OKLAHOMA
AGRICULTURAL AND MECHANICAL COLLEGE
AGRICULTURAL EXPERIMENT STATION
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Outfield Experimental Results

McCLAIN COUNTY
For
1925, 1926, 1927

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FOREWORD

This bulletin is a report of the outfield work in McClain county, Oklahoma, conducted by the Experiment Station of the Oklahoma Agricultural and Mechanical College.

Outfield experiments in Oklahoma are conducted by the Department of Field Crops and Soils of the College, and have been going for three years under the supervision of H. C. Potts, assistant agronomist in charge, who gives direct supervision to all outfield experimental work. Work is now being conducted in McClain, Bryan, Okmulgee, Pittsburg, McIntosh, Creek, Nowata and Garfield counties. The Garfield county work was started in 1926. A few acres are rented from each place of some good farmer who supplies the land, the labor, tools and equipment, and for his services takes the crops and a small agreed sum to pay him for his extra trouble.

In addition to the work in the above named counties, specialized work is being conducted in two places: (1) at Granite on the State Reformatory farm, for the benefit of the farmers of Southwestern Oklahoma. Roy W. Ellithorpe, assistant agronomist, is in charge of this work. It was established three years ago through the cooperation of the late Dr. G. A. Waters, then warden of the reformatory. It was continued under the administration of his successor, Mr. J. J. Savage. The present warden, Mrs. G. A. Waters, widow of Dr. Waters, has been enthusiastic in her cooperation in the continuance of the work. (2) At the Panhandle Agricultural College at Goodwell special work is being conducted under the supervision of H. H. Finnell, associate agronomist, who is in charge of the work at that place in crops and soils, in cooperation with the Panhandle Agricultural College. This work is for the benefit of the Panhandle and the Northwestern section of Oklahoma.

In order to extend Outfield Experiment work to other counties, additional funds will be necessary.

REPORT OF EXPERIMENTAL WORK IN McCLAIN COUNTY

The experimental work in McClain county was carried on in 1925 and in 1926 with L. S. Hopper, who lives seven miles northwest of Purcell. But in 1927 Mr. Hopper could not do the work so the experiments were changed to the farm of H. A. Perkinson, who lives one mile east of Mr. Hopper. The soil on which these experiments are conducted is a sandy loam and is representative of the average upland soil of that locality.

CORN VARIETIES

Table I—Corn Variety Test Yield in Bushels Per Acre**

Variety	1926	1927	2 Yr. Ave.	Rank
Silvermine	10.8	40.0	25.1	7
Pride of Saline	10.2	42.0	26.1	5
Surcropper	10.4	40.3	25.4	8
Reid's Yellow Dent (Clay)	10.4	42.6	26.5	4
Reid's Yellow Dent (Cole)	*	42.6		
Ferguson's Yellow Dent	9.6	44.0	26.8	3
Midland Yellow Dent	11.6	45.1	28.9	2
Dent Squaw	10.4	41.7	25.9	6
Chisholm	9.6	39.2	24.4	9
St. Charles White	10.0	49.2	29.6	1

*Not planted.
**70 lbs. of ear corn to bushel.

In Table I only the results of 1926 and 1927 are shown. In 1925, the same varieties were planted as in other years but due to extremely dry weather no yields were secured. The season of 1926 was not favorable for corn production in this section and for that reason a very low yield was obtained from each of the varieties. However, the growing season of 1927, being more favorable for the growing of corn, a large yield was secured from all varieties.

GRAIN SORGHUM VARIETIES

Table 2—Grain Sorghum Varieties Yield in Bushels Per Acre

Varieties	1925	1926	1927	2 Yr. Ave.	Rank
Darso	15.1	50.0	55.2	52.6	1
Common Kafir	20.0	44.4	55.6	50.0	2
Reed's Kafir	***	44.0	40.6	42.3	5
Hegari	*	47.5	40.8	44.2	4
Sunrise	***	50.0	38.5	44.3	3

*Not planted.
***Destroyed by birds.

As shown in Table 2, the yield of grain sorghums for 1925 was greatly reduced because of bird damage. Reed's and Sunrise kafir were completely destroyed and about one-fourth of the Darso and Common kafir. The reason for the bird damage is probably due to the very small acreage being planted to these varieties. In 1926 and 1927 grain sorghums were not damaged any at all by the birds; therefore, the yields secured from these varieties indicate that grain sorghums are more profitable as a grain crop in this locality than is corn.

SWEET SORGHUM VARIETIES

Table 3—Sweet Sorghum Varieties Yield in Tons Dry Forage Per Acre

Varieties	1925	1926	1927	3 Yr. Ave.	Rank
Sumac	2.75	9.00	4.20	5.31	4
Orange	2.05	10.26	5.25	5.84	2
African Millet	2.86	10.08	3.49	5.48	3
Red Amber	2.42	9.72	3.30	5.15	5
Seeded Ribbon	5.15	11.24	9.00	8.46	1

While the Seeded Ribbon cane as shown in Table 3 yielded more than eight tons of dry forage per acre, this variety cannot be recommended over Orange or Sumac because of its lack of quality. Seeded Ribbon is a very late maturing variety. It has a large stalk which is not very palatable and is very hard to handle. The Red Amber being an early maturing variety, matures early in the summer. The quality of forage is lessened because of the drying out during the hot dry weather.

The African millet while a good yielder, has a tendency to lodge and for that reason under field conditions, some of the crop would be wasted. It cannot be recommended over the Orange or Sumac.

SOYBEAN VARIETIES

Table 4—Soybean Varieties Yield of Grain and Forage Per Acre

Variety	1926		1927	
	Bu. Grain	T. Forage	Bu. Grain	T. Forage
Virginia	8.0	.75	7.0	2.10
Laredo	**	1.00	12.0	4.47
Chiquita	*	*	26.0	2.55
Old Dominion	*	*	17.3	2.40
Morse	10.0	.64	*	*

*Not planted.
**No seed produced.

In 1925 six varieties of soybeans were planted but were destroyed by rabbits. Indications from 1927 data are that soybeans may be a profitable hay crop in this section.

Table 5—Cowpeas and Mung Beans Varieties Yield of Grain and Forage Per Acre

Variety	1925		1926		1927	
	Bu. Grain	T. Forage	Bu. Grain	T. Forage	Bu. Grain	T. Forage
Early Buff	21.0	.92	9.5	1.53	11.8	2.10
New Era	8.1	.95	10.0	1.80	17.0	2.13
Whippoorwill	**	1.33	6.0	2.40	16.5	2.26
Brabham	**	1.48	12.8	2.70	6.0	2.70
Red Ripper	*		9.0	2.49	12.0	2.95
Blackeye	15.5	.74	9.5	2.1	11.0	1.52
Erect Mung Bean	*.		**	3.15	5.5	4.62
Dwarf Mung Bean	16.0	.60	20.0	1.58	12.3	2.24

As a seed producing variety, the Early Buff gave the largest yield but it is a very low forage yielder. For that reason it cannot be recommended as a dual purpose variety. The Brabham, Red Ripper and Whippoorwill are all heavy forage yielders but are light seed producers, while the New Era promises to be more of a dual purpose variety than any other variety used in the test.

OAT VARIETIES

Table 6—Oat Varieties Yield Bushels Per Acre

Variety	1926	1927	2 Yr. Ave.
Fulghum	42.3	45.6	43.9
Local Variety**	25.4	45.1	35.3
Nicholson's Extra Early	37.3	31.3	34.4
Kanota	33.2	28.4	30.8
Nicholson's 100 Bushels	30.3	31.3	30.8
Ferguson No. 922	*	35.5	

**Texas Red.

*Not planted.

No oat varieties were planted in 1925.

The Nicholson's Extra Early and Kanota are both strains of the Fulghum while the other three varieties are all strains of the Texas Red.

In 1927, the Kanota and Extra Early were damaged about 10% by smut.

COTTON VARIETIES

In 1925 the leading varieties made about one-half of a bale to the acre while in 1926 some of the same varieties made one bale per acre, but the linting per cent was low and the price per pound was so much lower than in 1925 that the money value per acre did not exceed that of the previous year. In 1927, however, the price of cotton was so much higher that the money value per acre ran about one-third higher than in the previous years.

The seed that were used in these variety tests were secured each year direct from the breeder of that variety. The samples taken for determining the length of staple and linting per cent are from the first picking.

From the data shown in Table 7, the early maturing varieties are best for this community. As the true value of a variety to any community is necessarily the amount of money returns from the sale of the lint and seed, these varieties are compared on that basis. The three main factors taken into consideration in determining the value of these varieties are length of staple, linting per cent, and yield per acre.

The value is based on the average price paid for Middling cotton using the length of staple of each of these varieties. This method, however, favors to a slight extent the later maturing varieties and penalizes the earlier ones for usually a higher grade is secured from the earlier varieties because they open at a season when the conditions are favorable for harvesting.

FERTILIZER EXPERIMENTS WITH COTTON

For the years 1925 and 1926, the fertilizer tests were conducted on the Hopper farm. The soil on which this experiment was conducted is sandy loam in nature. The fertilizers were applied in the row beneath the seed except that the nitrate of soda was applied at chopping time as a side dressing.

Moisture rather than plant food seems to be the limiting factor in crop production with this soil. The yields for the year 1925 were secured when the growing season was lacking in moisture while in 1926 the moisture supply was better. The yields, therefore, are very wide apart, no one treatment being outstanding for each of the two years.

Table 8 gives the results in detail. One thing to be observed is that during dry seasons the ferilized plots, as a rule, didn't yield any more, if as much, as the unfertilized plots. If this happens many years during a given number of years, the cost of the fertilizers and the decrease in yield for these unfavorable years will soon reduce the profits secured during favorable years to the extent that for the total period the fertilizers will be applied at a loss. It might well be added that perhaps we have not found out the proper time and manner of applying the fertilizers so as to avoid disastrous effects during dry seasons.

Table 7—Cotton Varieties Showing Length of Staple, Linting Per Cent, Yield of Seed Cotton, and Money Value Per Acre

Variety	1925				1926				1927				Average Yield	Average Value
	Length Lint	% Lint	Yld. Per Acre	Value Per Acre	Length Lint	% Lint	Yld. Per Acre	Value Per Acre	Length Lint	% Lint	Yld. Per Acre	Value Per Acre		
Okla. Tri. 44	15	30.88	716	59.29	16	26.50	1605	68.18	14	33.74	1035	82.97	1117	70.15
Acala 5-37	16	32.86	458	41.72	16	28.66	1425	64.66	15	34.30	810	66.71	874	57.66
Acala 5	*	*	*	*	*	*	*	*	16	34.50	1020	86.71	1020	86.71***
Mebane	16	35.87	200	21.31	16	27.88	1110	39.26	15	37.68	675	56.93	662	39.17
Delfos 6102	*	*	*	*	18	22.30	1200	51.30	16	30.15	1230	93.92	1215**	72.61**
New Boykin	15	32.83	573	49.77	15	30.21	1380	63.92	14	34.13	1050	84.95	1001	66.21
Okla. Tri. 44	15	33.78	750	66.87	16	27.15	1515	65.69	15	35.48	1200	103.37	1155	78.64
Tri. 406	14	36.60	315	27.96	15	27.56	1005	43.16	15	35.93	870	74.16	730	48.43
Lone Star	14	30.21	477	36.91	15	32.52	675	33.35	16	34.50	720	61.19	624	43.82
Rowden	17	34.53	157	16.57	15	28.77	735	32.71	14	31.16	840	63.32	577	37.53
Half and Half	10	36.10	802	64.83	12	34.90	960	42.23	12	40.00	1140	102.44	964	66.50
Trice	*	*	*	*	15	24.00	1365	52.27	12	32.84	1200	92.28	1282**	72.28**
Okla. Tri. 44	15	33.80	773	68.91	16	28.04	1440	64.14	14	35.63	1110	92.90	1108	75.32

*Not planted.
**Two year average.
***One year only.

In order to learn more about the time and manner of applying fertilizers for cotton, the plan of the experiment was changed at the beginning of the 1927 season. This will be noted in Table 9. Each treatment was triplicated and the results given in the tables are the averages of the triplicate treatments. There are several facts which can be deducted from this table, namely:

(1) The yield of cotton was reduced according to the lateness at which it was planted.

(2) A complete fertilizer gave slightly higher yields than acid phosphate alone.

(3) Fertilizers increased the yield more when used with late planting than with early planting.

(4) The methods of treatment ranged as follows according to their influence in increasing yields: Below the seed, broadcast and side application. In the side application, the fertilizer was placed in the soil on both sides of the seed by means of spouts fastened to the fertilizer distributer. The spouts were guided behind small shovels which opened the way for the spouts. "Scrapers" and a press wheel on the rear of the fertilizer drill covered the fertilizer and packed the soil.

Table 8—Showing the Results of the Cotton Fertilizer Test on the Hopper Farm. (Yields in Pounds of seed Cotton Per Acre)

	Treatment	Year 1925	Year 1926
1.	Check	1045	1875
2.	Nitrate of soda 100 lbs.	825	1965
3.	Nitrate of soda 100 lbs. (Chopping)	770	2040
4.	(nitrate soda) (50 lbs. planting) (50 lbs. chopping).	742	1815
5.	Acid phosphate 200 lbs.	714	2060
6.	Check*	769	1875
7.	(Acid Phosphate 200 lbs.) (Nitrate soda 100 lbs.)	880	1500
8.	(Acid Phosphate 200 lbs.) (Kainit 25 lbs.)	852	1800
9.	(Nitrate Soda 100 lbs.) (Kainit 25 lbs.)	715	1485
10.	(Acid Phosphate 160 lbs.) (Nitrate of soda 30 lbs.) (Kainit 10 lbs.)	797	1500
11.	Check*	934	1260
12.	(Acid Phosphate 320 lbs.) (Nitrate soda 60 lbs.) (Kainit 20 lbs.)	879	1140
13.	Manure, 8 T. per acre	880	1260
14.	(Acid Phosphate 100 lbs.) (Manure 8 T. per acre)	550	1275
15.	Legumes Rotation. Cowpeas to be turned under		1200
16.	Legumes Rotation. Cowpeas to be turned under		1140
17.	Cotton Rotation	715	
18.	(Cotton Rotation) (Acid Phosphate 200 lbs.)	742	
19.	Check*	687	
20.	Average of all checks	856	1666.6

Table 9 (a)—Showing the Effect of Time on Planting and Effect of Fertilizers on the Yield of Cotton (1927)

Fertilizer Treatment	Method of Applying	Fert. Applied, Cotton Planted April 18	Fert. Applied, Cotton Planted May 2	Fert. Applied, Cotton Planted May 16
No fertilizer		1843	1293	857
Acid Phos. 100 lbs. per A.	Side application	1939	1341	1067
12-4-4 240 lbs. per acre	Side application	1972	1503	1164

Table 9 (b)—Showing the Influence of Time and Method of Applying Fertilizers in Yield of Cotton When the Time of Planting Remains the Same. (May 2). (1927)

Treatment	Method of Applying Fertilizer	Fert. Applied April 18, Cotton Planted May 2	Fert. Applied May 2, Cotton Planted May 2
No fertilizer		1730	1293
Acid Phos. 180 lbs. per A.	Below the seed	1827	1520
12-4-4 240 lbs. per A.	Below the seed	1843	1584
Acid Phos. 180 lbs. per A.	Broadcast	1810	1439
12-4-4 240 lbs. per A.	Broadcast	1811	1519

Table 9 (c)—Showing the Influence of Method of Fertilizing on the Yield of Cotton Where the Time of Planting and Time of Fertilizing Were the Same Date. (May 2). (1927)

Fertilizer Treatment	Below the Seed	Side of Seed	Broadcast
No. fertilizer	1293	1293	1293
Acid Phos. 180 lbs. per A.	1520	1341	1439
12-4-4 240 lbs. per A.	1584	1503	1519

More work needs to be done before definite conclusions can be drawn as to the best method of applying fertilizers. From the data given in the several preceding tables it will be observed that the soil on which these experiments were conducted is rather productive. Even during the adverse season of 1925, one-half bale of cotton was produced per acre in the fertilizer test using the Oklahoma Triumph No. 44 variety. With a more favorable season almost a bale to the acre was produced. With such yields it is probable that fertilizers will not give big returns until the soil has become less productive than it is at the present time.