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Estimates of Consumptive-Use and Irrigation Water Requirements of Crops in Oklahoma

By
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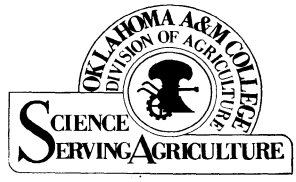

Experiment Station

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By
James E. Garton
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The purpose of this bulletin is to suggest figures on consumptive water requirements of crops for the various areas of Oklahoma, using a method developed by Blaney and Criddle.[1] Because of the limited information available on some of the factors, it is expected that refinement will result with use of the data by technicians under field conditions. Increased knowledge and better evaluation of the influences involved will justify revised estimates and will require fewer assumptions.

The consumptive-use data reported here will be improved, no doubt, as irrigation practices in Oklahoma are extended and more information becomes available.

Definition of Terms

Irrigation requirement: This is the quantity of water, exclusive of precipitation, that is required for maximum crop production. It includes surface evaporation and other economically unavoidable wastes. It is usually expressed as depth in inches or feet for a given time. (American Society of Agricultural Engineers) (American Society of Civil Engineers).

Consumptive use (evapo-transpiration): The sum of the volumes of water used by the vegetative growth of a given area in transpiration and building of plant tissue plus that evaporated from adjacent soil, snow, or intercepted precipitation on the area in any specified time, divided by the given area is called the consumptive use. If the unit of time is small, the consumptive use is expressed in acre-inches per acre or in depth in inches, whereas if the unit of time is large, such as a

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[1] Determining Water Requirements in Irrigation Areas from Climatological and Irrigation Data by Harry F. Blaney and Wayne D. Criddle, Soil Conservation Service, Research, U. S. Department of Agriculture, SCS-TP-96, August, 1950.

crop-growing season or a 12-month period, the consumptive use is expressed as acre-feet per acre or depth in feet or inches. (American Society of Agricultural Engineers) (Soil Conservation Service).

Water requirement: The water requirement is the quantity of water, regardless of its source, required by a crop in a given period of time, for its normal growth under field conditions. It includes surface evaporation and other economically unavoidable wastes. Usually expressed in depth (volume per unit area) for a given time. (American Society of Agricultural Engineers.)

Irrigation efficiency: This is the percentage of the water delivered to the farm or field which is ultimately stored in the soil for consumptive use by the crop. When measured at the farm headgate, it is called farm-irrigation efficiency; when measured at the field or plot, it is designated as field-irrigation efficiency.

Consumptive Water Requirements

Procedure

Because of the limited measurements of consumptive use of water by crops in the State, estimates of unit use by the various agricultural crops in Oklahoma are based largely on studies in other areas of the West. Results of these studies are transferred to this State by the method suggested by Blaney and Criddle.[2] Briefly, the procedure is to correlate existing consumptive-use data with monthly temperature, percent of daytime hours and precipitation for the frost-free period or irrigation season. The coefficients so developed for different crops are used to transfer consumptive-use data from one section to other areas where only climatological data are available.

Stations Used In Computing Water Requirements

Because there are few concentrated irrigated areas in Oklahoma, water requirements are computed for each weather station having long-time records. Unit rates of consumptive use were computed for each of the major crops grown in Oklahoma.

Consumptive-Use Formula

Disregarding the unmeasured factors, consumptive use varies with the temperature, daytime hours, and available moisture (precipitation, irrigation water or natural ground water.) A monthly consumptive-use factor (f) can be obtained by multiplying the mean monthly temperature (t) by the monthly percent of annual daytime hours (p). It is assumed that the consumptive use varies directly as this factor (f) when an ample water supply is available. Expressed mathematically, U= KF=sum of kf where:

[2] Determining Water Requirements in Irrigated Areas from Climatological and Irrigation Data, by Harry F. Blancy and Wayne D. Criddle, Soil Conservation Service, Research, U. S. Department of Agriculture, SCS-TP-96, August, 1950.

U = Consumptive use of crop (or evapo-transpiration) in inches for any period.

F = Sum of the monthly consumptive-use factors for the period. (Sum of the products of mean monthly temperature and monthly percent of annual daytime hours.)

K = Empirical consumptive-use coefficient (irrigation season or growing period.) Determined from experiments at various locations (different value for each crop.)

t = Mean monthly temperature, in degrees Fahrenheit.

P = Monthly percent of daytime hours of the year.

$f = \frac{t \times p}{100}$ = Monthly consumptive-use factor.

k = Monthly consumptive-use coefficient.

u = kf = Monthly consumptive-use in inches.

The consumptive-use factor (F) for any period may be computed for areas for which monthly temperature records, and sunshine hours are available. Then by knowing the consumptive-use coefficient (K) for a particular crop in some locality, (determined by experimental or actual quantitative measurements) an estimate of the use by the same crop in some other area may be made by application of the formula U=KF.

Consumptive-Use Coefficients

The consumptive-use coefficients (K) for the more important irrigated crops grown in Oklahoma are shown in Table I. These coefficients were developed from actual measurements of consumptive use in tank and soil moisture field studies and inflow-outflow measurements made throughout the West over a period of years by the Division of Irrigation and Water Conservation, Soil Conservation Service, and other agencies. These coefficients are based on the assumption that the crops receive a full water supply throughout the growing season or frost-free period.

It is recognized that consumptive-use values for the different crops have been computed for many locations in Oklahoma where that parti-

(continued on page 8)

Table I—Coefficients Used In Computing Consumptive Use of Water in Oklahoma.

Classification	Growing season or period	Consumptive-use coefficient (K) Growing period
Irrigated crop		
Alfalfa	Frost-free period	0.85
Corn	Apr. 15 - Aug. 15	0.80
Cotton	May 1 - Oct. 31	0.70
Early truck	3 months from last spring frost	0.60
Grass pastures	Frost-free period	0.80
Sorghum	May 1 - Sept. 1	0.70

Table II.—Computed Normal Water Requirements of Crops For Various Areas in Oklahoma

	Area	Total Consumptive Use of Water - Inches						Net Irrigation Requirement (Consumptive Use Minus Effective Rainfall) Inches					
		Alfalfa	Pasture	Cotton	Sorghum	Corn	Truck	Alfalfa	Pasture	Cotton	Sorghum	Corn	Early Truck
1	Ada	41.1	38.6	29.2	21.2	23.3	11.7	13.4	11.0	7.3	7.3	7.3	--
2	Altus	41.8	39.4	29.6	21.6	23.7	12.0	21.5	19.0	12.5	10.6	12.6	2.6
3	Alva	36.3	34.1	28.4	20.9	23.0	12.6	16.5	14.4	9.8	7.5	9.9	2.5
4	Ardmore	43.1	40.5	29.7	21.4	23.6	11.6	15.7	13.2	8.7	7.2	8.2	.6
5	Arnett	37.0	34.8	27.5	20.4	22.4	11.6	19.1	16.9	11.5	8.5	10.7	2.3
6	Bartlesville	39.6	37.2	28.8	21.2	23.2	11.9	12.4	10.0	6.0	5.8	7.0	--
7	Beaver	35.4	33.4	27.4	20.8	22.8	12.3	21.2	19.2	14.2	10.8	13.0	4.7
8	Boise City	33.9	31.1	26.1	19.6	21.5	11.9	20.6	18.6	14.1	10.4	12.6	5.0
9	Bristow	40.2	37.8	29.1	21.3	23.4	12.0	12.8	10.5	6.6	6.1	7.8	--
10	Buffalo	39.3	37.0	28.7	21.1	23.0	12.1	22.0	19.7	13.4	10.0	12.2	3.6
11	Carnegie	38.8	36.5	28.9	21.2	23.3	12.2	17.3	15.0	10.2	8.8	10.5	1.5
12	Chandler	40.3	37.9	29.1	21.2	23.3	11.8	15.0	12.6	7.9	6.6	8.2	.4
13	Chickasha	40.2	37.8	29.1	21.3	23.4	11.9	16.8	14.4	9.7	8.3	9.6	.9
14	Cherokee	39.0	36.8	29.0	21.2	23.3	11.9	19.6	17.4	12.0	9.4	11.6	2.3
15	Claremore	39.2	36.9	28.5	21.1	23.2	11.8	11.2	8.9	5.3	4.9	6.2	--
16	Cloud Chief	38.8	36.5	29.0	21.2	23.2	12.1	17.9	15.6	10.6	8.3	10.1	1.6
17	Enid	38.7	36.4	28.1	21.2	23.2	11.8	16.1	13.8	8.8	7.1	9.3	.6
18	Erick	38.5	36.2	28.6	20.9	23.0	11.9	19.4	17.1	11.8	9.4	11.2	2.1
19	Eufaula	39.8	37.5	28.8	21.0	23.1	11.9	11.8	9.8	6.4	5.6	6.8	.6
20	Fort Reno	39.0	36.7	28.6	20.9	23.0	11.9	15.5	13.2	8.6	7.3	9.2	1.1
21	Frederick	40.5	38.2	28.6	20.6	22.9	12.2	19.6	17.3	11.1	9.0	10.9	1.9
22	Geary	40.2	37.8	29.1	21.3	23.4	11.8	18.5	16.2	10.8	8.7	10.5	.9
23	Goodwell	34.5	32.5	26.9	20.2	22.1	12.0	21.5	19.5	14.5	10.7	13.1	5.2
24	Guthrie	39.5	37.2	28.9	21.2	23.4	12.0	15.8	13.5	8.6	7.3	9.2	1.1
25	Hammon	38.6	36.4	28.4	21.0	23.1	11.8	18.8	16.6	11.4	9.6	11.2	1.5
26	Holdenville	41.0	38.6	28.0	21.1	23.2	11.6	13.3	10.9	7.1	6.6	7.5	.3
27	Hollis	41.8	39.4	29.8	21.8	23.9	12.2	22.0	19.5	13.1	11.2	13.0	2.3
28	Hooker	33.9	31.9	26.8	20.3	22.2	12.3	20.6	18.7	14.1	10.6	12.8	5.0
29	Idabel	43.4	40.8	29.3	21.2	23.4	11.2	15.1	12.9	9.3	6.7	7.2	.4
30	Jefferson	37.4	35.2	28.2	21.1	23.1	12.1	16.5	14.3	9.3	7.6	9.6	1.4

Table II.—(continued)

	Area	Total Consumptive Use of Water - Inches						Net Irrigation Requirement (Consumptive Use Minus Effective Rainfall) Inches					
		Alfalfa	Pasture	Cotton	Sorghum	Corn	Truck	Alfalfa	Pasture	Cotton	Sorghum	Corn	Early Truck
31	Kingfisher	39.1	36.8	29.1	21.3	23.4	12.1	16.8	14.5	9.4	7.4	9.3	1.1
32	Lawton	40.8	38.4	29.1	21.2	23.4	12.0	17.0	14.6	9.0	7.4	9.2	1.2
33	Mangum	41.2	38.8	29.2	21.3	23.5	11.8	20.4	17.9	11.3	8.8	10.9	1.9
34	Marlow	40.5	38.1	29.0	21.1	23.2	11.9	15.7	13.3	8.9	7.6	8.6	.4
35	Meeker	39.5	37.1	28.6	21.2	23.2	11.9	14.5	12.2	7.7	6.6	8.2	.4
36	Miami	38.4	36.2	28.4	21.0	23.1	11.9	8.5	6.6	4.4	4.4	5.3	.2
37	Newkirk	39.0	36.7	28.8	21.1	23.2	11.8	13.1	10.8	6.2	4.9	6.8	.2
38	Norman	39.5	37.2	29.0	21.2	23.2	12.0	15.3	13.0	8.4	7.1	8.6	.7
39	Oakwood	37.0	34.8	27.7	20.8	22.8	12.0	18.1	16.0	11.4	9.1	10.7	1.9
40	Okeene	39.2	36.9	29.0	21.3	23.3	12.0	18.6	16.3	11.2	8.7	10.7	1.6
41	Okemah	40.8	38.4	28.9	21.1	23.2	12.0	13.8	11.6	7.7	7.3	8.8	.3
42	Okmulgee	39.6	37.2	28.6	21.1	23.2	12.0	12.8	10.6	6.8	6.2	7.7	.1
43	Paul's Valley	38.8	36.5	28.9	21.1	23.3	12.2	13.9	11.6	7.5	6.4	7.6	.6
44	Pawhuska	38.2	36.0	28.2	21.1	23.2	12.0	10.8	8.5	4.7	4.3	5.7	.2
45	Perry	40.7	38.5	28.9	21.2	23.2	11.9	13.5	11.4	6.8	6.2	7.7	.5
46	Poteau	41.1	38.7	29.5	21.5	23.6	11.9	13.0	11.1	7.6	6.8	7.5	.4
47	Pryor	39.2	36.9	28.8	21.1	23.2	11.9	7.8	6.6	5.0	5.0	5.1	.2
48	Sallisaw	39.7	37.4	28.6	20.7	23.1	11.9	11.9	9.8	6.5	5.7	7.3	.2
49	Shawnee	39.9	37.6	28.9	21.1	23.2	11.8	13.8	11.4	7.3	6.5	7.7	.1
50	Smithville	38.2	35.9	28.4	20.7	22.8	12.0	8.7	7.2	4.4	4.4	5.3	.2
51	Spavinaw	39.9	37.5	29.0	21.2	23.3	11.8	8.6	7.1	5.0	5.0	5.6	--
52	Stillwater	39.2	36.9	28.6	21.0	23.1	11.7	14.2	11.9	7.5	6.4	8.0	.4
53	Sulphur	40.8	38.4	29.4	21.3	23.4	12.0	13.6	11.4	8.1	7.0	7.6	.5
54	Tahlequah	38.1	35.8	28.3	20.7	22.8	12.0	10.3	8.3	5.0	4.9	6.3	.3
55	Walters	41.4	39.0	29.6	21.5	23.7	12.2	20.0	17.5	11.5	10.0	11.4	1.9
56	Waurika	42.2	39.8	29.6	21.5	23.7	12.0	19.4	16.9	10.6	8.7	10.7	1.4
57	Webbers Falls	40.0	37.6	29.1	21.4	23.5	12.1	11.3	9.1	6.0	5.3	6.3	.2
58	Wichita Mt. W.L.R.	37.4	35.2	28.3	20.8	22.8	12.1	15.5	13.3	8.6	7.4	9.3	1.6
59	Woodward	38.0	35.8	28.4	21.2	23.2	12.4	19.3	17.0	11.6	9.0	11.1	2.9

cular crop is not ordinarily grown. For example: corn is not grown extensively in southwestern Oklahoma and cotton is not usually grown in the northwest.

Precipitation and frost-free period data are based on published records of the U. S. Weather Bureau. Monthly percent of annual daytime hours is obtained from Appendix Table I on page 10. The monthly consumptive-use factor, average monthly precipitation, and the normal frost-free period are given for each location in Appendix Table II on pages 11, 12, and 13.

The computed use of water and the net irrigation requirement (consumptive-use minus effective rainfall) of the various agricultural crops are shown in Table II.

The computed net irrigation requirements listed in Table III are based on average monthly rainfall. In dry years more irrigation water will be required; in wet years, less irrigation water will be required.

Range in Water Requirement Values

As shown in Table II, the range in consumptive-use between crops and between areas is rather high. Alfalfa normally uses about twice as much water as sorghum and 25 percent more water than cotton. Early truck crops, largely because of their short growing season, are not heavy users of water and, in many areas of Oklahoma, if rainfall is normal, they may not need irrigation. However, their high value per acre may justify an irrigation system for the years with less than normal rainfall. Even with a normal amount of rainfall the distribution may not be such as to obtain maximum yields. Also, truck crops growing later in the growing season will require more water than is listed in the table. The range in total consumptive use and the consumptive irrigation requirements are given in Table III.

Irrigation Water Requirement

The gross irrigation water requirement of crops in any area is the quantity of water needed, exclusive of rainfall or other sources, to satisfy consumptive use, plus the quantity that is required to take care of losses incurred in conveyance and application. These losses in-

Table III.—Range of the Calculated Consumptive-Use and Net Irrigation Requirement Values of Crops In The State of Oklahoma for Normal Rainfall.

Crop	Consumptive Use	Net Irrigation Requirements*
	Inches	*Inches*
Alfalfa	33.9 - 43.4	8 - 22
Pasture	31.1 - 40.8	7 - 20
Cotton	26.1 - 29.8	4 - 15
Sorghum	19.6 - 21.8	4 - 11
Corn	21.5 - 23.9	7 - 13
Truck	11.2 - 12.6	0 - 5

* To obtain the gross irrigation water requirements divide the net irrigation requirements by the Irrigation Efficiency.

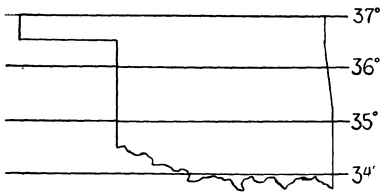
clude seepage and evaporation from canals and ditches as well as deep percolation and surface runoff while the fields are being irrigated.

Under present irrigation practices, the range of losses shown in Table IV might be used as a guide in determining farm headgate requirements for various soil conditions using surface irrigation. The percentages of water available for consumptive use shown in the last item on table IV are estimates of farm-irrigation efficiency. Under sprinkler irrigation, the application efficiency is usually about 70 percent in areas not subject to high wind movement. These efficiencies may be used in estimating irrigation requirements if measured efficiencies for local areas are not available. It is suggested that irrigation efficiency determinations be made in the field, when feasible.

Table IV.—Typical Surface Water Application Losses and Irrigation Efficiencies for Different Soil Conditions.[1] (Percent)

Item	General soil type		
	Open porous	Medium loam	Heavy clay
Farm-lateral loss	15	10	5
Surface-runoff loss	15	15	30
Deep percolation loss	35	15	5
Field-irrigation efficiency	50	70	65
Farm-irrigation efficiency	35	60	60

[1] Blaney, Harry F., Criddle, Wayne D., Determining Water Requirements in Irrigated Areas from Climatological and Irrigation Data. U.S.D.A. Soil Conservation Service, Research, 1950.



Appendix Table I.—Monthly Percentages of Annual Daytime Hours for Latitudes 30 to 40 Degrees North of Equator.

Month	Latitudes in degrees north of equator										
	30	31	32	33	34	35	36	37	38	39	40
					Percent						
January	7.30	7.25	7.20	7.15	7.10	7.05	6.99	6.93	6.87	6.81	6.76
February	7.03	6.99	6.97	6.94	6.91	6.88	6.86	6.82	6.79	6.76	6.73
March	8.38	8.37	8.37	8.36	8.36	8.35	8.35	8.35	8.34	8.33	8.33
April	8.72	8.74	8.75	8.78	8.80	8.83	8.85	8.87	8.90	8.93	8.95
May	9.53	9.58	9.63	9.68	9.72	9.76	9.81	9.87	9.92	9.97	10.02
June	9.49	9.55	9.60	9.64	9.70	9.77	9.83	9.89	9.95	10.02	10.08
July	9.67	9.72	9.77	9.83	9.88	9.93	9.99	10.05	10.10	10.16	10.22
August	9.22	9.25	9.28	9.31	9.33	9.37	9.40	9.44	9.47	9.51	9.54
September	8.34	8.34	8.34	8.34	8.36	8.36	8.36	8.37	8.38	8.38	8.38
October	7.99	7.96	7.93	7.92	7.90	7.87	7.85	7.82	7.80	7.77	7.75
November	7.19	7.15	7.11	7.06	7.02	6.97	6.92	6.87	6.82	6.77	6.72
December	7.14	7.10	7.05	6.99	6.92	6.86	6.79	6.72	6.66	6.59	6.52
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

[1]Computed from "Sunshine Tables," U. S. Weather Bureau Bulletin 805, 1905 ed.

Appendix Table II.—Monthly Consumptive-use Factors (f), Monthly Precipitation in Inches (r), and Average Frost-free Dates for Oklahoma.

Station County		April	May	June	July	Aug.	Sept.	Oct.	Frost Dates
Ada	(f)	5.43	6.73	7.58	8.21	7.72	6.30	5.05	Mar. 27
Pontotoc	(r)	4.03	5.47	4.51	2.44	3.25	3.39	3.81	Nov. 6
Altus	(f)	5.49	6.86	7.78	8.33	7.82	6.34	5.08	Mar. 28
Jackson	(r)	2.78	3.50	3.18	1.84	2.49	2.83	3.21	Nov. 9
Alva	(f)	5.21	6.63	7.63	8.09	7.54	6.19	4.82	Apr. 18
Woods	(r)	2.74	3.99	3.61	2.52	3.25	3.01	2.42	Oct. 29
Ardmore	(f)	5.58	6.85	7.69	8.25	7.83	6.58	5.16	Mar. 21
Carter	(r)	4.32	5.23	3.90	2.78	2.74	2.15	3.62	Nov. 10
Arnett	(f)	5.05	6.43	7.34	7.99	7.44	6.01	4.70	Apr. 5
Ellis	(r)	2.34	3.44	3.46	2.28	2.78	2.20	2.08	Nov. 27
Bartlesville	(f)	5.31	6.70	7.63	8.24	7.69	6.19	4.84	Mar. 30
Washington	(r)	4.09	4.97	4.77	2.98	2.90	4.10	3.43	Oct. 30
Beaver	(f)	5.04	6.49	7.48	8.17	7.57	6.02	4.62	Apr. 15
Beaver	(r)	1.91	2.67	2.88	2.09	2.39	2.06	1.50	Oct. 23
Boise City	(f)	4.67	6.09	7.14	7.74	7.10	5.65	5.24	Apr. 20
Cimarron	(r)	1.42	2.47	2.62	2.04	2.09	1.68	1.57	Oct. 21
Bristow	(f)	5.40	6.76	7.62	8.24	7.74	6.18	4.98	Mar. 30
Creek	(r)	4.04	4.23	4.71	3.10	3.11	3.87	4.09	Nov. 2
Buffalo	(f)	4.99	6.54	7.60	8.31	7.71	6.14	4.81	Apr. 10
Harper	(r)	1.95	3.12	3.42	2.12	2.49	2.50	1.68	Nov. 17
Carnegie	(f)	5.37	6.70	7.68	8.25	7.69	6.21	4.93	Apr. 6
Caddo	(r)	3.48	4.00	3.71	2.02	2.67	3.36	3.01	Oct. 30
Chandler	(f)	5.41	6.74	7.63	8.23	7.74	6.25	4.95	Mar. 28
Lincoln	(r)	3.65	4.94	4.12	2.65	3.14	3.33	3.24	Oct. 31
Chickasha	(f)	5.41	6.73	7.65	8.23	7.77	6.27	4.98	Mar. 31
Grady	(r)	3.49	5.06	3.71	1.99	2.52	3.39	3.12	Nov. 2
Cherokee	(f)	5.20	6.65	7.65	8.32	7.70	6.24	4.89	Apr. 4
Alfalfa	(r)	2.80	3.44	3.51	1.86	2.95	2.81	2.42	Oct. 31
Claremore	(f)	5.31	6.68	7.62	8.19	7.71	6.15	4.91	Apr. 1
Rogers	(r)	4.05	5.15	5.17	2.96	3.43	3.87	3.71	Oct. 28
Cloud Chief	(f)	5.33	6.68	7.61	8.25	7.71	6.24	4.93	Apr. 6
Washita	(r)	3.07	4.42	3.52	2.44	2.47	3.07	2.51	Nov. 1
Enid	(f)	5.25	6.65	7.58	8.26	7.73	6.20	4.86	Mar. 30
Garfield	(r)	3.23	4.08	4.02	2.40	3.57	3.12	2.74	Oct. 24
Erick	(f)	5.26	6.58	7.53	8.15	7.62	6.14	4.85	Apr. 5
Beckham	(r)	2.68	3.90	3.32	1.98	2.32	2.69	2.61	Oct. 31
Eufaula	(f)	5.45	6.74	7.56	8.05	7.71	6.20	5.01	Mar. 29
McIntosh	(r)	4.71	5.53	3.90	2.84	3.98	3.53	3.56	Oct. 30
Fort Reno	(f)	5.30	6.63	7.54	8.09	7.64	6.15	4.91	Apr. 5
Canadian	(r)	3.21	4.54	3.82	2.43	2.81	3.05	3.90	Nov. 4
Frederick	(f)	5.50	6.87	7.74	7.71	7.06	6.40	5.14	Mar. 30
Tillman	(r)	2.80	4.01	3.36	2.15	2.07	2.91	3.04	Nov. 9
Geary	(f)	5.31	6.69	7.66	8.31	7.76	6.24	4.98	Apr. 1
Blaine	(r)	3.16	3.77	3.95	2.25	2.64	3.10	2.62	Nov. 3
Goodwell	(f)	5.04	6.36	7.15	7.98	7.33	5.91	4.56	Apr. 17
Texas	(r)	1.44	2.57	2.33	2.35	2.17	1.83	1.36	Oct. 25
Guthrie	(f)	5.43	6.75	7.64	8.24	7.74	6.24	4.95	Apr. 2
Logan	(r)	3.54	4.75	3.68	2.46	3.08	3.45	3.03	Oct. 30

Appendix Table II.—(continued)

Station County		April	May	June	July	Aug.	Sept.	Oct.	Frost Dates
Hammon	(f)	5.22	6.60	7.59	8.25	7.71	6.12	4.82	Apr. 3
Roger Mills	(r)	2.94	3.91	3.62	1.80	2.20	3.18	2.61	Oct. 29
Holdenville	(f)	5.40	6.71	7.57	8.15	7.72	6.28	5.00	Mar. 26
Hughes	(r)	4.09	5.36	4.15	2.60	3.09	3.85	3.63	Nov. 6
Hollis	(f)	5.52	6.89	7.86	8.43	7.92	6.34	5.05	Mar. 29
Harmon	(r)	2.88	4.13	2.88	1.51	2.01	3.04	3.07	Nov. 8
Hooker	(f)	4.87	6.29	7.37	8.00	7.37	6.07	4.49	Apr. 21
Texas	(r)	1.55	2.77	2.55	2.22	2.17	1.91	1.58	Oct. 23
Idabel	(f)	5.58	6.82	7.63	8.13	7.68	6.40	5.20	Mar. 15
McCurtain	(r)	5.32	5.43	3.78	3.39	2.56	2.51	2.97	Nov. 10
Jefferson	(f)	5.14	6.58	7.61	8.27	7.73	6.15	4.78	Apr. 9
Grant	(r)	2.84	4.09	4.11	2.40	2.98	3.19	2.55	Oct. 26
Kingfisher	(f)	5.35	6.72	7.69	8.28	7.79	6.29	4.95	Apr. 5
Kingfisher	(r)	3.21	4.56	3.84	2.65	2.84	2.99	2.87	Oct. 30
Lawton	(f)	5.48	6.79	7.65	8.19	7.72	6.31	5.02	Mar. 31
Comanche	(r)	3.05	4.99	3.66	2.67	2.70	3.22	3.12	Nov. 6
Mangum	(f)	5.44	6.80	7.68	8.26	7.73	6.25	4.97	Mar. 26
Greer	(r)	2.62	4.46	3.45	2.06	2.53	2.63	2.69	Nov. 6
Marlow	(f)	5.43	6.74	7.58	8.16	7.71	6.26	5.03	Mar. 30
Stephens	(r)	3.88	5.12	4.15	2.14	2.53	3.19	3.40	Nov. 5
Meeker	(f)	5.38	6.72	7.61	8.18	7.72	6.25	4.90	Mar. 31
Lincoln	(r)	3.68	4.95	4.21	2.41	3.23	3.32	3.39	Oct. 29
Miami	(f)	5.27	6.66	7.60	8.17	7.63	6.15	4.87	Apr. 4
Ottowa	(r)	4.49	5.09	5.75	3.06	3.56	4.86	4.75	Oct. 28
Mutual	(f)	4.97	6.52	6.80	8.21	7.64	6.12	5.60	Apr. 7
Woodward	(r)	2.70	3.31	5.17	2.83	2.55	2.93	2.48	Oct. 31
Newkirk	(f)	5.22	6.65	7.58	8.25	7.72	6.16	4.83	Apr. 3
Kay	(r)	3.29	4.97	5.17	2.83	3.53	3.78	2.70	Oct. 31
Norman	(f)	5.38	6.74	7.62	8.15	7.71	6.26	4.97	Apr. 3
Cleveland	(r)	3.44	5.07	4.11	2.46	2.77	3.17	3.39	Nov. 2
Oakwood	(f)	5.22	6.53	7.47	8.11	7.57	6.10	4.80	Apr. 8
Dewey	(r)	3.35	3.77	3.52	1.92	2.45	2.77	2.41	Oct. 25
Okeene	(f)	5.26	6.62	7.67	8.32	7.78	6.25	4.87	Apr. 4
Blaine	(r)	3.11	3.70	3.69	2.18	2.98	2.69	2.63	Oct. 31
Okemah	(f)	5.36	6.70	7.60	8.20	7.68	6.21	4.98	Mar. 30
Okfuskee	(r)	4.17	4.39	4.24	2.29	2.89	3.94	4.25	Nov. 8
Okmulgee	(f)	5.43	6.71	7.62	8.16	7.66	6.23	4.92	Mar. 30
Okmulgee	(r)	4.30	4.72	4.46	2.72	3.01	3.72	4.04	Oct. 28
Paul's Valley	(f)	5.45	6.76	7.63	8.16	7.68	6.25	5.00	Apr. 6
Garvin	(r)	3.71	5.31	4.39	2.74	2.86	3.28	3.52	Oct. 30
Pawhuska	(f)	5.31	6.69	7.59	8.20	7.68	6.14	4.83	Apr. 4
Osage	(r)	3.87	5.22	5.21	3.36	3.51	3.98	3.31	Oct. 26
Perry	(f)	5.32	6.69	7.58	8.25	7.72	6.20	4.93	Mar. 30
Noble	(r)	3.84	5.14	4.12	2.51	3.59	4.10	3.15	Nov. 8
Poteau	(f)	5.54	6.83	7.71	8.27	7.83	6.37	5.12	Mar. 27
LeFlore	(r)	4.73	5.68	4.18	2.68	3.05	3.62	3.67	Nov. 1
Pryor	(f)	5.35	6.70	7.55	8.20	7.69	6.17	4.95	Apr. 3
Mayes	(r)	4.79	5.54	6.21	2.98	3.15	5.25	4.71	Oct. 31
Sallisaw	(f)	5.45	6.79	7.62	8.24	6.92	6.31	5.08	Mar. 31
Sequoyah	(r)	4.44	5.09	4.32	2.51	3.40	3.60	4.25	Nov. 3
Shawnee	(f)	5.36	6.70	7.59	8.16	7.69	6.23	4.97	Apr. 1
Pottawatomie	(r)	4.06	4.92	4.47	2.62	2.85	3.49	3.56	Nov. 2

Appendix Table II.—(continued)

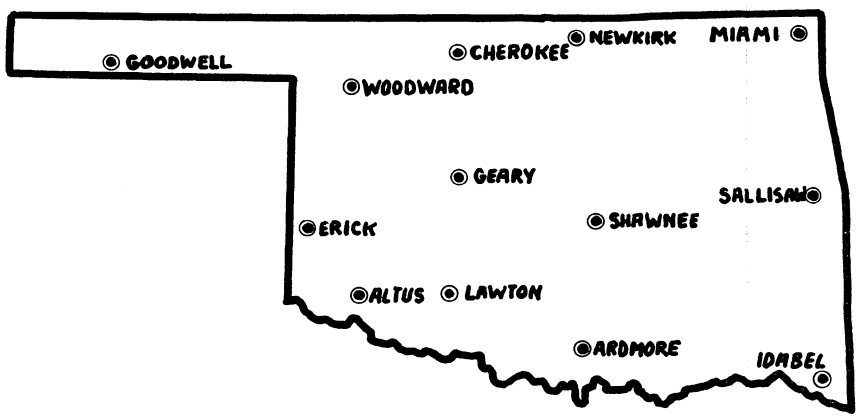
Station County		April	May	June	July	Aug.	Sept.	Oct.	Frost Dates
Smithville	(f)	5.40	6.63	7.45	7.98	7.54	6.23	4.93	Apr. 6
McCurtain	(r)	6.20	5.61	4.42	3.93	3.35	4.41	4.46	Oct. 30
Spavinaw	(f)	5.39	6.71	7.59	8.25	7.78	6.25	4.95	Mar. 31
Mayes	(r)	5.09	5.18	5.80	3.04	3.15	5.58	5.79	Oct. 31
Stillwater	(f)	5.29	6.67	7.57	8.14	7.65	6.14	4.85	Mar. 31
Payne	(r)	3.81	4.77	4.09	2.68	3.23	3.52	2.98	Oct. 30
Sulphur	(f)	5.56	6.78	7.65	8.20	7.79	6.36	5.17	Mar. 29
Murray	(r)	4.50	5.57	4.11	2.70	2.82	3.28	3.96	Nov. 2
Tahlequah	(f)	5.38	6.65	7.49	7.86	7.60	6.16	4.87	Apr. 6
Cherokee	(r)	4.35	4.93	4.70	2.92	3.54	4.22	4.26	Oct. 30
Walters	(f)	5.52	6.88	7.74	8.32	7.83	6.35	5.12	Mar. 30
Cotton	(r)	3.04	3.58	3.60	1.98	2.32	3.21	3.35	Nov. 7
Waurika	(f)	5.61	6.88	7.73	8.28	7.80	6.40	5.17	Mar. 26
Jefferson	(r)	3.09	4.15	3.56	2.39	2.71	2.78	3.36	Nov. 9
Webbers Falls	(f)	5.45	6.81	7.66	8.22	7.92	6.30	4.96	Apr. 1
Muskogee	(r)	4.45	5.38	4.50	3.49	3.36	3.75	3.95	Oct. 29
Wichita Mt. W.L.R.	(f)	5.34	6.88	7.46	8.05	7.57	6.12	4.85	Apr. 10
Comanche	(r)	3.29	4.32	3.64	2.40	3.05	3.21	3.20	Onct. 30
Woodward	(f)	5.22	6.68	7.64	8.26	7.69	6.13	4.75	Apr. 12
Woodward	(r)	2.47	3.53	3.45	2.62	2.60	2.55	2.29	Oct. 27

Monthly Rainfall Tabulations

The information on the following pages is a tabulation of the monthly rainfall at 13 selected locations in Oklahoma (See map) for a 30-year period compiled by Roy Dugger while a graduate student at Oklahoma A&M.

From these tables an idea can be had of deviations from the average rainfall and the variation in irrigation water usage which can be expected.

Locations Used for Tabulating Monthly Rainfall for 30-Year Period, 1924-1953.



Goodwell, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Goodwell, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	5	5	9	4	2	4	1										2.57
June	6	9	5	7	1	1			1								2.33
July	6	7	4	3	6	3				1							2.35
August	5	11	7	1	2	3	1										2.17
September	10	11	4	3	1	1											1.83
October	17	7	1	1	2		2										1.36

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June	3	7	10	5	5												4.90
June & July	5	6	7	9	1	1	1										4.68
July & August	4	8	6	8	2	1		1									4.52
August & September	3	16	7	2	1	1											4.00
September & October	12	11	2	3	1	1											3.19
May & June & July		2	8	9	3	3	5										7.25
June & July & Aug.	1	1	8	6	9		4		1								6.85
July & Aug. & Sept.		7	8	5	7	2					1						6.35
Aug. & Sept. & Oct.	2	9	9	4	3	2		1									5.36

Woodward, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Woodward, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	4	9	4	2		3	4	1	2	1							3.53
June	3	7	5	4	6	2	2							1			3.45
July	7	7	7	3	2	2			1		1						2.62
August	7	10	5	4	2	1			1								2.60
September	8	10	2	7	2	1											2.55
October	11	6	4	2	3	2		1				1					*2.29*

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June	1	7	6	5	4	2	2	3									6.98
June & July		7	10	6	3		2	2									6.07
July & August	3	11	8	4	2		2										5.22
August & September	5	8	8	8	1												5.15
September & October	8	6	8	4	1	2		1									4.84
May & June & July		1	3	10	5	3	3	2	1	1	1						9.60
June & July & Aug.		2	8	5	8	2		1	2	2							8.67
July & Aug. & Sept.		6	5	9	4	4	1	1									7.77
Aug. & Sept. & Oct.	3	2	8	6	6	3	1	1									7.44

Erick, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Erick, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	3	7	4		7	1	3	2		3							3.90
June	3	6	8	2	5	3	2		1								3.22
July	12	4	5	5	4												1.98
August	7	7	6	8	1		1										2.32
September	10	5	7	3	2	1	1	1									2.69
October	8	9	4	2	3	1	2			1							2.61

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June	1	5	8	5	4	4	1	1	1								7.22
June & July	2	8	9	8	2	1											5.30
July & August	5	12	6	4	3												4.30
August & September	4	11	5	6	3		1										5.01
September & October	6	9	9	1	2	2		1									5.30
May & June & July		1	7	7	5	4	2	1	3								9.20
June & July & Aug.	1	4	7	6	8	2	2	1									7.62
July & Aug. & Sept.	1	7	6	7	5	3	1										6.99
Aug. & Sept. & Oct.	2	5	4	10	3	1	3	1	1								7.62

Altus, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Altus, Oklahoma.

	(inches)															
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	1	7	9	4	2	2	2	2		1							3.50
June	4	7	6	4	5	1	1				2						3.18
July	11	9	4	2	2	1			1								1.84
August	7	7	7	6	2		1										2.49
September	11	3	5	3	2	3	1	1		1							2.83
October	9	5	7	4	1	2		1	1								3.21

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		6	9	8	2	3			1		1						6.68
June & July	2	11	7	5	2	1	2										5.02
July & August	4	11	9	4		1	1										4.33
August & September	8	6	5	6	3		2										5:32
September & October	4	8	8	4	3	2	1										6.04
May & June & July		2	7	5	7	4	2	1	1		1						8.52
June & July & Aug.	1	3	6	9	6	2	1	2									7.51
July & Aug. & Sept.	2	4	7	9	2	2	2	1	1								7.16
Aug. & Sept. & Oct.	2	3	7	5	7	3		1	1	1							8.35

Cherokee, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Cherokee, Oklahoma

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	5	4	4	6	2	3	2	3			1						3.44
June	4	3	7	8	4	1		1		1	1						3.51
July	8	10	3	5	3			1									1.86
August	3	9	8	1	4	2		1	1	1							2.95
September	8	5	8	3	1	3	1				1						2.81
October	9	7	7	4	2			1									2.42

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June	2	4	7	7	5	2	1		2								6.95
June & July	2	7	10	4	4	1	2										5.37
July & August	2	11	8	4	2	1		2									4.81
August & September	2	7	11	4	3	1	2										5.76
September & October	5	9	7	6	1	1	1										5.23
May & June & July		2	2	8	5	1	1	2		1	1						8.81
June & July & Aug.		4	3	11	5	1		2	2	2							8.32
July & Aug. & Sept.		3	8	9	1	3	4		2								7.62
Aug. & Sept. & Oct.		4	6	7	6	5	1	1									8.18

Geary, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Geary, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	3	6	5	5	2	2	2	3	1				1				3.77
June	2	6	7	7	3	2				2						1	3.95
July	5	11	3	5	2	2	1		1								2.25
August	6	8	6	3	3	3				1							2.65
September	7	4	4	3	5	4	3										3.10
October	8	9	9	1	2					1							2.62

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		3	8	8	6	1	2	1	1								7.22
June & July	1	8	6	6	4	3	1			1							6.20
July & August	2	8	11	5	2	1			1								4.90
August & September	3	9	6	5	4	1	2										5.75
September & October	5	6	6	11		2											5.72
May & June & July			2	9	6	6	3		3		1						9.97
June & July & Aug.		4	5	6	6	2	1	4			2						8.85
July & Aug. & Sept.	1	1	5	10	6	4	1		1		1						8.00
Aug. & Sept. & Oct.	1	5	5	6	3	5	3	1	1								8.37

Lawton, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Lawton, Oklahoma.

(inches)

	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
June	1	4	4	6	1	3	3	2	2		1			1	2		4.99
June	2	4	7	8	2	2	1	1	1	1	1						3.66
July	9	5	5	5	4	1	1										2.67
August	8	6	7	4	4		1										2.70
September	7	5	4	5	1	5			2	1							3.22
October	7	8	5	3	2	2				1	2						3.12

(inches)

	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		2	7	5	7	1	5		2		1						8.65
June & July	1	8	6	7	6		2										6.33
July & August	7	2	13	5	3												5.37
August & September	2	10	6	6	3	2	1										5.92
September & October	5	6	6	5	2	3	2	1									6.34
May & June & July			2	5	7	7	2	2	3		1		1				11.32
June & July & Aug.		4	4	5	4	9	2	2									9.03
July & Aug. & Sept.	1	5	4	6	6	4	2	2									8.59
Aug. & Sept. & Oct.	1	3	5	7	5	2	4	1	2								9.04

Newkirk, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Newkirk, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	2	4	5	7	3	3	1	2	1		1	1					4.97
June	1	1	7	6	4	4	1	3	2						1		5.17
July	6	3	5	8	5		1			1	1						2.83
August	3	9	4	3	5	4				1		1					3.53
September	5	5	4	3	7	1	1	3		1							3.78
October	7	10	7	3	1			2									2.70

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		2	5	6	8	3	2	3		1							10.14
June & July		5	5	7	6	4	1		1	1							8.00
July & August	5	3	6	9	2	1	2	2									6.36
August & September	2	6	6	7	4	4	1	1									7.31
September & October	4	6	6	8	3	2			1								6.48
May & June & July				6	6	5	3	2	5	1	1	1					12.97
June & July & Aug.		1	4	5	3	5	6	1	3		2						11.53
July & Aug. & Sept.		1	7	3	3	6	4	4	1		1						10.14
Aug. & Sept. & Oct.		3	3	9	3	5	4		2		1						10.01

Shawnee, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Shawnee, Oklahoma

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May		2	8	5	4	1	1	3	2	3			1				4.92
June	3	4	5	3	4	3			3	3		1	1				4.47
July	6	5	4	3	5	2		3	1	1							2.62
August	6	3	12	4	4					1							2.85
September	7	3	4	6	2	3	1	1		2			1				3.49
October	6	3	5	7	4	3		1						1			3.56

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		2	6	3	6	5	2	3	3								9.39
June & July	1	6	3	6	4	5	1	2	2								7.09
July & August	2	7	8	6	3	3	1										5.47
August & September	2	10	5	5	5		1	2									6.34
September & October	3	5	6	5	4	3	3			1							7.05
May & June & July		1	2	3	1	5	7	3	2	3	2	1					12.01
June & July & Aug.	1	1	3	5	5	2	4	3	3	1	2						9.94
July & Aug. & Sept.		2	5	5	5	3	5	2	1	1	1						8.96
Aug. & Sept. & Oct.	1	3	3	5	7	2	4	2	1		2						9.90

Ardmore, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Ardmore, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	2	1	8	4	2	2	4	1		2	1		1	1		1	5.23
June	4	3	3	5	2	6	3			4							3.90
July	7	8	5	1	2	2		1	3						1		2.78
August	5	12	4	3	2	1	1		2								2.74
September	9	8	4	1	2	2	1			2	1						3.15
October	7	6	4	3	4	3			2						1		3.62

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June	2	2	4	2	6	4	5	2		1	1	1					9.13
June & July	1	7	6	5	1	4	3	2	1								6.68
July & August	4	9	7	4	1	2	1	1	1								5.52
August & September	3	10	5	5	3	4											5.89
September & October	6	4	4	6	4	2	2	2									6.77
May & June & July		2	1	3	4	5	1	4	5	1	3	1					11.91
June & July & Aug.		3	6	2	7	1	3	3	3	1		1					9.42
July & Aug. & Sept.		3	7	8	4	2	2	1		3							8.67
Aug. & Sept. & Oct.	2	2	5	3	5	5	5	2		1							9.51

Miami, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Miami, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May		1	7	5	3	4	3	4	1	1						1	5.09
June	3	3	2	2	4	7	2	1	3				2		1		5.75
July	6	5	6	2	3	1	4	3									3.06
August	6	3	5	2	6	3	4	1									3.56
September	6	1	4	6	2	2	3	1				2		1	2		4.86
October	5	2	6	5	6	1	4									1	4.75

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		2	2	6	4	8	2	2	1	1	1				1		10.84
June & July		6	4	3	7	4	3	1		2							8.81
July & August	2	7	3	8	5	2	2	1									6.62
August & September		3	7	6	5	4	1		3	1							8.42
September & October	3	1	8	6	5	1	1	1		3						1	9.61
May & June & July			3	1	4	2	5	6	3	2	2		1	1			13.90
June & July & Aug.		1	5	2	1	7	3	7		1	1	1	1				12.37
July & Aug. & Sept.			3	4	5	7	3	2	3	1	2						11.47
Aug. & Sept. & Oct.		1	1	8	2	7	2	4			2	2					13.17

Sallisaw, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Sallisaw, Oklahoma.

(inches)

	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	2	3	3	6	3	1	3	3	1	3		1	1				5.09
June	4		6	6	4	3	3	1			1	2					4.32
July	8	5	6	5	2	1		2		1							2.51
August	5	5	6	3	4	2	2	1	1	1							3.40
September	3	8	3	4	1	3	2		3	3							3.60
October	4	3	5	7	2	2	2	4	1								4.25

(inches)

	0-2	2-4	4-6	4-6	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June	2	1	4	5	3	5	6	2	1	1							9.41
June & July	2	4	8	6	3	2	2	3									6.83
July & August	4	7	3	9	2	3	1	1									5.91
August & September		4	8	6	4	5	3										7.00
September & October	1	5	5	4	9	3	2		1								7.85
May & June & July		2	2		4	7	6	1	2	5	1						11.92
June & July & Aug.	1	1	3	4	7	4	2	3	2	2	1						10.23
July & Aug. & Sept.		1	7	3	4	7	2	4	1	1							9.51
Aug. & Sept. & Oct.			1	7	4	6	6	3	2			1					11.25

Idabel, Oklahoma

Number of Years in the 30-Year Period, 1924-1953, Which had the Rainfall Indicated for the Period Listed; Idabel, Oklahoma.

	(inches)																
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15 & over	Avg. Rainfall
	(number of years)																
May	1	2	2	3	5	4	1		5	4		1	2				5.43
June	6	5	7	3	1	2		2	1	2		1					3.78
July	4	5	6	4	6	1	2				1	1					3.39
August	7	6	7	4	4	2											2.56
September	7	8	5	2	2	1		2	1	1							2.51
October	6	3	8	4	4	4	1										2.97

	(inches)																
	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30 & over	
	(number of years)																
May & June		1	5	5	7	6	2	2	1		1						9.21
June & July	1	11	3	4	1	5	3	2									7.17
July & August	2	5	9	9	2	1		2									5.95
August & September	2	5	13	2	3	5											5.07
September & October	3	10	3	8	1	2	2	1									5.48
May & June & July			1	2	6	3	6	7	1		3	1					12.60
June & July & Aug.		3	5	6	4	3	3	2	3	1							9.73
July & Aug. & Sept.			7	7	8	2	3	1	1		1						8.46
Aug. & Sept. & Oct.		3	4	6	6	5	2	3	1								8.04