

ANNUAL REPORT

OF

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PINAL COUNTY

DECEMBER 1, 1949 - NOVEMBER 30, 1950

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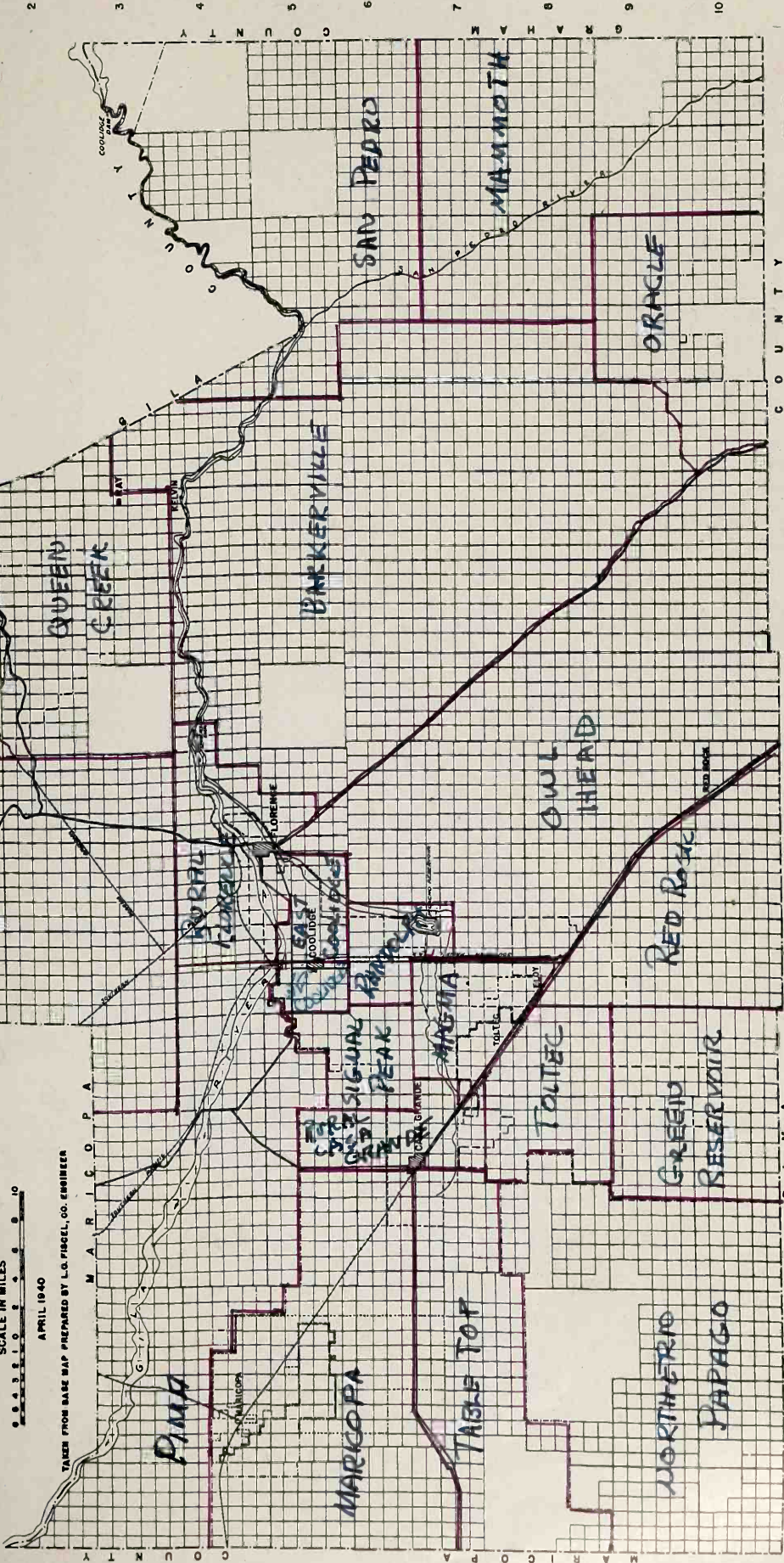
PINAL COUNTY, ARIZONA

PREPARED BY
ARIZONA AGRICULTURAL EXTENSION SERVICE

SCALE IN MILES
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10

APRIL 1940
TAKEN FROM BASE MAP PREPARED BY L.G. FISCEL, CO. ENGINEER

- IN. 15. 2
- LEGEND
- TOWNSHIP LINE
 - SECTION LINE
 - RESERVATION BOUNDARY
 - RAILROAD
 - CANAL
 - HIGHWAY
 - BDY - ELECT. DIST. 2
 - BDY - ELECT. DIST. 3
 - BDY - ELECT. DIST. 4



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SUMMARY

The 1950 estimated average short cotton yield, as of November 1st, was 797 pounds, the highest average by over one hundred pounds ever made by this county. Contributing to this high yield is a good cotton year, almost universal use of commercial fertilizers, chiefly nitrogen, an adequate dusting program with potent dusts, deep tillage of many lands which in the past have produced low yields, and the general program of farmers to adequately water the acreage that they plant, as had to be done this year under a control program. Those in this office feel that we have, thru our fertilizer test demonstrations, a fund of valuable information on cotton fertilization. We feel also that we have a well-developed and practical insect control program based upon regular weekly surveys of cotton insect populations, and the notifying of growers thru circular letters, radio and newspaper articles of any changes in the insect situation that require their attention.

Our County Cotton Improvement Associations have been reorganized with all growers as members, and they receive within a few days after ginning the grade and staple of their cotton. This has helped to make a satisfactory marketing situation with growers knowing what they have to sell. The two new Arizona varieties, X-28 and X-44, have been increased until there should be almost enough seed to insure sufficient for planting needs. These cottons, particularly the X-44, has been selling at a premium of up to 300 points or \$15 per bale, with the X-28 sometimes bringing a somewhat less premium but still well above the old P-18 Acala. Both are higher yielding varieties than the P-18 Acala, as proved thru our three years of variety tests in cooperation with the same local grower but on three different farms and different types of soil.

Our fertilizer test demonstrations on barley have proved that on the weaker lands profits may be made thru increased yields because of fertilization.

Deep plowing of our "slick" or "tight" soils has now become common practice, and many soils that were hard to water and produced light cotton crops are now producing yields of two bales and even more to the acre.

We are beginning the production of northern adapted alfalfa seed and it appears that up to a limited acreage such seed can be marketed at satisfactory and profitable prices. Production of Certified grain sorghum seed occupies almost one-half of our acreage devoted to grain sorghums, thus relieving pressure upon the market for feed grains. Supplies of Certified Arivat barley seed are ample for planting requirements.

Owing to the absence of the Assistant County Agricultural Agent because of illness, 4-H Club work with boys has suffered somewhat during the year. But with the aid of all personnel in this office we again have this work well organized and believe that we will have more completions of projects and better work accomplished. We have this year organized further work in leader training, have an active county 4-H Club Council, and plans are already under way for a good 4-H Club Fair.

The Itinerant County Agricultural Agent has gathered much valuable information on operation of mechanical pickers in cotton fields. With a probable shortage of labor next year this information will be valuable to the now more than 120 owners of mechanical pickers.

During the year we prepared one hundred and fifty-seven news stories, carrying on a regular column in our four weekly papers. Other news stories have been prepared for and published in the new magazine, Pinal County Farm Life. We find that this method of publicity, plus a regular weekly radio program over Station KCKY, is one means of making our work more effective.

Our pocket gopher control program is again well financed by the San Carlos Irrigation and Drainage District and by Pinal County Electrical District No. 2. This year's work was particularly effective in getting good control of these rodents which cause much loss of water.

Dairy herd improvement work continues in combination with Pima County. The association is full and dairymen are making good use of their herdbooks in their breeding and production program.

Farm bureau membership has dropped to 350, but is now being built up thru an active membership program. Five locals meet regularly and are helpful to this office in enabling us to reach more people in our work.

III. The Agricultural Situation in Pinal County

In introducing this report one year ago, we opened by saying "Serious crop adjustments incidental to cotton acreage control face most growers as they enter the new year. Water and power conditions are generally favorable."

During the past year world conditions have so changed that it has been announced that there will be no cotton acreage control in 1951, when a crop of 16,000,000 bales is desired. Gravity water supplies are now non-existent for lands of the San Carlos Project, which includes about 87,000 acres of the irrigated land in the county. Limited pump water is available for these lands. In the several electrical districts and adjacent pump lands the situation is satisfactory, with ample natural gas for pumping and more electricity to be available following a changeover from 25 to 60 cycle power. This changeover presents some group as well as many individual problems, but it is believed that it can be made with little loss of crops. Winter run-off in quantity could of course quickly change the water situation on the San Carlos Project.

With cotton quoted at around 42 cents per pound, plus premiums of around 250 to 300 points for lint of the two new Arizona varieties, A-28 and A-44, most growers are determined to go all out for cotton in the new year, and will plant all the acreage their water supply permits. This further delays the planting of an increased alfalfa acreage so badly needed for soil building purposes. Probably there will be nearly enough seed of the new Arizona cotton varieties for this increased acreage. There is little interest long staple American-Egyptian cottons, and plantings will be below the 15,000 acres grown this year.

Growers generally recognize that we are entering into a war-economy, with all the shortages in farm equipment and parts and materials necessary to carry on the farming operation. They presume also that with a much larger cotton crop and demand from defense industries for labor that the supply of harvest help will be limited. Each year they are harvesting more cotton by mechanical means, and in the new year will harvest much more.

Farm wages have strengthened during the year. Cotton picking opened at \$3 per hundredweight and remains at that figure, which is comparable to the price paid in 1948 but lower than the average price paid in 1949.

Drouth in some parts of Arizona have made heavy demands for all available irrigated pasturage. More than the usual amount of hegar has been put into ensilage. Present county cattle population is more than sufficient for the feed available, and winter rains to make pasture on desert ranges is badly needed.

Supplies of feed grains in storage are at an all-time high, but plantings of winter barley will be far below the 38,000 acres grown last year. The dairy business now finds itself with surpluses of Grade A milk, which condition may adjust itself with lower production in the late winter and perhaps greater demand from military installations. The many small poultry flocks established last spring are now paying well with the recent advance in egg prices.

Declining market prices coupled with two cold winters which did severe frost damage to vegetables has reduced the acreage of both commercial vegetables and potatoes.

During the past year wide use was made of commercial fertilizers by cotton growers, and we can report that both from field experience and our fertilizer test demonstrations the addition of heavy nitrogen applications (100 to 125 pounds of nitrogen) has proved to be profitable. Generally increased production from such applications has ranged from around 600 to 900 pounds of seed cotton per acre. Combined with phosphate applications somewhat higher yields are usually obtained. Farmers are becoming more conscious of the need for most effective use of irrigation waters, and many have done expensive levelling jobs, as well as installing concrete ditches.

Adequate insect control, more efficient use of irrigation water on limited cotton acreage, heavy nitrogen fertilization, and to some extent use of the new cotton varieties, has brought the county average yield to about 800 pounds of lint per acre. This compares with an adjusted average yield, for Agricultural Adjustment Administration purposes, of 296 pounds in the year 1937.

A severe shortage of nitrogen fertilizers is expected in 1951, plus probable shortage in dusting materials. A shortage of both would materially reduce cotton yields.

. Status of County Extension Organization

1. Form of Organization - Changes and Development

Work in Pinal County is carried on with the cooperation of the Pinal County Farm Bureau and five associated locals, which include the Bridge-Florence, Valley Farms, Casa Grande, Stanfield, and Winkelman locals. The Eloy local has become inactive. Membership dropped off from a high of 450 to 350. All these farm bureaus with the exception of Eloy meet regularly and the County Agricultural Agent or assistants often meet with them. The County Agricultural Agent always meets with the Board of Directors of the Pinal County Farm Bureau, which is of great assistance in running our program.

The Pinal County Farm Bureau and the five active locals cooperate with this office, and representatives of our office meet with many of their committees in work designed for the improvement of our communities and county. Cooperation has been splendid. As a means of helping in carrying on extension work, this office assists in the planning of many programs for the local farm bureaus. Various subject matter specialists from the Agricultural Extension Service appeared on their programs during the year to discuss matters of interest and value to the farmers present.

2. Function of Local People, Committees and Project Leaders in Developing the Program of Work

All work carried on by the county and local bureaus is thru committees. Representatives of this office work with many of these, and this method has given good results in working out problems. Project leaders assist in carrying to completion various projects of this office, and these leaders may or may not be members of the Farm Bureau.

The relationship between the County Agricultural Agent's office and county and local farm bureaus is most cordial. The farm bureau works with the Agent in matters which are considered helpful to the agriculture of the county, and the work accomplished this year has been of value to the county's agriculture and of help to the farm families of the county.

V. Program of Work, Goals Established, Methods Employed, and Results Achieved

1. Factors Considered and Methods Used in Determining Program of Work

Extension projects upon which work is to be done are outlined as a need for them arises. During the past year work was done on the following objects:

- I. Soil Building Crops
- II. Improved Cotton Irrigation
- III. Improved Conditions on Tight Lands
- IV. Cotton Mechanization
- V. Seed Improvement
- VI. Boys and Girls Club Work
- VII. Rodent Control
- IX. Livestock Feeding
- X. Land Levelling & Preparation
- XI. Marketing
- XII. Agricultural Survey of Pinal County
- XIV. Poultry Feeding and Management
- XV. Plant Disease and Insect Control

Work not falling under these projects has been handled as Miscellaneous Work as the problems arose, and at such times as the people in this office or Specialists or County Farm Bureau board of directors deemed advisable.

2. Project Activities and Results

Small grains are normally one of Pinal County's minor crops. Winter grains are grown by some farmers in combination with cotton, in order to make most efficient use of the pumping plant. Generally it is considered that a farmer may have about one-half as much winter grain as he has cotton, if the cotton acreage is up to the full amount that can be well watered during the early summer when water requirements are high. Summer grain crops such as milo maize or hegari do not fit into a program in which full use of the pump during the summer is needed for the cotton crop. Usually grain sorghums have been grown in large acreage on newly developed lands where owners had difficulties in securing well-drillers or casing or pumping plants, or getting the land prepared for crop, and because of the lateness planted grain sorghums instead of cotton. Under cotton acreage control, such as we had during 1949, there were some farmers with ample water who chose to plant grain sorghums rather than American-Egyptian cotton.

Barley is the main winter grain, and average yields are only slightly above 2,000 pounds per acre. While there are many yields of 3,000 4,000 pounds and even over, too many crops are almost failures. Often this is because of delayed pasturing, but more often it is because the barley planted on infertile land.

To attempt to solve this problem and to encourage growers to adopt profitable fertilization programs, this office, in cooperation with our Agricultural Experiment Station, secured the cooperation of three farmers, Bud Wells and A. A. Fearn of Casa Grande, and Rodney Elsbery of Coolidge, and upon their grain fields we installed fertilizer test demonstrations. The plan included light and heavy nitrogen applications and light and heavy phosphate applications, singly and in combination, as top-dressings when the young grain was three or four inches high. We conducted no tours but did allow a practice of showing one or two of these plots to every farmer that inquired about grain fertilization. Later when the plots were harvested and field data secured, we prepared a mimeographed circular giving the results and mailed a copy to every farmer on our mailing list who had shown an interest in either grain or commercial fertilization. Many other copies were distributed to farmers who were interested. News stories were prepared giving our results and the information gained was also used in a radio talk on grain growing. A copy of this circular accompanies this report.

Nitrogen Fertilization Increases Barley Yields

Nitrogen applications showed to advantage in barley fertilization demonstrations conducted by the Office of the Pinal County Agricultural Agent in cooperation with the Arizona Agricultural Experiment Station. Tests were made on two farms in the Casa Grande area, and on one farm in the Coolidge area. Land selected in all three instances had been extensively farmed with soil-depleting crops, and its cropping history was such that light yields of barley could be expected if no fertilization was done.

Applications of fertilizers were made in February as top dressings, when the barley was about four to six inches high, and included Ammonium nitrate and Treble superphosphate in light and heavy applications, singly and in combination. There were six check or unfertilized plots in each demonstration, and three plots in each demonstration received identical fertilization treatment. Figures given are therefore averages of eighteen plots in the case of the check or unfertilized plots, and nine plots in the case of each fertilization treatment.

There is presented a table giving a summary of the several treatments, average yields, increased yields because of fertilization, fertilizer costs per acre, value of the increased grain produced, and the net profit or loss per acre on the fertilization venture. All plots were 10x10 feet, including 100 square feet of ground, and figures given are calculated to an acre basis.

The average yield of the unfertilized plots was 1394 pounds. The addition of 100 pounds of Ammonium nitrate (33 pounds nitrogen) increased the yield to 2473 pounds, a gain of 1079 pounds. Cost of the fertilizer was \$4.41 per acre. The value of the increased grain produced at \$1.85 per cwt. in the field was \$19.96, leaving a net profit from the fertilization operation of \$15.55 per acre. No charge for application of ferti-

lizers has been included in any of the results given.

When 300 pounds of ammonium nitrate was applied (99 pounds nitrogen) the acre yield averaged 3230 pounds, an increase of 1886 pounds over the check plot yield. Cost of the fertilizer was \$13.23, and the value of the increased grain produced was \$34.89, leaving a net profit of \$21.66 per acre.

It is significant that when applied as a top-dressing without nitrogen under the conditions of these demonstrations that 150 pounds of ~~Re-~~ble superphosphate showed an increase in grain yield of only 36 pounds, which is not significant. Addition of light and heavy applications of Treble superphosphate in combination with the heavy nitrogen applications gave slight increases over the plots which received the heavy nitrogen application alone.

From a standpoint of profitable yields thru fertilization it is indicated that a nitrogen application somewhat in excess of our light application and perhaps less than our heavy application would have been the most economical. There is need for further study in this regard.

The grain grower will be interested in knowing that our N_2P_2 application is equivalent in nitrogen to 700 pounds of 14-7-0, or 600 pounds of 16-20-0. The N_1P_2 application is the equivalent of the nitrogen and phosphate found in a little over 300 pounds of 10-20-0.

Results of Fertilization Demonstrations Conducted by Office of County
 Agricultural Agent, in Cooperation with Department of Agricultural Chemistry
 and Soils of the Arizona Agricultural Experiment Station

	Average Yield, lbs.	Increased Yield Over Check Plot, lbs.	Cost of Fertilizer Materials	Value of Increased Yield of Grain at \$1.85 per cwt.	Profit - Increased Yield Less Fertilizer Cost
Check (Unfertilized)	1394	0	\$0.00	\$0.00	\$0.00
Heavy Phosphate (150 lbs 46% Treble super- phosphate)	1430	36	5.43	0.67	4.76 (Loss)
Light Nitrogen (100 lbs 33% Ammonium nitrate)	2473	1079	4.41	19.96	15.55
Heavy Phosphate (150 lbs 46% Treble Super- phosphate) and Light Nitrogen (100 lbs 33% Ammonium nitrate)	2611	1217	9.84	22.51	12.67
Heavy Nitrogen (300 lbs 33% Ammonium nitrate)	3280	1886	13.23	34.69	21.66
Light Phosphate (50 lbs 46% Treble superphos- phate) and Heavy Nitro- gen (300 lbs Ammonium nitrate).	3212	2018	15.04	37.33	22.29
Heavy Phosphate (150 lbs 46% Treble super- phosphate) and Heavy Nitrogen (300 lbs Ammonium nitrate)	3571	2176	18.66	40.26	21.60



Photograph illustrates growth of barley on plot fertilized with Light Nitrogen (100 pounds 33% Ammonium nitrate). This treatment resulted in an average yield of 2,473 pounds of barley grain as compared with 1,394 pounds for the Check or unfertilized plot yield, an increase of 1,079 pounds per acre. Cost of the fertilizer was \$4.41 and the value of the increased grain yield was \$19.96, leaving a profit, at \$1.80 per cwt. in the field, of \$15.55 per acre.



Photograph illustrates growth of barley on plot fertilized with Heavy Nitrogen (300 pounds 33% Ammonium nitrate). This treatment resulted in an average acre yield of 3,280 pounds of barley grain as compared with 1,394 pounds for the Check or unfertilized plot yield, an increase of 1,886 pounds. Cost of the fertilizer was \$13.23 and the value of the increased grain yield was \$34.89, leaving a profit, at \$1.80 per cwt. in the field, of \$21.66 per acre.



Photograph illustrates growth of barley on plot fertilized with Heavy phosphate (150 pounds 46% Treble super-phosphate). This treatment resulted in an average acre yield of 1,430 pounds of barley grain as compared with 1,394 pounds for the Check or unfertilized plot yield, an increase of only 36 pounds. Cost of the fertilizer was \$5.43 and the value of the increased grain yield was 67 cents, leaving a net loss for the fertilization operation of \$4.76 per acre. Grain was calculated as worth \$1.80 per cwt. in the field.



Photograph illustrates growth of barley on plot fertilized with Light Phosphate (50 pounds 46% Treble superphosphate) and Heavy Nitrogen (300 pounds Ammonium nitrate). This treatment resulted in an average acre yield of 3,212 pounds of barley grain as compared with 1,394 pounds for the Check or unfertilized plot yield, an increase of 2,018 pounds. Cost of the fertilizer was \$15.04 and the value of the increased grain yield at \$1.80 per cwt. in the field was \$37.33, leaving a profit of \$22.29 per acre.



Photograph illustrates growth of barley on plot fertilized with Heavy Phosphate (150 pounds 46% Treble superphosphate), and Light Nitrogen (100 pounds 33% Ammonium nitrate). This treatment resulted in an average acre yield of 2,611 pounds of barley grain as compared with 1,394 pounds for the Check or unfertilized plot yield, an increase of 1,217 pounds. Cost of the fertilizer was \$9.84 and the value of the increased grain yield was \$22.51, leaving a profit, at \$1.80 per cwt. in the field, of \$12.67 per acre.



Photograph illustrates growth of barley on plot fertilized with Heavy Phosphate (150 pounds 46% Treble superphosphate) and Heavy Nitrogen (300 pounds Ammonium nitrate). This treatment resulted in an average acre yield of 3,570 pounds of barley grain as compared with 1,394 pounds for the Check or unfertilized plot yield, an increase of 2,176 pounds. Cost of the fertilizer was \$18.66 and the value of the increased grain yield was \$40.26, leaving a profit, at \$1.80 per cwt. in the field, of \$21.60.



Photograph illustrates growth of barley on the Check or unfertilized plot. Our demonstrations were on lands that had been farmed to cotton and grain and were considered to be soils that would respond to fertilization. The yield of 1,394 pounds made by an average of these Check or unfertilized plots is about 1,000 pounds below the average yield of barley in the county, but many fields yield only about that amount. Our fertilizer test demonstrations illustrated that applications of nitrogen somewhat higher than our light application and probably a little below our heavy application could be expected to give profitable and maximum yield increases. More work will be done in the new year.

2

Cooperation was furnished the Arizona Crop Improvement Association in their pure-seed program devoted to increasing the supply of Registered and Certified grain sorghums and Arivat barley. Publicity regarding a pure-seed growing demonstration at the Mesa Agricultural Experimental Station farm was released to all our pure-seed grain sorghum growers. Applications covering 7,525 acres of pure-seed grain sorghums, divided between 2,316 acres of hegari, 2,566 acres of Martin's Combine milo, 376 acres of Combine Kaffir, 750 acres of Double Dwarf '38 milo, 80 acres of Bonita, 275 acres of Plainsman milo, 150 acres of Early Hegari, and 10 acres of Sooner milo were processed thru this office. The Itinerant County Agricultural Agent spent two days in an inspection of pure-seed grain sorghum fields with the secretary of the association.

Forty-seven days were devoted to problems of production and marketing of cereals, and we used four days of Specialist's time. Work was done in seventeen of our twenty-one communities. We estimate that eighty-six farmers were able to secure improved strains of seed thru our work, and that sixty were furnished information on grain fertilization. Fifteen were assisted in the control of plant diseases, and three in controlling injurious insects. Twelve were furnished information on the use of December planted barley, followed by plowing and a second plowing or renovation, in the control of Johnson grass.

Work in grain marketing is reported under the heading (1) Marketing.

(b) Legumes

The acreage of alfalfa in Pinal County is far below that required or the maintenance of soil fertility. So long as high prices prevail for cotton this situation will continue, and on lands where water costs are high because of lifts of up to 300 feet farmers simply feel that it is not economical for them to grow alfalfa and they attempt to meet their fertility problems thru the use of commercial fertilizer.

As one means of attempting to meet the problem of soil fertility on pump lands, we have established a demonstration in which four clovers, Dixie Crimson, Ladino, Red, and Kenland, will be grown and an attempt made to produce seed. It is believed that if we can do this that such clovers can go dry during the season when pumps are needed for cotton, and then can be re-established by irrigation with seed wasted by the threshing operation. As. Kortsen Sr. of the Stanfield area is cooperating in this work.

Our first Ranger seed was threshed from the Bianco Brothers planting. The new planting of this variety, for seed production only, has been made by Fern Wuertz of Coolidge. Two other plantings are contemplated.

Our demonstration on the O. W. Rugg ranch, where alfalfa was planted

on "tight" or "slick" soil which was deep-plowed to a depth of about two feet has been observed frequently during the year. With the exception of a small area this alfalfa is producing well, showing that the deep plowing materially helped the rate of water penetration.

One farmer was furnished information on the use of Vetch as a winter green manure crop to be followed by cotton. Five farmers received information on the use of Peas for the same purpose. In previous years demonstrations using these Indian peas have not shown any great value as a green manure crop.

Thirteen days were devoted to work with legumes, and work was done in fifteen of the twenty-one communities of the county. Two leaders, assisted in our program.

(c) Cotton

One hundred and four days of our time was devoted during the year to problems incidental to cotton production. Work was done in fifteen of the twenty-one communities. Thirteen leaders assisted. We estimate that thru our efforts three hundred farmers were able to secure seed of improved varieties, and two hundred and sixty-eight were helped with problems of fertilization. One of our biggest jobs was that of cotton insect control, to be reported later in this report under (f) Rodent and Insect Control.

Five cotton fertilization test demonstrations were conducted for the purpose of demonstrating the efficiency of various commercial fertilizers. Cooperators in this work were F. E. Jones of Coolidge, D. R. Brittain of Florence, the General Farms Company of Eloy, R. E. Palmer of Casa Grande, and C. H. Montgomery of Casa Grande. Data is now being assembled and will have to be reported in next year's report as some picking remains to be done. Preliminary information indicates the value of heavy nitrogen applications (100 pounds of nitrogen), which gave increases of 685 pounds of seed cotton per acre on the first picking in one of our demonstrations. There is evidence also that phosphate applications helped in combination with the heavy nitrogen applications. For dollar invested the farmer got more from the dollar spent for nitrogen. We assume that if a farmer has \$15 to spend for fertilizer, that it should all be spent for nitrogen. If additional funds are available a combination of nitrogen and phosphate is desirable and will result usually in higher and profitable yields. Many farmer accomplish this by the addition of a combination fertilizer followed by a later side-dressing of nitrate fertilizer.

Much interest in these tests was shown by farmers, and probably not less than one hundred and fifty visited one or more of the tests. We expect to prepare a mimeographed circular giving the results, which will be furnished to all farmers on our mailing list who have shown an interest in receiving publications dealing either with cotton or fertilization.



Airplane photograph illustrating cotton fertilizer test demonstration on the C. H. Montgomery ranch in the Stanfield district. Plots were 100 feet long and five rows wide, with 10 foot intervals between them. Dark plots are those receiving heavy nitrogen (100 pounds per acre as side dressing at chopping time), or heavy nitrogen plus light or heavy phosphate.

Cotton growers will be interested in a test conducted by this office during the past season in the Stanfield area, where nitrogen and phosphate fertilizers were used singly and in combination, at heavy and light rates of application. The land used was a heavy type of soil, quite typical of much of the heavier soils in the south Stanfield area. Preliminary analyses showed the soil to be medium well supplied with phosphates, but very low in nitrogen, which low nitrogen would be expected from a soil that had produced eight straight cotton crops after having been cleared out of desert. The following table gives the amount of nitrogen and phosphate applied, and the calculated yield of seed cotton per acre in the first picking. A small amount remains to be picked, but will change the figures but little.

<u>Treatment</u>	<u>Average Yield per Acre of Seed Cotton</u>
Check or unfertilized plot	859 pounds
Light phosphate (25 lbs P ₂ O ₅)	859 pounds
Heavy phosphate (75 lbs P ₂ O ₅)	870 pounds
Light nitrogen (20 lbs)	1077 pounds
Heavy nitrogen (70 lbs) -	1458 pounds
Heavy nitrogen (70 lbs) and Light phosphate (25 lbs P ₂ O ₅)	1469 pounds
Light nitrogen (20 lbs) and heavy phosphate (75 lbs P ₂ O ₅)	1164 Pounds
Light nitrogen (20 lbs) and Light phosphate (25 lbs P ₂ O ₅)	1045 Pounds
Heavy nitrogen (70 lbs) and Heavy phosphate (75 lbs P ₂ O ₅)	1676 pounds

Conclusions that may be drawn are that the heavier nitrogen application should be recommended on this particular type of soil. The average yield per acre of seed cotton of the three plots which received the heavy nitrogen application, singly and in combination with a light and heavy application of phosphate, was 1534 pounds, as compared with the Check of unfertilized plot yield of 859 pounds. This is a difference of 675 pounds of seed cotton, or about one-half bale per acre. The heavy phosphate application in combination with a heavy nitrogen application gave an increase that is significant but from the practical standpoint it is doubtful if it should be recommended on a basis of this particular test.

November 10, 1949

K. K. Hennessy
County Agricultural Agent

Accompanying this report is a photograph taken from an airplane showing our fertilizer test demonstration on the C. H. Montgomery ranch. The darker areas are those which made greater growth and production because of the nitrogen application, or nitrogen and phosphate. The lighter shaded plots received either phosphate alone or received no fertilization of any kind. Also included is a mimeographed report of our 1948 cotton fertilization work.

Our earlier demonstration had shown the yield of seed cotton on the Check or unfertilized plots to average 859 pounds. The same yield was secured where 25 pounds of P_2O_5 , in Treble superphosphate, was added. An application of 75 pounds P_2O_5 gave 870 pounds. When a light nitrogen application (20 pounds nitrogen) in the form of ammonium nitrate was given the yield was 1,077 pounds. Nitrogen alone at the rate of 70 pounds gave a yield of 1,458 pounds of seed cotton. When combined with 25 pounds of P_2O_5 this heavy nitrogen application gave a yield of 1,469 pounds, and when combined with 75 pounds of P_2O_5 the yield increased to 1,676 pounds. The light nitrogen and light phosphate treatment, in combination, gave a yield of 1,045 pounds, very nearly the yield of 1,077 pounds which was secured from the light nitrogen application without phosphate.

The subject of cotton fertilization was discussed at four meetings of local farm bureaus by either the County Agricultural Agent or Prof. W. I. Thomas of the Arizona Agricultural Experiment Station.

We reorganized both the Pinal County Acala Cotton Improvement Association and the Pinal County American-Egyptian Cotton Improvement Association. All growers in the county became members and secured free classing of their cotton under the Smith-Doxey legislation.

Cooperation was furnished the Arizona Cottonseed Distributors in selection of increase fields for the growing of the A-28, A-44, Pima 32, and Amsak varieties.

Sixteen news stories dealing with cotton fertilization, irrigation, varieties, and other subjects relating to cotton were prepared and published by the four valley papers and by a semi-monthly magazine known as Pinal County Farm Life.

We have continued to emphasize the value of heavy pre-irrigation of cotton lands, followed by planting and clean cultivation and chopping and irrigation just as soon as the weather is warm enough to permit rapid growth. Followed by frequent irrigations during the growing season, water can be discontinued early and maximum yields made. This system has now become almost standard practice.

Four talks were given on the subject of cotton production before civic clubs.

A demonstration of cotton defoliant, most of which are still experimental, was arranged thru the cooperation of the Sacaton Field Station of the U. S. Department of Agriculture. Thirty farmers attended this demonstration, when a mechanical harvester was available and samples of cotton from each plot available for inspection of the growers present. Mr. V. W. Walhood of the Sacaton Station gave a discussion of the defoliant and their use.

To illustrate the change that has taken place in cotton yields in this county during the past twenty or so years, we can refer to the adjusted average yield of 296 pounds per acre used in 1937, for Agricultural Adjustment Administration purposes, and the estimated average yield (November 1) of 797 pounds. Contributing to this increase has been the development and use of more potent cotton dusts, wider use of nitrogen and other fertilizers, improved strains of higher-yielding cottons, and the determination of farmers to plant cotton acreages no greater than their water supplies will take care of adequately.

The Itinerant County Agricultural Agent devoted forty-eight and one-half days to problems of cotton mechanization. There are about 120 mechanical pickers in the county, and it is estimated that approximately twelve percent of the 1949 crop will be picked by machine. Several problems developed, and our work has consisted in attempting to find the reason for these problems and to assist the growers.

Some growers attempted picking in knotty cotton which matured in that state due to poor irrigation practice. It was impossible to get hand pickers for picking such crops and the efficiency of machines was low. No recommendations could be made concerning circumstances where plant condition produced an impossible situation.

Deterioration because of weather materially affected the pickability of late season cotton. Locks pulled apart leaving a fair portion of the cotton remaining in the boll, but this loss was not too apparent to growers. We found that increasing the moisture on the spindles seemed to help, as did slower operating speeds.

Several farmers experienced an unusually large amount of loss during late season picking. This was found to be due to the extremely dry condition of the plants which did not conduct electric charges to the ground as would happen normally. Slight breezes common at that time of year put a static charge of electricity into the cotton and when pulled from the boll it was attracted to the branches or stalk and became caught. More moisture on the spindles helped and some growers felt it eliminated the trouble. Gins liked the idea of more moisture in very dry cotton because it helped in the ginning process.



Photograph illustrates Cotton Defoliation demonstration on the Dick Harmon ranch southwest of Eloy. This demonstration was arranged in cooperation with the Sacaton Field Station of the U. S. Department of Agriculture, and included the use of several experimental defoliants. Thirty-four farmers visited the demonstration which was held between the hours of 2:00 and 5:00.

Defoliation Discussion

by K. K. Hennes

There are two main reasons why Pinal County farmers may wish to defoliate their cotton. First, they may wish to harvest it with a mechanical picker when most of the bolls are open and frost has not killed and dropped the leaves. Secondly, in rank cotton they may wish to drop the leaves from the plant in order to open lower bolls to the air and sun and thus hasten opening and prevent rotting of lower bolls.

Studies made by the Bureau of Agricultural Economics and the several agricultural experiment stations of cotton producing states have shown that costs of harvesting cotton by machine compare favorably with hand harvesting. It also has been found that machine harvested cotton usually grades lower than hand harvested cotton. If this difference in grade could be eliminated, much more wide spread use of harvesting machines probably would result.

Our County Agricultural Agent's office has secured some information in Pinal County fields, which indicates that under best conditions there is a considerable saving through mechanical harvesting, even though there may be a loss of about one-half grade. In other instances, with improperly adjusted machines and poor operating conditions, mechanical harvesting has not shown to advantage over hand picking.

Many of the benefits of defoliation also apply to hand harvesting. In fact, work on defoliation was begun before a practical cotton harvesting machine was developed.

According to a research progress report, "Chemical Defoliation of Cotton," prepared by the Defoliation Conference Steering Committee and published by the National Cotton Council, six defoliant will be on the market this year. They include two dusts, calcium cyanamide and monosodium cyanamide, and the following sprays: ammonium thiocyanate, sodium chlorate-sodium pentaborate, sodium monochloracetate and potassium cyanate. The first, calcium cyanamide, has been used for several years in the South. Its chief shortcoming arises from the fact that the leaves must be wet for at least 2 hours after it is applied. This limits its effective use to more humid areas where dew is frequent and humidity high.

The other five defoliants are better adapted to arid areas. They do not depend

on dew and all except monosodium cyanamide are effective when the humidity is low. Detailed instructions about the rates at which defoliants should be applied, the time to apply them and the areas to which they are adapted is included in the Defoliation Conference's report.

The efficiency of defoliation has been found to depend not only on the chemical used but on the condition of the cotton plant. For best results, the chemicals must be applied when the plants are active and most of the leaves are mature. These requirements make proper timing difficult. Cotton plants become inactive, or dormant, most frequently as a result of drought or cold weather. When they are in this state, defoliation is difficult and sometimes impossible. Sometimes heavier applications of a defoliant will remove the leaves but frequently this results in slow or partial defoliation. Plant inactivity is one of the conditions that limits the effectiveness of defoliants though future research may find ways to overcome it.

The degree of maturity of the cotton plants also limits the time when defoliation can be applied effectively. Mature leaves defoliate easily while new leaves or second growth leaves are hard to remove. In addition, the degree of maturity of the bolls must be taken into account. Defoliation, by cutting off the supply of food from the leaves, interferes with the growth of the bolls. If a defoliant is applied when a high percentage of the bolls are immature, losses in yield and quality of the lint and seed may be substantial.

In most of the nonirrigated areas of the Cotton Belt, plants usually come to a point where growth slows down or stops rather abruptly. Losses from immature bolls usually will be at a minimum if defoliants are applied when the youngest bolls are 25 to 30 days old. Where plants tend to set new bolls and grow new leaves into the fall, timing is more difficult. Growers may have to go ahead and defoliate before bad weather sets in, thus sacrificing yield and quality of late bolls.

Despite the problems that remain, the advances made in cotton defoliation have been substantial. They hold out the promise that the day is not far off when defoliation will be the standard practice throughout the cotton-growing region.

Artificial defoliation has often not proved practical under our dry conditions. This news article was prepared to furnish growers with the latest information available on this subject.

A number of calls to farms where machines were cracking seed were made, and in all cases the situation was the same. High yielding fields were being picked in early morning when moisture content of the cotton was high. This increases the weight of the cotton passing through the fan to the extent that some would fail to go through and remain in the fan housing and be subjected to the threshing effects of the fan which cracked the seed. We recommended that first the cotton be allowed to dry out, thus beginning work later in the day and quitting earlier in the evening. Use of first gear operation also was recommended when conditions were such that the farmer preferred to continue running longer. In some instances installation of a larger fan was recommended. Our suggestions were always helpful in lowering the amount of seed cracking, and in some cases eliminating it entirely.

Late season picking also produced increased field losses because of the extreme brittleness of the plants. As machines pass through the field any slapping action it gave the plants caused many mature bolls to drop. Slower speeds and greater care of the operator in driving helped to reduce these field losses.

Grade losses were serious only when the farmer was careless in handling the cotton after the picking and when picking was done when cotton was wet. Cotton must not be picked when wet and if wet the cotton should not be tramped in the trailer.

Late in the season picking by mechanical means proved to be less efficient than early post-frost picking. The International Harvester machines . picked slightly more than 92 percent of the cotton out of the field of which about four percent remained unpicked or tagged and 4 percent was dropped on the ground. Efficiency tests were run on a Rust Prototype which is being manufactured by the Ben Pierson Company of Pine Bluff, Arkansas. These proved very good. A 92.6 percent picking efficiency with a 7 percent ground loss and a .6 percent field or plant loss was what we found. These tests were in late cotton yielding two and one-half bales per acre. Hand pickers in the same field had a field loss of 11 percent. Grade of the Rust picked cotton was one full grade higher than the hand picked cotton and ginned out 41 percent where the hand picked cotton ginned out only 32 percent.

Six schools for mechanical picker operators were held in the two counties of Pinal and Maricopa, with two being held in Pinal County. The Itinerant County Agricultural Agent took part in all these schools discussing cultural and harvesting practices which have been found to be of help to the operator of a mechanical picker. These schools were sponsored by the O. S. Stapley Company. The Neil B. McGinnis Company, dealers in Allis Chalmers equipment held a similar school for operators and owners of the Allis Chalmers pickers of which there are a reported ten in the state this year.

Two mechanical picker demonstrations were held in the state this year, one of which was on the Otice Self ranch near Stanfield. I. H. C. and Allis Chalmers pickers took part. Poor arrangements and unanticipated rate of picking found the demonstrators in Pinal county out of trailers after two and one-half hours of operation. The results were only compared on observance. The Itinerant County Agricultural Agent also attended the demonstration held in Maricopa County where over 300 farmers were present. The results showed the Allis Chalmers machine the fastest in picking but with the lowest picking efficiency. The Rust machine picked the cleanest sample and picked faster than the I. H. C. machine, but the later got the most cotton out of the field. These results are of course not too indicative of what each machine will do and it is the impression of the Itinerant County Agricultural Agent that more and larger and more exacting tests should be run to compare these machines.

Several farmers were contacted who had had experience with flame cultivation and mechanical choppers. As yet we have done little with this in western irrigated agriculture.

The Itinerant County Agricultural Agent spent four days at Greenville Mississippi at the 4th Beltwide Cotton Mechanization Conference. On the day preceding this conference ginning specialists held a conference to discuss new and accepted practices in ginning and use of lint cleaners.

One Pinal County gin which had lint cleaners installed this year was contacted and the ginner interviewed regarding his success with these cleaners. Information was furnished the ginner which had not previously been given him and proved to be beneficial in his operation of this equipment.

(d) Home Gardens and Landscape Gardening

Demonstrations included one by Specialist Tate at the A. C. Valentine ranch near Winkelman, where he demonstrated pruning of deciduous trees with twenty-five present. Later he gave a pecan top-working demonstration on the same ranch, with eighteen present. Using a new home built by Wilbert Saltau of Casa Grande, Mr. Tate demonstrated the use of ornamental plants in landscaping the home. A second demonstration on this same subject was given at Superior. Arrangements have been made for two more such demonstrations early in the new year at Coolidge and Winkelman.

Many inquiries regarding home landscaping, planting and care of lawns, control of weeds in lawns, levelling of yards for irrigation, irrigation and care of citrus and dates and other trees and vines, and miscellaneous problems of the homeowner who wishes to grow a few plants or trees were handled.



Landscaping demonstration by Harvey F. Tate, Extension Specialist in Horticulture. Such demonstrations are planned using a newly constructed home where there has been no landscaping done, and the idea is to use plants that blend with the building and set it off to best advantage. This work has reached many builders of new homes in the county. This photograph is of Mr. Tate discussing the use of ornamental plants, at the wide of the Wilbert Saltau home in Casa Grande.



Prior to the demonstration Specialist Tate visited the home and prepared a diagram of the home and lot. When the demonstration was complete he wrote upon this diagram the location and variety of each ornamental to be planted. This provides a permanent record of this landscaping work.



As Specialist Tate discussed the use of plants for different locations, the County Agricultural Agent drove a stake where the ornamental was to be planted. Upon the stake was written the variety name. At the conclusion of the demonstration the home owner knew just what plants to buy and where to put them. The audience of course took notes and were able to do similar landscaping at their own homes.

(e) Market Garden and Truck Crops

There has been a considerable drop in the acreage of winter vegetables and potatoes, brought about by lower markets and the two cold winters immediately preceding this winter which did heavy damage to carrot tops and broccoli. No serious insect or disease problems appeared during the year as determined by several inspections of fields made by this office.

Information on growing of cantaloupes were furnished three growers and seven received similar information on the growing of watermelons. A news article was prepared and published on planting and care of winter gardens and their value in augmenting the home food supply. Two other articles dealing with phases of home gardening were prepared and published. One grower was furnished information on growing of sweet potato plants and sources of clean seed.

(f) Rodent and Insect Control

Under this heading we will first report our work in control of cotton "sucking insects". It is estimated that growers in this county used 15 million pounds of dust last year in their control program. We continued our previous plan of work which includes regular weekly checks or counts in forty selected fields located in all parts of the cotton growing area. Thru this system we are able to know each week what increases if any in insects are being found, and in what areas those increases occur. We report our findings each week to the Specialist, who includes them in his weekly report published by the State daily papers. We also prepare regular weekly reports which are published in our weekly column in the four valley weekly papers. Anything of particular interest where quick action is needed, such as a late bollworm infestation where growers must be cautioned to watch their fields and to dust at the right time, are reported thru the radio and by circular letter. Thru all these means growers are kept well informed and we believe that we have as fine an insect control program as can be developed.

Such regular weekly checks of insect populations are the means of preventing many growers from dusting "just because their neighbor did." We constantly emphasize that dusting should be based upon insect counts, and not upon what other growers in the community may be doing. This has resulted in a saving of many thousands of dollars to growers.

Early in the season, before cotton was planted, arrangements were made by the Agent for the Specialist to appear at meetings of the Coolidge and Casa Grande Farm Bureaus and thru the use of slides illustrate the various insects and damage they do. Seventy farmers attended these two meetings. Wide use was made of the annual circular on cotton insect control prepared

by the Specialist, and six hundred copies were distributed thru this office and thru the cotton gins. A publication illustrating most of the insects in color, prepared by a commercial concern, was mailed under postage to all cotton growers.

Eighty-eight and one-half days were devoted to work in insect control, mostly in the problem of cotton insects. We estimate that three hundred and seventy cotton growers were helped in cotton insect control. Work was done in seventeen communities.

A program was developed during the winter designed to get farmers to burn out or otherwise destroy weedy ditch banks and other areas where cotton insects overwinter. Leaders were appointed in the cotton growing communities and these worked to encourage their neighbors to destroy weeds and grass where insects might be over-wintering. Many farmers cooperated in this program and some work has already been done along a similar line in organizing for similar work this winter.

Including our regular weekly reports of cotton insect counts made in selected cotton fields, thirty-six news stories were prepared and published dealing with insect control.

Beet armyworms appeared in some cotton fields early in the season, mostly in the Stanfield area. Thru news articles and the radio farmers were advised to delay chopping until they were brought under control, and to dust if necessary. As a result damage to stands was slight.

A grasshopper infestation developed on about 800 acres of alfalfa and grain on the Ethington ranch. The Specialist visited the county and with the agent worked out a dusting program which resulted in good control. An attempt to use 25 percent wettable Aldrin powder instead of the pure extract which could not be purchased, did not work out, so Toxaphene was used.

Pea aphids in one barley field were brought under control thru dusting with Parathion.

Cotton aphids appeared in many fields and a number of growers planned on dusting. Field inspections made by this office showed a high population of predator insects and we recommended that growers wait and see if these did not bring the aphids under control. They did and growers were saved many thousands of dollars which they would have otherwise spent for dust and its application.

Continuing our cooperative pocket gopher control program, Pinal County Electrical District No. 2 and the San Carlos Irrigation and Drainage District made available a total of \$5,000, which was used to buy materials and hire help in the poisoning and trapping program. Owing to the fact that there had been ample irrigation water for all San Carlos Project lands, gophers were confined to ditches and canal banks or nearby, and a much greater acreage was treated than in previous years. Arrangements were made in November of this year for similar financing of the program which is to start shortly after January 1, 1951.

Rabbits gave more trouble than for many years, but were brought under control thru use of poisoned alfalfa. Sparrows caused some loss of stand in a planting of canaigre by the U. S. Bureau of Plant Industry, but were brought under control.

Many inquiries regarding control of houseflies, particularly around dairy barns, as well as household insects and ants were handled.

(g) Agricultural Engineering and Soil Reclamation

Fifty-one days of work were devoted to our program of agricultural engineering and soil reclamation, with three leaders assisting. Thirty-six farmers were assisted with problems of land use and twenty-eight in problems of establishing proper crop rotations. Nine were furnished information on use of green manure crops, and fifty received information on the value of summer fallowing on the heavy types of soil in order to help maintain crop yields. Seventy-six farmers were assisted with irrigation problems, including twenty-six with land levelling work. Twelve were furnished information on methods and costs of land development. Assistance was furnished all soil conservation districts in the county in their plans of work.

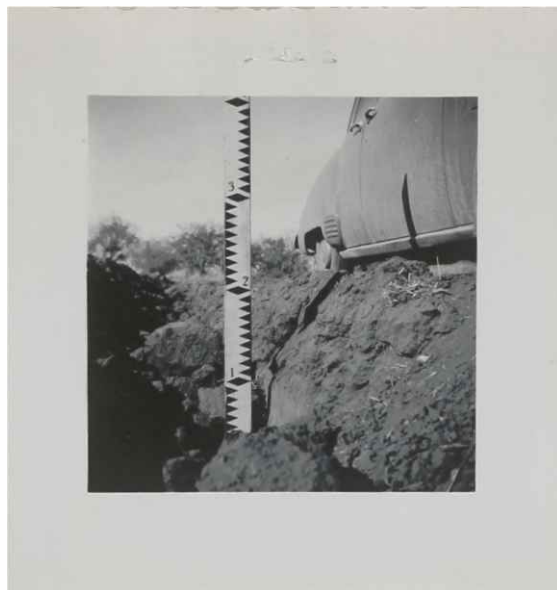
We have the problem in this county of handling thousands of acres of "tight" or "slick" soils. These soils show a profile of a top covering of silt usually from twelve to eighteen inches in thickness, underlain with the native soil of the area, usually a red sandy soil. Deep-plowing to a depth of two to two and one-half feet and mixing of the two types of soil has proved helpful in creating a condition where these soils take water more rapidly and are easier to work. Our work began with the establishment of a demonstration on the O. W. Rugg ranch, which we have continued this year, where deep-plowing has been followed by planting of barley, alfalfa and cotton. The practice has taken hold and we estimate that some 5,000 acres of this type of soil has been deep-plowed. During the year we have discussed deep-plowing and its value over the local radio station, cooperated in preparing a news story for Arizona Farmer, and have prepared ten news stories dealing with this subject for publication in our news column. Two stories were also prepared on this subject and published in Pinal County Farm Life.



In order to meet a special soil condition existing on several thousand acres of Pinal County lands, where "tight" or "slick" topsoil covers better types of soil, usually red sands, to a depth of twelve to eighteen inches, plows which plow to a depth of 28 to 30 inches have been built and used. Photograph illustrates one type, a two-way plow with blade in front of moldboard.



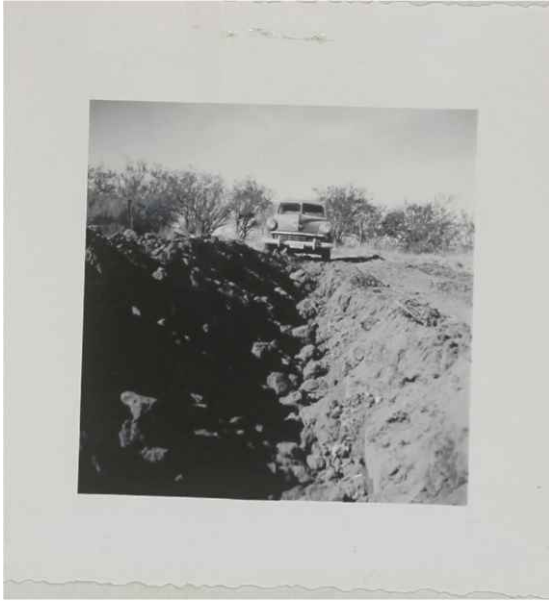
Photograph illustrates two-way deep-plow at work, plowing to a depth of about twenty-six inches. Note the blades in front of the plow, scraping off five or six inches of the "tight" or "slick" topsoil and dropping it into the bottom of the furrow before the plow turns its furrow. Depositing this tight top soil in the bottom of the furrow apparently is helpful when the soil is irrigated, as it has a high water-holding capacity and when wet apparently acts as a reservoir of moisture for the growing cotton crop.



Photograph illustrates depth of a job of deep-plowing. Such a plowing job usually costs between \$18 and \$20 per acre, and is not recommended as a usual practice, and is recommended only in such soil situations that its use will improve the rate at which the soil takes irrigation water.



Photograph illustrates the width of furrow where deep plowing is done. In the background is the tractor and plow. Best results are secured when plows are pulled with a D8 Caterpillar or a TD24 International. Smaller tractors such as the D7 or TD18 do not have sufficient power to do the right kind of job.



Thru the use of an automobile width and depth of plow furrow is illustrated. The use of the two-way deep plow simplifies the job of getting the land back to level and in good condition for irrigating. The use of the one-way deep plow leaves the back furrow which usually require the carrying of dirt with a carryall to fill it up.

With the increase in acreage of barley there appeared need for extra storage facilities. Following a meeting of thirty grain growers we decided to have the Itinerant County Agricultural Agent make a study of methods and costs of construction of such storage. Particular care was taken to study the type of storage that could be later used for other purposes when the farmer was no longer growing grain. Information from building concerns was collected in order to compare costs of commercial buildings and tanks with those of farm design.

In our soil work we have collected and had analyzed samples from thirty-six farms. Twenty-nine water analyses have also been made, about two-thirds of which were to determine their suitability for domestic use.

The Agent met a class in soil chemistry and discussed with them our work in deep-plowing. Inspection was made of a deep-plowing job on the G. M. Marsh farm.

Thru the use of soil analyses and the use of a barley fertilization test demonstration, we determined that on at least some of the old farms of the San Pedro area that deep working of soils thru sub-soiling and plowing, followed by aeration thru summer fallowing, was all that was needed to greatly improve their production. Many of these fields have been pastured for years and improvement in soil structure is necessary. Applications of 300 pounds per acre of ammonium nitrate on such soils gave no response over the Check or unfertilized plots.

(h) Poultry

The poultry population of the county is somewhat higher than last year, but still is not a major industry. Our work consisted largely in handling problems that developed rather than in an organized program. Three news stories were prepared and published dealing with poultry production. An outbreak of Newcastle Disease was diagnosed by the Pathology Department and recommendations for control given. An outbreak of fowl pox occurred and recommendations for vaccination given. A complete program for housing and operation of a 2,000 hen venture was furnished one farmer. Twenty-one poultrymen were furnished information on sources of good baby chicks, eighteen were furnished information on feeding, twenty were furnished information on control of parasites, mostly blue-bugs, and fifteen were furnished information on worm control.

We anticipate that recent egg prices will create greater demand from farmers for small flocks, and probably we can expect a greater amount of work to be done with poultry in the coming year.

(i) Dairy

It is difficult to separate the Pinal County herds from those of Pima County, since both counties are combined into one Herd Improvement Association. The number of Pinal County dairy herds on test during the year ranged from twelve to fourteen, and the number of cows on test from 860 to a high of 1,055. The two high Pinal County herds averaged 403.1 and 435.9 pounds of fat, and 11,608 and 13,974 pounds of milk respectively. Records for cows leaving the dairy herds are upon an association basis, and the records show that low production accounted for the largest number of cows, one hundred and thirty-nine. This shows that these dairymen are using their records in culling their cattle. Sterility was second, with eighty-three cows being disposed of. Forty-three were sold because of mastitis, a most important consideration in most of our dairy herds. Thirty-six died during the year. Total cows disposed of during the year amounted to 28.1 percent of the cow years reported, but included fifty sold for use in other dairies.

For all cows in the association, including both counties, in 1950 the average number of herds on test was 26.7, average milk produced 9,439 pounds, average test 3.70 percent, and average total fat produced 348.9 pounds. Average pasture costs was \$25.11, roughage cost averaged \$126.35, and cost of concentrates averaged \$68.68, a total cost of feed per cow for the year of \$220.14, down \$54.03 from the preceding year. The value of product over feed cost per cow year was \$312.95, a little less than \$6 below the same figure for 1949.

Cooperation has been furnished representatives of the Bureau of Animal Industry in their Bang disease testing work. Seven news stories dealing with dairying including such subjects as fly control and pasture improvement, were prepared and published in our weekly news column.

One dairyman who was having trouble in raising young calves was assisted in developing a feeding program based upon the most practical sanitary conditions that could be worked out, and is now having little difficulty in raising his young calves. Another dairyman who had purchased a number of dairy calves thru auction sales had considerable die-off which was brought under control by moving the calves into dry-lot and feeding them mixed alfalfa-barley hay and rolled barley, plus treatment with Sulmet tablets. Thru farm visits we have continued to emphasize the need of strict sanitation in the raising of young dairy calves.

(j) Livestock

High cotton prices have continued to make further demands upon our acreage, with the result that the supply of pasturage available for livestock is probably at the lowest point that it has been in several years. Drouth has also contributed to the situation, especially on lands of the San Carlos Project which are watered from the now dry Coolidge Reservoir.

During the year we have continued to work with both cattle feeders and range operators, largely upon an individual basis. Thirty-seven were furnished information on feeding, including the meal-salt mix on range lands and in two cases on dry hegarl stalk pasture late in the winter. Information on spraying for fly control was furnished thirty-two feeders and range operators. Eleven were furnished information on control of disease and internal parasites. One of the problems locally in cattle feeding is loss from calves when they are first run on irrigated pasture after coming from dry range. Our recommendation has been that these calves first be penned and fed hay, preferably a mixed grain-alfalfa hay, for perhaps a week or ten days, and that after this period they be grazed only an hour or two a day for another week, during the middle of the day when they are full. This practice means that they take a longer period to change from dry low protein feed to high protein green pasture, and avoid the digestary upsets which are often followed by pneumonia and death.

Thru a news story we emphasized that horse owners should vaccinate their animals for sleeping sickness. Most horse owners did this and we heard of no losses.

A news story outlining possible development of livestock feeding in order to utilize increased pasture and hay production was prepared and published. This story was written at a time when it appeared that cotton acreage controls would continue and more alfalfa and grain would be planted.

A water analysis was made to determine what changes were needed if this water was to be used in a boiler used in connection with a large cattle pen-feeding operation.

Much of our work with livestock has been in connection with our 4-H Club livestock projects, and will this year be reported under (n) 4-H Club Work.

(k) Farm Management

Twenty-three days were devoted to work with Farm Management, including problems of farm credit and Outlook Information. Work was done in all communities of the county. Sixteen farmers were helped in developing farm plans, and twenty-three farmers or tenants were assisted in working out land rental arrangements. Sixteen were assisted in getting started in

farming and sixteen with credit problems. We estimate that seventy farmers used Outlook Information in planning their operations and farming adjustments. An estimated twenty-five were helped with farm labor problems, and seven were assisted in developing supplemental sources of income.

As in previous years, two farmers were selected to meet Dr. Geo. W. Barr's class in Farm Management and explain their leasing deals, operations, costs, profits, etc. to them. Owing to the fact that it was a large class it was handled in two sections on two different days, each class meeting with the two farmers and discussing their operations with them.

Thru our weekly news column we have endeavored to keep farmers informed relative to Commodity Credit Corporation loans and their terms and conditions. Other information dealing with Farm Management has been prepared and published, seven news stories in all being published. Wide use has been made of Outlook Information thru meetings with farmers attended by the Agent. Two hundred and fifty copies of the publication, Arizona Agriculture - 1950, were distributed to farmers interested.

(1) Marketing

Regular monthly reports of agricultural conditions in the county were furnished the Engineer in charge of the San Carlos Project. Similar reports on livestock sales, pasture sales and supplies, and matters of interest to cattlemen and cattle feeders were furnished the Secretary of the Arizona Cattle Growers' Association.

Thirteen days were devoted to marketing work, which was done in twelve communities. We estimate that forty-two farmers were helped in their grain marketing problems, three with livestock, and twenty-six with cotton. A news article on the loss to growers because of underweight and overweight cotton bales was prepared and published.

We have reported the survey made in order to determine best types of grain storage facilities. One meeting of barley growers was held with thirty farmers present, for the purpose of presenting the problem of barley marketing that would develop with the larger than usual acreage, estimated to be 38,000 acres, and inadequate storage. Out of this meeting came the building of some storage and changing of buildings so they were suitable for storage, with considerable help to the marketing situation.

Using the Outlook Information, the Agent discussed the subject "Looking Ahead with Pinal County Agriculture" at a meeting of the Casa Grande Rotary Club. Later he discussed the same subject at a meeting of the Winkelman Farm Bureau. Arrangements were made for a representative of the local FMA office to discuss Commodity Credit Corporation loans at a meeting of the Casa Grande Farm Bureau.

(m) Community Activities

We have a large number of very large cotton farms in the county, most of which maintain large cotton camps consisting of a number of cabins. Some of these camps house as many as three hundred or more people. Farmers recognize generally that health and sanitation conditions are not of the best, but many argue that if more money is spent for better facilities that the workers will not take care of them. The Pinal County Sanitarian and the County Agricultural Agent devoted considerable thought to the matter, and out of it came a meeting attended by sixty people, many of whom were farmers, and the group included the State Director of Public Health and others of his staff. After discussion of the problem those present voted to have the chairman appoint a committee to work on ways and means of improving the situation. The County Agricultural Agent suggested names to make up the membership of this committee, and it is at work. Included in the overall program is the installation of better and more adequate garbage disposal and toilets and bathing facilities, and where necessary the installation of public toilets in the small towns and rural centers where farm labor trades. We believe that this is a start in the right direction and that over a period of time both farmers and farm help will cooperate in a better health and sanitation program.

During the year we emphasized Farm Safety at every opportunity. One local newspaper editor wrote for mats and used these mats in several advertisements paid for by his farm implement customers. For National Fire Prevention Week we prepared and mailed to pastors and civic clubs and schools and other organizations a circular calling attention to the need for fire prevention. We had a wide response from this work. Material on fire prevention in cotton gins was furnished all gin managers.

The Agent cooperated with Mr. A. F. Peters, Pinal County Fair Commissioner, in the selection of exhibits for the Pinal County Agricultural Exhibit at the Arizona State Fair in Phoenix.

Cooperating with the Pinal County School Superintendent, the Agent met twice with a committee appointed by him for the purpose of diagnosing schoolroom requirements in some of the cotton growing areas and ways of meeting the problem of having housing when migrant workers brought their children into the community. Thru the cooperation of school boards the problem was met in a satisfactory manner.

We have continued our work with the Winkelman Farm Bureau in trying to work out ways and means for extension of lines of the San Carlos Project in order that some 120 families not now using electricity can receive it. We can report now that work in extension of powerlines has begun. Several meetings have been held attended by representatives of the San Carlos Project and the Rural Electrification Administration.

ALONG THE FARM FRONT

By K. K. HENNESS
County Agricultural Agent

Through last Monday's meeting and the appointment of the Pinal County Health and Sanitation Committee, farmers and others interested have taken a definite step forward in meeting one of the pressing problems of our county, that of the improvement of health and sanitation not only in cotton camps, but in other areas where it is needed. This committee will meet on Monday, December 4, for the purpose of perfecting its organization and outlining a program of work.

On the committee are William Ritezal of Casa Grande, James Kortsen, Jr., of Stanfield, and Kenneth Clark of Eloy, all farmers who are well acquainted with farm labor camp problems. Also appointed were Mrs. George Anderson of Casa Grande and Mrs. Melvin Gammage of Coolidge, wives of farmers who already have been working on labor camp problems. Ed Pederson, city clerk of Casa Grande, will represent the incorporated towns of our valley, who have an important stake in improved health and sanitation. Ralph Archer, Pinal County sanitarian, is the seventh member of the committee, and is well acquainted with the situation throughout the county.

Co-operating with officers of the state department of health, we believe that there can be worked out a voluntary program which over a period of years will greatly improve health and sanitation. While some attention of the press has been devoted to sanitation and health

problems of Pinal County, it can safely be said that the same problems exist wherever large areas of crops are grown and great numbers of temporary and migrant laborers are needed for their harvesting and processing.

Here is a quotation from the Secretary of Agriculture: "Most informed persons now agree that there are a few select items, such as rubber, tin, copper (mostly imports) for which controls may be required in order that these commodities will be available at reasonable prices. On the other hand, most informed persons are aware that there is not one domestically produced agricultural commodity for which controls are needed at this time. The American farmer has produced so abundantly and is capable to produce so abundantly that price controls of foods and fibers are not now needed."

On Friday of this week L. F. Warnock, engineer for the Indian Irrigation Service, San Carlos Project, will meet with members of the Winkelman Farm Bureau at the D. O. Shartzler ranch near Mammoth for the purpose of outlining plans for extension of power lines and service from Kelvin on the Gila river by Winkelman and up the San Pedro river to Mammoth. Some work is now being done and the news is welcome to the some 120 residents of the area who up to now have not had electric power.

This is a sample from our news column from the Coolidge Examiner of December 3rd. Quite often these columns contain three or four stories dealing with different subjects. The first story usually is the most important and timely, and in this issue tells of the organization of a committee to work on health and sanitation problems in farm labor camps as well as in the small towns where labor comes to trade. The County Agricultural Agent assisted in organizing the preliminary meeting, and suggested the committee members to the President of the Pinal County Farm Bureau, who was authorized at the meeting to appoint them.



Men in the office of the County Agricultural Agent participated in many community events. Shown in the photo is a meeting of Homemaker groups at the Southwestern Arboretum near Superior. Seventy-three women attended the meeting.

Along The Farm Front

By K. K. HENNESS

County Agricultural Agent

Here is a brief summary of the cotton situation and what may be expected in 1951:

The Government has asked for the production of 16 million bales in 1951, which is a 60 percent increase over the 1950 crop. We will need 9 to 10 million bales for domestic consumption and about five million bales for export.

There will be no cotton quotas or allotments in 1951, and the price support will be at 90 percent of parity.

Cotton planted in 1951 will count on cotton history for future quotas. What regulations may be written by the Congress regarding such 1951 acreage is not

known.

It appears that there will be sufficient of the new Arizona 44 and Arizona 28 varieties to plant 450,000 acres in Arizona in 1951 and the supply of long staple cottonseed will be much greater than demand.

Insecticides will be short but it is not advisable for growers to buy and store them for future use. It is advisable to talk to your dusting company and tell them about what you think your minimum needs will be.

There will probably be an acute shortage of nitrogen fertilizer. Fertilizer needs should be contracted for as soon as possible

and stored.

With expanding defense work and a greatly increased cotton production there probably will be an acute shortage of cotton pickers in 1951. The possibility of getting Mexican nationals depends on the development of a program suitable to the Mexican Government. Cotton picking machines will harvest a greater proportion of the 1951 crop than of this year's crop.

Water is the measuring stick of cotton production, and the planting should never exceed the acreage that can be watered frequently enough during the hottest summer to prevent water stress. The cotton yield usually is in direct proportion to the size of the cotton plants on July 1, which is an argument for early planting and rapid development of the plants. The first irrigation after planting should be as early as possible to assure early growth, but not until the weather and soil have warmed up. This is usually about fifty days after planting if planting is done early. If the first irrigation is applied before the soil warms up, the growth of the cotton plant is retarded.

The attached copy of our "farm column" is prepared regularly each week and published by the four valley papers, which are the Casa Grande Dispatch, the Coolidge Examiner, the Florence Blade-Tribune, and the Eloy Enterprise. This copy is from the Casa Grande Dispatch.

The 11-Mile Corner Camp, a migratory farm labor camp originally built by the Farm Security Administration and during recent years rented and operated by the Arizona Farm Bureau Federation, was taken over by the Federal Housing Administration. It became necessary to set up a County Housing Authority to operate the camp if the Federal Housing Administration was not to do it. The Agent helped in securing the appointment of such an authority, and on November 1st this authority began operation of the camp.

Arrangements were made for the Engineer of the Pinal County Electrical Districts Nos. 2 and 5 to meet with members of the Casa Grande Farm Bureau and discuss methods of making the changeover from 25 to 60 cycle power for both pumping and domestic use.

The Agent attended two meetings of a committee appointed by the State Land Commissioner for the purpose of assisting in developing a formula for the rental of state agricultural lands.

Annual meetings of the Pinal County Farm Loan Association and Arizona Farmers' Production Credit Association were attended by the Agent.

Crop acreage and production statistics were furnished the City Clerk of Coolidge.

One day was spent with a photographer from Life Magazine interested in securing pictures to illustrate the need of additional water for irrigation.

Visiting representatives of the Agricultural Extension Services of Oregon and Washington were shown thru a number of cotton labor camps. They were interested in camps used for the housing of both migrant and permanent labor.

Thruout the year the Agent has cooperated with the five local farm bureaus and Pinal County Farm Bureau in their many programs. He attends all of the meetings of the county farm bureau and most of those of the locals, and participates in many of their programs, including membership.

Information on development of a water supply for grassing of a golf course in Casa Grande was furnished by the Agent.

Cooperating with the Home Demonstration Agent, the Agent spoke at a countywide meeting of Homemaker groups at the Southwestern Arboretum near Superior. He acted as judge of a cotton picking contest during the Casa Grande Cotton Carnival, and also judged farm crops at the Junior Fair in Chandler.

(n) 4-H Club Work

Our 4-H Club program is well organized, with the Assistant County Agricultural Agent in charge of the boys' work. The overall sponsoring group is the Pinal County 4-H Club Council, made up of 4-H Club leaders. This group has their chairman and other officers, and met several times during the year in planning their work. Again this year they conducted, with the assistance of people from this office and the state office, a Leaders' Training School, the purpose of which was to bring old leaders up to date on changes in the program, and to acquaint new leaders with the work. The Assistant County Agricultural Agent and others in this office met often with the individual leaders, encouraging and helping them in their work.

There are two main problems in conducting 4-H Club Work in this county. First is that large areas of the county are devoted almost entirely to large cotton farms, upon which there is usually nothing in the way of feed for livestock. The population is largely migratory and boys and girls enrolled in 4-H Club Work often move with their parents before finishing their projects. A second problem is that of getting more good leaders. We have been making a special effort along this line and are making progress.

Publicity has been a big factor in building up interest in 4-H Club Work. We have made wide use of the local radio station and the newspapers in the release of 4-H news, particularly emphasizing what the boys and girls were doing in 4-H Club Work. We have had the finest of cooperation from all newspapermen and radio people, and they have aided greatly in the promotion of the program.

Financing of certain of our 4-H Club activities is thru contributions from a number of firms and individuals. Such funds are handled by the treasurer of the Pinal County 4-H Club Council, and disbursed by him after approval by the Council. Each year a part of these funds are used for materials and in some cases for labor in connection with the 4-H Club Fair, but the larger amount is used as awards to 4-H Club members, including paid trips to the Annual 4-H Club Camp and Roundup.

We have no permanent fair ground, so must depend upon the cooperation of school officials. This year's fair was held again at the Kenilworth School, where cooperation has been splendid. Officials of the school simply turn it over to the 4-H Club Council during the two days of the fair, including classrooms for exhibits and the grounds for the livestock and poultry and other exhibits. The Kenilworth P. T. A. again operated the cafeteria serving meals thruout the two days. Thru the years we have been able to collect certain material which is necessary, including two large tents for the livestock and poultry and rabbit show. We also have a number of panels for construction of stalls, and some poultry coops. Others are borrowed each year from the Arizona State Fair Commission.

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National 4-H Week Observance Finds 422 Pinal County Youths Busily Preparing For Annual Kenilworth Fair

With a theme of "Better Living for a Better World" nearly 2,000,000 young people in America will observe National 4-H week March 4 thru 12. In our own Pinal county, 422 boys and girls will take part in this national program.

Bob Bever, assistant county agent, heads the 4-H set-up in Pinal and his plans call for the setting up of a window display in Casa Grande and Coolidge to acquaint the general public with the work of the local 4-H members. There will be a broadcast just before the start of the week-long program.

Pinal county's 422 members have a multitude of projects underway, most of which will be on exhibit at the annual 4-H Fair to be held April 14 and 15

at Kenilworth school east of Coolidge.

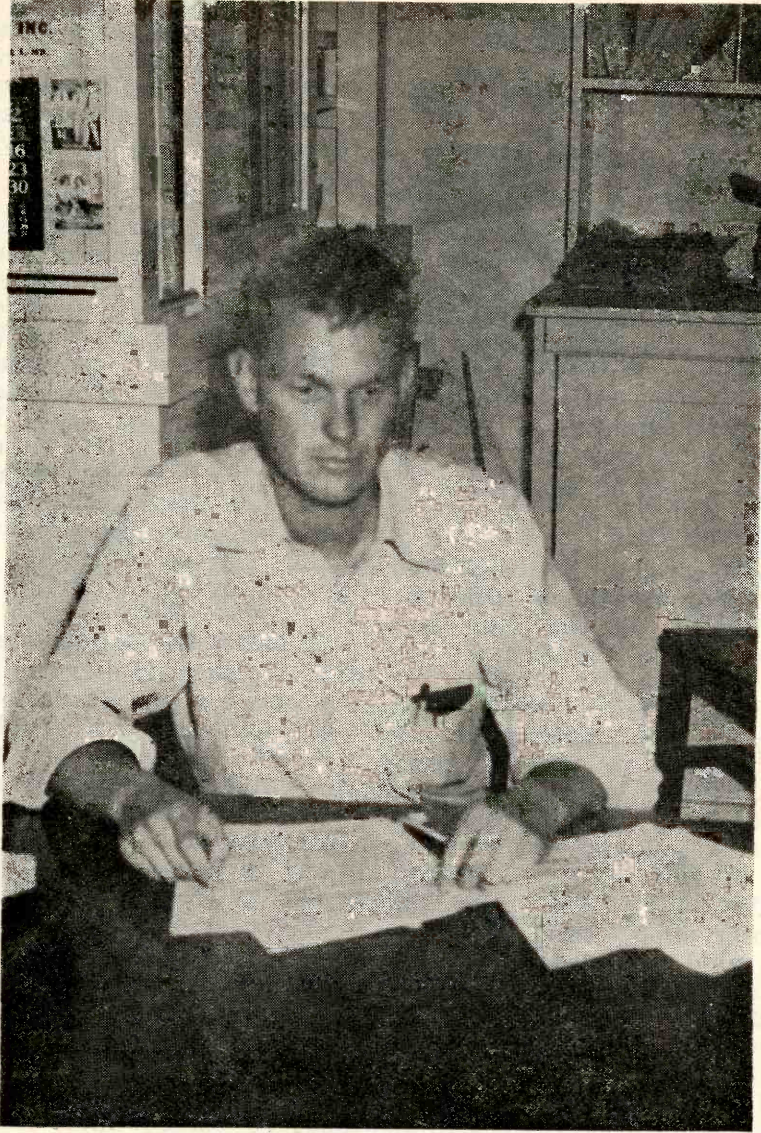
After several years of inactivity, two clubs have been re-activated on the Indian reservation, one at San Tan and the other at Casa Blanca. Members of these clubs will compete at the fair for the first time.

Top 4-H members in Pinal county include Mary Lou Hennes of Casa Grande, now a junior leader of Mrs. Branum's Casa Grande girl's senior club. Mary Lou was Pinal county and state winner in the dress revue contest last year and went back to Chicago for the national 4-H competition. Patty Cunningham of Kenilworth school is a junior leader, assisting Mrs. Loucks with the club at Kenilworth school. Patty was state

dress revue winners two years ago. Another Kenilworth student outstanding in 4-H work is Gene Carter who is known for his poultry projects. Carter is leader of a junior club in Florence. Tommy Wilson of Casa Grande, a newcomer to Arizona, is very active with his beef projects. A former resident of Boston, Tommy took second place in beef judging at the State Fair 4-H livestock contest and took top honors in the same event in F. F. A. competition. Last year he won the beef award at the Pinal county fair at Kenilworth and is preparing a black Angus steer for the same event this year. He will also show the Hereford heifer he was awarded by Valley National Bank as his prize last year.

One of the most active clubs in the county is at Red Rock. Under the direction of Mrs. Alberta Harris, they have a total of 31 projects underway. A breakdown of their activities reveals that there are two with clothing projects, eight in food preparation, two with beef calves, seven with garden projects and twelve in the camping project.

Pinal County Farm Life, March 5, 1950



Meet Bob Bever, assistant county agent.

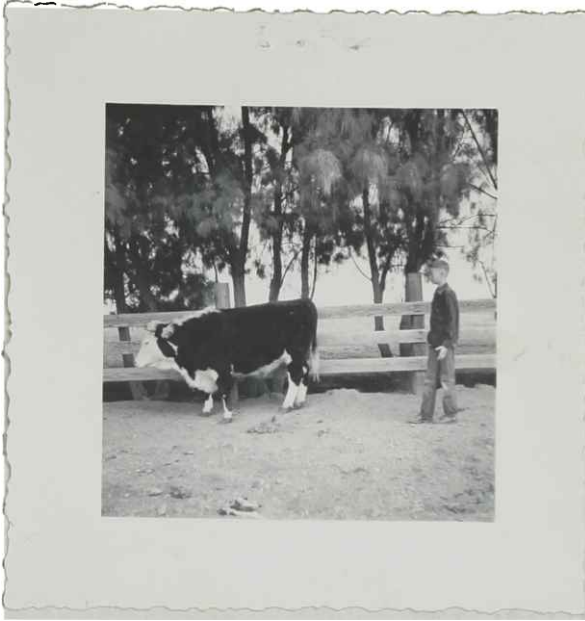
Bob first came to Pinal county in June 1949 when he took over from Bill Brechan who was transferred to Coconino county as county agent. Born in Wyoming, Bob was raised in that state and New Mexico. He came to Arizona in 1945.

A graduate of the University of Arizona, Bob is a veteran of the Army Air Forces where he served as a sergeant in operations.

Emphasis was placed on National 4-H Week. This news story illustrates part of the publicity released by the Assistant County Agricultura Agent, Mr. Bob Bever



4-H Club Work occupied most of the time of the Assistant County Agricultural Agent. Shown in the photograph is Tommy Wilson, outstanding 4-H Club boy, with a heifer calf awarded by the Valley National Bank. Tommy won a Cudahy award and a trip to Chicago to the National 4-H Club Congress. Previously he had shown a Grand Champion fat steer and a Reserve Chamption at two of our 4-H Club Fairs.



Shown in the photograph is Jimmy Hennes with his steer which was Grand Champion fat steer at the 1950 Pinal County 4-H Club Fair.

Again this year we used the Pinal County 4-H Club Fair Commission in carrying on the fair. This commission is appointed by our Pinal County 4-H Club Council, and assists in making up the fair catalog, promotes publicity in the several communities, helps secure buyers for the livestock auction, and assists in getting transportation to and from the fair for both 4-H club members and their projects.

Twenty boys and five girls completed projects in Home Gardening. Twenty-four boys and one girl completed poultry projects. Eight boys completed dairy projects and ten boys and six girls completed beef cattle projects. Other projects completed included swine, three; rabbits, four; other livestock, one; wildlife and nature study, seven; junior leadership, one; and all others, five.

Continuing our policy of previous years, arrangements were made for eight boys to attend the Annual 4-H Club Roundup held at the University of Arizona on June 5-10. Transportation of both boys and girls was by High School bus.

Three Boys Club leaders attended a Leaders' Training Camp held on July 25-29.

The Oracle 4-H Club undertook as their community project the building of a recreation center. Mrs. Reggie Ramsey, club leader, has long felt the need for such a center for the youth of the Oracle community, and has worked hard to get it established. Over \$3500 was contributed by the people of Oracle and surrounding country, and plans are underway for its official dedication on Sunday, December 17th.

A new 4-H Club project introduced into Pinal County during the year was Tractor Maintenance. The Itinerant County Agricultural Agent organized and assisted in a clinic for the training of leaders of tractor maintenance clubs. Five leaders were trained and we expect to organize one or more such clubs during the coming year.

In livestock judging training was furnished both junior and senior 4-H Club members. One day was spent at the University Farm in Tucson, where members were given practice judging and an elimination contest held. Out of those scoring highest junior and senior judging teams were selected. These participated in the judging contest at the Arizona State Fair, where our teams won second high in the Junior Judging and 3rd high in Senior Judging. One of our club members was second high individual in livestock judging.

The high event of our 4-H Club program is the Annual 4-H Club Fair. Last April we held our 14th Annual 4-H Club Fair at the Kenilworth School, where many others have been held, with an estimated attendance of 1,000. Including girl exhibitors, there were 269 individual participants,

with entries in foods, clothing, vegetables, livestock, dairy, and poultry and rabbits. A highlight of our fair is always the auction of fat cattle, swine and lambs. Herman Moore, auctioneer of Phoenix, donated his services and the use of his sound truck. There were plenty of buyers on hand and the sale moved along nicely with an average of \$39.75 per hundredweight being received for the fat cattle, the top being \$51.00. We use the Danish system of judging and only animals that receive a blue or red ribbon can be offered in the sale. This system has worked well and buyers have come to expect that any livestock offered will be finished suitable for slaughter.

Calves for our beef projects have been secured from various sources. In May six yearlings were needed, and thru the cooperation of W. J. and M. T. Clemans of Florence six fine yearlings were selected out of a lot of feeder cattle bought by them, and sold to the 4-H Club members at cost. Others were secured thru the cooperation of Earl Thode of Casa Grande, and several 4-H Club members secured their own calves, including several Aberdeen-Angus feeders from Phoenix breeders. Roland Curry, rancher of Casa Grande and a breeder of Brahma cattle, gave one cross-bred Brahma-Hereford steer to one of our outstanding 4-H Club members with the understanding that he would finish it and exhibit it at the 4-H Club Fair.

Beginning in September, all members of this office assisted in the organization of 4-H Club Work for the new year. This was necessary because of the absence on sick leave of the Assistant County Agricultural Agent. Several new clubs have been organized and leaders found for them, and the older clubs have been reorganized. Two meetings of the Pinal County 4-H Club Council have been held since September, and the location of the 1951 fair has been selected. Arrangements have also been made for a 4-H Club officers' training meeting to be held early in the new year.

(o) Miscellaneous

For the first year in many the Agent enjoyed almost a full month's vacation.

The Agent appeared before the Pinal County Farm Bureau Board of Directors and secured their approval of an increase in the County appropriation for Agricultural Extension Work of \$350. This raise was approved by the Pinal County Board of Supervisors.

When time permitted during the year we did considerable work in re-writing of our several projects, including not only their history but the work which is planned to be done.

Information on an agricultural text suitable for 7th and 8th grade pupils was secured for one school principal.

VI. Agricultural Adjustment and other Federal Functions

Cooperation was furnished the county office of the PMA in their educational program. Arrangements were made to have the State Chairman discuss crop adjustment at meetings of two farm bureaus. Their secretary also was invited to discuss U. C. C. loans on barley at a meeting of thirty grain growers called by the Agent. Many news stories dealing with crop adjustment, loans, and cotton insurance were prepared by the Agent.

Conferences were held with representatives of the REA in an effort to work out a program under which some one hundred and twenty farm families in the Winkleman area could receive electric power.

Arrangements were made for representatives of the Department of Labor to explain the operation of child labor laws to farmers.

We have cooperated with the Treasury Department in mailing out literature encouraging farmers to buy savings bonds.

Several conferences were held with the local representative of the Bureau of the Census in working out plans for collection of farm and ranch information.

Two cooperators were secured for the Bureau of Plant Industry who would grow small acreages of canaigre.

Two representatives of the Turkish Department of Agriculture visited the county under an arrangement with the Department of State, and spent two weeks with the Agent observing agricultural and extension methods.

One meeting of F. H. A. borrowers was attended where reports of their farming progress were given by a representative of that agency.

The Agent attended six meetings dealing with soil conservation work, including one at Phoenix where the proposed water conservation program on Queen Creek was discussed. Frequent consultations were held with local representatives of the Soil Conservation Service and directors of the several soil conservation districts regarding plans for soil and water conservation, including stream bank erosion. No new districts were organized this year so the Agent did not take part in any such organization work, as in previous years.

VII. Outlook and Recommendations for Coming Year

We begin the year 1951 with a greater demand for all agricultural commodities because of expanding defense activities. This county is particularly affected because it produces a crop which is to be almost doubled by request of our Government. It is apparent that almost all farmers will go all out for cotton and will plant every acre that their water supply justifies. Probably only a few hundred acres of American-Egyptian cotton will be planted because of anticipated risks in getting it harvested and unknown marketing conditions.

Apparently there will be ample electric power and natural gas for pumping, although because of the changeover from 25 to 60 cycle power in a large part of the irrigated area there may be interruptions in power service, and temporary dislocations in individual operating units on account of necessary re-winding of electrical equipment and re-staging of pumps. Lands of the San Carlos Project, which make up about 87,000 acres of our total irrigated area, are in a critical situation as regards gravity water, with the Coolidge Reservoir dry at this time. This situation may change with rainfall and run-off in volume, or we may still find the reservoir dry with the beginning of the new crop year. Insofar as underground water supplies are concerned, water levels have continued to drop but with present high cotton prices cost of water is not so important an item as it is when lower prices prevail.

Farm wages have increased and probably will increase further with demand for more men for the military forces and defense industries. With a larger cotton acreage many farmers are of the opinion that it will be necessary to work out some agreement for importation of labor from Mexico. No great shortage of labor is anticipated prior to the cotton harvest which will begin about August 15th.

During this year wide use was made of commercial fertilizers, particularly by cotton growers, many of whom did some experimenting on their own farms. Our cotton fertilizer test demonstrations again furnished new proof that fertilization can be done profitably. We expect, if the fertilizer is available, that the total tonnage used will be much more than that used last year. With high cotton prices and no acreage control, we can expect no increase in alfalfa plantings for soil-building.

We should furnish the best information available on profitable use of fertilizers on cotton. Information from our several cotton fertilizer test demonstrations will be published and should prove helpful. Four more will be installed in the new year. We have good information also from our barley fertilization test demonstrations, published in mimeographed form, and this information should be helpful to barley growers. Such

tests should be conducted also on grain sorghums, something we intended to do last year but were unable to carry out.

We have a well-organized cotton insect control program which has resulted in effective control. No changes in our methods are contemplated and it will be continued as in 1950. Shortages of dusts may develop and complicate the problem of insect control.

Cooperating with the Pinal County Sanitarian and the State Director of Public Health, we are starting a program for the improvement of health and sanitation in the cotton camps of the county. While progress may be slow work will be continued and attempts will be made to work out a program which will meet with the approval of both labor and farm owners and will give results. We shall also continue to aid in the development of an interest in better housing, much of which will be needed with a greater cotton acreage.

We shall continue our cooperation with the Arizona Crop Improvement Association and Arizona Cotton Seed Distributors, designed to make available sufficient certified seed of the several varieties of cotton and cereal grains. We intend also to secure one or two additional plantings of Ranger alfalfa for production of seed. No cotton variety tests are planned for we have sufficient information gained thru tests conducted in 1947, 1948, and 1949.

We are now engaged in the building up of our 4-H Club program. The work has been reorganized this fall and several new clubs started, and we expect the Assistant County Agricultural Agent to return on January 1 and take over. We anticipate a stronger program this year.

Dairymen are in a more unfavorable situation because of advancing hay and grain prices and because of surpluses of Grade A milk. Information gained from herdbooks by those participating in our Herd Improvement Association should be helpful to dairymen in meeting these problems. We shall continue our program of improved feeding and parasite control. There is now a much greater interest in poultry and we expect to encourage the establishment of many more small home flocks.

Demonstrations are planned in weed control, particularly the control of Johnson grass on irrigation ditches and laterals.

Much improvement in soils has been accomplished thru deep-plowing of silty "tight" or "slick" soils underlain with better sandy soils. We shall continue to encourage this practice on soils where it will be helpful.

With more limited supplies of water, it is even more important that every farmer practice conservation measures that will result in its most effective use. We shall continue to encourage the building of concrete-lined ditches, better levelling, and laying out of rows where necessary across the direction of the least fall.

Project	No. Communities in Which Work Will be Done	No. of Dems.	Work to be Done, Methods Employed, and Goals Achieved
I. Soil Building Crops	18	2	Continue alfalfa demonstration on deep-plowed land and clover demonstration on Kortsen Ranch. Establish two additional plantings Ranger alfalfa for pure seed production. Encourage alfalfa plantings for soil-building. Accomplish objectives thru farm visits, office calls, meetings, news articles and radio broadcasts.
II. Improved Cotton Irrigation	14	2	Establish demonstration in alternate row irrigation of cotton. Encourage heavy pre-irrigation followed by light regular irrigations and early discontinuance of irrigation in fall to mature crop. Specialist to assist. Encourage best methods thru farm visits, office calls, meetings, news articles and radio broadcasts.
III. Improved Conditions on Tight Lands	6	2	Continue two demonstrations on "tight" soils, and observe results. Thru farm visits, office calls and news column and radio build up interest in deep plowing where it will be helpful.
IV. Cotton Mechanization	14	2	Two demonstrations in use of mechanical harvesters in cotton, comparing different makes of machines if possible. One demonstration in cotton defoliation with demonstration of mechanical harvesting following such defoliation. Furnish best information on machine adjustments. Cooperate with dealers in demonstrations and schools.
V. Seed Improvement	14	17	Continue cooperation with seed improvement agencies. Establish pure seed plantings of grain sorghums, Arivat barley, Ranger alfalfa, and new cotton varieties. Encourage use of pure seed. Specialist to assist.

- VI. - Boys and Girls Club Work 21 50 Expand membership and improve quality of work. Specialists to assist. Find new leaders and establish clubs in areas where none have existed before. Hold regular meetings 4-H Council and hold officers training school. Hold annual 4-H Club Fair. Increase percentage of completions.
- VII. - Rodent Control 21 Continue present well-financed plan for pocket gopher control with Pinal County Electrical District No. 2, San Carlos Irrigation and Drainage District, and Fish and Wild Life Service cooperating.
- IX - Livestock Feeding 21 2 Furnish best information on livestock feeding on irrigated farms and range. Encourage development of small livestock feeding enterprises to utilize alfalfa and other pasture. Specialist to assist. Two demonstrations in spraying range cattle for parasite control.
- X - Land Levelling and Preparation 14 Encourage better levelling of farms thru news articles, radio, and farm visits. Continue to provide level for use of farmers. Goal of 30 better levelled farms.
- XI - Marketing 21 Keep farmers informed thru press and radio of changes in marketing and commodity loan arrangements. Assist in developing market outlets wherever possible. Goal to furnish farmers best information available on marketing.
- XII - Agricultural Survey of Pinal County 21 Continue to collect information regarding resources and production of county. Continue cooperation with Pinal County Research Committee, Chambers of Commerce, and Central Arizona Project Association.

XIV - Poultry Feeding and Management 21

Thru farm visits, office calls, news articles and radio encourage best production methods. Specialist to assist. Goal to secure establishment of many more small poultry flocks to augment home food supply.

XV - Plant Disease and Insect Control 21

Continue presently well organized and effective cotton insect control program. Meetings to inform growers. Weekly counts in selected cotton fields and weekly news stories giving situation. Emphasize seed treatment for control of seed borne diseases. Assistance to homeowners in all parts of the county on plant disease and insect control problems. Goal of better plant and insect control.