91	290,059	128,452	161,607	158,234	3,003	53	814
Kiowa	1-T4N-R19W	29	2.10	340	1,607	78	178,334	122,235	56,099	54,243	1,870	58	831
Kiowa	2-T4N-R19W	35	1.80	425	1,470	93	153,134	141,066	12,068	9,815	279	70	1,241
Jackson	3-T4N-R19W	86	2.00	418	1,590	92	472,148	147,084	325,064	319,547	3,707	107	1,272
Jackson	4-T4N-R19W	86	2.00	377	1,599	84	399,902	133,554	266,348	260,831	3,026	86	571
Jackson	9-T4N-R19W	86	2.00	413	1,582	91	469,193	126,958	342,235	336,718	3,906	132	1,254
Jackson	12-T4N-R19W	62	1.90	398	1,519	88	307,485	139,631	167,854	163,867	2,630	149	1,724
Jackson	12-T4N-R19W	51	2.00	396	1,595	88	292,726	147,941	144,785	141,495	2,753	51	794
Jackson	13-T4N-R19W	86	2.00	393	1,542	87	407,344	132,179	275,165	269,648	3,128	86	950
Jackson	13-T4N-R19W	25	2.10	382	1,624	85	146,843	134,729	12,114	10,508	419	75	1,107
Jackson	17-T4N-R19W	86	2.00	412	1,589	91	474,853	150,292	324,561	319,044	3,701	86	789

Appendix Table 4 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	18-T4N-R19W	68	2.10	365	1,602	82	406,747	123,750	282,997	278,619	4,073	68	754
Jackson	24-T4N-R19W	35	2.00	371	1,600	83	203,315	135,507	67,808	65,600	1,901	69	838
Jackson	25-T4N-R19W	47	2.10	346	1,605	79	284,768	125,045	159,723	156,734	3,356	128	1,687
Jackson	1-T3N-R19W	55	1.80	368	1,440	83	236,185	122,574	113,611	110,104	2,009	55	966
Jackson	11-T3N-R19W	58	2.10	362	1,597	82	344,398	129,509	214,889	211,158	3,622	138	1,378
Jackson	11-T3N-R19W	25	2.10	355	1,604	81	147,463	127,277	20,186	18,618	760	74	811
Kiowa	13-T3N-R19W	58	2.10	355	1,604	81	347,359	123,610	223,749	220,063	3,821	58	763
Jackson	23-T3N-R19W	30	2.10	359	1,603	81	180,111	125,902	54,209	52,276	1,731	60	798
Jackson	24-T3N-R19W	86	2.10	362	1,602	82	409,469	124,148	285,321	279,804	3,246	86	571
Kiowa	25-T3N-R19W	31	2.00	397	1,595	88	173,623	150,352	23,271	21,313	696	61	809
Tillman	36-T2N-R19W	86	1.80	482	1,488	103	261,090	169,900	91,190	85,673	994	86	571
Jackson	1-T1N-R19W	86	2.00	423	1,588	92	470,282	126,420	343,862	338,345	3,925	135	1,486
Jackson	2-T1N-R19W	32	2.00	379	1,599	85	184,142	140,947	43,195	41,173	1,303	63	767
Jackson	11-T1N-R19W	86	2.10	368	1,601	83	412,871	128,971	283,900	278,383	3,230	86	571
Tillman	15-T1N-R19W	74	1.90	415	1,498	91	340,676	138,396	202,280	197,518	2,655	74	983
Jackson	33-T1N-R19W	39	2.00	416	1,591	91	214,503	159,180	55,323	52,846	1,366	77	767
Kiowa	20-T3N-R18W	71	1.80	680	1,609	137	292,853	257,179	35,674	31,130	438	71	783
Kiowa	30-T3N-R18W	56	2.10	366	1,601	83	331,124	123,491	207,633	204,043	3,637	56	743
Jackson	36-T3N-R18W	53	2.00	416	1,591	91	295,521	170,558	124,963	121,552	2,281	152	1,587
Jackson	1-T2N-R18W	26	2.10	346	1,606	79	160,415	126,818	33,597	31,914	1,213	79	811
Kiowa	2-T2N-R18W	86	2.00	383	1,598	85	445,516	133,414	312,102	306,585	3,557	121	1,113
Jackson	4-T2N-R18W	86	2.00	416	1,591	91	465,854	124,866	340,988	335,471	3,892	86	926
Jackson	9-T2N-R18W	86	1.90	392	1,493	87	381,065	129,110	251,955	246,438	2,859	77	1,232
Jackson	9-T2N-R18W	29	2.10	355	1,603	81	176,229	133,813	42,416	40,534	1,379	131	1,702
Jackson	21-T2N-R18W	86	2.00	427	1,588	93	332,230	122,773	209,457	203,940	2,366	75	1,343

Appendix Table 4 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Tillman	22-T2N-R18W	86	1.70	432	1,431	94	261,217	147,941	113,276	107,759	1,250	-	761
Tillman	26-T2N-R18W	86	1.80	585	1,583	120	391,151	186,041	205,110	199,593	2,315	83	754
Tillman	27-T2N-R18W	86	2.00	369	1,601	83	226,245	125,244	101,001	95,484	1,108	-	379
Tillman	28-T2N-R18W	86	1.80	452	1,513	97	314,372	124,467	189,905	184,388	2,139	58	1,019
Jackson	34-T2N-R18W	37	2.00	381	1,598	85	214,086	167,688	46,398	44,036	1,193	146	1,667
Tillman	3-T1N-R18W	36	2.00	383	1,598	86	209,005	141,325	67,680	65,370	1,811	72	796
Tillman	4-T1N-R18W	37	2.00	396	1,595	88	211,167	149,953	61,214	58,846	1,590	74	816
Kiowa	31-T3N-R17W	86	2.00	575	1,651	119	398,709	169,641	229,069	223,552	2,593	86	761
Jackson	8-T1S-R19W	86	2.00	408	1,592	90	277,801	151,010	126,791	121,274	1,407	-	379
Jackson	19-T1S-R19W	86	2.00	451	1,571	97	316,001	157,008	158,993	153,476	1,780	88	961
Jackson	5-T2S-R19W	86	2.00	414	1,591	91	476,016	154,457	321,559	316,042	3,666	135	1,347
Tillman	7-T2S-R19W	72	2.00	386	1,597	86	414,998	141,843	273,155	268,567	3,746	72	789
Jackson	9-T2S-R19W	86	1.90	537	1,581	112	286,215	222,905	63,310	57,793	670	-	761
Tillman	16-T2S-R19W	86	1.80	586	1,565	121	311,036	206,625	104,411	98,894	1,147	62	1,058
Tillman	18-T2S-R19W	86	2.00	421	1,588	92	363,965	124,148	239,817	234,300	2,718	76	486
Jackson	18-T2S-R19W	69	2.10	352	1,604	80	420,243	124,925	295,318	290,880	4,194	69	347
Jackson	19-T2S-R19W	86	2.00	431	1,587	94	382,957	135,845	247,112	241,595	2,803	58	403
Jackson	20-T2S-R19W	86	2.00	381	1,598	85	482,518	140,927	341,591	336,074	3,899	86	345
Tillman	28-T2S-R19W	42	2.00	374	1,600	84	246,181	139,173	107,008	104,326	2,489	84	377
Jackson	29-T2S-R19W	86	1.90	453	1,582	98	374,955	134,530	240,425	234,908	2,725	56	395
Tillman	34-T2S-R19W	86	1.90	502	1,567	106	199,523	184,885	14,638	9,121	106	-	172
Jackson	36-T1S-R20W	86	2.00	403	1,547	89	169,114	135,786	33,328	27,811	323	-	172
Jackson	1-T2S-R20W	65	2.00	396	1,596	88	371,618	143,358	228,260	224,094	3,442	117	742
Jackson	12-T2S-R20W	55	2.00	426	1,601	93	308,786	214,337	94,449	90,916	1,647	134	575

Appendix Table 5. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with -10% rainfall, 1.05 dS/m EC and 54 cents/lb Cotton Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	17-T6N-R25W	53	2.20	384	1,491	86	225,413	142,860	82,553	79,148	1,488	143	595
Greer	17-T6N-R25W	84	2.10	385	1,410	86	287,543	133,235	154,308	148,906	1,764	84	745
Greer	21-T6N-R25W	73	2.00	372	1,373	84	237,756	125,204	112,552	107,886	1,480	73	644
Greer	25-T6N-R25W	86	2.10	407	1,452	90	196,417	128,831	67,586	62,069	720	-	379
Greer	35-T6N-R25W	59	2.20	378	1,457	85	230,712	146,048	84,664	80,914	1,381	141	1,653
Greer	36-T6N-R25W	68	2.10	372	1,414	84	247,200	126,759	120,441	116,070	1,699	68	602
Greer	25-T6N-R24W	50	2.00	450	1,396	97	145,540	140,169	5,371	2,190	44	50	1,096
Greer	25-T6N-R24W	86	1.80	395	1,270	88	156,205	133,155	23,050	17,533	203	86	571
Greer	27-T6N-R24W	86	1.80	400	1,258	88	170,624	134,670	35,954	30,437	353	86	571
Greer	28-T6N-R24W	86	2.10	387	1,387	86	203,356	130,047	73,309	67,792	786	86	379
Greer	28-T6N-R24W	78	2.20	441	1,517	96	311,905	135,427	176,478	171,486	2,199	78	516
Greer	29-T6N-R24W	62	2.00	420	1,363	92	173,370	151,986	21,384	17,390	279	62	963
Greer	30-T6N-R24W	86	2.00	391	1,328	87	174,773	126,818	47,955	42,438	492	62	1,184
Greer	33-T6N-R24W	86	2.00	559	1,472	116	220,613	190,684	29,929	24,412	283	86	571
Greer	22-T6N-R23W	86	2.00	564	1,491	117	256,710	205,071	51,639	46,122	535	78	725
Greer	25-T6N-R23W	86	2.20	416	1,502	91	207,440	132,239	75,201	69,684	808	-	379
Greer	26-T6N-R23W	49	2.20	377	1,441	84	183,919	130,166	53,753	50,617	1,033	49	756
Greer	27-T6N-R23W	86	2.20	411	1,471	90	328,012	129,429	198,583	193,066	2,240	113	1,038
Greer	30-T6N-R23W	86	2.00	388	1,333	86	196,375	126,818	69,557	64,040	743	86	761
Greer	30-T6N-R23W	86	2.20	392	1,471	87	272,659	126,818	145,841	140,324	1,628	153	1,305
Greer	32-T6N-R23W	86	2.00	393	1,334	87	183,989	128,891	55,098	49,581	575	86	571
Greer	32-T6N-R23W	86	2.20	419	1,462	92	315,265	151,747	163,518	158,001	1,833	130	1,477
Greer	33-T6N-R23W	60	2.00	362	1,313	82	161,760	123,750	38,010	34,196	574	60	789
Greer	33-T6N-R23W	86	2.30	341	1,472	78	141,861	131,481	10,380	4,863	56	517	6,080

Appendix Table 5 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	34-T6N-R23W	74	2.20	371	1,495	83	320,556	128,632	191,924	187,194	2,533	74	489
Greer	35-T6N-R23W	86	2.20	390	1,490	87	260,343	131,461	128,882	123,365	1,431	86	379
Greer	1-T5N-R23W	86	1.50	520	1,243	109	142,457	126,719	15,738	10,221	119	85	725
Greer	31-T6N-R22W	86	1.80	493	1,358	104	180,661	169,063	11,598	6,081	71	79	818
Greer	31-T6N-R22W	37	2.20	378	1,506	85	164,054	130,445	33,609	31,222	837	75	494
Greer	1-T5N-R22W	86	2.20	375	1,442	84	308,366	127,616	180,750	175,233	2,033	86	761
Greer	1-T5N-R22W	86	1.80	444	1,295	96	180,556	126,818	53,738	48,221	559	138	1,334
Greer	4-T5N-R22W	86	2.00	443	1,418	96	177,305	155,852	21,453	15,936	185	86	379
Greer	5-T5N-R22W	86	2.20	379	1,437	85	228,689	126,818	101,871	96,354	1,118	61	1,056
Greer	9-T5N-R22W	86	2.20	384	1,435	86	170,634	126,818	43,816	38,299	444	-	379
Greer	10-T5N-R22W	61	2.00	377	1,324	84	169,896	126,818	43,078	39,174	642	61	672
Greer	5-T5N-R21W	86	2.20	441	1,519	95	273,460	137,738	135,722	130,205	1,511	86	571
Greer	6-T5N-R21W	86	1.90	527	1,392	110	202,241	126,818	75,423	69,906	811	86	571
Greer	8-T5N-R21W	86	2.10	435	1,441	95	292,664	126,818	165,847	160,330	1,860	93	994
Greer	8-T5N-R21W	86	2.00	456	1,375	98	156,343	125,503	30,840	25,323	294	85	1,153
Greer	8-T5N-R21W	60	2.10	373	1,394	84	201,213	131,043	70,170	66,311	1,100	60	798
Greer	15-T5N-R21W	86	2.20	403	1,508	89	191,907	128,891	63,016	57,499	667	-	190
Greer	15-T5N-R21W	86	1.90	400	1,281	88	166,152	138,356	27,796	22,279	258	86	571
Greer	16-T5N-R21W	86	2.10	403	1,408	89	139,028	126,818	12,210	6,693	78	-	190
Greer	16-T5N-R21W	86	2.00	414	1,393	91	160,672	139,890	20,782	15,265	177	-	379
Greer	24-T5N-R21W	69	2.30	382	1,520	85	306,517	134,929	171,588	167,198	2,437	176	1,034
Greer	24-T5N-R21W	53	2.20	357	1,430	81	199,284	126,818	72,466	69,087	1,308	53	930
Greer	25-T5N-R21W	43	2.20	368	1,416	83	152,118	126,818	25,300	22,554	526	86	851
Greer	25-T5N-R21W	80	2.10	377	1,400	84	269,900	126,818	143,082	137,988	1,734	80	877
Greer	25-T5N-R21W	86	2.30	370	1,511	83	319,026	126,818	192,208	186,691	2,166	86	379
Greer	28-T5N-R20W	82	1.90	432	1,323	94	200,682	143,158	57,524	52,250	634	82	908

Appendix Table 5 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	29-T5N-R20W	86	2.20	397	1,461	88	252,765	126,818	125,947	120,430	1,397	156	1,378
Greer	29-T5N-R20W	86	2.20	413	1,530	91	142,989	126,818	16,171	10,654	124	-	190
Greer	30-T5N-R20W	75	2.30	368	1,529	83	354,266	126,818	227,448	222,635	2,961	75	331
Greer	30-T5N-R20W	86	2.00	465	1,435	100	207,657	126,818	80,839	75,322	874	62	602
Greer	32-T5N-R20W	86	2.10	419	1,427	92	233,768	126,818	106,950	101,433	1,177	49	1,107
Greer	4-T4N-R20W	52	2.30	365	1,489	82	218,469	138,794	79,675	76,373	1,480	158	1,744
Greer	12-T4N-R20W	53	2.20	417	1,456	91	190,831	128,452	62,379	59,006	1,120	53	814
Jackson	3-T4N-R19W	86	2.20	418	1,456	92	309,761	147,084	162,677	157,160	1,823	107	1,272
Jackson	4-T4N-R19W	86	2.20	377	1,465	84	273,301	133,554	139,747	134,230	1,557	86	571
Jackson	9-T4N-R19W	86	2.20	413	1,451	91	310,030	126,958	183,072	177,555	2,060	132	1,254
Jackson	12-T4N-R19W	62	2.10	398	1,406	88	205,076	139,631	65,445	61,458	986	149	1,724
Jackson	12-T4N-R19W	51	2.20	396	1,461	88	196,712	147,941	48,771	45,481	885	51	794
Jackson	13-T4N-R19W	86	2.20	393	1,457	87	298,094	132,179	165,915	160,398	1,861	86	950
Jackson	17-T4N-R19W	86	2.20	412	1,456	91	313,497	150,292	163,205	157,688	1,829	86	789
Jackson	18-T4N-R19W	68	2.20	365	1,467	82	280,541	123,750	156,791	152,413	2,228	68	754
Jackson	24-T4N-R19W	35	2.20	371	1,466	83	139,493	135,507	3,986	1,778	52	69	761
Jackson	25-T4N-R19W	47	2.30	346	1,471	79	199,232	125,045	74,187	71,198	1,525	158	1,583
Jackson	1-T3N-R19W	55	2.00	368	1,344	83	158,831	122,574	36,257	32,750	598	55	966
Jackson	11-T3N-R19W	58	2.20	362	1,481	82	248,504	129,509	118,995	115,264	1,977	138	1,296
Jackson	24-T3N-R19W	86	2.20	362	1,468	82	283,145	124,148	158,997	153,480	1,781	86	571
Jackson	1-T1N-R19W	86	2.20	423	1,454	92	307,636	126,420	181,216	175,699	2,038	135	1,433
Jackson	11-T1N-R19W	86	2.20	368	1,467	83	284,345	128,971	155,374	149,857	1,738	86	571
Jackson	36-T3N-R18W	53	2.20	416	1,456	91	195,186	170,558	24,628	21,217	398	163	1,563
Jackson	4-T2N-R18W	86	2.20	416	1,456	91	306,258	124,866	181,392	175,875	2,040	86	926
Jackson	9-T2N-R18W	86	2.00	392	1,396	87	263,055	129,110	133,945	128,428	1,490	77	1,232
Jackson	21-T2N-R18W	86	2.10	427	1,454	93	217,392	122,773	94,619	89,102	1,034	149	1,287

Appendix Table 5 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	8-T1S-R19W	86	2.20	408	1,458	90	184,612	151,010	33,602	28,085	326	-	379
Jackson	19-T1S-R19W	86	2.10	451	1,463	97	210,128	157,008	53,120	47,603	552	88	961
Jackson	5-T2S-R19W	86	2.20	414	1,457	91	313,919	154,457	159,462	153,945	1,786	135	1,347
Jackson	18-T2S-R19W	69	2.20	352	1,470	80	292,924	124,925	167,999	163,561	2,358	69	765
Jackson	19-T2S-R19W	86	2.10	431	1,452	94	245,933	135,845	110,088	104,571	1,213	58	888
Jackson	20-T2S-R19W	86	2.20	381	1,464	85	328,807	140,927	187,881	182,364	2,116	86	761
Jackson	29-T2S-R19W	86	2.10	453	1,447	98	234,402	134,530	99,872	94,355	1,095	56	871
Jackson	1-T2S-R20W	65	2.20	396	1,462	88	250,159	143,358	106,801	102,635	1,577	117	1,607
Kiowa	3-T4N-R20W	86	2.20	393	1,497	87	325,078	122,614	202,464	196,947	2,285	73	860
Kiowa	1-T4N-R19W	29	2.30	340	1,472	78	125,340	122,235	3,105	1,249	43	87	767
Kiowa	13-T3N-R19W	58	2.20	355	1,469	81	241,472	123,610	117,862	114,176	1,982	58	763
Kiowa	30-T3N-R18W	56	2.20	366	1,467	83	227,548	123,491	104,057	100,467	1,791	56	743
Kiowa	2-T2N-R18W	86	2.20	383	1,463	85	301,981	133,414	168,567	163,050	1,892	121	1,113
Kiowa	31-T3N-R17W	86	2.20	575	1,512	119	224,744	169,641	55,103	49,586	575	86	379
Tillman	15-T1N-R19W	74	2.10	415	1,413	91	239,040	138,396	100,644	95,882	1,289	74	983
Tillman	22-T2N-R18W	86	1.90	432	1,345	94	170,746	147,941	22,805	17,288	201	86	761
Tillman	26-T2N-R18W	86	2.00	585	1,476	120	241,142	186,041	55,101	49,584	575	83	571
Tillman	27-T2N-R18W	86	2.20	369	1,467	83	155,339	125,244	30,095	24,578	285	-	379
Tillman	28-T2N-R18W	86	2.00	452	1,394	97	191,396	124,467	66,929	61,412	712	58	1,019
Tillman	7-T2S-R19W	72	2.20	386	1,463	86	281,641	141,843	139,798	135,210	1,886	72	789
Tillman	18-T2S-R19W	86	2.20	421	1,454	92	234,056	124,148	109,908	104,391	1,211	124	1,071
Tillman	28-T2S-R19W	42	2.20	374	1,466	84	168,577	139,173	29,404	26,722	638	84	739

Appendix Table 6. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with -10% rainfall, 1.05 dS/m EC and 70 cents/lb Cotton Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	10-T5N-R22W	61	2.30	377	1,364	84	471,998	126,818	345,180	236,478	3,877	61	672
Greer	11-T4N-R20W	24	2.30	396	1,483	88	216,339	126,818	89,521	47,644	2,027	70	829
Greer	11-T5N-R22W	22	2.40	362	1,441	82	197,924	126,818	71,106	31,367	1,407	89	836
Greer	12-T4N-R20W	53	2.30	417	1,481	91	474,763	128,452	346,311	252,400	4,789	53	814
Greer	12-T5N-R22W	19	2.40	348	1,489	79	179,069	126,818	52,251	19,284	1,042	92	816
Greer	12-T5N-R22W	35	2.20	465	1,429	100	279,716	203,975	75,741	13,371	382	169	1,874
Greer	14-T5N-R21W	77	2.10	557	1,383	116	526,882	233,506	293,376	156,875	2,048	77	844
Greer	15-T5N-R21W	86	2.40	403	1,534	89	445,379	128,891	316,488	162,880	1,890	-	190
Greer	15-T5N-R21W	86	2.20	400	1,324	88	515,281	138,356	376,925	223,317	2,591	86	761
Greer	15-T5N-R21W	27	2.30	441	1,477	95	234,223	159,678	74,545	26,787	1,000	165	1,318
Greer	16-T5N-R21W	86	2.30	403	1,440	89	360,777	126,818	233,959	80,351	932	-	190
Greer	16-T5N-R21W	86	2.30	414	1,428	91	428,223	139,890	288,333	134,725	1,563	86	379
Greer	17-T6N-R25W	84	2.30	385	1,435	86	728,883	133,235	595,648	445,247	5,275	84	745
Greer	17-T6N-R25W	53	2.40	384	1,517	86	518,149	142,860	375,289	280,487	5,272	201	569
Greer	19-T6N-R24W	58	2.20	487	1,468	103	480,862	200,966	279,896	177,431	3,086	152	1,382
Greer	1-T5N-R22W	86	2.30	375	1,464	84	742,751	127,616	615,135	461,527	5,354	86	761
Greer	1-T5N-R22W	86	2.10	444	1,345	96	567,005	126,818	440,187	286,579	3,325	151	1,391
Greer	1-T5N-R23W	86	1.90	520	1,319	109	467,966	126,719	341,247	187,639	2,177	85	725
Greer	1-T5N-R23W	86	0.40	675	996	136	432,195	255,605	176,590	22,982	267	-	1,063
Greer	20-T5N-R20W	86	2.20	578	1,502	119	518,738	180,162	338,577	184,969	2,146	86	571
Greer	20-T6N-R24W	86	1.60	554	1,332	115	635,001	188,153	446,848	293,240	3,402	55	1,003
Greer	21-T5N-R21W	66	1.90	637	1,352	129	405,214	244,107	161,107	43,495	659	103	2,147
Greer	21-T6N-R24W	33	2.30	439	1,503	95	298,896	161,989	136,907	78,636	2,405	65	432
Greer	21-T6N-R25W	73	2.20	372	1,404	84	608,933	125,204	483,729	353,821	4,854	73	644

Appendix Table 6 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	21-T6N-R25W	20	2.40	350	1,523	80	206,205	126,121	80,084	43,731	2,144	82	540
Greer	22-T5N-R21W	86	2.20	416	1,424	91	335,101	142,660	192,441	38,833	450	-	379
Greer	22-T5N-R21W	24	2.40	360	1,488	82	227,076	131,960	95,116	52,704	2,214	71	787
Greer	22-T6N-R23W	86	2.30	564	1,539	117	717,102	205,071	512,031	358,423	4,158	78	725
Greer	22-T6N-R24W	86	2.00	668	1,434	135	569,057	173,626	395,431	241,823	2,805	82	743
Greer	23-T5N-R21W	36	2.30	354	1,411	80	308,898	129,788	179,110	114,602	3,166	72	957
Greer	23-T6N-R23W	86	2.00	701	1,444	141	541,279	250,444	290,835	137,227	1,592	70	877
Greer	23-T6N-R24W	86	1.20	566	1,199	117	349,309	180,302	169,007	15,399	179	83	919
Greer	24-T5N-R21W	53	2.30	357	1,451	81	477,869	126,818	351,051	256,961	4,867	53	930
Greer	24-T5N-R21W	69	2.40	382	1,544	85	690,379	134,929	555,450	433,205	6,315	176	1,078
Greer	24-T6N-R24W	38	2.20	424	1,351	93	278,464	174,543	103,921	36,205	953	152	1,548
Greer	24-T6N-R25W	86	1.60	560	1,257	116	525,811	191,023	334,788	181,180	2,102	70	1,413
Greer	25-T5N-R21W	80	2.30	377	1,426	84	680,460	126,818	553,642	411,795	5,173	80	877
Greer	25-T5N-R21W	86	2.40	370	1,532	83	713,794	126,818	586,976	433,368	5,027	86	379
Greer	25-T5N-R21W	43	2.30	368	1,439	83	376,763	126,818	249,945	173,497	4,044	86	946
Greer	25-T6N-R23W	86	2.40	416	1,530	91	490,376	132,239	358,137	204,529	2,373	86	379
Greer	25-T6N-R24W	50	2.20	450	1,427	97	401,864	140,169	261,695	173,130	3,483	50	1,206
Greer	25-T6N-R24W	86	2.20	395	1,318	88	481,043	133,155	347,888	194,280	2,254	86	571
Greer	25-T6N-R25W	86	2.30	407	1,478	90	484,896	128,831	356,065	202,457	2,349	86	379
Greer	25-T6N-R25W	23	2.30	400	1,452	89	197,741	143,417	54,324	13,338	580	163	1,572
Greer	26-T6N-R23W	49	2.30	377	1,463	84	444,405	130,166	314,239	226,921	4,631	98	864
Greer	26-T6N-R23W	22	2.30	372	1,415	83	182,592	130,086	52,506	13,837	638	87	670
Greer	26-T6N-R24W	36	2.10	382	1,336	85	262,860	134,391	128,469	64,673	1,807	72	1,105
Greer	27-T6N-R23W	86	2.40	411	1,496	90	796,758	129,429	667,329	513,721	5,960	113	1,058
Greer	27-T6N-R24W	86	2.10	400	1,311	88	533,556	134,670	398,886	245,278	2,845	86	761
Greer	27-T6N-R24W	37	2.10	377	1,337	84	274,234	132,458	141,776	75,664	2,039	74	1,144

Appendix Table 6 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	27-T6N-R24W	24	2.10	375	1,346	84	181,423	125,503	55,920	12,796	529	73	1,120
Greer	28-T5N-R20W	82	2.10	432	1,357	94	603,309	143,158	460,151	313,314	3,802	82	1,089
Greer	28-T6N-R24W	78	2.40	441	1,548	96	747,991	135,427	612,564	473,568	6,071	78	688
Greer	28-T6N-R24W	86	2.30	387	1,420	86	528,573	130,047	398,526	244,918	2,841	86	571
Greer	29-T5N-R20W	86	2.40	413	1,558	91	328,701	126,818	201,884	48,276	560	-	190
Greer	29-T5N-R20W	86	2.30	397	1,488	88	613,617	126,818	486,799	333,191	3,865	164	1,585
Greer	29-T6N-R22W	86	2.00	588	1,371	121	472,190	139,313	332,877	179,269	2,080	53	1,210
Greer	29-T6N-R24W	62	2.20	420	1,392	92	487,546	151,986	335,560	224,363	3,596	62	963
Greer	29-T6N-R24W	40	2.10	539	1,441	113	303,718	232,470	71,248	503	13	140	1,870
Greer	2-T5N-R22W	68	1.00	521	1,102	109	373,142	178,528	194,614	73,082	1,072	-	752
Greer	30-T5N-R20W	75	2.40	368	1,551	83	777,660	126,818	650,842	516,836	6,873	75	331
Greer	30-T5N-R20W	86	2.30	465	1,471	100	573,154	126,818	446,336	292,728	3,396	62	465
Greer	30-T6N-R22W	86	1.80	532	1,285	111	467,827	136,961	330,866	177,258	2,056	63	988
Greer	30-T6N-R23W	86	2.20	388	1,365	86	553,465	126,818	426,647	273,039	3,168	86	761
Greer	30-T6N-R23W	86	2.40	392	1,494	87	651,907	126,818	525,089	371,481	4,310	164	1,354
Greer	30-T6N-R24W	20	2.40	350	1,521	80	203,329	124,128	79,201	43,205	2,139	81	580
Greer	30-T6N-R24W	86	2.20	391	1,362	87	492,851	126,818	366,033	212,425	2,464	93	1,318
Greer	30-T6N-R24W	30	2.10	364	1,316	82	213,443	144,155	69,288	16,541	559	148	2,125
Greer	31-T5N-R20W	42	2.20	489	1,404	104	312,615	191,879	120,736	45,892	1,093	84	833
Greer	31-T6N-R22W	37	2.40	378	1,528	85	371,195	130,445	240,750	174,281	4,672	75	494
Greer	31-T6N-R22W	86	2.10	493	1,411	104	509,252	169,063	340,189	186,581	2,165	79	818
Greer	32-T5N-R20W	86	2.30	419	1,453	92	611,733	126,818	484,915	331,307	3,843	135	1,107
Greer	32-T6N-R22W	77	1.70	395	1,184	88	454,361	126,818	327,543	190,507	2,477	77	679
Greer	32-T6N-R22W	36	2.30	402	1,428	89	300,623	133,354	167,269	103,652	2,903	71	551
Greer	32-T6N-R23W	86	2.20	393	1,368	87	521,531	128,891	392,640	239,032	2,773	86	761
Greer	32-T6N-R23W	86	2.30	419	1,487	92	781,229	151,747	629,482	475,874	5,521	151	1,523

Appendix Table 6 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	32-T6N-R24W	58	2.10	566	1,417	117	418,158	193,234	224,924	121,212	2,083	58	1,155
Greer	32-T6N-R24W	86	1.70	664	1,313	134	463,029	216,329	246,700	93,092	1,080	49	1,521
Greer	33-T6N-R23W	60	2.30	362	1,347	82	454,142	123,750	330,392	224,185	3,761	60	919
Greer	33-T6N-R23W	86	2.40	341	1,490	78	358,152	131,481	226,671	73,063	848	603	6,272
Greer	33-T6N-R24W	86	2.30	559	1,518	116	636,676	190,684	445,992	292,384	3,392	86	571
Greer	34-T5N-R20W	24	2.40	393	1,484	87	221,479	141,923	79,556	36,788	1,533	72	794
Greer	34-T6N-R23W	74	2.40	371	1,517	83	727,436	128,632	598,804	467,114	6,321	74	489
Greer	34-T6N-R23W	18	2.40	361	1,488	82	166,829	130,644	36,185	5,000	286	88	811
Greer	34-T6N-R23W	55	2.00	409	1,276	90	361,874	146,147	215,727	118,073	2,155	127	1,830
Greer	35-T6N-R23W	26	2.20	357	1,319	81	186,772	128,552	58,220	12,601	492	77	959
Greer	35-T6N-R23W	86	2.40	390	1,514	87	604,932	131,461	473,471	319,863	3,711	86	379
Greer	35-T6N-R23W	21	2.30	367	1,464	83	192,462	126,818	65,644	28,044	1,329	84	838
Greer	35-T6N-R25W	59	2.30	378	1,481	85	545,456	146,048	399,408	294,983	5,034	141	1,836
Greer	36-T6N-R23W	25	2.30	364	1,403	82	204,156	131,143	73,013	29,354	1,198	74	864
Greer	36-T6N-R25W	68	2.30	372	1,442	84	604,646	126,759	477,887	356,176	5,215	68	602
Greer	4-T4N-R20W	52	2.40	365	1,510	82	501,644	138,794	362,850	270,899	5,250	158	1,865
Greer	4-T5N-R22W	86	2.20	534	1,477	112	426,939	201,086	225,854	72,246	838	86	190
Greer	4-T5N-R22W	86	2.30	443	1,455	96	469,827	155,852	313,975	160,367	1,860	86	190
Greer	5-T5N-R21W	86	2.40	441	1,550	95	649,729	137,738	511,991	358,383	4,158	86	571
Greer	5-T5N-R22W	86	2.40	379	1,462	85	548,581	126,818	421,763	268,155	3,111	92	1,056
Greer	6-T5N-R21W	86	2.20	527	1,439	110	623,453	126,818	496,635	343,027	3,979	86	571
Greer	6-T5N-R21W	86	2.00	510	1,369	108	358,621	154,078	204,543	50,935	591	58	1,116
Greer	6-T5N-R22W	31	2.30	365	1,386	82	251,632	126,818	124,814	69,394	2,231	93	891
Greer	7-T5N-R21W	28	2.10	372	1,307	84	206,603	141,524	65,079	14,648	518	141	1,704
Greer	8-T5N-R21W	60	2.30	373	1,420	84	513,257	131,043	382,214	274,759	4,557	60	930
Greer	8-T5N-R21W	86	2.30	435	1,473	95	751,413	126,818	624,595	470,987	5,464	93	1,010

Appendix Table 6 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	8-T5N-R21W	86	2.20	456	1,413	98	439,257	125,503	313,754	160,146	1,858	85	1,179
Greer	8-T6N-R25W	22	2.40	372	1,564	84	226,757	140,986	85,771	47,102	2,171	180	430
Greer	9-T5N-R22W	86	2.40	384	1,463	86	419,428	126,818	292,610	139,002	1,613	86	379
Greer	9-T5N-R22W	54	2.20	467	1,479	100	468,587	188,731	279,856	183,093	3,372	163	1,982
Jackson	11-T1N-R19W	86	2.40	368	1,487	83	661,336	128,971	532,366	378,758	4,394	86	571
Jackson	11-T3N-R19W	25	2.40	355	1,489	81	235,363	127,277	108,086	64,427	2,630	74	811
Jackson	11-T3N-R19W	58	2.40	362	1,502	82	566,672	129,509	437,163	333,272	5,717	159	1,426
Jackson	12-T2S-R20W	55	2.30	426	1,502	93	510,361	214,337	296,024	197,658	3,581	166	1,268
Jackson	12-T4N-R19W	51	2.30	396	1,483	88	474,326	147,941	326,385	234,790	4,568	103	794
Jackson	12-T4N-R19W	62	2.30	398	1,431	88	528,350	139,631	388,719	277,700	4,457	149	1,947
Jackson	13-T4N-R19W	86	2.40	393	1,486	87	727,414	132,179	595,235	441,627	5,123	86	950
Jackson	13-T4N-R19W	25	2.50	382	1,569	85	254,777	134,729	120,048	75,320	3,001	75	1,052
Jackson	17-T4N-R19W	86	2.30	412	1,480	91	777,709	150,292	627,417	473,809	5,497	86	805
Jackson	18-T2S-R19W	69	2.40	352	1,489	80	669,346	124,925	544,421	420,839	6,068	69	765
Jackson	18-T4N-R19W	68	2.40	365	1,487	82	651,298	123,750	527,548	405,659	5,931	68	754
Jackson	19-T1S-R19W	86	2.30	451	1,496	97	540,366	157,008	383,358	229,750	2,665	88	961
Jackson	19-T2S-R19W	86	2.30	431	1,479	94	633,712	135,845	497,867	344,259	3,994	58	888
Jackson	1-T1N-R19W	86	2.30	423	1,480	92	771,626	126,420	645,206	491,598	5,703	135	1,486
Jackson	1-T2N-R18W	26	2.40	346	1,490	79	255,095	126,818	128,277	81,410	3,095	79	811
Jackson	1-T2N-R18W	32	2.10	376	1,337	84	235,198	147,223	87,975	31,129	976	142	2,319
Jackson	1-T2S-R20W	65	2.40	396	1,485	88	601,735	143,358	458,377	342,369	5,259	182	1,664
Jackson	1-T3N-R19W	55	2.20	368	1,369	83	430,067	122,574	307,493	209,839	3,829	55	1,087
Jackson	20-T2S-R19W	86	2.40	383	1,485	86	777,293	140,927	636,366	482,758	5,600	148	1,444
Jackson	21-T2N-R18W	86	2.30	427	1,480	93	545,193	122,773	422,420	268,812	3,118	161	1,314
Jackson	22-T2N-R18W	47	2.00	500	1,372	106	326,960	180,621	146,339	63,476	1,365	46	1,025
Jackson	23-T3N-R19W	30	2.40	359	1,488	81	288,296	125,902	162,394	108,578	3,595	91	798

Appendix Table 6 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	24-T3N-R19W	86	2.40	362	1,488	82	654,821	124,148	530,673	377,065	4,374	86	571
Jackson	24-T4N-R19W	35	2.40	371	1,487	83	326,361	135,507	190,854	129,375	3,750	69	838
Jackson	25-T4N-R19W	47	2.40	346	1,489	79	452,871	125,045	327,826	244,607	5,238	175	1,687
Jackson	27-T3N-R19W	86	1.70	672	1,318	136	459,743	225,277	234,467	80,859	938	86	1,495
Jackson	29-T2S-R19W	86	2.30	453	1,475	98	626,749	134,530	492,219	338,611	3,928	86	871
Jackson	2-T1N-R19W	32	2.40	379	1,486	85	296,523	140,947	155,576	99,265	3,141	95	767
Jackson	2-T2N-R18W	31	2.10	402	1,333	89	220,433	148,977	71,456	16,749	546	61	1,082
Jackson	33-T1N-R19W	39	2.30	416	1,481	91	350,201	159,180	191,021	122,058	3,154	77	767
Jackson	34-T2N-R18W	37	2.40	381	1,485	85	345,190	167,688	177,502	111,746	3,028	158	1,667
Jackson	35-T5N-R19W	23	2.10	362	1,339	82	171,179	126,818	44,361	3,553	155	69	1,162
Jackson	36-T1S-R20W	86	2.40	403	1,484	89	299,699	135,786	163,913	10,305	120	-	379
Jackson	36-T3N-R18W	53	2.30	416	1,481	91	482,351	170,558	311,793	216,812	4,068	174	1,680
Jackson	3-T4N-R19W	86	2.30	418	1,480	92	774,021	147,084	626,937	473,329	5,491	128	1,464
Jackson	4-T2N-R18W	86	2.30	416	1,481	91	763,281	124,866	638,415	484,807	5,624	86	926
Jackson	4-T4N-R19W	86	2.40	377	1,486	84	642,998	133,554	509,444	355,836	4,128	86	571
Jackson	5-T2S-R19W	86	2.30	414	1,481	91	778,523	154,457	624,067	470,459	5,458	135	1,347
Jackson	8-T1S-R19W	86	2.30	408	1,482	90	452,418	151,010	301,408	147,800	1,715	86	379
Jackson	9-T2N-R18W	86	2.20	392	1,421	87	683,410	129,110	554,301	400,693	4,648	77	1,404
Jackson	9-T2N-R18W	29	2.40	355	1,489	81	281,697	133,813	147,884	95,493	3,248	160	1,702
Jackson	9-T2S-R19W	86	2.30	537	1,545	112	533,444	222,905	310,539	156,931	1,821	86	571
Jackson	9-T4N-R19W	86	2.30	413	1,475	91	772,645	126,958	645,687	492,079	5,709	132	1,254
Kiowa	13-T3N-R19W	58	2.40	355	1,489	81	554,005	123,610	430,395	327,752	5,690	58	763
Kiowa	1-T4N-R19W	29	2.40	340	1,490	78	282,941	122,235	160,706	109,028	3,760	87	831
Kiowa	20-T3N-R18W	71	2.40	680	1,538	137	526,535	257,179	269,356	142,834	2,012	71	313
Kiowa	25-T3N-R19W	31	2.30	397	1,483	88	281,720	150,352	131,368	76,839	2,511	92	809
Kiowa	2-T2N-R18W	86	2.40	383	1,485	85	720,005	133,414	586,591	432,983	5,023	121	1,113

Appendix Table 6 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Kiowa	2-T3N-R19W	19	2.30	355	1,409	81	163,811	126,878	36,933	2,362	122	78	1,111
Kiowa	2-T4N-R19W	35	2.20	425	1,407	93	281,786	141,066	140,720	77,994	2,216	70	1,318
Kiowa	30-T3N-R18W	56	2.40	366	1,487	83	531,582	123,491	408,091	308,121	5,492	56	743
Kiowa	31-T3N-R17W	86	2.50	575	1,564	119	683,227	169,641	513,586	359,978	4,176	86	190
Kiowa	3-T2N-R18W	22	2.40	360	1,488	82	204,715	129,050	75,665	37,352	1,737	86	853
Kiowa	3-T4N-R20W	86	2.40	393	1,521	87	764,143	122,614	641,529	487,921	5,660	73	860
Tillman	15-T1N-R19W	74	2.30	415	1,445	91	626,168	138,396	487,772	355,191	4,774	74	1,149
Tillman	16-T2S-R19W	86	2.30	586	1,536	121	600,180	206,625	393,555	239,947	2,784	62	922
Tillman	18-T2S-R19W	86	2.30	421	1,479	92	601,735	124,148	477,587	323,979	3,758	124	1,071
Tillman	22-T2N-R18W	86	2.10	432	1,379	94	501,139	147,941	353,198	199,590	2,315	86	761
Tillman	26-T1N-R19W	86	2.20	530	1,463	111	370,823	211,687	159,136	5,528	64	-	379
Tillman	26-T2N-R18W	86	2.20	585	1,521	120	708,700	186,041	522,659	369,051	4,281	86	754
Tillman	27-T2N-R18W	86	2.40	369	1,487	83	363,166	125,244	237,922	84,314	978	-	379
Tillman	28-T2N-R18W	86	2.20	452	1,426	97	560,516	124,467	436,049	282,441	3,277	58	1,019
Tillman	28-T2S-R19W	42	2.40	374	1,486	84	395,520	139,173	256,347	181,663	4,335	84	831
Tillman	34-T2S-R19W	86	2.30	502	1,496	106	356,085	184,885	171,200	17,592	204	-	379
Tillman	36-T2N-R19W	86	2.30	482	1,412	103	458,875	169,900	288,975	135,367	1,570	86	571
Tillman	3-T1N-R18W	36	2.40	383	1,485	86	337,179	141,325	195,854	131,524	3,643	72	796
Tillman	4-T1N-R18W	37	2.30	396	1,483	88	341,914	149,953	191,961	126,027	3,406	74	816
Tillman	7-T2S-R19W	72	2.40	386	1,485	86	669,327	141,843	527,484	399,732	5,576	72	789

Appendix Table 7. Individual Results of Profitable Sections in Four Counties under Traveling Reel Irrigation with -10% rainfall, 2.62 dS/m EC and 70 cents/lb Cotton Price

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Greer	17-T6N-R25W	53	1.20	384	1,036	86	259,012	142,860	116,152	21,350	401	209	6,277
Greer	21-T6N-R25W	73	0.90	372	963	84	306,320	125,204	181,116	51,208	702	73	2,090
Greer	24-T6N-R25W	86	0.20	565	893	117	352,599	191,023	161,576	7,968	92	17	1,398
Greer	36-T6N-R25W	68	1.00	372	989	84	304,624	126,759	177,865	56,154	822	68	2,410
Greer	28-T6N-R24W	78	1.30	441	1,080	96	384,140	135,427	248,713	109,717	1,407	78	1,892
Greer	22-T6N-R23W	86	1.20	564	1,089	117	379,247	205,071	174,176	20,568	239	78	1,812
Greer	27-T6N-R23W	86	1.10	411	974	90	329,957	129,429	200,528	46,920	544	113	3,534
Greer	32-T6N-R23W	86	1.10	419	959	92	310,042	151,747	158,295	4,687	54	151	4,001
Greer	34-T6N-R23W	74	1.20	371	1,027	83	345,786	128,632	217,154	85,464	1,156	74	2,443
Greer	1-T5N-R22W	86	1.10	375	959	84	308,174	127,616	180,558	26,950	313	86	1,900
Greer	1-T5N-R22W	86	0.60	444	919	96	294,572	126,818	167,754	14,146	164	39	3,192
Greer	5-T5N-R21W	86	1.20	441	1,058	95	320,897	137,738	183,159	29,551	343	86	1,711
Greer	6-T5N-R21W	86	0.40	424	899	93	321,283	126,818	194,465	40,857	474	32	1,711
Greer	8-T5N-R21W	86	1.00	435	1,005	95	360,689	126,818	233,871	80,263	931	86	2,108
Greer	24-T5N-R21W	69	1.20	382	1,054	85	340,877	134,929	205,948	83,703	1,220	195	4,855
Greer	25-T5N-R21W	80	1.00	377	980	84	322,759	126,818	195,941	54,094	680	80	1,404
Greer	25-T5N-R21W	86	1.20	370	1,020	83	326,876	126,818	200,058	46,450	539	86	2,090
Greer	28-T5N-R20W	82	0.90	432	950	94	292,253	143,158	149,095	2,258	27	82	1,089
Greer	29-T5N-R20W	86	1.10	398	1,019	88	289,856	126,818	163,038	9,430	109	86	1,329
Greer	30-T5N-R20W	75	1.30	368	1,051	83	378,613	126,818	251,795	117,789	1,566	75	2,818
Kiowa	3-T4N-R20W	86	1.20	393	1,029	87	359,895	122,614	237,281	83,673	971	73	1,940
Jackson	9-T4N-R19W	86	1.10	413	948	91	298,317	126,958	171,359	17,751	206	132	3,206
Jackson	13-T4N-R19W	86	1.20	393	1,061	87	387,203	132,179	255,024	101,416	1,177	86	1,140

Appendix Table 7 (continued)

County	Section	Acres	Irrigation rate (ac-ft/ac)	TDH (feet)	Yield (lbs/ac)	Pumping Cost ($/ac-ft)	NPV ($)	PV Capital ($)	NPV Irrigation ($)	Total NIB ($)	NIB per acre ($/ac)	Salt return (tons/yr)	Nit Ret (lbs/yr)
Jackson	18-T4N-R19W	68	1.10	365	948	82	251,878	123,750	128,128	6,239	91	68	2,262
Jackson	11-T3N-R19W	58	1.20	362	1,000	82	254,786	129,509	125,277	21,386	367	138	4,627
Jackson	1-T1N-R19W	86	1.10	423	944	92	291,906	126,420	165,486	11,878	138	135	4,215
Tillman	15-T1N-R19W	74	1.10	415	1,025	91	323,330	138,396	184,934	52,353	704	74	1,149
Jackson	4-T2N-R18W	86	1.10	416	944	91	288,915	124,866	164,049	10,441	121	86	2,399
Jackson	9-T2N-R18W	86	1.10	392	986	87	329,253	129,110	200,143	46,535	540	77	1,823
Jackson	18-T2S-R19W	69	1.10	352	949	80	260,125	124,925	135,200	11,618	168	69	2,293
Jackson	20-T2S-R19W	86	1.10	381	947	85	299,843	140,927	158,916	5,308	62	86	2,090

VITA

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