

ANNUAL REPORT

COUNTY AGENT SUPERVISION

ARIZONA AGRICULTURAL EXTENSION SERVICE

by

Howard R. Baker  
Assistant Director

December 1, 1946 to November 30, 1947

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THE SITUATION

Administrative responsibility for the operation of the Agricultural Extension Service of the University of Arizona is vested in the Director of Extension. Certain administrative and supervisory responsibilities pertaining to county agricultural agents' and specialists' programs of work have been assigned to the Assistant Director of Extension. State specialists assist the county agricultural agents and the home demonstration agents in planning their program within the county and in carrying out the planned program.

There are fourteen counties in the state, twelve of which carry a program of extension work. The other two counties are without agents. One of these counties, Mohave, has never had an agent. However, assistance is given to farmers and ranchers in these two unorganized counties if and when special requests are made. Generally this assistance comes from a nearby county. However, under certain conditions the assistance will come from the state office.

The program of the Agricultural Extension Service continues to expand. During the war period a great deal of service was given to special federal, state, and county programs. At the close of the war, many of these programs were discontinued and it was necessary for the Extension Service to return to a regular and organized extension program. This change-over is practically completed. In the meantime, many farmers have become accustomed to individual service and this, together with an enlarged program, has laid a heavy burden on the county agent's office. There are yet vacancies, both in the specialist staff and in one or two counties.

County personnel in 1947 included the following county workers:

County	Assistant		Home Dem. Agents	Asst. Home Dem. Agts.
	Agric. Agents	Agric. Agents		
Apache	1	0	Part-Time *	0
Cochise	1	0	1	0
Cocconino	1	0	Part-Time **	0
Gila	1	0	Part-Time **	0
Graham	1	0	Part-Time ***	0
Greenlee	1	0	Part-Time ***	0
Maricopa	1	4	1	1
Navajo	1	0	Part-Time *	0
Pima	1	1	1	0
Pinal	1	1	1	0
Yavapai	1	0	Part-Time **	0
Yuma	1	1	1	0

- \* One agent serves both Apache and Navajo Counties.
- \*\* One agent serves Cocconino, Gila, and Yavapai Counties.
- \*\*\* One agent serves Graham and Greenlee Counties.

State specialist personnel in 1947 was as follows:

Specialist in Agronomy - Norris W. Gilbert  
Specialist in Animal Husbandry - Walter D. Armer  
Specialist in Entomology - J. N. Roney  
Extension Horticulturist - Harvey F. Tate  
Extension Information Specialist - Joe McClelland  
Specialist in Irrigation - Donald L. Hitch  
Specialist in Poultry & Dairying - W. R. Van Sant  
Specialist in Rural Sociology - A. B. Ballantyne  
State Leader, 4-H Club Work - Kenneth L. McKee

Unfilled positions in 1947 included a specialist in agricultural engineering and an assistant extension economist.

## II. RESPONSIBILITIES

Certain administrative responsibilities have been assigned to the Assistant Director. He has the responsibility of preparing the county budgets and presenting them to the county supervisors. He has the responsibility of securing county personnel, subject to the final approval of the Director of Extension. The responsibility of management of the county offices in order that they meet state requirements has been assigned to the Assistant Director. This responsibility refers primarily to the purchase and inventory of equipment in the county offices, office location and arrangement, and the relationship of the county office to the state office.

The retirement program for extension personnel, and the life, health, and accident insurance programs for extension personnel are the responsibility of the Assistant Director.

Assigned supervisory responsibilities include the arrangement of programs for county agent meetings, both district and the annual conference, assistance with county extension programs, and the coordination of specialists' programs with county programs, and the over-all responsibility for the 4-H club program in the state. There are other miscellaneous responsibilities, including cooperation with federal agencies, and with state and county organizations. Considerable cooperation has been given to the agricultural economics program in the absence of an extension economist.

## III. OBJECTIVES, METHODS, AND RESULTS

### A. Personnel Problems

#### 1. Selection and employment of county and state personnel

It was extremely difficult to obtain qualified personnel during the year 1947. The demand was great throughout the country and the supply inadequate. Fortunately there were few resignations in county and state personnel during the year.

Changes were made in three counties in 1947. In Cochise County, the county agricultural agent resigned in mid-summer and was replaced in September of 1947 with another county agent who had been in charge of the Farm Labor Program. In Maricopa County, an assistant county agricultural agent in charge of 4-H club work was named as of January 1, 1947. The previous assistant agent had resigned in September. Also, an assistant agent in charge of agronomy was appointed in February, 1947. This post had likewise become vacant during the latter part of 1946. The county agricultural agent in Navajo County, who had resigned in the late fall of 1946, was replaced on March 16, 1947 with another transferee from the Farm Labor Program. These changes constituted the changes within the county extension offices during 1947.

In the state office, two specialist appointments were made during the year. The position of extension agronomist, which had been vacant for approximately a year, was filled with the appointment of Norris W. Gilbert on September 1, 1947. The position of information specialist was filled on October 1, 1947. These have been the changes in the Agricultural Extension Service during 1947.

It is hoped that additional employees can be obtained during 1948. With the progress of time, more trained individuals should be available. Qualifications for most of these positions include a degree from a recognized agricultural college and some experience, if at all possible. Also desired is actual farm training as a youth.

## 2. In-service training

Because of the great need for personnel and the almost entire lack of supply of trained individuals, it has been almost impossible to carry on a training program for new personnel. It is desirable for inexperienced personnel to serve a period of apprenticeship in the county and state offices prior to being assigned to a definite county position. Generally, the individual is given approximately one month's training in the state office, where he becomes familiar with state office routine. While at the state office, he is in constant contact with the various specialists and is learning methods and subject matter from them. After a brief period in the state office, he is assigned to a county in order that he may learn extension methods from the county agricultural agent. Depending upon circumstances, he may be assigned to several counties over a period of several months, in order that he may become acquainted with the different methods employed by different agents and also in order that he may learn the agriculture of the state more fully.

After apprenticeship in the state office and in one or more counties, it is often desirable to assign a special problem to the individual for his study and analysis. This gives the individual some knowledge of the method of attack on the more involved problems in the counties.

### 3. Professional improvement

Professional improvement is an essential in any progressive organization. This professional improvement may be obtained in several ways. Reading current literature in his own field is a first essential. Encouragement is also given to all extension personnel to obtain some organized course work. This may be summer school, a semester, or an entire year. Every effort is being made to encourage personnel to attend summer school, and to those who have been employed for a longer period of time sabbatic leave is available.

#### B. Assistance to Agents in the Development of the Extension Program

A requisite to setting up an adequate extension program in the county is a knowledge of the agricultural resources of that county. County surveys of agricultural resources are being made for each county in the state. This information will then be used as a basis for determining the major problems in the county. With a knowledge of the agricultural resources in the county and the various problems determined, the extension program for the county may be set up.

To be most effective, a plan set up for rural people should include the thinking of the individuals for whom the planning is done. The organization of the rural people to assist in this planning is essential. Some additional work needs to be done on the organization of rural people. In 4-H club work, a 4-H club county council is being established in several of the counties in an effort to better plan and conduct the 4-H club program.

Certain phases of the county extension program often receive valuable assistance from farmer commodity organizations. The commodity group is especially interested in its own welfare and is constantly seeking assistance from the county agent. Many times the county agricultural agent calls in the specialist and all three sit down to work out the problem. A portion of the county extension program is thus built in this way. This procedure has been customary through the years.

Other important problems in the county must of necessity be stressed by the county agent. Assisted by the extension specialist, he calls in a small group of farmers to discuss the problem and its solution. This meeting generally results in definite action being taken.

It is ultimately planned that the county extension plan of work shall be a unified program for farmers and the farm home. It will probably take some time to reach this goal, but it is a definite goal in the extension program.

### C. Assistance to Agents in Carrying Out the Extension Program

The county agent has the responsibility for the execution of the established program. From his own experience he must determine the best method of procedure. In making this final decision, suggestions are obtained from the specialists. The responsibility for obtaining local leaders is of course his. Knowing their interests and influence with other farmers in the community, he can select his leaders more wisely.

The extension program in the county is observed closely during the year and checked from time to time to note both changes in the program and the success being achieved. Ordinarily the agent needs the suggestions of the specialists and the supervisors in order to better determine the best procedures.

## IV. EVALUATION OF ACCOMPLISHMENTS

### A. Extension Conferences

The extension conference is an excellent method of encouraging better working relationships. In addition, it offers an opportunity to present both subject matter and extension methods to personnel. It also offers an excellent opportunity to discuss the over-all extension program as it affects the farmer state-wide.

Three extension conferences were held during the year 1947. The annual extension conference was held the week of December 15 on the campus of the University of Arizona at Tucson. This conference stressed both subject matter and extension methods. Two out-of-state speakers were present to offer inspirational talks to personnel in attendance at the conference. Two regional conferences were set up during the month of May. The high altitude county agricultural agents met on May 14 and 15 to discuss their programs and problems. The groups of agents from the lower altitude counties met on May 21-23 in conference. In addition to extension methods, these district conferences stressed subject matter. The program was built around soils, insecticides, fertilizers, and 4-H club work. Agronomic problems also received some consideration.

### B. 4-H Club Work

One of the most important phases of the extension program is the 4-H club program. There are over 3,000 boys and girls enrolled in 4-H club work in Arizona, of which approximately two-thirds are girls. The number of club members in the state must be increased and the program for these club members must be greatly improved. Every assistance is being given to the state 4-H club leader and to the various counties in the state in building a better 4-H club program. Each county is encouraged to have at least one county event in which all 4-H club members in the county may participate. Greater stress is being placed on the county event, such as 4-H club fair, picnic, camp, etc., than on the out-of-state trip.

Several state-wide events were held for 4-H club members in 1947. The 4-H Club Roundup had its usual well-planned program the first week in June. To this Roundup came representatives from each county in the state. Demonstration teams, judging teams, showmanship teams, and all phases of 4-H club work were represented. Five 4-H club fairs were held during the year and were attended by the supervisor. These 4-H club fairs are probably the best attended events held in the counties and the plan is to encourage all counties to hold 4-H club fairs. Two 4-H club camps were held during the year, so located that most of the counties could participate. One camp was held at Payson for one week, and the other one near Prescott. The state staff assisted in conducting these two camps. The supervisor of county agricultural agents acted as a member of the committee which judged the exhibits of those club members competing for National 4-H Club Congress and National 4-H Club Camp trips.

There are several major needs in 4-H club work in Arizona. The first need is probably a more complete and better adapted program. Work is being done with this in mind. A second important need is 4-H club leadership. Every effort is being made to improve this leadership through more assistance. Tentative plans are under way for a 4-H leaders camp for Arizona club leaders. Every effort is also being made to make 4-H club work more widely known amongst rural and towns-people. In at least one county, 4-H club work is receiving county-wide support from all groups. It is hoped to make this universal throughout the state.

#### C. County Office Arrangement and Equipment

An efficiently organized county office is essential to the success of the county extension program. Assistance is being given agents in organizing their offices, arranging their equipment, securing new equipment, and in filing systems. Initial steps in this program were taken in 1947.

Yuma County - Initial steps were taken in 1947 to improve the Yuma County extension office. Plans were made to partition the present large room into four private offices for the two agents and the home demonstration agent. A fourth office will be set up in anticipation of future needs. The small amount of equipment was purchased and will be greatly added to in 1948.

Navajo County - Initial steps have been made to rearrange the Navajo County agent's office. Needed equipment is being purchased, and the office entirely rearranged in order to best utilize the space therein.

Initial steps were taken in several of the other counties looking toward the improvement of the county offices during 1948. One of the first counties to be rearranged in 1948 will be the Cochise County office. Initial steps were taken in this regard late in 1947.

#### D. Program Planning

The county extension program should be planned largely by the rural people. The program itself will have several phases. It is almost impossible to omit the service phase of extension work. However, each agent will be encouraged to analyze his program carefully and to include certain phases of service in a project of county-wide scope. By developing certain major problems into extension projects, a much greater number of rural people can be served with much less effort. There should be both long-term and short-term projects. The short-term projects are those which can be solved rather easily within a short period of time. The longer term problems will require much more effort and time. Answers to these long-time problems can only be secured through long-time projects.

Assistance was given to county agricultural agents during 1947 in planning their county programs. The plan of operation of the last few years has not been greatly changed to date. It is anticipated, however, that there will be some change in the system of county planning. This change will involve two major points: More assistance will be given county agricultural agents in the preparation of their programs, and an effort will be made to obtain a better representation of rural people in the county planning work.

It may be necessary to vary the plan of operation in the county. In the late months of 1947, some definite county planning work was carried on in Graham County. The specialists and the state supervisor met with the county agent to discuss the agriculture in the county. After a brief discussion of the agriculture of the county, at which time agricultural resources in the county were presented to the entire group by the extension economist, the agent and the various specialists made a trip over the county to see at first-hand the situation. A stop was made in each community in the county and the major problems of that community discussed. At the conclusion of the trip, a detailed discussion was had of the major problems throughout the county. Several definite steps were outlined in an effort to establish certain projects for the county. For example, one community was rather carefully analyzed by the entire group. It was then decided to make a survey in the community to determine what the agricultural resources of that one community might be. After the resources were determined, a meeting would be planned and the entire situation discussed with the people in the community. Plans have been made to follow that procedure. This plan will be checked carefully for its successes and failures. If successful, it will likely be adopted in other counties.

Only the initial steps have been taken in program planning in Arizona. Much planning needs to be done, and it will be necessary to determine the best method of county planning for the state.

## E. Miscellaneous Supervisory Responsibilities and Accomplishments

### 1. County fairs

County fairs were held in five counties in the state in 1947. In an effort to assist county agricultural agents in better planning for their fairs, a fair committee was established at the state office. This fair committee assisted agents in setting their dates and gave them considerable assistance in setting up the fair catalog. This fair committee also assisted in selecting judges for these various county fairs and in coordinating the entire county fair program. At the conclusion of the fairs, it was decided that more assistance must be given to county agents in their fair programs. With this in mind, it was decided to prepare a bulletin on county fair techniques. This bulletin would discuss the mechanical organization of the fair, the records necessary to properly conduct a fair, and would give a list of suggested exhibits for the fair. This publication will be prepared in the early spring of 1948 in order to be utilized fully at 1948 county fairs.

### 2. Farm Labor Program

Considerable assistance was given in 1947 to the state supervisor of the Farm Labor Program in the planning and carrying out of the Farm Labor Program. 1947 was the last full year of the extension-operated Farm Labor Program. Farm labor became more plentiful and much easier to obtain. All of the prisoners of war had been removed from the state, and many of them returned to their homes in Europe. The Program became one of directing migrant labor to the areas of need, and this was done very effectively and efficiently through the operation of Farm Labor offices at the port of entry into the state and stop-over camps at the same location. It was at the suggestion of the county agent supervisor that an overnight camp was established at each port of entry in order to better contact migrant labor coming into the state. With his assistance, the entire program of migrant camps for those entering the state was prepared.

### 3. Soils school

One of the greatest needs of county agricultural agents is up-to-date information on subject matter. With this in mind, the county agent supervisor suggested at the May district extension conferences that a soils school or soils conference might be valuable to county agents. The suggestion was agreed with by the agents present, and the supervisor took it upon himself to plan such a meeting, there being no soils specialist on the state staff. After obtaining suggestions from interested personnel, a program was planned for the soils conference. It was held September 3, 4, and 5 on the campus of the University of Arizona, with all county agents and assistant agents present.

The entire program for this soils school had previously been worked out with the soils department. The talks to be presented were fully outlined by the supervisor and the soils department personnel ahead of time. Demonstrations were planned and set up in order to be in readiness for the school. The supervisor then took the various talks and made a brief outline of them. Each major point of the talk was set down on notebook paper and space left between each major statement in order that the agent might make notes as the talk was being given. In this way, the agent had a complete outline of the talk, and at the same time could make notes of his own as the talk was given. This proved very effective in getting across to the agent the subject matter presented. At the same time it offered an opportunity for him to take home with him the notes which he had made and the notes of the outlined speech.

The school was very effective along several lines. In the first place, it gave the new agents and the older agents up-to-date information on soils. At the same time, it brought a closer tie between the soils department and the Extension Service. This school will be followed by a similar school each year. Probably in 1948 a fertilizer school will be held.

#### 4. The retirement program

Considerable time during the year was spent on the retirement program of the U. S. Civil Service Commission. Early in the year the information became available that extension personnel were eligible for these benefits. With this in mind, information on the retirement program was assembled and after being carefully analyzed by the supervisor, was sent to all extension personnel. Mandatory and optional payments for each individual in the Extension Service were determined as of July 1, 1947. This information was sent to each individual on the staff. Accompanying this statement was a brief summary of the program.

As a result of the work done on the retirement program in Arizona, twelve members of the state and county staffs made application for the Civil Service retirement program. A plan was set up whereby their checks would be mailed in regularly by the state supervisor.

#### 5. Subject matter information for county agricultural agents

County agents were kept informed as to the latest bulletins which might pertain to agriculture in their county. In general, the specialists in the various fields sent out bulletins in their specific fields. Research bulletins on subject matter in fields not covered by specialists were sent out by the state supervisor. In order that county agents might have complete information on current activities of the Commodity Credit Corporation and the U. S. Department of Agriculture and its farm program, information was sent out regularly to agents on each new development in the program. This information pertained primarily to price supports, the loan program, etc.

## 6. Miscellaneous

A rather complete survey of irrigated lands in Cochise County was made in 1947. The primary purpose of this survey was to determine the amount of agricultural land in the county and its location. This information will be used as basic information in the planning of the Cochise County extension program.

Considerable assistance was given during the year to the radio programs of the agricultural college of the University of Arizona. As a member of the agricultural college radio program committee, the state supervisor assisted in planning the programs for the year. This committee met four times during the year to prepare these programs. The Assistant Director also served as a member of the University of Arizona Forum radio committee. This committee outlined the programs for the University of Arizona Forum, a program presented once each week throughout the school year. This committee met four times during the year to prepare the program of subjects and personnel for this presentation.

Several out-of-state meetings were attended during the year. The Extension Workshop at Pullman, Washington, March 10-22, 1947, was attended by the supervisor. This was an excellent workshop of state supervisors meeting to discuss their problems. The Western Farm Economics meeting at Logan, Utah, was attended in June. This was a meeting of agricultural economists of the western states. The Western States Extension Conference at Corvallis, Oregon, August 4-7, was attended by the Assistant Director. This program stressed administration, agronomy, and soil conservation.

Many meetings were attended during the year within the state. Among these were several of the monthly meetings of the State Farm Bureau. These meetings were held in Phoenix and centered around the Farm Bureau program. The annual meeting of the United Producers and Consumers Cooperative, Arizona's largest cooperative, was attended at the request of the officials of the group. The annual meeting of the Soil Conservation Service was attended and a short talk given.

Several county farm bureau meetings were attended during the year in the various counties in the state. The Assistant Director acted as discussion leader of a tour set up by the Douglas Chamber of Commerce. This tour was set up in an effort to bring the rural people and the townspeople closer together. The tour was made of farms in the Douglas area.

The annual meeting of the Bureau of Reclamation, Experiment Station, and Extension Service, held in Yuma, Arizona, early in July of each year, was attended. Of primary importance to the Extension Service at this meeting was the discussion of subject matter to be made available for the prospective veteran farmers on the mesa farm lands.

## V. EXTENSION ACTIVITIES AND ACCOMPLISHMENTS WITHIN THE COUNTIES

The following is a brief summary by counties of the extension program accomplishments for the year 1947:

### Apache County

There are only approximately 8,000 acres of irrigated land in Apache County, the remainder of the area being utilized by the range livestock industry. Approximately 15,000 head of cattle were dipped or sprayed in 1947 in the extension livestock program. Fifteen meetings were held, with a total attendance of 162, on the control of lice in cattle. Fifty-four different individuals attended eight meetings held on grub control. Several thousand head of cattle were treated for grubs during the year. Demonstrations showed both the use of dust and the spraying method in grub control.

The extension program also included the control of deer flies and horn flies. In an effort to control horn flies, a new fly spray was tried out during the year with considerable success. Ear ticks on cattle were controlled through the use of a mixture of two parts pine tar to one part cottonseed oil.

Three demonstrations were given during the year to eighteen ranchers on the control of lumpy jaw. During the winter and early spring a nutritional disease made its appearance. The trouble was diagnosed as a lack of phosphorus and protein. Alfalfa hay was fed once a week in order to remedy the situation.

In order to better acquaint ranchers with good stock and the sources of good stock, a pure-bred breeders field day was held in the early fall.

No pasteurized milk is produced in the county and there are very few commercial dairies. The extension program emphasizes the need of pasteurization of milk for local consumption. One demonstration was held on the selection of dairy calves, using the new technique developed by the U. S. Department of Agriculture.

Soil tests were made throughout the county in an effort to better determine the needs for adequate production. The analyses were depended upon to show the fertilizer needs for each farm. Nine meetings with a total attendance of 185 were held to discuss soil problems. In addition to soil problems, cultural practices, the use of the Lister drill in planting small grains, and other related matters were discussed. The Lister drill was widely recommended in an effort to meet the drought conditions.

In cooperation with the Eagar Irrigation Company, three test areas were set up along the irrigation ditches. These areas were oiled in order to check water losses. Irrigation practice during the year also included demonstrations on the use of the farm level.

Nine meetings were held during the year on orchard management, 66 individuals being present. Discussed at these meetings were the proper pruning of fruit trees, fertilization and care, and at harvest time the selection of apples for fair exhibits. Disease control was also demonstrated.

Two meetings with 68 individuals in attendance were held on weed eradication. Some testing has been done to determine the best weedicides to use. At the present time sodium chloride is rather widely used. Further test work will be necessary in order to determine the best methods of weed control.

Two demonstrations on grasshopper control were held, with fifteen individuals present. The grasshopper control work carried in previous years has undoubtedly reduced grasshopper populations in 1947.

A sociological survey was made in the Alpine community in 1947. The purpose of this survey was to determine the resources in that community and to make the necessary recommendations concerning agricultural production. Soil samples were taken and analyzed at the University in order to make the necessary soil recommendations.

Forty individuals out of 62 enrolled in 4-H club work completed their work during the year. Four communities were served with this program. The major problem in 4-H club work is proper leadership. A delegation of club members attended the Annual 4-H Club Roundup at Tucson.

A weekly column, "Farm and Garden Notes," has been carried in the local paper, together with various other news articles. Assistance was given in the planning and operation of the Apache County Fair. Cooperation was also given to the Soil Conservation Service and to the Agricultural Conservation Program. Assistance was also given to the State Sanitary Board in the TB program in the county.

### Cochise County

The Cochise County agricultural agent cooperated closely with the business and farm organizations in the county. Assistance was given to the County Fair Commission in re-establishing the county fair. This annual fair had not been held for eight years.

Cochise County is primarily a livestock county, there being only approximately 22,000 acres of irrigated land in the county. The beef cattle program is most important. The spraying program for the control of lice, warbles, and flies is fairly well established. One demonstration on insect control was given to 21 ranchers, 508 cattle being sprayed. Some test work with the spraying program was carried on, using benzene hexachloride in the spray in an effort to reduce the number of treatments needed.

Another project which has been carried on for the last year or two is the irrigation of native pastures. This land is fairly level, and therefore little leveling is needed in order to rough irrigate certain areas. This practice has increased materially the carrying capacity of certain areas of farm land.

Considerable assistance was given to a number of small dairymen in the county in their dairy management problems. Steps were taken to form a Dairy Herd Improvement Association. Some assistance was given to three sheep raisers during the year.

Soil problems are rather serious in Cochise County. A heavy soil with poor drainage has been the cause of certain serious production problems. Soil samples have been rather widely taken in an effort to determine the needs for crop production. Probably the most important problem is water penetration. In an effort to improve water penetration, gypsum is being recommended in certain cases.

The use of soil fumigants for sterilizing soil in chili hot beds was demonstrated and discussed with 24 farmers in a meeting at Elfrida. At a county farm bureau meeting with 33 farmers present, proper fertilizers for chili crops were discussed. Added information is needed on the proper fertilization of cotton. A fertilizer experiment is being established to determine the time and placement of fertilizer for cotton. Many soil management problems have been discussed with individual farmers.

A great deal of individual service was given farmers on their field crop problems. Field tests were carried in an effort to determine the best varieties of small grains and corn. To date, field tests have shown that Funks No. 7-11 surpasses other varieties for grain yield, and Pioneer 300 is the best silage corn. Twenty-five farmers were given information regarding adapted small grain varieties. The field of cotton grown in 1946 resulted in several farmers growing cotton in 1947. The introduction of cotton growing has brought additional requests for assistance to the county agent. All of the farmers producing the 2,000 acres of cotton in 1947 were growing this crop for the first time. Insufficient pre-irrigation resulted in spotty stands. Wilt is serious in Cochise County, and New Mexico 1517 wilt resistant cotton will be grown in 1948. Three meetings were set up, with an average of 25 farmers present at each meeting, to discuss cotton diseases, cotton seed certification program, and cultural practices.

Cochise County produces a considerable acreage of pinto beans, and an effort was made during the year to obtain a better variety of pinto beans. Permanent pasture has been rather widely advocated during the past years, but it is felt that this type of pasture is not well adapted to the small farmer. An effort is being made to better serve the farmer in this situation. Chili production is a most important crop in the county. The extension program made definite recommendations regarding soil sterilization, fertilization, and harvesting methods. One demonstration was held on seed treatment and hot bed fumigation.

Several plantings of lettuce were made in the county, and assistance was given to these farmers in the selection of the proper variety.

A home beautification program is being successfully carried on within the county. Six landscaping demonstrations were held in conjunction with orchard pruning demonstrations, with 209 individuals present. Adapted varieties, cultural practices, and pruning methods were discussed. The Douglas Chamber of Commerce assisted in developing a tree planting program for the city.

Weed control is an important problem in Cochise County, as well as in other counties. This program is being established, based on general information and local field tests. Insect control is an important phase of the extension program. Assistance was given to farmers throughout the county in the control of insects on alfalfa, cotton, orchards, and ornamental plants.

Two boys 4-H clubs were carried during 1947. Club meetings were held and several club members attended the 4-H Club Roundup at the University of Arizona.

Miscellaneous activities carried during the year included assistance in the farm labor problems related to cotton picking and chili harvesting. One demonstration on poultry culling and one on poultry management were given during the year, 27 individuals being present at these two demonstrations. An agricultural survey of irrigated land in the county gave rather definite information regarding the land under irrigation in the county during the year.

#### Coconino County

Coconino County is primarily a livestock county with a small acreage of dry farm land. 1947 was an exceptionally dry year, which resulted in a greatly decreased production of crops and livestock. Many additional problems were brought to the county agent's office as a result of the drought.

Assistance to dairy farmers included problems in the feeding of dairy cattle, disease control, market outlook information, and general dairy management problems. A circular letter on the feeding of dairy cows was prepared and sent out. Another circular letter pertained to general dairy management problems. Assistance was given in the selection and purchase of pure-bred dairy animals. The TB and Bangs control program were strongly supported and assisted during the year.

Poultry production has not been important in Coconino County in recent years. Poultrymen were advised regarding sources of disease free baby chicks. This was followed by assistance in the feeding and care of these chicks and their later selection as laying pullets. Assistance was also given in the care and housing of laying hens.

The chief crops grown in Coconino County are pinto beans and small grains. A field test planting of four pinto bean varieties carried in 1946 showed two high-yielding strains. These two strains were again grown in 1947, both of them producing more beans than the local variety. Fifty pounds of pinto beans grown in Nebraska were included in the 1947 test. At harvest time marketing information was made available to bean growers.

Potato acreage in 1947 was the smallest in 28 years, due to the greater profit of pinto bean production. Immediately prior to planting time, a meeting of potato growers was held, at which time seed treatment, adapted varieties, and other problems were discussed in detail. Two circular letters were prepared and sent to the fifty potato growers in the county. These letters stressed good seed, seed treatment, and the necessary spraying program. At spraying time a third circular letter gave detailed information on spraying potatoes. The drought eliminated a potato variety test plot.

Oats and wheat production are important in a small way in Coconino County. Two meetings of grain farmers were held early in the year to discuss seed selection and treatment and cultural practices. Over a period of years the Extension Service has been largely responsible for the introduction of several small grain varieties now in use. Hannchen barley was introduced by the Extension Service and is the best yielding barley adapted to Coconino County. Markton and Idamine oats and Reliance wheat, all of which were introduced by the Extension Service, are the highest yielders in their respective fields. These varieties are being checked with older varieties and new introductions in an effort to determine the varieties best adapted to Coconino County conditions. Canadian field peas drilled in oats has been recommended as a hay crop for the county. Three farmers were assisted in planting a grass mixture for permanent pasture.

The Oak Creek area is noted primarily for apple and peach production. Many problems occur in orchard work. Late frost, codling moth, thrips, red spider, root rot and powdery mildew are the principal problems in the apple growing areas. These diseases all receive the attention of the Extension Service. In the spraying season a demonstration was held with thirteen orchardists present. There is widespread belief that the use of DDT in sprays has killed the parasitic insects of red spider. This will result in some change in spraying recommendations. Soil fertility maintenance is important in these orchards.

Soil management is important because of the type of soil and the inadequate rainfall. The terracing of farm lands was initiated by the Extension Service several years ago and is today one of the most important soil management practices in the county. Strip cropping is widely advocated, as is contour farming. There has been some subsoiling, with fall subsoiling being preferable to subsoiling in the spring.

Weed control is an important phase of the extension program. 2,4-D has replaced the sodium chloride recommended in previous years. Tests are being made to determine the most effective sprays.

One 4-H club was organized, with a total enrollment of 14 girls and 9 boys; 14 of the 23 completed the project. Preliminary organizational work has been done in Doney Park in the organization of a 4-H club.

Assistance was given to farmers in their farm labor problems. In 1947, 130 laborers were placed with 47 different farmers. There was considerable interest in construction in 1947. Eleven requests were received for construction plans for homes, poultry housing, and home freezers.

### Gila County

Gila County is a livestock producing county, with probably 3,000 acres of irrigated land in the county. The extension program is based primarily upon the needs of the ranchers. In order to assist ranchers in selling their livestock, a cattle listing service has been maintained by the county agent's office. The county agent cooperates closely with the Gila County Cattle Growers Association, assisting them in the planning of their program. Cattle spraying demonstrations were held at eight ranches in Gila County during the year. These demonstrations showed ranchers the proper method of control of external parasites on cattle. Demonstrations on the spraying of cattle for grub and lice control were also presented during the year. Two demonstrations on the control of lumpy jaw through the use of sodium iodide injected in the jugular vein were held during the year.

Fluid milk for consumption in the Globe-Miami district is produced by five commercial dairies in the county. Assistance was given these dairymen in various management problems, including feeding and disease control.

An outbreak of distemper early in 1947 required assistance from the county agent's office. Control methods recommended included the use of sulfa, penicillin, and distemper vaccines.

The shortage of home-produced feeds has prevented the development of any appreciable number of commercial poultry producers. Assistance in feeding and housing was given to the small number of poultry producers in the county. The poor quality of feed has been a problem during 1947. One caponizing demonstration was given to an individual producer who planned to supply a special market.

A joint Soil Conservation Service - Agricultural Extension Service project was completed on one ranch during the year. The land was leveled, the irrigation ditches were established, and a 900-gallon well was drilled to supply water for this land. The farm plans were prepared by the county agricultural agent. Assistance was given to one other farmer in the terracing and leveling of his land. Some releveling work was carried on in the county during the year.

A field test plot for hybrid corn brought out the fact that Wisconsin No. 692 outyielded the locally grown seed by 20 per cent. Further tests are being carried on with this variety. A wheat test plot produced a hard red winter wheat variety which considerably outyielded the variety locally grown. Field test plots on grain sorghums were carried out in an effort to determine adapted varieties. Drought prevented any definite results.

There are a number of small home orchards in the county, and considerable assistance was given to these operators during the year. They were given a spraying program for the control of codling moth, thrips, and other miscellaneous insects. Two fruit tree grafting demonstrations were given and pruning demonstrations were held in each of the fruit growing areas. Several new orchards were planted and pruned under the direction of the county agent. Some work was done in home beautification and in home garden production.

Two 4-H clubs were organized during the year with only average success. A community fair was held at Young, with judges supplied by the Agricultural Extension Service.

#### Graham County

The Graham County agricultural agent cooperated closely with several farm and business organizations in the county in 1947. These included the Graham County Farm Bureau, the Graham County Chamber of Commerce, the Valley National Bank, and several of the rural churches of the Latter Day Saints. The Valley National Bank cooperated in the 4-H club program by financing 65 per cent of the cost of 4-H club calves purchased by 4-H club members.

There are approximately 34,000 acres of irrigated land in Graham County, and farmers in these irrigated areas require considerable assistance from the county agent. The remainder of the county is given over to the livestock interests. A livestock feeders day was held and visits were made to three cattle feeding pens. Experimental data on cattle feeding by the University of Arizona was discussed in full at the various feeding pens. The Graham County feeders were also asked to discuss their rations and their per head gains. Four demonstrations were given on the spraying of cattle for lice and grubs. Benzene hexachloride was used in the spray.

A junior fair for Future Farmers of America and 4-H club members was developed into a county fair for both adults and juniors. The junior fair had been carried on for several years.

Six dairies in Graham County were given assistance in dairy management problems. The majority of the farmers in the county have only a small number of cows. These six dairies have herds varying from 15 to 100 cows in milk. Dairymen in the county were assisted in organizing a Dairy Herd

Improvement Association. The primary purpose of this Dairy Herd Improvement Association is to increase the production per animal and to increase the farmer's net income. The county agent has worked closely with dairymen starting out in the dairy business. Assistance was also given to the TB testing program and the Bangs control program. Two demonstrations on the use of power equipment in spraying for grub control in dairy cattle, and five demonstrations on the hand method of rotenone and sulphur were given. Several milk fever and mastitis cases in dairy cattle were handled by the county agent. Other dairy management problems included the feeding of dairy cattle and the culling of dairy heifers. Dairy barn plans and safety bull pen plans were given to six farmers.

Commercial poultry production is of minor importance in Graham County. Many of the farms have small farm flocks. Feed costs are high, which makes proper feeding, culling, and housing very important in the county. The poultry program has been carried on primarily through farm visits, office calls, circular letters, and the press.

Until very recent years, water supplies for the irrigated land have come chiefly from the Gila River. With the building of the Coolidge Dam, Graham County farmers receive an allotment, based on the supply in the reservoir. This allotment was insufficient and wells were drilled in order to supplement the river water. Pump water in Graham County normally has a high salt content, which in turn has developed a serious soil problem in the county. The extension program in irrigation and soils has taken this fact into consideration. Field tests with gypsum in the irrigation water and distributed on the land have been made. Results are not complete to date. Another phase of the soils program is the releveling of land. Assistance was given to ten farmers in the releveling of their land and in changing the direction of the irrigation run. A large number of soil samples have been taken on many farms in the valley in an effort to determine the needs of those soils. Where soil structure is a problem, gypsum has often been recommended.

The most important crop in Graham County is cotton. Approximately half of the irrigated acreage is in cotton each year. An effort was made in 1947 to develop and maintain pure seed supplies of Acala and Santan cotton. This work was carried on under the supervision and regulations of the Arizona Crop Improvement Association. This pure seed will be used for planting purposes in 1948.

Another phase of the cotton program in Graham County is insect control. Sweeps were made regularly at specific cotton fields throughout the county in order to determine the insect count and the proper time to start dusting. Newspaper articles and radio broadcasts were also prepared on this problem of cotton insect control. Aphid control was also necessary and arrangements were made by the county agent for the importation of ladybird beetles.

In an effort to select suitable corn varieties, corn variety tests have been carried on for three years. Funks G-711 is being grown rather widely as a result of these field tests. Markton oats continues to be the best pasture crop available. Forty acres of Arivat barley were sown in 1947 in order to produce a seed supply. However, this crop was destroyed.

There are approximately 200 acres of pecans in Graham County, in addition to many individual trees found at various homes. Assistance was given to pecan growers through eleven demonstrations given during the year. These demonstrations gave information on the proper methods for budding pecans, pecan culture, disease control, and harvesting. Pecan rosette is prevalent, and the use of zinc sulphate in small circular trenches at the base of the trees and irrigated in in the early spring was advocated by the extension program. Aphid control is generally necessary with pecans. In order to determine the feasibility of control by airplane dusting, two pecan groves were dusted in this manner in 1947.

Three demonstrations were given on the pruning of deciduous fruit trees. Through the importation of parasites from Washington state, wooly aphid was controlled in orchards. This practice will be continued as necessary.

There are a large number of home gardens in the county and the extension agent has given a great deal of assistance in the development of these gardens. A mimeographed vegetable planning outline was prepared and distributed throughout the county. Assistance was also given in insect and disease control. Home beautification is another important phase of the extension program in horticulture. Information on the care and culture of ornamental plants was prepared and presented in the form of a mimeographed circular.

Efforts have been directed during the last two or three years to the establishment of a weed control program for the county. Johnson grass is probably the most serious weed, and tests on the value of burning, plowing, clean cultivation, and spraying have been carried out. Some of these methods are costly, and an effort is being made to determine the most economical form of control. A demonstration was set up on the highway where passing farmers might see the results. Three types of sprays were used in this test. All three of the sprays killed the Johnson grass within three or four days time. However, in most cases the Johnson grass soon recovered. Eight demonstrations were given on the control of bindweed with Sinox general spray. Six demonstrations were established showing the effects of 2,4-D application. It is believed that 2,4-D may be effective with only two or three sprayings. Additional work is being done on this test. A field test project on the control of weeds in alfalfa was carried on. Clipping weeds early in the year was tested on several alfalfa fields in the county. The most serious difficulty with this procedure was the delaying of the first cutting of alfalfa by two or three weeks. Four demonstrations were given in the control of pepper grass and tansy mustard in alfalfa through the use of Sinox general spray. The weeds were killed but there was some delay in the maturity of the succeeding alfalfa hay crop.

Some assistance was given in the farm labor problems of cotton growers in the county. The names and addresses of cotton pickers who had worked in the county in 1946 were sent to the farmers. They were then urged to write letters to these people concerning 1947 cotton picking in the county. Fifty-one Navajo Indians were brought into the county in an effort to increase labor supplies. Assistance was also given in the importation of Mexican Nationals for this purpose. Better labor housing was stressed by the county agent's office.

The 4-H club program in Graham County has always been an important phase of the extension program. A junior livestock show offers an opportunity for 4-H club members to exhibit their projects. Judging contests are established in order to assist them in learning livestock judging. 4-H club members are brought in to the Annual 4-H Club Roundup at the University of Arizona in June. Six communities carried boys' 4-H club work in 1947, with livestock clubs being the most successful.

In an effort to assist turkey growers in the marketing of their birds, growers were supplied with a list of wholesale houses in several of the western and middle-western states. The same procedure was followed in the marketing of pecans. Several wholesale houses were contacted, resulting in the sale of a goodly portion of the 1947 pecan crop.

Miscellaneous activities of the Extension Service in the county included the control of gophers and rabbits in the county. Gopher damage is found both on ditch banks and in alfalfa fields. A rural sociology program was established in one small community with rather good results. Poor soil and a short supply of irrigation water have been serious problems in this particular community. A program was developed whereby the standard of living in this community might be raised.

#### Greenlee County

Greenlee County has suffered from a shortage of rainfall for several years. This shortage has affected both crop production and livestock production in 1947. It was necessary to reduce livestock numbers on the range in 1946 and again in 1947. Supplemental feeding was necessary in many areas.

A spraying program for the control of lice, grubs, and flies is being established in the county. An effort was made to organize a Dairy Herd Improvement Association in the county, but the dairymen preferred to join with Graham County in their Association. The number of dairy herds in the county is very small. Dairy management problems included feeding and disease control.

There are few poultry producers in the county. There are many small farm flocks, and considerable assistance is given to these producers throughout the year. Emphasized in the extension program is proper feeding, culling, and disease control. There is some turkey production in the county, and assistance was given to them.

The soils program in the county is built around the problems of poor soil structure, low fertility, improper land leveling, and insufficient irrigation water. In an effort to increase fertility, green manure crops, the plowing under of crop residues, and the use of commercial fertilizers in certain cases are recommended. The use of gypsum as a soil amendment is recommended under certain conditions. The winter irrigation of land in order to build up storage supplies of water is also a recommended practice. Approximately 900 acres of irrigated land received winter irrigation supplies in 1947. This is double the acreage which was winter irrigated in 1946.

The chief crop grown in the county is cotton. The extension program has stressed and resulted in the development of a one variety cotton district. New Mexico 1517 wilt resistant cotton is planted and certified seed produced under the regulations of the Arizona Crop Improvement Association. The Duncan Valley Pure Seed Association has been active for several years and has always received the support of the Extension Service. This organization owns its own cotton gin and its own seed warehouse.

Alfalfa acreage declined during the year, primarily due to the shortage of irrigation water. The alfalfa program includes primarily alfalfa management problems. A variety field test compared India and African alfalfa with locally grown varieties.

Field tests of corn indicated that Funks G-711 variety of hybrid corn was best adapted to conditions in Greenlee County.

Permanent pasture acreage in the county continues to decline, mainly because of short water supplies. Sweet Sudan grass is replacing common Sudan as a temporary summer pasture.

An important phase of the extension program is the home beautification project. One schoolhouse was landscaped during the year and a Bermuda grass lawn established on the grounds. The county agent attended one garden club meeting, discussing the use of ornamental plants and the control of insects and diseases affecting these ornamental plants.

There is a small but prominent acreage of vegetable crops in the county each year. In order to aid these small truck growers, a potato variety test was carried out with six varieties of potatoes being planted. This field test verified the fact that White Rose potatoes were probably best adapted to Greenlee County conditions. Assistance was given to the Duncan Valley Cantaloupe Growers Association in the selection of proper varieties to grow, cultural practices, and insect control methods. The farmers in this area cooperated in the purchase of the seed used in the cantaloupe production. Production was almost triple that of 1946.

Orchard management has been receiving some attention from the extension agent. Pruning demonstrations were established in several orchards. Some work was done with pecan trees and the zinc sulphate treatment advocated for the control of pecan rosette.

Irrigation problems are important in the county. Proper irrigation structures for the efficient use of water were recommended during 1947. Two demonstrations were given during the previous year on the control of aquatic weeds in irrigation canals. As a result of these demonstrations the previous year, one irrigation district purchased equipment for the application of chemicals in aquatic weed control.

A weed control demonstration was carried on on the ditch banks in the county with very satisfactory results. Five farms carried test plots for the control of bindweed through the use of 2,4-D. Tests with 2,4-D on Russian knapweed did not prove effective. Results indicate that spray applications should be made early in the life of the plants while they are yet growing vigorously.

The county agent worked closely with the farmers in their farm labor problems. Farm labor needs are high only during the cotton season and the truck harvest season. With an increased cotton acreage in 1947, labor needs were increased proportionately. Information on labor supplies and labor housing was distributed to farmers immediately prior to the cotton picking season. An exhibit on farm labor housing was on display at the Greenlee County Fair.

Two 4-H clubs in the Duncan community had a total membership of 53 individuals. Fifteen meetings were held by these clubs during the year. Club members participated in the Greenlee County Fair with project exhibits. National 4-H Club Week was observed with a program at the Duncan grade school early in March, at which meeting 270 boys and girls were in attendance. The entire program was presented by club members, including two visiting club members from Graham County who had made out-of-state trips during the year. One leaders training meeting was held in the county agent's office at the beginning of the club year.

### Maricopa County

There are approximately 400,000 acres of irrigated land in Maricopa County. The principal crops grown are cotton, alfalfa, barley, grain sorghums, and wheat. The most important phase of the livestock industry is the fattening of beef cattle. Dairying, poultry production, and the winter pasturing of sheep are also important.

There are several farmer commodity groups in Maricopa County, and the county agricultural agents work closely with these groups. The results of the experimental work on the two University experimental farms in Maricopa County are given to the farmers in the county through field days, the radio, and the local press.

Five Dairy Herd Improvement Associations in the county, organized under the direction of the Extension Service, are indirectly supervised by the assistant agent in charge of poultry and dairy work. The training of milk

testers for these associations has been an important phase of this program. Considerable assistance has been given to the Grade A milk producers in Maricopa County in the production of Grade A milk. Many have changed over from the production of Grade D milk to Grade A milk and have needed assistance in the development of their milk processing facilities. In several cases they have had to remodel their entire dairy farm layout. Much assistance was also given to dairymen in their feeding problems. With feed prices high, there has been a tendency for milk producers to prepare their own mixed feeds from feeds grown on the farm. Assistance was also given to dairymen in the county in their breeding and disease control problems. The agent has worked closely with the several breed associations in the county.

Considerable assistance was given to poultry producers in the county. Their chief problems were housing, feeding, and sanitation and disease control. The agent worked closely with the Arizona Poultry Improvement Board in publicizing the importance of flock selection and pullorum testing. Twelve demonstrations in poultry culling were given during the year. One caponizing demonstration was presented. 292 requests for assistance on poultry diseases were received during the year. The lack of sanitary facilities is one of the chief causes of poultry diseases in the county.

With 400,000 acres of irrigated land in the county, soil problems are paramount. Fertilization practice is one of the most important problems. Fertilization trials were carried in 1947 with alfalfa, grain sorghums, and barley. The testing was done both as to proper depth of application of fertilizer, the spacing and placement of fertilizer, and the quantity and type. Fertilization trials with alfalfa indicated that placing the phosphate on the surface of the ground is fully as satisfactory as deep placement. On medium and lighter soils, phosphate can be placed at or near the surface. Water penetration is another serious problem in Maricopa County. Compaction of the soil by heavy equipment definitely breaks down soil structure. Tests to date indicate that plowing under barnyard manure, especially in the medium and heavy soils, may increase the rate of water penetration. If left on the surface, little effect was noted. Trials to date indicate that gypsum used without organic matter may have little beneficial effect on water penetration if applied in the small amounts often recommended. Apparently heavier applications of gypsum, and gypsum with barnyard manure, improved water penetration.

Pure seed production is an important phase of the Maricopa County extension program. Five meetings of the Maricopa County Crop Improvement Association were attended during the year. Seed certification during the year included the following accomplishments: 156 different growers made application for 22,656 acres of grain sorghums, consisting of thirteen different varieties; 16 growers made application for 2,785 acres of small grains to be produced under the regulations of the Crop Improvement Association; 2100 acres of Chilean and African alfalfa were grown under the pure seed program; 358 acres of Santan Acala cotton, of which 70 acres were foundation seed; 36 acres of Punjab flax; and 35 acres of Mexican June corn were also accepted

in the pure seed program. This pure seed program required innumerable field inspections at various times during the growing period. It also required the inspection of cotton gins, combines, and threshers in order to maintain purity of seed. The Extension Service worked closely with the seed dealers in this program.

Several demonstrations were carried on during the year in the control of weeds. Results to date indicate that Johnson grass can now be controlled rather easily. However, additional testing will be necessary before the complete program on weed control has been developed. A great deal of assistance was given to farmers during the year in their crop production programs. Planting procedures, time of irrigation, fertilization, and other basic problems were handled through individual contacts with farmers.

Citrus production in Maricopa County is again coming to the front as a problem area. The low prices for grapefruit have revived interest in the extension project of top-working grapefruit trees to oranges, lemons, and tangerines. A circular on top-working has been prepared and distributed. Assistance has also been given in fertilization problems. Weed control in citrus groves is being handled through the use of oil sprays. This is relatively new but is being rather highly recommended by the county agricultural agent. In the meantime, several groves are being watched closely for more definite results on oil spraying. A study of root stocks on citrus is being made in an effort to control the quick decline which has been so serious in California. Many of the citrus trees in Arizona have been budded on root stocks susceptible to quick decline. Rough lemon and other root stocks are being tried out in an attempt to meet this situation.

The Extension Service cooperated with the Federated Women's Garden Club in obtaining an American Rose Society trial garden for the Phoenix area. This rose garden tests out the various new varieties and old varieties of roses. The assistant agent was appointed secretary of this club. In cooperation with Radio Station KOY and the Arizona Farmer, a demonstration garden program was carried out for the fourth consecutive year. This program is under the direction of the assistant county agent in charge of horticulture.

The Maricopa County 4-H club program is the largest 4-H club program in the state, with some 1500 club members enrolled. The annual 4-H club fair, held on the campus of the Arizona State College at Tempe, is one of the oldest fairs in the state. Club members from all over the county exhibit their projects and compete with each other on demonstration teams, judging teams, and various other contests. The winners at the county 4-H club fair make the trip to the Annual 4-H Club Roundup at the University, where they compete with club members from all over the state. Thirty-one 4-H club members attended the state 4-H club camp at Payson in July. Two Maricopa County club members made the trip to the National Club Congress in December. The 4-H club program in Maricopa County is a well-planned program, including a wide choice of projects for both boys and girls, and participation in state-wide and national events, as well as local and

county events. Older club members and junior club leaders are in charge of the annual 4-H club fair in Maricopa County. A county 4-H club leaders council has been of great assistance in planning the 4-H club program. The county farm bureau has also cooperated in the 4-H club program.

### Navajo County

A large part of Navajo County is taken up with the Navajo Indian Reservation. Much of the remaining area is range area, with only approximately 7,000 acres under irrigation. There is some dry farming area in the county, totaling probably 8,000 acres. 1947 was again a dry year, resulting in reduced water supplies for the irrigated areas and reduced feed for cattle and sheep. Cattle numbers continued to be reduced, due to the drought.

The most active farmers' organization in Navajo County is the Northern Arizona Cattlemen's Association. This Cattlemen's Association sponsored the livestock show and the rodeo which was held in conjunction with the county fair. The county agricultural agent worked closely with the county fair commission in planning and conducting the fair.

Much of the time of the county agricultural agent is spent in assisting the range cattle industry in the county. Assistance was given in 1947 in the selection of pure-bred bulls and in the general improvement of the ranges and range cattle. Thirty-seven tanks were built on the ranges during the year. This management practice is probably one of the best carried on by ranchers during the year. An external insect control program has been initiated in the county and will probably become county-wide in 1948. Several demonstrations on spraying cattle for lice and grubs have been given in the county.

Dairy production in the county is only sufficient to supply local demands. Assistance to dairymen has been primarily in dairy management, including feeding and disease control. One of the greatest needs is modern equipment, and every effort is being made to improve and modernize the dairy equipment in the dairy plants in the county. The fly and lice control program is also included in the program for dairymen.

There are few commercial poultry producers in Navajo County. There is one cooperative poultrymen's organization in Joseph City, and the extension program gives them every encouragement. Individual poultrymen have been assisted in their poultry feeding programs and in their poultry disease problems. Assistance has also been given in the marketing of their eggs and fryers. Although feed costs have been high, income has been very satisfactory.

The soils and irrigation program in the county stresses primarily water supplies, water utilization, and soil analysis. Water supplies generally are inadequate and every effort is being made to increase them. Assistance was given to farmers in one area in planning and building a desilting basin

along the Little Colorado River. Water from the river is run into the desilting basin where the silt settles to the bottom and the clear water is removed from the other end of the basin. In an effort to secure more complete information on soil types and needs, soil testing has been rather widely adopted.

The most important field crops in Navajo County are corn, wheat, and alfalfa. These crops are grown on both irrigated and dry farms. The extension program has strongly recommended the use of trench silos, and in some few cases pit silos have been abandoned and trench silos have been dug. Wheat grown in Navajo County is planted in the fall, used for spring pasture, and then cut for grain. In order to assist wheat farmers in selecting best adapted varieties, wheat test plots have been carried on in the county for several years in both the irrigated and dry land farming areas.

Alfalfa production is an important phase of the extension program, and will receive even greater attention in 1948. Alfalfa wilt is rather common and takes a heavy toll of the alfalfa crop. Miscellaneous assistance was given to farmers in their permanent pasture program. The county agent has insisted on greater care being given to permanent pastures in order to secure the greatest returns.

There are several small orchards in Navajo County and the extension horticultural program includes care and management of these orchards. The control of insects is important and has received considerable attention. The Extension Service has developed a spraying program for codling moth and various other insects common to the orchards of that area.

A small acreage of truck crops is grown in the county, and this requires considerable assistance from the county agent. Insect control problems are probably most important in the production of these truck crops. Improved cultural practices and the use of modern insecticides is an important phase of the extension program in both home gardens and vegetable production.

Three 4-H clubs were organized in boys work in Navajo County in 1947. Two of these clubs completed their work and were represented at the Annual 4-H Club Roundup. One of the greatest problems in 4-H club work is leadership.

### Pima County

There are approximately 26,000 acres of land under irrigation in Pima County. Of this acreage, approximately one-half is in cotton, the most important crop in the county. The remainder of the area is given over to the range livestock industry. In addition to cotton, the chief crops are grain sorghums, barley, and a small acreage of alfalfa. The county agricultural agents cooperate closely with the various agricultural groups in

the county and also the two or three principal business organizations.

A great deal of work is being done with cotton fertilization and varietal testing through field tests. One cotton fertilization project initiated in 1946 was completed in 1947. Another fertilization test was started in 1947. The field test on fertilization showed increases in cotton production from nitrogen fertilization. 220 pounds of ammonium sulphate resulted in an increase of 463 pounds of seed cotton. The application of Chilean nitrate also gave a 250 pound increase in seed cotton. The pure seed program of the Crop Improvement Association was also given attention. Four meetings were held during the year on insect control, and insect counts were made regularly during the season, the results of these counts being publicized fully in order to assist the farmers in determining the proper time to dust cotton. Two cotton defoliation demonstrations were given in an effort to find a successful defoliant. Practically all farmers in the county are members of the Smith-Doxey classing organization.

In an effort to determine the best adapted varieties of alfalfa, two variety tests were made during the year. India, African, and Hairy Peruvian alfalfa were compared with each other. Results were not definite and the project will be continued in 1948. A field test on alfalfa fertilization carried for the past three years was completed. This test proved rather conclusively that 80 to 100 pounds of P-205 would give yield increases. Liquid phosphate proved most effective of the phosphate fertilizers.

The acreage of small grains in the county is very limited. Markton oats were produced by one farmer under the regulations of the Arizona Crop Improvement Association. Markton oats are produced for pasture purposes primarily. A field demonstration was also carried on on small grain fertilization. Nitrogen fertilizer applied during the cold weather gave definite increases in both pasturage and grain yields. This practice is being adopted by farmers.

Three soil amendment demonstrations were completed during the year. Three other soil amendment demonstrations have been established. Recommendations on the use of sulphur and gypsum are awaiting more definite results. The extension agent is recommending deep tillage and certain other soil management practices which will give greater water penetration and result in better soil structure.

Some work is being done with the beef cattle interests in the county. One demonstration was held on the control of grubs and lice in cattle, a high pressure spray rig being used in this demonstration. The Pima County Dairy Herd Improvement Association combined with the Pinal County Dairy Herd Improvement Association during the year in order to more effectively carry on the program.

Grasshopper control work required 30 tons of poisoned bait on approximately 5,000 acres of crop land. Chlordane was also used and proved to be very successful.

There were sixteen agricultural 4-H clubs in Pima County in 1947, with an enrollment of 184 club members and completions of 134 individuals. Of this number, 159 club members were boys and 25 were girls. Special county events were held during the year for these 4-H club members. They participated in the Tucson Livestock Show, the county 4-H club fair and auction day, and the annual Pima County Fair. Pima County club members also participated in the State 4-H Club Roundup, a state 4-H club camp, and exhibited at the State Fair. Winners of the county demonstration team and judging team events participated in the annual 4-H club fair and at the 4-H Club Roundup. The agent in charge of 4-H club work appeared in 25 broadcasts over the local radio station and prepared 50 articles for the press during the year. 399 farm visits were made in the interests of the 4-H club program. Thirty tours were made during the year to give club members instructions in judging, and also in order to visit 4-H club projects. Twenty-four individuals participated in demonstration teams and sixty individuals participated in the various judging contests.

### Pinal County

With some 200,000 acres under irrigation, Pinal County is the second largest irrigated agricultural county in the state. Approximately one-fourth the water supply for this irrigated area comes from the San Carlos Reservoir. The other three-fourths of the water supply is pumped water. There has been a steady expansion of irrigated land in the county during the past ten years. The county agricultural agent cooperates closely with the Pinal County Research Committee in its study of water supplies and needs. He also works closely with the Pinal County Farm Bureau and the various local farm bureaus. Miscellaneous assistance was given in a county road marking program, and in the organization of a rural fire district.

Fifteen communities in Pinal County were given assistance by the county agent in their problems pertaining to livestock. Fourteen cattle feeders were furnished with information on feeding cattle. Sixteen were given information on the control of external parasites, and three were given information on the control of internal parasites. A large number of cattle were imported from southern states in 1947, and the rather long and hard rail trip resulted in many cases of shipping fever. The extension agent gave considerable assistance in the treatment of these cattle.

The dairy extension program gave assistance in dairy management problems, and to the Dairy Herd Improvement Association. This association is composed of 21 herds of dairy cows, with a total of 1,353 cows on test. The Dairy Herd Improvement Association is combined with the Pima County Dairy Herd Improvement Association. The county agricultural agent has stressed proper feeding of dairy cattle and has set up dairy rations and pasture systems for the dairymen. He has encouraged the purchase of hay during the growing season rather than during the winter season when high prices prevail for hay. Assistance was also given in the Bangs and TB eradication program carried on in the county.

Some assistance was given to poultrymen in sixteen communities in the county. This work included the feeding, care, and housing of poultry. Fourteen poultrymen were assisted with information regarding disease-free baby chicks. Twenty received assistance in the feeding of poultry, and fifteen in disease and parasite control.

Soil analysis, land leveling, efficient use of water, fertilization tests, and alkali reclamation were the chief phases of the extension program stressed by the county agent. Forty-seven farmers used the extension-owned farm level in leveling their land. Total land leveled with the disc farm level was approximately 2,500 acres. Through soil analyses a fertilization program was established and advocated to farmers. During the year fourteen farms were covered in the soil analysis program, and 40 water analyses were made. A deep plow which plows to a depth of 24" was purchased by one of the farmers. 240 acres have been deep-plowed in order to mix the sandy subsoil with the heavier clay top soil. Two and one-half miles of irrigation ditch were lined in 1947. Every effort is being made to fully utilize the water supply.

The county agent cooperated closely with the Arizona Crop Improvement Association. 4000 acres of grain sorghums, 270 acres of certified Vaughn barley, and a few acres of California red oats and Punjab flax were grown under the certification regulations of the Crop Improvement Association during the year. Considerable assistance was given to flax growers during 1947. This assistance included information on cultural practices, marketing, and the outlook for flax. Fertilization of barley was stressed in the fall of 1947. Assistance with the alfalfa crop was given in sixteen communities. Twenty-nine office calls and twelve farm visits were made relative to alfalfa production. African and India alfalfa seed were secured for five alfalfa growers. Five farmers were given information regarding permanent pastures and were assisted in establishing these pastures.

Cotton is an important crop in Pinal County. Forty-four days of the agent's time were spent in cotton work in thirteen communities, with twelve local leaders assisting. The cotton program includes a weekly insect survey report which was sent to all cotton farmers and otherwise publicized throughout the county. Cotton acreage in 1947 was fifty per cent greater than in 1946. Six cotton defoliation demonstrations were given in 1947. Three new cotton varieties developed by the Plant Breeding Department of the University of Arizona were tested in a field test. Recommended by the county agent for cotton production are the important factors of proper soil preparation, heavy pre-irrigation, early planting, and careful cultivation and weed control.

The county agent continued to carry a home garden project during the year. Publicity through news releases, radio, and meetings, stressed the need of home gardens and furnished information on proper procedures. Home beautification is also an important phase of the extension program. Landscape planning for the home was discussed at several women's club meetings, and demonstrations were presented on the pruning of ornamental plants. Assistance was also given in the control of insects and diseases on ornamental plants.

Seven days were spent in assisting the vegetable producers in Pinal County. Emphasis was placed on the use of ring rot free potato seed and the cutting of potato seed with a sterilized knife. Forty-one vegetable growers were assisted in the control of plant diseases and insects. Grasshopper control included the baiting of grasshoppers on 3600 acres of irrigated land.

Sixteen days were spent on farm management practices in eighteen communities in the county. Eight farmers were given assistance in the development of a farm plan. Sixteen farmers were given assistance in their leasing contracts with landlords. Seven individuals were assisted in getting started in farming and seven others in securing credit for their operations. Fifteen days time was devoted to marketing problems in fourteen communities.

Assistance was given to sixteen ginners in the county in proper ginning methods. Throughout the regular cotton harvest season, regular weekly reports on the cotton ginned in the county were secured and widely publicized. This assisted in the farm labor program.

Seventy-five farmers were given marketing information on hay, grain, livestock, poultry, and eggs.

Considerable assistance was given to farmers in the securing of cotton pickers. Cotton pickers were placed with 315 farmers, and total labor placements for the year were 1,975. Information was given to farmers on farm labor housing. Assistance was given to the county farm bureau in planning a recruiting and transporting program from other areas.

A weekly column in the paper entitled "Along the Farm Front" was carried in all four papers in the county. This column carried timely information concerning important problems in the county.

357 4-H club members were enrolled in Pinal County, a 300% increase over the previous year. 226 individuals completed 230 projects. These club members were enrolled in six communities throughout the county. 185 farm and home visits were made to 137 different farms and homes in the 4-H club program. 599 office calls were received by the agent regarding 4-H club work. The annual 4-H club fair was held in Pinal County with 230 exhibitors from the various communities. Fifteen demonstration and judging teams competed in the contests. Approximately 1500 people visited the annual 4-H club fair. Seventeen 4-H club members and three leaders attended the State 4-H Club Roundup and competed in the contests there. Pinal County attended the 4-H club camp, sending 28 young people and two leaders to the camp. A total of 80 press articles were prepared for the papers in the county, and at the time of the 4-H club fair an entire page in each newspaper was devoted to 4-H club work.

## Yavapai County

There are only a few thousand acres of irrigated farm land in Yavapai County, the remainder of the area being given over to range livestock. The extension program is based primarily upon the problems of the ranchers in the county and the needs of the many small farmers in the irrigated valleys. During 1947 the county agent worked closely with the Yavapai County Cattle Growers' Association. Listings of calves for sale by ranchers in the county were made available to prospective buyers from within and without the state. Assistance was also given the Association in the planning of their annual calf sale. A supplementary feeding program was offered to ranchers, twenty-six operators taking advantage of this assistance. A lice and grub control program was continued in the county, with seven operators being given assistance. Four operators were assisted in building dipping vats, and two were assisted in securing spray equipment.

Junipers are rapidly taking over the range in certain areas in the county, and with this in mind the county agent is preparing a program for their eradication. This project will be in cooperation with the Forest Service and will be on Forest Service land. It will be primarily experimental in nature. The Arizona Mohair Growers Association, organized in previous years by the Agricultural Extension Service, was given assistance in their reorganization. Many of the goat raisers have changed to cattle production in order to better utilize the range. In this way, the organization has dwindled from 40 members in 1943 to only six in 1947. The organization will continue to function, with meetings once or twice a year, but will carry no active publicity program. A goat range study project, carried on with the Association, will continue to check goat range plots to determine grazing effects.

There are only a few commercial dairymen in the county. Assistance was given them primarily in dairy management problems. Three dairymen were assisted in establishing pasteurization plants. Four were assisted in purchasing feed supplies cooperatively and in securing financing for this project. A survey was made to determine the need for a Dairy Herd Improvement Association, but dairy cow numbers were too small to justify such an association. A permanent pasture program originally advocated by the county agent's office is producing desired results with five commercial dairies. Water requirement for permanent pasture is rather heavy, but a tremendous amount of feed is being produced. Assistance was given one dairyman in building a modern dairy barn.

An effort was made to place eggs in cold storage in the surplus spring period. Because of inadequate supplies of fresh eggs, this attempt failed. Feeds were high-priced during the year and protein supplies rather short. This required assistance from the agent's office in the way of preparing rations to meet these problems. Eight new commercial poultry operators were given assistance.

The project of ditch lining in the Chino Valley Irrigation District was continued in 1947. A section of the ditch originally oiled in 1946 was re-oiled in 1947. Results indicate that this oiling process is economical, prevents excessive weed growth, and does save water losses. The work points to the fact that the ditches should be wet at the time of the application in order to give proper penetration. Oiling should probably be done for two successive years. Twenty-five concrete drops were installed in ditches with steep grades and forty concrete turnout boxes were built and put in place. Assistance was given to twelve operators in planning irrigation ditch lines.

The extension program on soils is making a test of three different means of increasing water penetration. Comparison is being made between the use of gypsum, the use of organic matter, and mechanical means of improving structure. Results will not be known for some time. Because of the water shortage during the year, crop production in the county was greatly reduced in 1947. Assistance was given farmers in setting up a plan for the efficient use of the water available. Assistance in working out crop rotation programs was given to six operators. Five operators were assisted in land leveling. Ten operators received information regarding pumping plant installations and ditch lining for the distribution of irrigation water.

An important phase of the extension program in field crops is the securing of pure seed for small grain plantings. Assistance was given to farmers in Soil Conservation Districts in working out crop rotation programs. Orchardists in the county were given assistance in cultural practices and insect and disease control. Codling moth control and thrip control spray programs have been in force and are giving satisfactory control. The orchard pruning program was established primarily for new operators who had not had previous experience. The small acreage of grapes is receiving considerable attention. A field test for the control of western yellows on six varieties of tomatoes gave inconclusive results. Pearson and Marglobe varieties apparently were the most resistant to western yellows. The production of truck crops has been greatly reduced as compared with 1946.

Three 4-H clubs were organized in 1947, with 38 boys enrolled. Only 18 boys completed their work. Local leadership again was the most serious problem. Considerable assistance was given by the county agent in the planning of the annual county fair. Assistance was given in the preparation of the premium book and in the operation of the fair itself.

#### Yuma County

There are approximately 80,000 acres of irrigated land in Yuma County. With rainfall in the county approximating only three or four inches annually, there is little livestock production on the range. Principal crops grown in the valley lands are flax, alfalfa, and truck crops. Insect and disease problems are of major importance in the county. The

development of the Wellton-Mohawk Division of the Gila Project will probably double the irrigated acreage in the county.

The county agent's office has worked closely with beef cattle feeders throughout the county in an attempt to determine the cause of the loss of steers on feed. Assistance has been given in the Bangs and TB testing program which was initiated in 1947.

In 1946 a ditch lining project was initiated in which fifty feet of ditch were lined with bitumuls at a cost of 70 cents per linear foot. This lining is proving very satisfactory and economical. It is thought that some problems may arise when Colorado River water is used in the Roll-Wellton area for irrigation purposes. With that in mind, soil from that area was placed in tanks in an effort to determine water penetration under three different types of soil amendments. This testing was carried on throughout the year.

Flax has developed into a most important crop in Yuma County. Pasm disease and fusarium wilt have necessitated test projects for the control of these diseases. Field test work has been carried on in the proper fertilization of flax. It was determined that the use of calcium cyanamid to rot grain sorghum stalks prior to planting flax was an excellent practice. Information concerning disease control, fertilization, and planting dates of flax has been widely circulated among the farmers through radio talks, meetings, and newspaper articles. Assistance was given to India and African alfalfa seed growers in an advertising and marketing program for their seed. An alfalfa variety test of three varieties, including African and India, was started in northern Yuma County. This field test project will serve the Parker area.

The pure seed program, carried under the Arizona Crop Improvement Association rules, is obtaining definite results for Yuma County. There were 4,250 acres of certified alfalfa seed produced in the county in 1947. Two alfalfa dehydrating plants were encouraged to move into the county in 1947.

A cotton variety field test was established in Parker to determine adapted varieties. Results indicated that Paula cotton was best adapted to the Parker area. Field tests with sugar beets are being made in order to check yield and sugar content in anticipation of developing a new source of income for Yuma County. The Yuma County agent assisted farmers in that area in growing 700 acres of guar for the General Mills Company. Two varieties of oats were increased under the regulations of the Crop Improvement Association for a seed company in Minnesota.

An insect and disease control program for the county has become fairly well established. The use of DDT and other new insecticides has been an effective means of controlling lygus on alfalfa. The beet army worm and the false chinch bug on flax have been the cause of damage in flax and a control program has been worked out for these insects. A red spider control program in alfalfa fields has been developed. A grasshopper control program for the Wellton-Mohawk area and for the south Gila Valley area was established and carried out with very satisfactory results.

Field testing has been done in an effort to secure a wilt resistant watermelon. Ten varieties were planted in this field test. The Blue Ribbon variety was finally selected as the most promising.

A large scale citrus fertilizer field test was carried during the year. The primary purpose of this test was to determine whether phosphate or potash has any effect on citrus quality and yield. This test was set up in ten-acre blocks and will continue for several years.

Assistance was given to farmers in their farm labor problems in the early part of the year. Requests from veterans for information on reclamation projects were received by the agent and each of these veterans given assistance. In order to better serve the farmers of Yuma County, three mimeographed pamphlets were prepared on ornamental plants adapted to Yuma County.

The 4-H club program in Yuma County is serving the young people very satisfactorily. The townspeople and business people are enthusiastic in their support of this program. 250 individuals were enrolled in 4-H club work, with a high percentage of completions. The annual 4-H club fair carried exhibits from every community and from almost every club member. A county 4-H club council advises with the agent regarding 4-H club work. The council served as an advisory committee for the junior fair and other 4-H club events. Twenty-five club members attended the Annual 4-H Club Roundup at the University of Arizona, and sixty club members attended the annual 4-H club camp. Fourteen new leaders have been secured for agricultural clubs for the 1947 program. Club leaders meetings are held at regular intervals in order to plan and carry out the 4-H club program. At the completion of the year's work, a recognition banquet was held for all club members and club leaders. Seven Yuma County delegates were chosen to attend the National Club Congress, and their names made known at this recognition banquet.

#### VI. CHANGES IN PERSONNEL

There were few changes in personnel during the year 1947. In Cochise County, Paul Brown, county agricultural agent, resigned in June, and Roy Young, formerly in the Farm Labor Program, was appointed county agricultural agent for the county on September 1, 1947.

Two appointments were made in Maricopa County during the year. On January 1, 1947, LeRoy Gavette was appointed assistant county agricultural agent and given the responsibility of the 4-H club program. On February 1, 1947, Robert Pinnow was appointed assistant county agricultural agent in charge of the agronomy field of work.

The county agent in Navajo County resigned in November of 1946, and James Armer, a former employee in the Farm Labor Program, was appointed county agricultural agent March 16, 1947.

These constituted the changes in the counties during 1947.

In the state office the position of extension agronomist, which had been vacant for some time, was filled by the appointment of Norris W. Gilbert as extension agronomist on September 1, 1947.

The position of information specialist was filled on October 1, 1947, with the appointment of Joe McClelland.

## VII. COOPERATION

Close cooperation was had with federal agencies during the year 1947. These agencies included the Soil Conservation Service, the Production and Marketing Administration, the Bureau of Plant Industry, and the Bureau of Reclamation. The Extension Service is cooperating with the Bureau of Reclamation in the planning for assistance to veterans on the mesa.

Plans were made during late 1947 to assist the Food Conservation Program in its program for the conservation of food and feed. A meeting was had with the leader of that project, Mr. Halbert W. Miller, to plan the program. The first meeting was held in the Capitol Building at Phoenix, at which time each group present indicated the type of assistance which they might be able to give. Immediately after this meeting, a brief meeting with Mr. Miller and his assistants was held to discuss further plans. Mr. Miller then made a trip to the University to discuss with a group in the Extension Service and Experiment Station the over-all program. In personal meeting with Mr. Miller, the work was outlined in such a way that the Extension Service would carry the program in seven counties, and Mr. Miller's organization in the other seven.

The Extension Service cooperated closely with the state and county farm bureaus and the various commodity organizations of farmers. In some few cases, extension personnel has acted as secretary for the organization. However, this is not customary. Assistance is given these organizations in planning their programs.

## VIII. OUTLOOK AND RECOMMENDATIONS

Requests for assistance during the year 1947 were many more than in the pre-war years. This will undoubtedly be characteristic of the years to come. The primary reason for the greater number of demands upon the county agent's office is the large amount of individual assistance given to farmers during the war period. There is only one logical method of handling the increased volume in the county agent's office in the years to come. That is through the inclusion of the more important demands into a project or projects which will obtain the same or greater results through serving a larger number of individuals. The hiring of additional personnel is probably essential, but efficiency demands that the above procedure be followed.

The needs of agriculture should be analyzed from two angles. The first refers to the needs within the Agricultural Extension Service. The other refers to the needs of agriculture within the state.

Several recommendations can be made regarding the Extension Service. Added personnel, both in the counties and to a certain extent in the state office, is essential to the efficient and complete operation of the Service. The method of planning the county extension programs should be materially improved within the next few years. In conjunction with this improved planning, the system of county extension reports should be streamlined with a uniform system in use throughout the state. Finally, some improvement should be made in the organization and equipping of county extension offices.

There are several important needs within agriculture itself. Probably the greatest need within the state is the need for an improved organization of farmers to assist in program planning itself. The 4-H club program is a most important phase of the extension program. There is a need for greater emphasis on strictly agricultural projects. With the increased staff and program of the last few years, there is a need for reaching a larger number of young people. It would appear logical that a greater number of county events would stimulate greater interest in 4-H club work. The need for trained leadership is likewise an important need.

The marketing of farm products should receive greater attention from the Extension Service in 1948. With surpluses increasing, a definite program of assistance in this field should be developed. Weed control is a phase of agriculture that needs greater clarification within the state, followed by definite assistance to farmers. It will be necessary for the Extension Service to prepare additional subject matter bulletins in order to fully serve this need. The influx of veterans into farming will increase the demands upon the county agent for assistance in planning farm programs.