

ANNUAL NARRATIVE REPORT

OF

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County Agricultural Agent

PIMA COUNTY

December 1, 1948 to November 30, 1949

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SUMMARY OF ACTIVITIES & RESULTS

COTTON PRODUCTION

Four variety test demonstrations were completed and two more carried through the year. Six sets of cotton fertilization demonstration plots were established with local growers. Increase of improved variety of cotton was arranged with ten growers to plant 2,000 acres. Growers attended 15 meetings for information on cotton production. A total of 284 attended these meetings. This includes both field meetings at result demonstrations and meetings where cotton subjects were only discussed. Charts and graphs were used at two of the meetings. Other methods used in carrying information to cotton growers was news articles, circular letters and radio programs besides individual contacts.

Ten growers who grew the improved variety will make an adequate supply of this seed available for 1950 planting, not only in Pima County, but in other counties. Then too, from data available from variety test results, looks like their incomes this year were increased \$30,000 or more on their lint production alone. Then, if their seed is all sold as planting seed, next year's growers of the improved variety, Acala 44, should make a similar increase in their incomes, but on an acreage about five times as great. The additional income from pure seed should net these growers an estimated \$100,000.

Fertilizer demonstration plots are pointing the way to a sane cotton fertilization program in the County. Growers increased this practice about 30% this year. Practically all of the growers using fertilizer for the first time this year report satisfactory results, and claim that it paid dividends.

Growers did a job on cotton insect control. Practically all growers participated.

SOILS & IRRIGATION

Farmers were advised on soil management problems through discussions at meetings, the press, radio programs and observations of result demonstrations. Gypsum applications to tight soils continued to increase in the County. Farmers continued their land levelling program at an increasing rate.

SMALL GRAINS

Promotion of new improved varieties and use of nitrogen fertilizer has been carried on with Pima County growers through meetings, the press, circular letters, individual contacts, and radio programs. New varieties have been largely adopted and fertilizing practice has increased by growers.

SUMMARY OF ACTIVITIES & RESULTS

LEGUMES

Farmers have been urged to use alfalfa in their crop rotations. Fertilization with phosphates has been demonstrated as a profitable practice. All methods were used in furthering this work.

Fertilization of alfalfa is on the increase, but alfalfa acreage is not.

Peanut variety and fertilizer demonstration plots were carried on with one grower. No results were apparent from peanut fertilization. Two years' variety test shows one variety superior to one now being planted. It showed 36% better yield. All growers are committed to planting new variety.

BEEF CATTLE - RANGE MANAGEMENT

Two extensive range grass re-seeding projects were established with cattlemen. It is too early to report results.

DAIRY

Cooperation with dairymen in carrying out dairy herd improvement work was given by the County Agent's office. Dairymen have increased participation in this work.

GRASSHOPPER CONTROL

Assistance was given to four ranchers in controlling grasshoppers. The Agent cooperated with the State Entomologist and the Bureau of Entomology in making test baitings which lead to baiting by airplane over the Arivica Valley. The J-6 ranch and H.B. Thurbur carried on ground baiting operations. An estimated 80% kill was made on an estimated 12,000 acres.

G.E. Blackledge
Pima County
1949

COTTON

COTTON VARIETIES

University Developed Improved Cotton

University of Arizona cotton breeder, Professor E.H. Pressley, has made great strides toward improving Arizona cotton. The results of his breeding work is especially valuable to growers in Pima County. While the cotton produced in this county during the past several years has been fairly satisfactory from a growers standpoint, it has been pointed out time and time again that there has been some criticism of our cotton by the cotton trade. Two of the objections to our cotton has been low tensile strength and neppiness. Mr. Pressley developed three strains of Acala Cotton all of which are improved in these respects. These three strains are all distinctly different in growing habits and have somewhat different lint characteristics. One of his strains which has been named "Acala 44" has especially strong fiber. The other two strains, "Acala 28" and "Acala 33" have satisfactory tensile strength. All three of the Pressley strains are much more free of neppiness than our old strains of Acala which have been grown here almost exclusively in the past.

There are other desirable characteristics which Mr. Pressley has bred into these three strains of cotton, uniformity of fiber and staple length are very satisfactory in these three strains of cotton.

University Improved Cotton Varieties Show Increased Yields

More cotton per acre is realized by Mr. Pressley's new strains of Acala Cotton. With an improved lint which will be acceptable to the cotton trade bred into a cotton which will at the same time produce more per acre, the new cotton varieties are almost assured of popularity with the growers.

The Extension Service of Pima County planned ways and means of bringing the facts concerning these new varieties to the growers in the most forceful manner. New varieties must necessarily be proved in the locality where they are to be grown. Variety tests grown in different parts of the cotton growing districts of the County serve to test out the adaptability of the new varieties in Pima County. Then too, these variety tests which are grown in Pima County give the growers an opportunity to see the new varieties growing in their own locality and compare them with other varieties and especially old adapted varieties.

COTTON

COTTON VARIETIES

Pima County Agent's Office Demonstrates Value of New Improved Cotton Varieties

When the Plant Breeding Department at the University of Arizona released Professor Pressley's improved strains of Acala Cotton for the first phase of seed increase, the Pima County Agent's Office started plans for cotton variety test demonstrations.

Cotton is by far the major crop in the County bringing in a gross income of about three and one-half million dollars. It gives the highest gross and net return per acre of any of the crops grown in the County. More than half of the cultivated acres in the County is normally devoted to cotton. It appeared to be one of the most worthwhile projects which the Extension Service in Pima County could promote. A systematic program of proving the value of the new varieties locally and at the same time giving the growers the necessary information called for some work on several farms throughout the County. Four variety tests were planned and carried to completion in 1948. Mr. Pat Tucker grew one of the tests in the Marana district. Mr. Don Clark, Manager of the Midvale Farms, grew another of the variety tests. Then Mr. O'Dell Massey and Mr. C.B. Hooper each grew tests in the Sahuarita-Continental district. Each of these four tests were grown under different conditions as to altitude, soil, irrigation, weediness, and even insects and plant diseases. The four variety tests grown in these four different locations gave a very good cross-section of growing conditions in the County.

Individual tests showed real differences in the comparative phases of the different varieties used in the tests. There were eight varieties in each test. Four rows of approximately one-quarter mile were planted for each breed. There were four replications of each breed thus making sixteen rows of each variety. The varieties used in the tests were Mr. Pressley's three new improved varieties - BX-33 or Acala 33, BX-28 or Acala 28 and X-44 or Acala 44. Then there was the two old strains of Acala which had been the adapted varieties here for several years, which are Santan Acala and P-18-C, or the old type California Acala. California's new strain of Acala known as 4-42 was included in the test. New Mexico's 1517 strain of Acala was included in all of the tests. Then a very early maturing strain of cotton known as Paula was also included.

COTTON

COTTON VARIETIES

Pima County Agent's Office Demonstrates Value of New Improved Cotton Varieties

Pat Tucker's test showed the most uniform results with four strains of Acala. In this test, Mr. Pressley's Acala 28 ranked first showing a gain of \$11.32 per acre in net value over the old adapted Acala strain. The Acala 44 showed only a gain in net value of \$4.89 per acre in this test. Paula variety lost \$21.18 per acre when compared with the old adapted Acala strain. The poorest showing was the New Mexico 1517 which lost \$39.37. The new strain of California, Acala 4-42 lost \$14.11 per acre. Acala 33 was very little different in net value than the old strain of Acala Cotton.

Going south of Sahuarita about one mile we find the test grown by Mr. C.B. Hooper. This test was also very uniform in results. Here again Acala 28 was the leader with a net gain in value over the old Acala strain amounting to \$35.29 per acre. Acala 44 ranked second and showed a net gain of \$20.38 per acre. Here again the Paula and New Mexico 1517 proved to be less valuable than the other varieties. Paula lost \$19.31 per acre and New Mexico Acala lost \$13.46 per acre. The other test in the Sahuarita-Continental district which was about six miles north of the C.B. Hooper test showed some very erratic results. The only variety which showed an improvement over the old strain of Acala Cotton was Acala 44 which showed a net increased value of \$17.75, per acre. The Acala 28 was very little different than the old strain of Acala but showed a net loss of \$2.21 per acre. For some reason the Acala 33 fell down on this particular test as did the new strain of California Acala 4-42 which lost \$124.31 per acre, while the Acala 33 was charged up with a loss of \$60.20. The Paula variety lost \$92.39 per acre.

Going over to the Midvale Farms we found even different results when comparing varieties. Here the Acala 44 showed a gain of \$46.00 per acre in net value and the Acala 28 showed \$31.23 and Acala 33 - \$7.58 per acre. Then Paula, the early maturing variety of the lot, showed a gain in net value of \$29.64 per acre.

There is a good reason for the Paula variety showing to some advantage in this particular test on Midvale Farms as it so happened that the test was held in an area where an early maturing strain was particularly advantageous. One of the plant diseases which affects cotton is known as Texas Root Rot. This is a fungus disease and is scattered throughout the irrigated areas of Southern Arizona.

COTTON

COTTON VARIETIES

Pima County Agent's Office Demonstrates Value of New Improved Cotton Varieties

The effect of this fungus on the cotton plant is to kill the plant during the hot season of late July and early August. Naturally, the early maturing varieties will have a larger percentage of the crop set at the time and will produce proportionately more cotton than the later maturing varieties. Since the infestation of Texas Root Rot is only spotted and takes in a very small percentage of the cotton land in the County it is doubtful that this particularly early maturing variety of cotton can be given serious consideration on account of this one particular test. However, it is well to keep in mind that two of Mr. Pressley's new improved varieties held up with a greater net return than did the Paula variety.

The net returns were computed by giving credit to the two products produced at their respective market values. This gave a gross value. Then the net value was determined by subtracting all of the costs incident to harvesting, ginning, and marketing. The costs included picking, weighing, hauling, ginning, packing and ties, yardage insurance and in this case where the cotton went into government loan, hauling to cars and freight to compress or warehouse. These latter charges, that is hauling, freight charges, and processing the government loan was deducted from the loan value as it appears in the tables under "price per pound".

Two of the variety tests were kept separate when picked and then ginned separately. This was done to make bales of cotton of the different varieties available for testing purposes, and to gain some information on the ginning qualities of the cotton. That is, whether it was easy to gin and also the percent of turnout. The growers who went to the trouble to provide extra trailers and kept each variety separate were Mr. Pat Tucker and Mr. O'Dell Massey. Mr. Frank McDuff, manager of the gin at Marana, and Mr. George Durham, manager of the gin at Sahuarita, made special efforts to get a fair ginning test on these two lots of variety test cotton.

Samples from the variety test bales were sent to Eastern mills, cotton laboratories at Texas A & M and to the government classing office at Phoenix. The laboratory reports were valuable in showing favorable results from these two different plantings. Then, too, the favorable report from one of the large Eastern mills on the new improved varieties was very encouraging. Growers also gained some first-hand information from these varieties due to the separate ginning of each individual variety. Then, too, one of the leading cotton merchants became interested in the new varieties at the time of ginning.

COTTON

COTTON VARIETIES

Pima County Agent's Office Demonstrates Value of New Improved Cotton Varieties

Field days were held at the variety test plots. Interest in the new varieties was greatly enhanced by the personal inspection afforded during these field days.

Keeping each variety separate and ginning them separately was something new in variety test work in this state. The credit for handling variety test work this way must certainly go to the two growers, Mr. Pat Tucker and Mr. O'Dell Massey. Then too, the ginners Mr. Frank McDuff and Mr. George Durham were very willing cooperators. Without their cooperation, the project could not have been handled in this manner.

Since the 1948 variety test plots were not completed during the last report year, the completed data from these tests are included in the following pages.

COTTON

COTTON VARIETIES

Pat Tucker

1948 Cotton Variety Test

	<u>1st Pick- ing #Seed Cotton</u>	<u>Gin %</u>	<u># Lint</u>	<u>2nd Pick- ing #Seed Cotton</u>	<u>Gin %</u>	<u># Lint</u>
BX-33	2383	37.2	886.5	139	36.7	51.0
N.M. 1517	2056	33.5	688.8	131	33.0	43.2
BX-28	2383	38.0	905.6	237	37.5	88.8
Santan	2303	38.2	879.7	209	37.7	78.8
4-42	2229	39.4	878.2	163	38.9	63.4
P-18-C	2229	39.6	882.7	176	39.1	68.8
Paula	2596	33.3	864.5	184	30.0	55.2
X-44	2459	38.5	946.7	175	38.0	66.5

Oro Verde Ranch

1948 Cotton Variety Test

BX-33	2011	39.7	798.4	306	39.0	119.3
N.M. 1517	1759	37.5	659.6	314	33.8	106.1
BX-28	1940	41.2	799.3	539	40.6	218.8
Santan	1811	39.8	720.8	439	39.5	173.4
4-42	1794	41.3	740.9	256	39.1	100.1
P-18-C	1786	40.9	730.5	304	39.6	120.4
Paula	1977	36.0	711.7	195	30.0	58.5
X-44	1934	41.6	804.5	277	39.8	110.2

Midvale Farms

1948 Cotton Variety Test

BX-33	1972	37.0	729.6	156	36.5	56.9
N.M. 1517	1779	33.9	603.1	120	33.4	40.1
BX-28	1975	39.6	782.1	282	39.1	110.3
Santan	1928	36.9	711.4	216	36.4	78.6
4-42	1779	37.8	672.5	144	37.3	53.7
P-18-C	1779	38.8	690.3	195	38.3	74.7
Paula	2510	33.0	828.3	228	30.0	68.4
X-44	2204	39.1	861.8	165	38.6	63.7

G.E. Blackledge
Pima County
1949

COTTON

COTTON VARIETIES

Lee Moor Ranch

1948 Cotton Variety Test

	<u>1st Pick- ing & total #Seed cotton</u>	<u>Gin</u>	<u>#Lint</u>	
EX-33	2312	37.2	860.1	There was no 2nd picking
N.M. 1517	2716	33.6	912.6	
EX-28	2800	38.3	1072.4	
Santan	2580	37.0	954.6	
4-42	1608	38.6	620.7	
P-18-C	2784	38.1	1060.7	
Paula	2332	33.6	783.6	
X-44	2872	39.1	1123.0	

COTTON

COTTON VARIETIES

1st PICKING - 1948 COTTON VARIETY TESTS - GROSS VALUES

PAT TUCKER

<u>Variety</u>	<u>#Lint Per A.</u>	<u>Grade Staple</u>	<u>Price Per #</u>	<u>Value Lint</u>	<u>#Seed Per A.</u>	<u>Value Seed</u>	<u>Total Per A.</u>
BX-33	886.5	G.M. 1-1/8	33.97	300.97	1437	43.11	344.03
N.M. 1517	688.8	G.M. 1-5/32	36.02	248.18	1314	39.42	287.60
BX-28	905.6	G.M. 1-1/8	33.97	307.77	1417	42.51	350.28
Santan	879.7	G.M. 1-3/32	32.72	287.94	1366	40.98	328.92
4-42	878.2	St.M. 1-3/32	32.62	286.40	1297	38.91	325.31
P-18-C	882.7	G.M. 1-1/8	33.97	299.95	1292	38.76	338.71
Paula	864.5	St.M. 1-3/32	32.62	281.84	1732	51.96	333.80
X-44	946.7	St.M. 1-3/32	32.62	308.91	1452	43.56	352.47

C.B. Hooper - Oro Verde Ranch

BX-33	798.4	St.M. 1-3/32	32.62	260.31	1164	34.92	295.23
N.M. 1517	659.6	St.M. 1-1/8	33.87	223.54	1055	31.65	255.19
BX-28	799.3	St.M. 1-3/32	32.62	260.63	1095	32.85	293.48
Santan	720.8	St.M. 1-3/32	32.62	235.19	1046	31.38	266.57
4-42	740.9	St.M. 1-3/32	32.62	241.71	1013	30.39	272.10
P-18-C	730.5	St.M. 1-3/32	32.62	238.13	975	29.25	267.38
Paula	711.7	M. 1-3/32	32.12	228.69	1214	36.42	265.11
X-44	804.5	St.M. 1-3/32	32.62	262.26	1085	32.55	294.81

Dan Clarke - Midvale Farms

BX-33	729.6	St.M. 1-3/32	32.62	238.13	1192	35.76	273.89
N.M. 1517	603.1	St.M. 1-1/8	33.87	204.24	1129	33.87	238.11
BX-28	782.1	St.M. 1-3/32	32.62	255.09	1145	34.35	289.44
Santan	711.4	St.M. 1-3/32	32.62	231.93	1168	35.04	266.97
4-42	672.5	St.M. 1-3/32	32.62	219.21	1063	31.89	251.10
P-18-C	690.3	St.M. 1-3/32	32.62	225.08	1045	31.35	256.43
Paula	828.3	M. 1-3/32	32.12	265.95	1615	48.45	314.40
X-44	861.8	St.M. 1-3/32	32.62	281.18	1288	38.64	319.82

O'Dell Massey - Lee Moor Ranch

BX-33	860.1	M. 1-3/32	32.12	276.23	1394	41.82	318.05
N.M. 1517	912.6	M. 1-1/8	33.27	303.75	1732	51.96	355.71
BX-28	1072.4	M. 1-3/32	32.12	344.33	1659	49.77	394.10
Santan	954.6	M. 1-3/32	32.12	306.75	1560	46.80	353.55
4-42	620.7	M. 1-3/32	32.12	199.46	948	28.44	227.90
P-18-C	1060.7	St.M. 1-3/32	32.62	346.10	1654	49.62	395.72
Paula	783.6	S.L.M. 1-3/32	30.87	242.02	1486	44.58	286.60
X-44	1123.0	St.M. 1-3/32	32.62	366.32	1680	50.40	416.72

COTTON

COTTON VARIETIES

1st PICKING-1948 COTTON VARIETY TESTS-GROSS & NET VALUES

PAT TUCKER

<u>Variety</u>	<u>Total Gross Value Per Acre</u>	<u>Harvesting & Ginning Costs Per Acre</u>	<u>Net Value Per Acre</u>
BX-33	344.08	88.17	255.91
N.M. 1517	287.60	76.07	220.53
BX-28	350.28	88.17	262.11
Santan	328.92	85.21	243.71
4-42	325.31	82.47	242.84
P-18-C	338.71	82.47	256.24
Paula	333.80	96.05	237.75
X-44	352.47	90.98	261.49

ORO VERDE RANCH - C.B. HOOPER

BX-33	295.23	74.41	220.82
N.M. 1517	255.19	65.08	190.11
BX-28	293.48	71.78	221.70
Santan	266.57	67.01	199.56
4-42	272.10	66.38	205.72
P-18-C	267.38	66.08	201.30
Paula	265.11	73.15	191.96
X-44	294.81	71.56	223.25

MIDVALE FARMS - DAN CLARKE

BX-33	273.89	72.96	200.93
N.M. 1517	238.11	65.82	172.29
BX-28	289.44	73.07	216.37
Santan	266.97	71.34	195.63
4-42	251.10	65.82	185.28
P-18-C	256.43	65.82	190.61
Paula	314.40	92.87	221.53
X-44	319.82	81.55	238.27

LEE MOOR RANCH - O'DELL MASSEY

BX-33	318.05	85.54	232.51
N.M. 1517	355.71	100.49	255.22
BX-28	394.10	103.60	290.50
Santan	353.55	95.46	258.09
4-42	227.90	59.50	168.40
P-18-C	395.72	103.01	292.71
Paula	286.60	86.28	200.32
X-44	416.72	106.26	310.46

COTTON

COTTON VARIETIES

2nd PICKING - 1948 COTTON VARIETY TESTS - GROSS & NET VALUES

PAT TUCKER

Variety	Total Gross Value			Harvesting & Ginning Costs Per Acre	Net Value Per Acre
	Per Acre				
	<u>Lint</u>	<u>Seed</u>	<u>Total</u>		
BX-33	\$10.20	2.55	\$12.75	\$ 6.19	\$ 6.56
N.M. 1517	8.64	2.55	11.19	5.83	5.36
BX-28	17.76	7.26	25.02	10.55	14.47
Santan	15.76	3.75	19.51	9.30	10.21
4-42	12.68	2.88	15.56	7.25	8.31
P-18-C	13.76	3.09	16.85	7.83	9.02
Paula	11.04	3.48	14.52	8.19	6.33
X-44	13.30	3.15	16.45	7.79	8.66

ORO VERDE RANCH - C.B. HOOPER

BX-33	23.86	5.40	29.26	11.32	17.94
N.M. 1517	21.22	6.27	27.49	11.62	15.87
BX-28	43.76	9.21	52.97	19.94	33.03
Santan	35.47	7.56	43.03	16.24	26.79
4-42	20.02	4.50	24.70	9.47	15.23
P-18-C	24.08	5.31	29.39	11.25	18.14
Paula	11.70	3.69	15.39	7.22	8.17
X-44	22.04	4.80	26.84	10.27	16.57

MIDVALE FARMS - DAN CLARKE

BX-33	11.38	2.97	14.35	5.77	8.58
N.M. 1517	8.02	2.40	10.42	4.44	5.98
BX-28	22.06	5.16	27.22	10.43	16.79
Santan	15.72	4.11	19.83	7.99	11.84
4-42	10.74	2.70	13.44	5.33	8.11
P-18-C	14.94	3.60	18.54	7.22	11.32
Paula	13.68	4.80	18.48	8.44	10.04
X-44	12.74	3.03	15.77	6.11	9.66

COTTON

COTTON VARIETIES

1948 COTTON VARIETY TESTS - NET VALUE COMPARISONS

PAT TUCKER

<u>Variety</u>	<u>Net Value Per Acre 1st Picking</u>	<u>Net Value Per Acre 2nd Picking</u>	<u>Net Value Per Acre Total Crop</u>	<u>Gain or Loss Over P-18-C</u>	<u>Rank</u>
BX-33	\$255.91	\$ 6.56	\$262.47	\$ -2.79	4
N.M. 1517	220.53	5.36	225.89	-39.37	8
BX-28	262.11	14.47	276.58	✓11.32	1
Santan	243.71	10.21	253.92	-11.34	5
4-42	242.84	8.31	251.15	-14.11	6
P-18-C	256.24	9.02	265.26		3
Paula	237.75	6.33	244.08	-21.18	7
X-44	261.49	8.66	270.15	✓ 4.89	2

ORO VERDE RANCH - C.B. HOOPER

BX-33	220.82	17.94	238.76	✓19.32	3
N.M. 1517	190.11	15.87	205.98	-13.46	7
BX-28	221.70	33.03	254.73	✓35.29	1
Santana	199.56	26.79	226.35	✓ 6.91	4
4-42	205.72	15.23	220.95	✓ 1.51	5
P-18-C	201.30	18.14	219.44		6
Paula	191.96	8.17	200.13	-19.31	8
X-44	223.25	16.57	239.82	✓20.38	2

MIDVALE FARMS - DAN CLARKE

BX-33	200.93	8.58	209.51	✓ 7.58	4
N.M. 1517	172.29	5.98	178.27	-23.66	8
BX-28	216.37	16.79	233.16	✓31.23	2
Santan	195.63	11.84	207.47	✓ 5.54	5
4-42	185.28	8.11	193.39	- 8.54	7
P-18-C	190.61	11.32	201.93		6
Paula	221.53	10.04	231.57	✓29.64	3
X-44	238.27	9.66	247.93	✓46.00	1

LEE MOOR RANCH - O'DELL MASSEY

BX-33	232.51		232.51	-60.20	6
N.M. 1517	255.22		255.22	-37.49	5
BX-28	290.50		290.50	- 2.21	3
Santan	258.09		258.09	-34.62	4
4-42	168.40		168.40	-124.31	8
P-18-C	292.71		292.71		2
Paula	200.32		200.32	-92.39	7
X-44	310.46		310.46	✓17.75	1

COTTON

COTTON VARIETIES

1948 COTTON VARIETY TESTS

COMPARATIVE DATA

<u>Variety</u>	<u>Tucker Gain or Loss</u>	<u>Rank</u>	<u>Hooper Gain or Loss</u>	<u>Rank</u>	<u>Clarke Gain or Loss</u>	<u>Rank</u>	<u>Massey Gain or Loss</u>	<u>Rank</u>
BX-33	\$- 2.79	4	\$/19.32	3	\$/ 7.58	4	\$/-60.20	6
N.M. 1517	-39.37	8	-13.46	7	-23.66	8	-37.49	5
BX-28	/11.32	1	/35.29	1	/31.23	2	- 2.21	3
Santan	-11.34	5	/ 6.91	4	/ 5.54	5	-34.62	4
4-42	-14.11	6	/ 1.51	5	- 8.54	7	-124.31	8
P-18-C		3		6		6		2
Paula	-21.18	7	-19.31	8	/29.64	3	-92.39	7
X-44	/ 4.89	2	/20.38	2	/46.00	1	/17.75	1

COTTON

COTTON VARIETIES

Increase of Improved Seed Underway

Professor E.H. Pressley of the University of Arizona's Plant Breeding Department gave Pima County growers the opportunity of planting a new improved variety of cotton. A brisk demand for the new improved cotton resulted from the information that the growers received in 1948. Results of the four variety tests conducted in Pima County were assembled and given to cotton growers this year. Variety test information was presented at meetings held in Marana and Sahuarita in February of this year. Mimeographed material was also prepared on this subject for the convenience of local growers. News articles and radio broadcasts also were used to forward information on cotton varieties.

Enough Breeders seed of the Acala 44 variety was released to the University of Arizona's Agronomy Department to make an 80 acre planting in 1948. Mr. Dan Clarke, manager of Midvale Farms, planted the small lot of Breeders seed in a well isolated field which qualified it as a Foundation Field. At least one mile isolation from other cotton, and land that did not grow cotton the previous year were the two important requirements. Mixing seed of other varieties and cross-pollinization with other varieties must be prevented in any pure seed program, and the nearer the Breeders seed is the more important this precaution becomes. Mixing of seed at the gin must be guarded against. Mr. Clarke had the entire Foundation Crop of Acala 44 picked within a period of one week. Mr. Durham stored all of the excess cotton that couldn't be held in available trailers, in the house. The cotton was ginned on two different Sundays. All seed has to be removed from the gin before ginning pure cotton seed. This takes several hours, and ties up the gin and its crew.

Twenty-five tons of the Acala 44 Foundation Seed was saved and tagged. The County Agent had to improvise tags since there were no tags for the new varieties at that time. The next step was to locate growers who had eligible land for increasing this 25 ton lot of improved seed on the basis of registered and certified seed. The mechanics of allotting the seed was delegated to the Arizona Crop Improvement Association. Locating growers with eligible land was accomplished by the County Agent and Mr. W.I. Thomas of the University of Arizona Agronomy Department. Growers with eligible land were rather eager to take advantage of the improved variety of cotton. Both registered and certified fields were included in the 1949 seed increase program.

COTTON

COTTON VARIETIES

INCREASE OF IMPROVED SEED UNDERWAY

Field requirements are more lenient for certified seed than for registered seed. One mile from other varieties of cotton is required for the registered grade and one-half mile isolation for the certified grade. Registered seed, like Foundation seed must be grown on land that did not produce cotton of another variety the previous year, while the certified grade can be grown on land that had one of the old Acala varieties grown on it the previous year provided the land is plowed six inches or more in depth. Then too, the certified grade can be produced from a planting of registered seed, whereas it takes Foundation seed to produce registered seed.

Due to isolation requirements for registered seed, several fields were planted for production of certified seed so as to protect the isolation requirements of registered fields. This system of increasing Acala 44 seed had to be used in three of the four communities where plantings were made.

Acala 44 Growers Make Record Yields

Two bales of cotton per acre or more is the yield that most of the Acala 44 growers are reporting for their 1949 crop. Only one grower among the eleven pure seed growers will miss this high yield, and that grower will not miss the two bale mark very far. It looks like an average yield of about two bales of lint cotton per acre for these eleven growers. These growers are well distributed over the cotton districts of the County, from Marana 24 miles west of Tucson to south of Continental about 29 miles south of Tucson. This year's planting of Acala went a long way toward proving its adaptability to the variable cotton growing conditions in Pima County.

Cotton Trade Favors New Variety

Buyers are bidding for the Acala 44 lint. While a large portion of the old type of Acala Cotton is going into the government loan, the new strain is being purchased by local cotton firms and placed in regular trade channels. Buyers report that the textile mills are receiving this cotton favorably. One of the mills of a major tire manufacturer that used some of the Acala 44 cotton from Midvale Farms 1948 Foundation Field, was so well pleased with the lint that they were interested in using this cotton exclusively.

COTTON

COTTON VARIETIES

Cotton Trade Favors New Variety

Pat Tucker's variety test helped promote early mill reaction on the new varieties. The eight different varieties grown in his variety test plots were ginned out separately at the Marana gin one Sunday. Mr. Frank McDuff, the gin manager, invited Mr. Peterson of Phoenix, one of the State's leading cotton merchants, to come to Marana and look the variety test deal over. He was immediately interested in all three of Mr. Pressley's varieties after inspecting samples from the eight bales.

After looking over the yield data and ginning percentages, he decided to send samples to a large mill in the East and also another set of samples to the cotton laboratory at Texas A & M. He promised at that time to try to buy at least part of the cotton from Midvale Farms Acala 44 Foundation Field. When he received the laboratory reports from the Eastern mill and Texas A & M, his interest mounted. He purchased the entire Acala 44 crop at a premium of two cents per pound. This was the beginning of gaining mill reaction. The Peterson firm followed the lot of cotton thru the mills and received their opinion on it. The mill reaction was favorable and from all appearances, the same reaction is being maintained on this year's crop.

Variety Testing a Continuous Process

Different varieties of cotton may not produce in the same order each year. One variety that is early maturing may out-yield a later maturing variety one year when weather conditions are right for the early maturing variety. An early frost for example, would be unfavorable for Acala 28 which is a late maturing variety. On the other hand, Acala 44 is an earlier maturing variety, and would have a comparative advantage during a year when a killing frost comes early. Plant diseases such as Wilt, Texas Root Rot, and Rust are more prevalent and severe some years than others. Different varieties have different degrees of resistancy and tolerance to plant diseases. Then too, our Plant Breeders, such as Mr. Pressley, are continuously making improvements on different varieties of cotton. Certainly, these new improvements should be tested out under local field conditions so that any measurable improvements that would help the cotton growers to more success can be put into action.

Two cotton variety tests were conducted this year. Mr. O'Dell Massey grew one test on the Lee Moor Ranch in the Sahuarita district, and Mr. Pat Tucker grew the other in the Marana district.

COTTON

COTTON VARIETIES

Variety Testing a Continuous Process

Mr. Massey expanded his variety test planting so as to have 32 rows or approximately two acres of each variety. His test was set up in four row plots with eight replications for each variety. This test is the most extensive of any variety test of cotton on record in Arizona. The large scope of this test not only gives more accurate data, but affords the opportunity of ginning out each variety separately on at least two pickings.

Only six varieties were used in this year's variety test. These included Acala 28, Acala 33, Acala 44, Santan, New México Acala (1517), and Meselia Valley. Each variety was kept separate and ginned separately. Two bales were ginned from each of the varieties, except the Acala 44, which ginned out three bales.

A heavy frost occurred on the Lee Moor Ranch the morning of October 11th. This is over three weeks earlier than the normal frost date. Acala 28 suffered from the abnormally early frost. Acala 44 did fine with the early frost. There will be a second picking on this test.

Pat Tucker's variety test included Acala 28, Acala 33, Acala 44, California Acala (4-42) Santan, and Meselia Valley. This test had only two row plots with four replications for each variety. Samples from each variety were obtained for laboratory use which was mainly estimating ginning percentages.

The early killing frost did not occur in the Marana district. The Acala 28 variety gave the highest yield in Mr. Tucker's test on the basis of first and second pickings. A third picking will likely be necessary.

Additional New Varieties Tested

The Bureau of Plant Industry's U.S. Field Station at Sacaton, Arizona released an improved variety of long staple cotton this year. Mr. Robert Poebles, Superintendent of that station developed this new cotton known as Pima 32. A planting of this new long staple variety was made adjacent to Pat Tucker's variety test. S X P, our old adopted long staple variety was planted with it for comparison purposes. Another short staple variety was also planted along with both Massey's and Tucker's variety tests. This is an upland type designated as A X D. It is an Acala crossed with Durango, and was also developed at the Sacaton Field Station. Yield data on these varieties is being obtained, although there were no replicate plantings made.

COTTON

COTTON VARIETIES

Growers' Interest in Variety Tests Continues

Field days were held to further acquaint growers with the different cotton varieties. Growers were interested mainly in the Acala 44 since it is the best variety of which there is available planting seed for 1950. However, several growers became interested in Acala 28 when looking over Pat Tucker's test plots. The yield data for the first two pickings further interested them. Acala 28 planting seed should be available for 1951 planting, and it is possible that a switch to it might be feasible at that time, if favorable mill reaction to it has been obtained.

The 1949 cotton variety test harvest data is not complete, but the ranking of varieties from the one picking on the Massey test and the two pickings on the Tucker test will probably remain about the same after the harvest is completed. Harvest data for these tests follow.

COTTON

COTTON VARIETIES

1949 - COTTON VARIETY TEST

LEE MOOR RANCH

First Picking

October 10-11, 1949

<u>Replication</u>	<u>Acala 44</u>	<u>Santan</u>	<u>Acala 33</u>	<u>Acala 28</u>	<u>M.V.</u>	<u>(1517)</u>
1	504	407	399	293	374	380
2	462	381	338	294	335	368
3	452	336	360	278	375	360
4	422	369	369	330	402	381
5	493	394	406	326	393	446
6	446	339	332	358	409	428
7	501	365	437	330	357	426
8	<u>414</u>	<u>308</u>	<u>338</u>	<u>258</u>	<u>387</u>	<u>359</u>
Total	3694	2899	2979	2467	3032	3148
Y.P. Acre	1847	1449	1489	1233	1516	1574
Gin %	38.63	40.12	35.86	37.05	31.69	34.72
Lint Per A.	713	581	534	457	480	546

COTTON

COTTON VARIETIES

PAT TUCKER - 1949 COTTON VARIETY TEST

First Picking - September 20 to 23

<u>Variety</u>	<u>#Seed Cotton per acre 1st Replication</u>	<u>#Seed Cotton per acre 2nd Replication</u>	<u>#Seed Cotton per acre 3rd Replication</u>	<u>#Seed Cotton per acre 4th Replication</u>
Meselia Valley	1664	1860	1640	1455
(4-42)	1514	1790	1575	1175
(28)	1870	1725	1525	1400
Santan	1605	1640	1370	1255
(44)	1910	1630	1475*	1460
(33)	1690	1840	1450*	1500

*Acala 44 and Acala 33 in 3rd replication had an approximate reduction of 20% in yield due to heavy Johnson grass growth, which eliminated the stand of cotton. Adjustments should be made for these two varieties in this replication.

AVERAGE YIELD OF REPLICATIONS

<u>Variety</u>	<u>Average Yield (1&2) Replications</u>	<u>Average Yield (3&4) Replications</u>	<u>Average Yield all Replications</u>
Meselia Valley	1762	1547	1655
(4-42)	1652	1375	1513
(28)	1797	1462	1630
Santan	1622	1312	1467
(44)	1770	1467	1618
(33)	1765	1475	1620

One replication on 3 varieties adjacent to 4th replication

(A X D)	1365
Pima 32	530
(S X P)	520

COTTON

COTTON VARIETIES

PAT TUCKER VARIETY TEST

Second Picking

November 14, 1949

<u>Variety</u>	<u>#Seed Cotton per acre 1st Replication</u>	<u>#Seed Cotton per acre 2nd Replication</u>	<u>#Seed Cotton per acre 3rd Replication</u>	<u>#Seed Cotton per acre 4th Replication</u>
M.V.	260	405	265	305
(4-42)	345	375	395	425
Acala 28	650	620	515	410
Santan	490	485	420	330
Acala 44	425	430	485	305
Acala 33	420	340	250	375

*Acala 44 and Acala 33 had a disadvantage in 3rd and 4th replications due to some solid grass plots falling heavily in those particular rows.

COTTON

COTTON VARIETIES

AVERAGE YIELD OF REPLICATIONS

Second Picking

<u>Variety</u>	<u>Average Yield 1&2 Replications #Seed Cotton Per Acre</u>	<u>Average Yield 3&4 Replications #Seed Cotton Per Acre</u>	<u>Average Yield All Replications #Seed Cotton Per Acre</u>
M.V.	332	285	308
(4-42)	360	410	385
Acala 28	635	462	548
Santan	487	375	431
Acala 44	428	395	411
Acala 33	380	313	346

Mr. Pressley and others looked over this variety test, and it was decided that the first two replications should be used in judging the comparative values of the varieties in the test. This decision was made in lieu of solid Johnson grass areas which effected yields much greater on a couple of varieties than on the other four varieties.

Three other varieties of cotton were planted adjacent to the variety test plots. Harvest data was obtained from these plantings which were not replicated.

<u>Variety</u>	<u>1st Picking #Seed Cotton Per Acre</u>	<u>2nd Picking #Seed Cotton Per Acre</u>	<u>Total 1&2 Pickings #Seed Cotton Per Acre</u>
(A X D)	1365	445	1810
(S X P)	520	900	1420
Pima 32	530	930	1460

COTTON

COTTON FERTILIZATION

Fertilizers Increase Cotton Yields

According to results of fertilizer tests the use of commercial fertilizers on cotton has paid off in a big way. This is not true in all cases, and this fact should be kept in mind at all times. Tests carried on in Pima County under the direction of the County Agent during the past four years reveals that nitrogen bearing fertilizers do a splendid job of increasing cotton yields on the lighter type soils. On the other hand, the same fertilizers applied on heavy soils gave disappointing results. Results of the tests do not prove that fertilizer on all heavy soils will fail to increase cotton yields, but only points out that at least on soils used in these tests, the heavy soils did not respond. Heavy soils generally just contain more plant food in the first place. Then too, these soils hold plant food better than the light soils.

Cotton Growers Using More Fertilizer

Pima County cotton growers used a sizable quantity of commercial fertilizer for the first time this year. Approximately 50% of the cotton acreage received some form of commercial fertilizer this year. No doubt, some of it was applied on heavy land where it did not pay. However, by far and large, fertilizer applications were made on the lighter soils, and most of the growers who adopted the practice are pleased.

County Agent Points Way to Fertilizer Use

Pima County cotton growers have had opportunities of personally seeing fertilizer results on cotton during the past four years. Twelve sets of demonstration plots have been set up and conducted by the County Agent's office cooperating with Pima County growers. Yield records on the plots were personally obtained by the County Agent. These records were compiled, analyzed, and made available to all growers. Besides mimeographed material and news articles, reports on fertilizer test results were presented at meetings and on radio broadcasts.

Field meetings at the demonstration plots were held at different stages of maturity. Inspecting the plots after the first picking had been made gave growers the best opportunity to see fertilizer response on cotton. First picking records were presented at these field meetings. Records for each fertilized plot and check plot clarified the appearance of empty burrs on the plants of the different plots. Then too, the number, size and stage of maturity of the remaining bolls gave a fair index on what final results should be expected.

COTTON

COTTON FERTILIZATION

County Agent Points Way to Fertilizer Use

It is said that "seeing is believing". Extension Service workers believe that old saying or they wouldn't spend so much time and effort in preparing for, and conducting meetings at result demonstrations. Occasionally it is difficult to show growers the practiced results that are being obtained from demonstration plots. The reaction of growers at a meeting on the Dale Gladden Farm is an example of such a situation.

The first series of cotton fertilizer plots inspected on Mr. Gladden's place consisted of seventeen plots 100 feet long. Five of the plots were untreated or check plots. The remaining plots were all well fertilized. However, some were fertilized twice as heavy as others. When looking at these plots, a check plot would be much smaller plants, less yield than the adjacent fertilized plot. Then the next plot to the first fertilized plot which received twice as much fertilizer showed still larger plants and higher yield. Then the next plot was back again to the lighter fertilizer application, with smaller plants and less yield. In other words, the applications were placed so as to show a perfect fertilizer response. Records which the growers had at the meeting showed that plot 10 was a check and the yield was 2365 pounds of seed per acre; plot 11 received 48 pounds nitrogen and 60 pounds of phosphoric acid and the yield was 2580 pounds of seed cotton per acre; plot 12 received 96 pounds of nitrogen and 120 pounds of phosphoric acid and the yield was 3356 pounds of seed cotton per acre. Then plot 13 was fertilized the same as plot 11, and the yield dropped down to 2840 pounds of seed cotton per acre. The next plot number 14 was another unfertilized or check plot and the yield dropped on down to 2324 pounds per acre. This sort of picture immediately led some of the growers to conclude that the high rate of nitrogen and phosphate fertilizer was most desirable. This particular set of plots were on the upper end of the field, and surface applications had been in the furrows between the rows.

From these plots, the meeting proceeded to a series of 40 plots which ran five plots of four rows each in width and eight plots long. The fertilizer had been applied in a band, six inches deep and ten inches to the side of the row on these plots. Starting out on the upper end of the plots, the response from fertilizer was about on a par with the first series of plots, but further on down in the field, the results became erratic. In some cases, the low rates of fertilizer was apparently doing a better job than the high rates, and in some cases it was even revealed that an adjacent check plot was out-yielding a heavily fertilized plot. These variable results stringing out over the 40 plots was quite confusing to some of the growers. Several assumptions were hagered by

COTTON

COTTON FERTILIZATION

County Agent Points Way to Fertilizer Use (continued)

different growers on the reasons for the variable results. Some expressed a belief that it was a difference in slope of the land, and that the areas where the fertilizers showed no response was on steep land that did not have water penetration. Others believed that it was a difference in soil, while still others couldn't offer an explanation. A suitable explanation wasn't given by the County Agent. It could only be pointed out that it was necessary to take an average of all the replicated plots of each treatment and base an opinion on the average yields. It was also pointed out that when a field is fertilized, the results are based on the average or gross production of the entire field and not just certain plots or areas in that field. It would be mechanically difficult to fertilize spots or areas in a field that would use fertilizer at a profit and at the same time leave out the areas that would not pay off. Then too, it would be very difficult, if not impossible, to pick these areas unless there was strips of light soil running in large enough areas and fairly regular in shape.

Soil Analyses Not the Answer

The proposition of formulating a cotton fertilization program on soil analysis alone was one of the subjects brought to the growers' attention. Results of cotton yields as compared to soil analyses, and fertilizer treatments were studied in an attempt to determine the feasibility of making recommendations on fertilizer applications on cotton. One hundred soil samples taken from one series of plots on the Lee Moor Ranch where phosphates and nitrates in different combinations and phosphates alone and nitrogen alone were used in fertilizer tests, failed to correlate yields with the soil analyses from corresponding plots. Graphs were prepared showing the response of cotton yields as related to the available PO_4 and NO_3 content of the soil samples taken from corresponding plots before fertilizer applications.

Then the same areas where samples were taken before fertilization were sampled about one week after the next two irrigations, which happened to be approximately one month apart. Analyses of these samples taken in the middle of the growing season revealed a remarkable increase in nitrogen and available phosphate content. Samples from plots that showed merely traces of available phosphates and nitrates in June showed very satisfactory levels of these plant foods in July and August. This was true for all plots regardless of whether the June samples were high, low or just average.

COTTON

COTTON FERTILIZATION

Soil Analyses Not the Answer (continued)

All samples showed increases in the root zone regardless of whether the plots were fertilized or left as checks.

It was pointed out to growers that this particular demonstration was on fairly heavy soil, and that soil analyses would come nearer telling the story on fertilizer needs on light soils. However, the real test is the field test, and farmers have been urged to carry some kind of tests on their own farms. Even when a grower is sold on the use of cotton fertilizer, he has been advised to leave out a couple or four rows here and there without fertilizer so as to check his yield increases, and in a measure check his return for the money invested in fertilizer. Such tests were made on about 30% of the acreage fertilized this year.

1949 Fertilizer Plots Normal

First picking results of 1949 Cotton Fertilizer Demonstration Plots appear to be in line with past years. The worthwhile results appear on the plots with light soils. The heavy soils again failed to react favorably to increase cotton yields where fertilizers were applied.

Some plots with heavy soil were chosen for demonstrations, while others were chosen for favoring fertilizer response and were on lighter soils. There were only two extensive sets of demonstration plots this year, one in the Sahuarita district and one in the Marana district.

Mr. McGeorge, head of the Agricultural Chemistry Department at the University of Arizona, proposed a randomized plot test in cooperation with the Pima County Agent's office. His proposition was accepted and the project was carried on with Mr. Dale Gladden of Marana. Soil analyses from the Gladden plots showed a very low level of available phosphates and a satisfactory level of nitrogen. This indicates that the cotton plants should respond to phosphates and not to nitrogen.

Results from the first picking, which took the bulk of the crop, showed a marked response to nitrogen and a lesser response to phosphates. In this case, however, it would appear that the investment in phosphates when used with nitrogen fertilizer could be considered profitable. Results indicate that the best return per dollar invested was from the nitrogen in this particular test.

COTTON

COTTON FERTILIZATION

1949 Fertilizer Plots Normal

Another series of plots on Dale Gladden's place showed comparative results to the randomized plots. Higher rates were used on this series of tests. Then too, the method of application was different. A surface application between the rows was made on these plots, while a band placement six inches deep and ten inches to the side of the row was used on the randomized plots.

The other series of demonstration plots was on the Lee Moor Ranch. Mr. Massey, the ranch manager, and the County Agent wanted to make a test on fairly heavy soil since response to fertilizer on the light soils on the ranch had been demonstrated and doubtful results had been obtained on heavy soil. Mr. Massey proposed that the plots be run in conjunction with the variety test set-up. There were eight replications of variety plots. He proposed fertilizing alternate replications thus making 24 rows of fertilized cotton alternating with 24 row checks. The soil was on the heavy side so the proposition was well founded. The scope of the test was also fair enough. Four 24 row fertilized plots alternated with four 24 row check plots. Another feature which was considered was varietal difference in fertilizer response which might occur among the different varieties used in the variety test plots.

The following tables present the detailed harvest data for all cotton fertilization demonstration plots from which data was obtained this year.

COTTON

DALE GIADDEN - RANDOMIZED FERTILIZER TEST

Placement - side band
 in cooperation with
 Agricultural Chemistry Department

Plot #	N	P	Lb. Seed Cotton per acre	Plot #	N	P	Lb. Seed Cotton per acre	Plot #	N	P	Lb. Seed Cotton per acre	Plot #	N	P	Lb. Seed Cotton per acre
<u>1</u>	70	75	2774	<u>2</u>	20	25	2064	<u>3</u>	0	75	2322	<u>4</u>	check	check	2000
<u>16</u>	check		2000	<u>15</u>	20	0	2064	<u>14</u>	20	75	2258	<u>13</u>	70	75	1936
<u>17</u>	0	75	2258	<u>18</u>	70	25	2322	<u>19</u>	0	25	2064	<u>20</u>	check	check	2064
<u>32</u>	0	25	2128	<u>31</u>	check		2000	<u>30</u>	20	25	2258	<u>29</u>	70	25	1612
<u>33</u>	20	75	2386	<u>34</u>	70	0	2194	<u>35</u>	70	0	2194	<u>36</u>	20	0	2000

<u>5</u>	70	25	2322	<u>6</u>	20	0	2452	<u>7</u>	0	75	2128	<u>8</u>	20	0	1806
<u>12</u>	check		2258	<u>11</u>	20	25	2194	<u>10</u>	70 25		2128	<u>9</u>	70	0	1612
<u>21</u>	0	75	2128	<u>22</u>	0	25	2064	<u>23</u>	check		2064	<u>24</u>	check	check	1870
<u>28</u>	check		2322	<u>27</u>	20	75	2258	<u>26</u>	20	75	1936	<u>25</u>	0	25	1936
<u>37</u>	70	75	2644	<u>38</u>	70	0	2516	<u>39</u>	20	25	2000	<u>40</u>	70	75	2194

COTTON

COTTON FERTILIZATION

COTTON FERTILIZATION DEMONSTRATION

DALE GLADDEN

Surface Application

First Picking

<u>PLOT</u>	<u>LBS. SEED COTTON PER ACRE</u>
1 - A check	2330
2 - A (56-30)	3096 ✓
3 - A (50-0)	2968 ✓
4 - A check	1979
5 - A (50-0)	2710
6 - A check	2516
7 - A (48-39)	3224
8 - A (96-78)	3096
9 - A (48-39)	2580
10 - A check	2365
11 - A (48-60)	2580
12 - A (96-120)	3356
13 - A (48-60)	2840
14 - A check	2324
15 - A (50-0)	3262
16 - A (50-0)	2592
17 - A (100-0)	2840

COTTON

COTTON FERTILIZATION

COTTON FERTILIZATION DEMONSTRATION - 1949
LEE MOOR RANCH

Variety	Rep. No.	Check Lb. Seed Cotton	Rep. No.	188# Am. Nit. Per Acre Lb Seed Cotton	Loss Lb. Seed Cotton	Gain Lbs. Seed Cotton
<u>X - 44</u>	1	504	2	462	42	
	3	452	4	422	30	
	5	493	6	446	47	
	7	501	8	414	87	
	Total X-44	1950		1744	206	
<u>SANTAN</u>	1	407	2	381	26	
	3	336	4	369		33
	5	394	6	339	55	
	7	365	8	308	57	
	Total Santan	1502		1397	105	
<u>BX - 33</u>	1	399	2	338	61	
	3	360	4	369		9
	5	406	6	332	74	
	7	437	8	338	99	
	Total B X - 33	1602		1377	225	
<u>BX - 28</u>	1	293	2	294		1
	3	278	4	330		52
	5	326	6	358		32
	7	330	8	258	72	
	Total BX - 28	1227		1240	72	13
<u>MESELIA VALLEY</u>	1	374	2	335	39	
	3	375	4	402		27
	5	393	6	409		16
	7	357	8	387		30
	Total MESELIA VALLEY	1499		1533		34
<u>N.M. 1517</u>	1	380	2	368	12	
	3	360	4	381		21
	5	446	6	428	18	
	7	426	8	359	67	
	Total N.M. 1517	1612		1536	76	

COTTON

COTTON FERTILIZATION

COTTON FERTILIZATION DEMONSTRATION (continued)

The first picking showed a net loss for the use of Amonium Nitrate on all varieties except BX 28 and the Meselia Valley. The difference in yield between the plots receiving 188# per acre of Amonium Nitrate and the check plots was not significant. When averaging the fertilized plots and comparing the yield with the average check plot, a net loss of about 6% is figured for the fertilized plots.

SUMMARY OF FERTILIZATION DEMONSTRATION

First Picking

Series	<u>Check</u> #Seed Cot. per acre	188#Am.Nit. #Seed Cot. per acre	Loss	Gain
1	1178	1089	89	
2	1080	1136		56
3	1229	1156	73	
4	<u>1208</u>	<u>1032</u>	<u>176</u>	<u> </u>
Totals	4695	4413	338	56

The average net loss is 70 pounds per acre or about 6% for first picking.

COTTON

COTTON FERTILIZATION

Several small demonstration plots on cotton fertilization were established this year. These spot applications were applied after chopping and just prior to the irrigation following chopping. The fertilizer material was spread on the surface of the soil in the furrows. The cotton plant response has been about the same as in past years. Nitrogen has stimulated plant growth to a marked degree on the lighter textured soils, while there has been very little response on the heavy soils.

Since growers in general are showing a keen interest in cotton fertilization, and there is a pertinent question still unanswered as to the feasibility of spending money on cotton fertilizer for all soils, an attempt is being made to obtain as much harvest data from the small demonstrations as possible.

Mr. Alvin Allen, Assistant County Agent, obtained harvest data for the first picking on several of these plots. These data are presented in the following tables:

J.J. McAllister - 1949
Cotton Fertilization Spot Test Demonstrations

Row	Material and Rate Per Acre	#Seed Cotton Per Acre	Increased Yield over Check Aver.	Remarks
6*	Am.Nit. 150#	525	192	A fairly light soil
7	Am.Nit. 300#	575	242	
8*	Am.Nit. 150#	450	117	
9	Check	250	---	
10	Check	375	---	
11	Check	375	---	
12*	Am.Nit. 150#	425	92	
13*	Am.Nit. 150#	475	142	

*Fertilizer on one side only.

Pat Tucker

		#Seed Cotton		
#4	Am.Nit. 200#	525	75	Heavy soil
	Am.Nit. 100#	537	87	
	Am.Nit. 100#	525	75	
	Check	450		
#5	Am.Nit. 300#	485	261	Light soil
	Check	224		
#7	Am.Nit. 300#	448	262	Very light soil
	Am.Nit. 150#	261	75	
	Check	261		
	Am.Nit. 150#	261	75	
	Check	112		

COTTON

COTTON INSECT CONTROL

Insects Threaten Cotton Crop

Nine species of insect are the main offenders to cotton in Pima County. These insects are on the job more or less during most of the season. Starting in with Darhling Butte which cuts the young plant off at the base, Beet Army Worm dovetails right into the picture. Thrip, Aphis, Flea Beetle, White Fly, Lygus, Boll Worm, and Stink Bug all come in on the home stretch. Boll Worms are the most destructive of the lot. Lygus and Stink Bug are considered the other two major insects. All in all, growers have a steady flow of insect trouble pretty well throughout the growing season.

U.S. Entomologists Work on Cotton Insects

Mr. W.A. Stevenson heads a research group of U.S. Bureau of Entomology workers with headquarters in Tucson. A great deal of their research work on cotton insects is carried on right here in Pima County fields. Mr. Stevenson and his staff are continuously trying out new insecticides and methods of applying insecticides on cotton. Their systematic research with the many different insecticide materials gives the growers the best information possible for guiding their insect control activities. With work being carried on in their own communities, growers not only have first hand information but information which will best fit their needs.

Extension Service Aids Insect Control

Dr. J.N. Roney, Extension Entomologist, prepares weekly bulletins on progress of cotton insect control research. Dr. Roney also records cotton insect population trends in these reports. What's more, he gives the growers timely information on dusting procedures, how to estimate need for dusting, and when to dust.

Field meetings are held each year for the purpose of demonstrating methods of checking fields for insect populations, identification of both harmful and beneficial insects, and generally sizing up given situations for determining feasibility of dusting. Both Dr. Roney and Mr. Stevenson cooperate in conducting these meetings. These entomologists stressed the importance of timely dusting this year. They pointed out that boll worms hatch out in the tops of the cotton plant, generally in the terminal bud, and that this was the important time to discover boll worm infestations. They further pointed out that young worms were most easily killed, especially in view of their location on top of plants.

COTTON

COTTON INSECT CONTROL

Extension Service Aids Insect Control (continued)

Then too, it was emphasized that boll worms work down the plant as they grow, and that only a casual inspection, or "windshield inspection", might result in discovering worms that have grown to large sizes and have already done most of their damage. It was pointed out that too many dustings had been made at the late stage of development of the boll worm. Dusting too late not only wasted dust, but missed the target on saving cotton bolls.

Growers Help Themselves

A fair representation has attended the insect control field meetings, and have taken a keen interest in Dr. Roney and Dr. Stevenson's demonstrations. Over 50% of the growers in Pima County have periodic insect checks made in their fields by a "bug crew" or by an individual employed for that purpose. Several growers are finding it profitable to do some extra personal checking.

Practically all growers in Pima County are cotton insect conscious and follow an active program of insect control.

COTTON

COTTON MARKETING

Growers Prefer Good Cotton

During the past two years several of the growers have complained about the government grading of their cotton. It has been claimed time and again that the Phoenix Classing Office was under-grading cotton. In connection with the variety test work the Agent has endeavored to get as much information on the grade and staple and other characteristics from the lint production of each variety. Some of the reports show that other cotton classing offices thought more of our cotton than the Phoenix Cotton Classing Office. While the additional information on the new cotton varieties which was gained from the Texas A. & M. laboratory and an Eastern mill wasn't secured for further proof of comparing the Phoenix Cotton Class reports with other opinions, it did appear to be an opportunity to judge somewhat on the validity of the growers' claim about under-classing. The attached tables present some of the data on this subject.

COTTON

COTTON MARKETING

COTTON VARIETY TEST - LEE MOOR RANCH

<u>Variety</u>	<u>Bale No.</u>	<u>Phoenix Office Staple & Grade</u>	<u>Texas A. & M. Upper half mean</u>
X - 44	4242	S M 1 3/32	1.13 1 1/8 plus
Paula	4238	SLM 1 3/32	1.10 1 3/32 plus
P-18-C	4237	S M 1 3/32	1.12 1 1/8 minus
BX 28	4240	M 1 3/32	1.13 1 1/8 plus
4-42	4248	M 1 3/32	1.12 1 1/8 plus
BX 33	4256	M 1 3/32	1.14 1 1/8 plus
1517	4239	M 1 1/8	1.16 1 5/32 plus
Santan	4243	M 1 3/32	1.09 1 3/32 plus

COTTON VARIETY TEST - PAT TUCKER

BX 33	2858	S M 1 1/8	1.12 G.M. 1 1/8
Santan	2860	S M 1 3/32	1.09 G.M. 1 3/32
X - 44	2857	Plated	1.09 S.M. 1 3/32
BX 28	2862	S M 1 1/16	1.12 G.M. 1 1/8
P-18-C	2863	S M 1 1/16	1.12 G.M. 1 1/8
Paula	2859	S M 1 3/32	1.09 S.M. 1 3/32
4-42	2861	Plated	1.09 S.M. 1 3/32
1517	2856	S M 1 1/16	1.15 G.M. 1 5/32

Indications: Lee Moor variety test samples, six out of eight were called from 1/16 to 1/32 under at Phoenix Office, two were even and none over.

Pat Tucker variety test samples, five out of six were called "under" on grade with one even. Three were called "under" on staple with three even and none over.

Looks like an average 1/32 under -- worth 45 points and about ten points "under" on grade.

COTTON

COTTON MARKETING

Growers Have Interest in Cotton Classing

After looking over the cotton classing data, growers were urged to get better acquainted with their Government Cotton Classing Office. Local growers have made several visits to the Phoenix Classing office this year, and find Mr. Crittendon, the classer in charge, very cooperative. Their closer relationship to the classing office has worked out some difficulties, which according to one grower has been very beneficial to him.

Mr. Earl Horton at Marana reported a substantial saving on one lot of cotton which he had re-sampled and re-classed. Some slip can be made anywhere down the line when volume of cotton handled for classing this year is considered.

It is certainly up to the growers to cooperate with their cotton classing office. A better job can be done with this closer relationship.

SOILS & IRRIGATION

New Soil Conditioners Offered

Each year there are one or more new so-called "Soil Correctives" or "Soil Conditioners" offered for sale to farmers. Many times the new products are acclaimed the answer to all of our soil problems and plant food needs. Many farmers are overcome by the sales talk for these new improved products. Most often the money invested is lost by the grower. The past year was no exception. There were three of these "Wonder" products offered for sale here in Pima County, as soil conditioners or soil correctives. Although the products contained very little essential plant foods, it was claimed that the soil would be conditioned so that plenty plant food elements would be made available from unavailable forms of plant food which were already in our soils. The Agent was asked for recommendations on these products.

Extension Service Has Responsibility

The Cortaro Farms Company which leases considerable cotton land had a clause in their lease which limited the lessee to the use of products added to the soil which was recommended by the Pima County Agent's Office. It was probably through this clause in their lease which saved the growers in the Marana District several thousand dollars, since the salesmen had carried on such a convincing campaign that it appeared like a large volume of sales in that district. The agent was advised on the unproved status of the new products and the unlikely possibilities of obtaining results by Mr. W.T. McGeorge of the Agriculture Chemistry Department of the University of Arizona. Naturally, recommendations were negative.

Enough material of one of the new products was accepted by the agent to make an observation test on $2\frac{1}{2}$ acres of cotton. The product that was accepted and used was known as "GHP-5". Mr. Pat Tucker of the Marana District, cooperated with the Agent in conducting this test. There was no response by the cotton plants that could be observed from the GHP-5 application. Harvest data, however, showed a slight increase from its use. Approximately one acre plots were picked out on treated and untreated plots. The GHP-5 plot yield was 1270 lbs seed cotton, while the check yield was 1184. This is about 7% increase which is insignificant, since there were no replications made, and it is a well known fact that variations occur in any field to this extent. Even if the results of the 86 lb increase per acre could be depended on, the increased yield would not pay for the material.

The few growers who did use some of these new so-called soil conditioners report negative results.

SOILS & IRRIGATION

Farmers are Soil Analysis Conscious

Numerous requests are received for soil analyses work. The soils laboratory at the University is pretty well loaded up with this work most of the year. While soil samples run through the different tests in the laboratory will often yield some pertinent data, many other times the information is of little value. This is generally true due to the very small areas sampled as compared to the spotted soil condition of the area involved. Then too, the slip-shod manner in which many samples are taken disqualifies any value from the analytical data. A great deal of this work is eliminated after the subject has been discussed with the parties requesting such work. Very often the problem involves irrigation methods rather than strictly a problem that would be solved by soil analysis.

Field tests with soil ammendments and correctives is the main method recommended by this office.

Use of Gypsum Continues

In spite of some rather weak demonstration plots on the use of gypsum, its use as a soil ammendment continues to increase in Pima County. At least from a laboratory standpoint, demonstration plots were successful. However, obtaining comparative yield data has been most difficult and without yield data, a soil ammendment demonstration plot shouldn't be very impressive. Nevertheless, users of gypsum in Pima County are judging their results by comparing yields after applying gypsum with former yields. What's more, they report favorable results. A survey on the use of gypsum is planned for next year. The reports obtained on the successful use of gypsum up to this time has come to the Agent in volunteer form. It may be that the successful users are the only ones who will make unsolicited conversation about it.

Leaching Important

Teaching is stressed in connection with gypsum applications. Without proper leaching the chances for results from the use of gypsum are defeated. This means that adequate irrigation water for leaching must be available. Land must be level for proper irrigation, and efficient leaching can't be obtained without it. Water carrying high sodium content is also a detriment. If the calcium-sodium ratio in the irrigation water is not favorable the sodium displacement in the base exchange reaction will be nullified. These fundamentals guiding the use of gypsum for improving soils has been pointed out to prospective users of gypsum.

SOILS & IRRIGATION

Organic Material Life of Soil

Organic material incorporated into the soil is the first fundamental principle of soil improvement. Plowing under all organic material that is available has been a practice recommended by the County Agent at every opportunity. When discussing commercial fertilizers, gypsum or even irrigation problems the use of organic matter is given first emphasis. This is particularly true when money is being spent on gypsum for tight alkaline soils. In most cases, the two go together for maximum results. Green manure crops have been encouraged for keeping up organic content in soils. This practice is not being followed to any great extent in Pima County.

All cotton stalks, grain stubble, sorghum stubble and stalks where grain is harvested should be put back in the soil. This is largely being done by Pima County growers. Burning this important organic material is just about a thing of the past here in Pima County.

Land Levelling Good Investment

Land that is not properly levelled for irrigation is most difficult to produce high yields of crops. Steep land or land with too great a slope is difficult to gain water penetration. The slope must be reduced to a minimum of three tenths foot per 100 feet in order to gain water penetration on most soils. Some of the heavier soils need less slope. A grower has the choice of cutting the volume of water flow in the field, reducing his irrigation runs or levelling his land. In many cases, a good land levelling job is most feasible. This has been recommended to many of the growers in Pima County during the past year as well as in former years. Engineering and other technical service offered by the Soil Conservation Service work group has always been recommended to farmers in the County. Real strides in good land levelling and irrigation practices are being made in Pima County. The Soil Conservation Service work group has been carrying on a full program of land levelling. Good land levelling is recommended as one of the best investments that can be made on a production farm. There are some irrigated fields, however, that are so steep that land levelling is impractical.

SMALL GRAINS

Growers Use New Varieties

Both Markton Oats and Arivat Barley are comparatively new varieties of small grains. These varieties have become well established here during the past five years. Markton Oats had its first introduction in the County in 1944. Mr. Dan Clarke gave it a good trial for winter pasture. What's more, he produced registered Markton seed oats for the past four years. It was the enthusiasm over the results with Markton Oats that was displayed by Mr. Clarke and Mr. G.F. Woods that sold the idea to other small grain winter pasture growers. The 1948-49 winter pasture season was a tough one on Markton Oats or any other winter pasture. Abnormally cold weather prevailed, and some users of Markton Oats blamed the poor winter pasture results on the new variety. Since the Extension Service promoted the use of this new variety, it is natural that this office heard the unfavorable reports. Weather Bureau records had to be used to explain the unusual growing conditions, and perhaps defend the merits of the new oat pasture. Mr. Clarke grew the Foundation Field of Markton Oats this year.

An improved strain of Arivat Barley, known as Arivat 18, was released by the University of Arizona Agronomy Department this year. This new strain produced somewhat heavier grain yields in tests at the Mesa University of Arizona Experiment Station. Mr. Dan Clarke grew a 30 acre Foundation Field of Arivat 18 Barley this year. The County Agent's Office has recommended the growing of registered seed of this new variety to several growers this fall. No doubt there will be a fair supply of seed for 1950-51 season.

Fertilizers Pay on Small Grain Crops

Small grains are grown in Pima County during the cold part of the year. Nitrogen fertilizer helps nearly all cool weather grown crops. Small grains is no exception. Demonstration plots proving this point have been conducted by the County Agent during the past four years. Results of these demonstrations have been called to the attention of farmers in the County by means of circular letters, the press, radio, meetings, and individual contacts. This year, the results of small grain fertilization work being carried on by our Agronomy Department at the University Experiment Station at Mesa, has been used as additional material for information to growers.

The experiment station's work brings about one change in the Agent's recommendations. Time of application was included in their work, and they showed a distinct advantage of applying small grain fertilizer at planting time over other times.

SMALL GRAINS

Fertilizers Pay on Small Grain Crops (continued)

However, their differential in time of application was at planting time and at heading time, while the agents recommendations have been applications before the boot stage. Nevertheless, this year's recommendations are based on the experiment station reports. The amount and kind of fertilizer is still a debatable question. From 30 to 50 pounds of nitrogen is the general recommendation. Use of phosphates on small grains is often questionable, but in many cases phosphates do seem to pay off.

Small grain fertilizer has become an accepted practice in Pima County during the past five years. Work on the most efficient fertilization practices is still a worthwhile project for Pima County. One fertilizer comparison demonstration has been established for 1949-50 season with Mr. J.J. McAllister, of the Flowing Wells District.

ALFALFA

Alfalfa is Kind to Soil

Alfalfa is the recognized crop for rotating with cotton in Arizona. This has never been established to any extent here in Pima County. Growers generally claim that the crop takes too much water and that it will not pay. Only a few have ever tried it out, but this general opinion prevails. With drastic cuts in cotton acreages in sight, there may be a new emphasis put on the feasibility of growing alfalfa. The point that is being stressed to growers by the Agent is that some credit to alfalfa should be given because of the increased cotton yields resulting from alfalfa-cotton rotations. Growers who are in a position to seed land to alfalfa are being encouraged to adopt this rotation. Short rotations of alfalfa with cotton not only increases cotton yields, but keeps land in much better tilth. It is the feasible long-time farming system and should pay off when figured over a period of years.

This recommendation is being carried to growers through discussions at meetings and individual contacts.

Phosphates Often Make Alfalfa Pay

A couple of demonstrations carried on Pima County gave fine results in favor of fertilizing alfalfa with phosphates. The Agent has spread the information gained from these demonstrations to all interested growers in the County. In making recommendations on this practice, available phosphates as revealed by soil analyses from well-taken soil samples is taken into consideration. No doubt, there are fields where phosphate fertilization on alfalfa would not pay. Experience has taught the Agent that the soil analysis procedure is a fair indicator for phosphate needs in growing alfalfa. Some of the best response to phosphates occurs in the cooler parts of the growing season. This has showed up in yield records of the different cuttings. This office has been recommending an application amounting to about 80 to 100 pounds of phosphoric acid per acre. The practice is being received well by a majority of the few alfalfa growers in the County.

PEANUTS

New Varieties of Peanuts Tested

Mr. W.I. Thomas of the University of Arizona Agronomy Department and the Agent got together and planned some field work on peanuts. This was three years ago when the crop appeared to have promise of becoming a fair cash crop for Pima County growers. Since it was a new crop and little was known about adaptability of improved varieties, some variety test work was planned. Mr. Thomas wrote to all of the experiment stations in peanut producing states, asking for seed of any promising varieties of peanuts that they would send to Arizona for variety test work. Mr. J.B. Bull volunteered to cooperate in growing a variety test, and laid out a suitable plot of land for that purpose.

Ten varieties of peanuts were planted with replications. These were harvested by hand and yields recorded. Oil content of the different varieties was also determined. Then too, the growth habits and threshing qualities were observed. The harvest data revealed that one of the new improved varieties produced at the rate of 36.5% heavier yield, than the old type now being planted. This new variety was designated as "121070". Two other varieties, North Carolina Runner 1513, and a Spanish type designated as "205" also gave somewhat heavier yields than the old type. This was 1948 work. Seed of the 1948 test was saved for another more extensive test this year.

Mr. J.B. Bull grew the variety test plots again this year. The same variety "121071" was also the leader in this test.

The Peanut Variety Test on the J.B. Bull Farm was harvested on October 20. Data on two varieties is missing, due to a mix-up by the harvesting crew.

The following table represents the variety test harvest data:

<u>VARIETY</u>	<u>YIELD PER ACRE</u>
(1021071)	2865 lb.
Spanish 1838	2700 lb.
(205)	1535 lb.
Tennessee Red	1320 lb.

The production from the leading variety "1021071" was saved for further seed increase. Mr. W.I. Thomas of the Agronomy Department, plans to carry on an improvement program starting with this leading variety. Mr. Bull plans to plant the seed saved from this test.

PEANUTS

New Varieties of Peanuts Tested

An attempt is being made to locate a supply of seed of the "121070" variety for 1950 commercial planting. Both Mr. Bull and Mr. Keith Walden want to plant their entire acreage to this new variety.

Peanut Fertilizer Tests Show Negative Results

Fertilizer plots were established on Mr. Bull's farm in 1948 and again in 1949. Both years' results were negative. Phosphates and nitrates were used in combinations, and nitrogen fertilizer was used singly.

HORTICULTURE

Deciduous Fruits May Succeed

Mr. W.F. Dudgeon of the Flowing Wells district may be pointing the way to successful fruit growing in the Tucson area. Mr. E.A. Beal in the southern end of Pima County, about half-way between Kinsley's and Arivica, is also giving it a trial in that district. Both of these men have established commercial orchards of deciduous fruits. There is a real need for an enterprise of this type in this section. Fresh deciduous fruits are almost entirely shipped into this trade area from other distant districts. Then too, many health-seekers come to Tucson who have farming back-grounds or are agriculturally minded. These people often look in vain for some means of making a living. Since irrigated land is very limited in the district, and deciduous fruit growing enterprises require only small acreages, the project appears to be very important. Mr. H.F. Tate, Extension Horticulturist, has helped a great deal in assisting Mr. Dudgeon and Mr. Beal in establishing their orchards. Selection of varieties, land preparation, irrigation, fertilization, setting trees, disease and insect control, and pruning or tree training has all been guided by Mr. Tate. Practically all of the recommended practices have been followed.

Mr. Dudgeon's orchard has made remarkable progress in growth and early production. A bumper crop of plums, apricots, and peaches came on the second and third year's growth. Mr. Beal's orchard is also making fine progress. It is one year younger than Mr. Dudgeon's orchard.

Pruning demonstrations were held on the farm of Mr. Lindeneau on River Road in a small deciduous orchard. Mr. Tate and the Agent worked most of the old trees over. This was designed as a result demonstration to show what open pruning, thinning and removing dead wood will accomplish in bringing about increased fruit quality and production.

Mr. Tate also carried on a pruning demonstration in the Dudgeon orchard. The pruning work in this young orchard was slightly changed, and the people in attendance took home some sound ideas on pruning practices.

New Home Orchard Pamphlet

Mr. Tate, Dr. R.B. Streets of the University of Arizona Plant Pathology Department, and the Agent prepared a new Home Orchard pamphlet for Pima County. The distribution of this pamphlet has been rather liberal, for many families in the County want information that will help them in establishing home fruit orchards of various sizes and varieties. Three hundred sixty of the Home Orchard was distributed this year from requests by mail, telephone and office callers.

HORTICULTURE

Home Gardens have Miscellaneous Troubles

Home gardeners encounter many different problems. The predominating calls on home gardens have been on insect and disease control. Many of the difficulties turn out to be too frequent irrigations and vegetable varieties that are not adapted here.

The County Agent's supply of Mr. Tate's Home Garden bulletin was exhausted during part of the year. When his revised bulletin became available distribution of it was brisk. Four hundred copies of Mr. Tate's Home Garden bulletin was distributed during the last half of the year.

Home Ground Plantings & Care Popular

Calls relating to home plantings of trees, shrubs, flowers, and lawns come frequently to the County Agent's office. Outside of calls relative to diseases, insects, soil problems and irrigation problems, a fair supply of pamphlets and bulletins was available for distribution. The printed material answered many of these calls. Approximately 800 bulletins were distributed on lawns, flowers, and shrubs for the Tucson area.

BEEF CATTLE - RANGE MANAGEMENT

Grass is the Life of Range Cattle Business

Any practice that will conserve, increase or improve range grass will be a boom to the range cattle business. Controlled grazing, water facility improvements, fencing and supplemented feeding all have places in improving range cattle management. However, grass is still the most important item. Cattlemen in this County realize this more than anyone else, or they wouldn't go to so much expense and trouble trying to work out such a discouraging practice of grass seeding on their range land.

Extensive Range Grass Trials

Many trials and tests have been made on re-seeding range grasses. In the aggregate these plantings have been unsuccessful. Plantings made on the Ruby Star Ranch on ripped areas last year, however, showed **promising** results. Mr. Matthew Baird, the owner of the ranch, has been consistently testing out methods of range grass re-seeding for the past several years with negative results. The contour ripping method, engineered by the Santa Cruz Soil Conservation Service work group looked so promising this past year, that Mr. Baird has greatly extended his efforts this year. His plantings this year included about 300 acres and several varieties of Love-grass and Grama grass.

Mr. H.B. Thurber enlisted the cooperation of the County Agent in establishing an extensive range grass seeding project on his ranch this year. Mr. Thurbur selected one of the many "flats" on his ranch for the grass seeding test. The area seeded, which contains about 12 acres, was fenced, and approximately half of it was ripped to a depth of about 22 inches. The ripping was done on contour lines. The ripped area was seeded with a Planet Junior planter rigged on a cultipacker. The other half of the area was planted with the same equipment following a half off-set disc.

The Soil Conservation Service Tucson Nursery furnished 19 varieties of grass seed for this test planting. Mr. Grant Anderson, head of the Santa Cruz Soil Conservation Service work group, cooperated with Mr. Thurbur and the Agent in planning and making the planting.

Mr. Thurbur has expressed a deep interest in the project and is willing to follow out any procedure for giving the grass seeding project a fair trial. It may be necessary to add rabbit-proof wire to the fence. This, however, is being postponed until a stand of grass is apparent.

BEEF CATTLE - RANGE MANAGEMENT

Extensive Range Grass Trials (continued)

The following grasses were included in the H.B. Thurbur plantings:

- | | |
|---------------------------|-------------------------------|
| 1. Mendora Scabra | 10. Digitalis Areantha |
| 2. Blue Grama | 11. Eragrostis Intermedia |
| 3. Side Oats Grama | 12. Sand Lovegrass |
| 4. Vine Mesquite | 13. Eragrostis Bicolor |
| 5. Giant Panic | 14. Panicum Coloratum |
| 6. Willman Lovegrass | 15. Pappophorium Macromulatum |
| 7. Weeping Lovegrass | 16. Chloris Saculatta |
| 8. Trichachme Californica | 17. Bristle Grass |
| 9. Lehmann Lovegrass | 18. Panicum Haleyie |
| | 19. Johnson Grass |

Five hundred and one rows of these 19 varieties were planted in a series of 17 plots. Each plot was designed to alternate varieties with Side Oats Grama on every third row. Arrangement of plots also called for each replication of varieties to be planted on both the ripped areas and pitted areas. A detailed outline giving the order and method of planting for each of the 501 rows was recorded. Copies of the detailed outline was included in the Agent's July report. One copy each was sent to Mr. Thurbur and Mr. Anderson of the Soil Conservation Service work group. Mr. Anderson had a map of the layout prepared from the outline, and furnished one copy for Mr. Thurbur and one for this office. Since the detailed outline covers twenty pages, it is being omitted from this report. When a stand of grass appears on these plots, the detailed outline will be necessary.

At the end of the growing season this year, there was a very poor showing of grass with the exception of Side Oats Grama. This variety of grass was used as a control, and was planted on every third row throughout the trial plots.

These plots was one of the scheduled stops on the California Stockmen Cattle Tour held in September. Besides the visitors, there were approximately 200 local people in attendance.

A planning outline, "The Range Re-seeding Project on Ruby Star Ranch" has been prepared by the Soil Conservation Service, a copy of which was sent to this office. This extensive planning will be watched with interest during the next few years.

Rains were sparse in the area of these plots. It is hoped that a better showing of the different grasses will appear next year on this set of grass variety plantings.

G.E. Blackledge
Pima County
1949

BEEF CATTLE - RANGE MANAGEMENT

Many People Interested in Beef Cattle

The lure of the range is apparent in Pima County each year. Many calls for information on beef cattle raising in Pima County are received in the County Agent's office each year. A large percentage of these calls are from winter visitors and prospective ranch buyers. Professor E.B. Stanley, Animal Husbandryman at the University of Arizona has prepared a pamphlet on the Range Cattle Industry in Arizona. This is a popular publication, and answers many of our new-comers' various questions.

Approximately 900 bulletins on Beef Cattle have been distributed this year. This includes copies mailed out as well as the ones given to office callers.

DAIRY

Dairy Herd Improvement Makes Progress

Under the leadership of Mr. Ralph W. Van Sant, the Pima Pinal Dairy Herd Improvement Association has made steady progress during the past three years. Mr. Bernard Law has been employed as tester during this period. The program has practically doubled during his period of service. The following table gives a picture of this increase in dairy herd improvement work:

<u>Testing Year</u>	<u>Aver. No. Herds</u>	<u>Cows on test Aver. No.</u>
1946	11	521
1947	15	888
1948	20.5	1430
1949	24	1635

Herds Maintain High Production

While average figures do not show a steady increase in production, the trend is distinctly upward. On the other hand, feeding practices appear to have been improved during the past three years when these records were recorded. The following two tables show production records and feeding practice efficiencies.

<u>Year</u>	<u>Aver.No. of herds on test per mo.</u>	<u>No. of herds reported</u>	<u>Cow years reported</u>	<u>Aver. milk</u>	<u>% Fat</u>	<u>Aver. fat</u>	<u>No.cows prod. over 400#fat</u>	<u>No.cows sold or culled</u>
1949	24	22	1579	9255	3.75	346.2	365	431
1948	20.5	17	1300	9349	3.69	345.9	448	--
1947	15	9	577	9072	3.89	353.4	179	--
1946	11	10	--	9558	3.98	380.9	151	--
1945	14	12	--	8926	3.90	348.6	156	--
1944	--	10	--	8788	3.69	324.8	77	--

<u>Year</u>	<u>No.herds reporting feed cost</u>	<u>Cow yrs. report- ing feed cost</u>	<u>Aver. cost of pasture per cow year</u>	<u>Aver. cost of roughage per cow year</u>	<u>Aver. cost of grain per cow year</u>	<u>Aver. total feed cost per cow yr.</u>	<u>Value above feed cost per cow yr.</u>
1949	1	51.7	3.38	182.78	88.00	274.16	451.32
1948	7	435	39.63	117.63	69.14	226.40	352.34
1947	--	---	46.82	104.60	60.46	211.88	333.34

DAIRY

Herds Maintain High Production

The Agent's office has served as headquarters for the Pima-Pinal Dairy Herd Improvement Association again this year.

One of the features of dairy herd improvement work is dairy herd classification. The Guernsey Breeders Association classified two herds during the year. The Holstein Association classified the Fairview Dairy herd this year. This herd classification was used as a public demonstration, and was well attended by interested dairymen.

GRASSHOPPER CONTROL

A couple of damaging infestations of grasshoppers in cotton fields were taken care of by chlordane dust. The growers reported excellent control with this material.

Range grasshoppers didn't show up to any extent until late July. Infestations were pretty well all over the south-east and southwest parts of the County. The predominating species was *Boopedon Nubilium*.

Due to reports that the major species of range grasshopper, "*Boopedon Nubilium*", would not take bait in other areas, the Agent cooperated with Mr. J.L.E. Lauderdale in conducting bait tests. Mr. Lauderdale, who represented the Bureau of Entomology's Grasshopper Control Division, sent Mr. W.E. Neerney, Entomologist from the Tempe Field Station, to make the necessary check counts. The tests are outlined in the following table:

Location	Bait Material Used	Est.Per	Est.Per	Est.Per	Est.Per	Est. % Control
		Sq.Yd. Count	Sq. Yd Count	Sq.Yd. Count	Sq.Yd. Count	
		Before Baiting	2 days After Baiting	On Check Before Baiting	on check 2 days After Baiting	
Boice Ranch	1/2# Chlordane	60	12		60	80
Arivaca	Wet	60	12		60	80
	1# Chlordane	60	12		60	80

All bait was applied at the rate of 10 pounds dry material per acre. All plots were one acre each. Checking was made by strong vigorous sweeps. Ten sweeps were made on each plot, before and after baiting. The check plots were adjacent to treated plots, and were chosen to be representative of baiting plots, both as to grasshopper population and vegetation.

Other species of grasshoppers besides the *Boopedon* which were found on the heavily infested range land were: *Morseiella*, *Dactylotum Veragatum*, *Brachystola* (Lubber) and *Lychinis*.

Wet bait material arrived during the first week in September. At the same time the Grasshopper Control Division of the Bureau of Entomology moved into Nogales with a mobile bait mixing unit and two airplanes. The largest plane, a DC-3, was equipped to carry 8,000 pounds of dry bait material. The small plane, a N-3-N, carried 500 pounds and was used for short runs.

GRASSHOPPER CONTROL

Since large scale baiting operations had never been carried on for the control of the Boopedon or Morseiella, the two dominant species of grasshopper that were damaging range grass in Pima County, the airplane baiting operation was considered an experiment by Mr. James Dutton, in charge of the Denver Office. These two species of grasshoppers are considered non-migratory. The object of the demonstration or experiment was to eliminate damaging populations of grasshoppers in 1950. The population this year was heavy enough in some areas so that a population was possible next year that could destroy all the range grass in those areas, if left undisturbed.

The immediate results were: First, better than an 80% reduction in population was estimated where the dry bait was applied by airplane, and about the same results were obtained where wet bait was applied with ground equipment. Second, a large amount of fall and winter feed was saved due to the reduction in grasshopper population. Third, a large amount of range grass seed was saved. (Grasshoppers cut the grass at a point near the ground, thus destroying the immature seed besides destroying the forage). Fourth, the number of females left for depositing eggs for future generations were greatly reduced in the baited areas.

The future results are expected to appear next year in the form of a reduced population of hoppers in the baited areas.

The three areas in Pima and Santa Cruz Counties where bait was distributed by plane were chosen on the basis of known heavily populated areas, and the accessibility to an airport.

The following is a partial list of ranchers in Pima County who used wet bait for control measures.

<u>NAME</u>	<u>Bait - Dry Wt.</u>	<u>Acreage</u>
H.B. Thurbur	20,100	2,000
Jack Spirden	17,000	1,700
Henry Boice	6,000	606

Reports on the use of both wet bait and dry bait applications indicate an 80% or better reduction in grasshopper population. The lighter rate ($\frac{1}{2}$ #) of Chlordane was used for the dry bait which was applied by airplane.

POULTRY

Mr. Alvin Allen, Assistant County Agent, did a major portion of the poultry work this year.

The Agent attended the monthly meetings of the Southern Arizona Poultry Association and participated in the educational phases of the program. Mr. Ralph Van Sant, Poultry Extension Specialist, Mr. Harry Embleton, and Mr. Hubert Hinds of the University Poultry Department presented interesting poultry talks at their meetings.

Approximately 1200 bulletins on poultry were distributed by this office, three-fourths of which were mailed out from requests in answer to a check card that listed available material from this office. Requests for poultry information is one of the indications of the interest being developed in this area as a poultry section. The industry is making a steady growth.

ORGANIZATION

Relationships to other organizations have been practically the same as in former years. There were only a few minor changes.

The Pima County Farm Bureau became more active during the year. A local became active at Marana, with 69 members. New officers of the County Board of Directors are Mr. Patrick Tucker president, and Mrs. J.E. Farrell secretary-treasurer. The Agent has attended all of the local bureau meetings and participated in the programs. This organization affords opportunities for forwarding the extension program.

Approximately 3,000 agriculture information check lists were mailed out to rural box holders in Pima County this year. The cards were accompanied by a letter asking the recipients to return the card with the subjects checked on which they wanted information material mailed to them. Approximately 600 of the cards were returned. In response to these requests for information approximately 9,000 bulletins have been mailed to rural residents in Pima County. Bulletins on insects lead the list, accounting for about 12% of the total mailed. Information material on soils was next in order, with about 10%. Poultry, plant diseases, alfalfa, and cotton accounted for about 6% each. Irrigation and landscaping literature was next in rank with about 4% each. Citrus ranked next with 3%. Other bulletins mailed out were on Agricultural Economics, vegetables, beef cattle, dairy cattle, sheep, climate, small grains, grain sorghums and rabbits.

AGRICULTURE SITUATION

Pima County is primarily a cotton and cattle producing area. The beef cattle industry is practically all on range land. Farm crops are practically all grown under irrigation. Besides beef cattle and cotton, the poultry industry produces more gross value than any other single phase of agriculture. Dairying ranks next in gross value of products. The following table presents a fair estimate of gross values of different agricultural products produced in Pima County.

Crop	Estimated Acres	Estimated Gross Ret. Per Acre	Estimated Gross Value of Crops and L'v'st'k Products
Cotton	16,000	\$ 219.00	\$ 3,500,000
Alfalfa and other Hay	2,800	140.00	392,000
Barley & other small Grains	3,900	52.00	202,800
Grain Sorghums	3,100	72.00	223,200
Corn	1,400	50.00	70,000
Beans	300	150.00	45,000
Truck Crops	200	400.00	80,000
Peanuts	1,500	126.00	189,000
Irrigated pastures and Orchard	1,000		
Poultry			1,750,000
Dairy			624,000
Livestock			*
	<u>30,200</u>		<u>\$7,076,000</u>

*Livestock estimated values are not included due to difficulties of gaining a fair estimate.

Range cattle business is greatly dependent on rainfall. The low precipitation in Pima County running from about 11 to 15 inches on most of our range land, doesn't afford forage for many animals per section. Thirty head per section carrying capacity is considered an excellent range. There is more range land with carrying capacities around 15 or 20 head than 25 to 30 head.

Efforts to re-seed range land may succeed sometime in the future, but the attempts up to the present time have been very discouraging. If it is true that, "where there is a will, there is a way", re-seeding of range can be worked out. Cooperation with cattlemen in working on this problem is being carried on, and its continuance is being planned.

AGRICULTURE SITUATION

Ant control on range land offers some promise of conserving grass. A small beginning on the use of chlordane for this purpose was made this year.

The irrigated crop land is limited by water supplies available. Large acreage expansion is unlikely. While cotton occupied about two-thirds of the irrigated land in Pima County this year it looks like the acreage would be nearer one-third next year due to governmental cotton acreage limitations. Although cotton acreages will be cut drastically next year the major crop in the County will still be cotton. The same cotton projects are planned again next year.

Peanuts is another crop under acreage control. Although Pima County has the entire state's allotment, the acreage will be limited to about 900 acres. Since it is a new and promising cash crop, the projects carried on peanuts should be continued.

Poultry keeping is expanding in the County at a steady pace. Many new poultrymen are planning on Tucson for a new location. Some definite poultry projects should be worked out with Mr. Van Sant, Poultry Specialist, the County Agent's office, and local poultrymen. Cost account records is one phase suggested. A project of this nature naturally leads to work in all phases of poultry keeping.

Dairy Herd Improvement work should be continued. Further planning, and more definite work should be done in connection with dairying.

Work on deciduous fruit should be given more attention. Close cooperation with Mr. W.T. Dudgeon and Mr. E.A. Beal should be continued. Records of varietal behavior and production should be recorded from their orchards.

Growers should be encouraged to plant alfalfa as one of the replacement crops for cotton. Enterprise cost of production records on farms or even individual fields on a farm where an alfalfa-cotton rotation is being practiced, would be a good method of promoting the use of alfalfa in the scheme of farming in Pima County. Continuance of alfalfa production projects, as variety and fertilizer trials, seems advisable.



October 4, 1949

Photo by Alvin Allen

Dale Gladden Cotton Fertilizer Demonstration plots show distinct plant response to nitrogen. The agent is standing between a check plot, (on his left and your right) and fertilized rows (on his left and your right).

The first row of tall cotton on the agent's right received 48 lb. nitrogen and 60 lb. PO_4 - yield was 2840 lb. seed cotton per acre, 1st picking; next row had 96 lb. nitrogen and 120 lb. PO_4 - yield was 3356 lb. seed cotton per acre, 1st picking. The check on agent's left, cotton not so tall, gave yield of 2324 lb. seed cotton per acre.

It would appear that high rates of fertilizer pays off best. This isn't always true by any means.



November 10, 1949

Photo by Alvin Allen

Inspecting Acala 44 after first picking and heavy frost.
Left to right; E.E. England, George Duraha, G. E. Blackledge,
and O'Dell Massey. These test plots were well visited during
the season.



October 11, 1949

photo by Alvin Allen

These trailers lined up on Lee Moor Ranch for Cotton Variety Test Picking. Each trailer was divided into two compartments, so that the six varieties in the test could be kept separate and ginned separately. The compartment for Acala 44 wouldn't hold enough cotton. There were three bales of this variety, while there was only two bales each of the other varieties.



October 11, 1949

Photo by Alvin Allen

Mr. O'Dell Massey, manager of Lee Moor Ranch, and the agent find time to pose for a picture while recording picking weights from Massey's cotton variety test. A crew of approximately one hundred pickers keeps everybody pretty busy keeping everything straight. Each picker carries a tag with his row number on it. Rows are plainly numbered, but pickers are placed on their rows and checked periodically. The picking was just winding up when picture was taken.