ANNUAL NARRATIVE REPORT

December 1, 1955
to
November 30, 1956

by

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County Agricultural Agent
Agricultural Extension Service

COCONINO COUNTY
ARIZONA

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HIGHLIGHTS

The year 1956, like the past few years, has been all but satisfactory for the farmers and ranchers of Coconino County. The most serious drought in sixty years, and some even say the worst since 1860, has all but ruined the farmer and livestockman this year. No relief is forecast for 1957 according to the long range weather forecasters.

The pinto bean and grain farmer cannot remember when such a severe drought has existed in this area. Most farmers were quite doubtful about planting crops in the spring but, like most farmers, went ahead. No great amount of summer rainfall and the infestation of their bean fields by the fall army worm caused the farmers to loose money on their crops. Some were a little more fortunate and were able to meet their financial obligations.

The cattlemen of this County are in a very serious condition. The year of 1956 has all but closed the door on many ranchers. Very little snowfall was received the first part of the year, consequently many stock tanks caught very little, if any, stock water. Continued dry weather throughout the remainder of the year has forced many cattlemen to haul water all summer. Ranges were only fair this year and the extreme dry condition that is still with us has caused all cattlemen to sell many of their breeding animals.

About the only bright side of the agriculture picture in Coconino County in 1956 was the moving of the County Agent's office to new and larger quarters. The office is now about four times as large as the old one and has a private office for the County Agent.
I. AGRICULTURE OF COCONINO COUNTY

Coconino County, the second largest county in the United States, is located in northern Arizona. Its northern border joins Utah. Coconino County has 18,238 square miles within its borders. The majority of this land, however, is national forests and Indian reservations. There are only around 25,000 acres classed as farming land. All of this, with the exception of about 2,500 acres, is dry farmed. Fredonia has about 1,200 acres under irrigation and Hay Lake area has about 1,000 acres prepared for irrigation. The remaining 150 - 200 acres lies in the Oak Creek and Sedona area. The majority of the dry farming land is within the 6,000 - 7,000 foot elevation level. With this high elevation, the frost free days only number about 100 - 125 days. These two factors definitely limit the varieties of crops that can be grown. Pinto beans, small grains, forage crops, and small fruit orchards comprise this County's agriculture crops.

The approximate acreage of the main crops in 1956 were as follows:

- Small grains: 7,000
- Pinto Beans: 3,500
- Forage and Pasture: 6,000
- Orchards: 200
- Idle Land: 8,300

The approximate yields of the main crops grown in 1956 were as follows:

- Pinto Beans (recleaned): 1 1/2 CWT/acre
- Winter wheat: 4 CWT/acre
- Spring wheat: 5 CWT/acre
- Spring oats: 8 CWT/acre
- Alfalfa hay (2 cuttings): 2 T/acre
- Apples (all grades): 18 Boxes/tree

Coconino County is the largest summer livestock grazing area in Arizona. Very little of the county's grazing land is low enough for winter grazing. Cattle and sheep come into the county on June first and leave about October 31st. In 1956 there were about 78,000 head of cattle and 59,000 head of sheep in Coconino County.

Commercial dairying is a thing of the past in Coconino County. All processed milk is shipped into the county from Verde Valley, 70 miles south, and Salt River Valley, 150 miles south. There are only a few head of dairy cattle left. Most dairy cow owners have only one to five head and they are for home use.
I. AGRICULTURE OF COCONINO COUNTY (continued)

The poultry industry in Coconino County remains quite small and stable. The number of birds will run about 5,000, all of which are layers. A good local egg market exists in this County. Local poultry-men never have a surplus of eggs. Most of their eggs are sold before they reach the local stores.

Coconino County has many unsolved problems. The most important ones are:

1. New crops or varieties to increase net yields
2. An expansion of diversified farming
3. A sound and practical livestock management program
4. A good marketing program for crops and livestock.
II. ORGANIZATION

A. EXTENSION -

1. Annual Agricultural Extension Conference:

The forty-first Annual Extension Conference was held at the University of Arizona in Tucson from December 13th to 16th. This Agent left the County on December 12th and returned December 16th.

This year's Conference was somewhat of a workshop as was the 1954 Conference except the Extension Specialists, instead of the County Agents and Home Agents, presented the program.

There were many very outstanding talks by Specialists and also some wonderful talks by outside speakers. One of the outstanding talks was given by Dr. Ivan J. Shields, Extension Plant Pathologist. Dr. Shields used a wagon wheel to illustrate how the College of Agriculture and its three main branches, Education, Experiment Station, and Extension have changed over the past years. Outside speakers included Louis P. Harrell, president of the Arizona Livestock Production Credit Association; John M. Jacobs, member of the Board of Regents; Ernest M. Johannsen, president of the Yuma County Water Users Association; and Donald T. Schild, program leader of the Audio Visual Aids from the Federal Extension Service. All of these gentlemen gave the Conference outstanding addresses.

Mr. John Sears, County Agent from Graham County, was the only County Agent on the program. Mr. Sears gave his reasons why he liked to be a County Agent. He also discussed the National Association of County Agricultural Agents' meeting which he attended in September in Michigan. Mr. Sears gave a very good address and brought out the many reasons why County Agents have chosen this as their life's work.

2. Higher Elevation County Agents' Meeting:

The County Agents from Cochise, Gila, Apache, Navajo, Yavapai, and Coconino Counties met in Flagstaff on August 30th and 31st. At least one meeting a year of these Agents is held. This year three main subjects were presented to the Agents.

Mr. Ralph Van Sant, Extension Dairy Specialist, presented the new Weigh-A-Day-A-Month dairy record plan to the Agents. This is a new method of weighing milk and is much easier. This plan is being adopted by all Dairy Herd Improvement Associations throughout the nation. Literature on this plan was distributed to the Agents so they could familiarize themselves and their dairymen with the new plan.

Dr. George Campbell, Extension Economist, spent some time explaining the workings of the proposed new Soil Bank program. This new program will be entirely administered by the Agriculture Stabilization and Conservation offices in the Counties. However, we as Extension Agents,
must understand this program so we can handle the educational end of it. It appeared as if most of the higher elevation Counties would participate in the Conservation Reserve part of the program and not in the Acreage Reserve section.

Mr. Joe McClelland, Information Specialist, gave the group a workshop session in news writing. Each Agent prepared a timely news article concerning his County and then as each was read, the group would discuss it.

3. New Extension Office and Re-organization:

In March the Agricultural Extension office moved to its new quarters. The new office is also in the County Court House but is much larger. The office now has a main room about 18' x 22'. In this room is the Home Agent's desk and the stenographer's desk and files. A large storage room about 8' x 10' leads off this room. Also in this room is a large new pegboard bulletin board, as shown by the picture below.

Leading off the main office is a private office for the County Agent. This is a room 18' x 12'. This enables the County Agent to discuss problems privately with farmers and not interrupt, or be interrupted, by persons in the outer office.
II. ORGANIZATION (continued)

Inside this office the County Agent has a new magazine display rack and also a display of poisonous weeds, both of which are shown in the picture below.

4. Extension Personnel Changes:

Mrs. Hilda R. Tovrea resigned as office stenographer in August. Mrs. Magda S. Wolff replaced Mrs. Tovrea.

B. ORGANIZED GROUPS -

1. Forest Advisory Board Meetings:

The County Agent worked very closely this year with the Coconino and Kaibab National Forest Livestock personnel. The Advisory Boards of these two National Forests met twice during the year and the County Agent met with them at both meetings.

Many problems are brought up before these Boards and in most all cases satisfactory solutions are reached. One problem that was brought
II. ORGANIZATION (continued)

up at the Coconino Board meeting was concerning water dogs, which are salamanders, and are used for fish bait. These water dogs are very common in this area and are found in the stock tanks. Their demand has grown to such an extent that there are many people going from stock tank to stock tank collecting them for resale. The cattlemen are objecting to these people seining their tanks because they are leaving gates open, breaking fences, leaving trash about the tanks, and are keeping cattle away from the tanks. The cattlemen asked that the Forest Service require these people to have a license for seining the water dogs and that they must get the permittees' permission before going on his range. The Forest Service said they would investigate this and report at the next meeting.

Many other problems such as overgrazing and undergrazing of Forest permits, stock tanks, game control, reseeding, fencing, etc., are discussed at these meetings. The County Agent was asked to answer many questions on various subjects.

2. Farm Bureau:

The Farm Bureau in Coconino County is only a fairly active group. There are about 115 members in the four locals - San Francisco Peaks, Parks, Oak Creek, and Tall Pines. The two most active groups are the Tall Pines and the San Francisco Peaks.

The Tall Pine group consists of ranchers in the southeastern part of the County. They have been conducting a great amount of work on Juniper eradication and other worthless growth on the Forest ranges. They have a field day once a year where they tour the large area in their part of the country. On this tour are men who can do something about developing a program to eradicate this growth. This year Senators Carl Hayden and Barry Goldwater and Representative John Rhodes were on the tour. They hope that some type of program can be initiated in Washington, D. C. whereby the rancher can be assisted financially in removing this growth from his ranges.

The San Francisco Peaks local includes the area east and north of Flagstaff. They have been instrumental this year in starting the paper work on the developing of a community water well. During dry seasons these farmers and ranchers haul water from Flagstaff for their livestock and home use. The cost of this water, including time and truck expense, is about $3.50 per thousand gallons. They secured the services of a geologist and he located a site as centrally located as possible in this area. The Farm Bureau is now in the process of securing assistance financially from the Agriculture Stabilization and Conservation office for the drilling of this well.

3. Agriculture Stabilization and Conservation Meetings:

The County Agent has worked cooperatively this year with the
II. ORGANIZATION (continued)

County Committee of the local ASC office.

The County Agent was asked in December to assist in publicizing the annual election of the County ASC Committee. This election was held on December 9th and the largest group ever to attend an annual election (58) was present. Mr. K. M. Quinn was elected chairman; Jim Clark, vice chairman; and Ike Fleming, member. Melton Flowers and Tom Marlar were elected as alternates.

Throughout the year the County Agent met with the County Committee at their regular monthly meetings. Assistance was given the committee in setting up recommendations for the 1957 ACP Handbook.

The County Agent was asked to attend two meetings of the County ASC Committee to assist in setting up the Conservation Reserve portion of the Soil Bank for this County. The County Committee had convinced the State ASC office that the proposed $9.00 per acre payment was not feasible in this County. They requested the figure to be raised for some areas within Coconino County. After two very lengthy meetings, a map was prepared by the ASC office manager showing where the different priced land was located. The area east and north of Flagstaff was considered more profitable land according to the survey made by the office manager and this area would be recommended for the highest payment. The Garland Prairie area west of Flagstaff was considered the next most profitable land and the remaining land throughout the County was to be the lowest paid land.

The State ASC office arrived at this payment plan for Coconino County:

- For top land........... $15.00 per acre
- For medium land....... 12.50 per acre
- For the poorest land.. 7.50 per acre

The local County ASC Committee will have the sole responsibility in classifying the land as to what payment it shall receive.

4. ASC Election Board Meetings:

The County Agent was chairman of the County Election Boards of Coconino and Mohave Counties in 1956.

The Mohave County Election Board composed of the Soil Conservation representative, the Farm Home Administration representative, and this County Agent met in Kingman on November 7th. A community Election Board was selected to conduct their election of the County ASC Committee in December. Members selected were Peter Bartmus, Jr., Chairman; Chester C. Cofer, vice Chairman; Leonard Neal, member; John Odle, alternate; Bob Blake, alternate; and Ed Stevens, alternate.
II. ORGANIZATION (continued)

The Coconino County Election Board met on November 15th. This Board was composed of the SCS representative; FHA representative; County Farm Bureau representative; and this County Agent. Members selected for the Community election board to conduct the Coconino ASC County Committeemen election were Al Crasmoen, Chairman; Bill Wright, vice Chairman; Walter B. Drye, member; Tom Harlar, alternate; and U. S. Crisp, alternate.

5. Coconino County Fair:

The Agricultural Extension Service is very closely related to the planning and conducting of the Annual County Fair. This office resumed the County Fair in 1949 after a lapse of several years. Each year the event has grown and the County Board of Supervisors has continually cooperated with this office by furnishing more money and men to supervise the Fair. The past three years a Fair Director has been appointed by the Supervisors to assume complete responsibility of planning and conducting the County Fair. This Director has relied very much on this office for assistance in planning the Agriculture, Home Economics, and 4-H departments of the Fair. Through this type of arrangement this office has maintained excellent cooperation and support from the Board of Supervisors and the Fair Director in holding the Annual Coconino County Fair.

This year the County Fair was held on Friday, Saturday, and Sunday, September 7, 8, and 9th at Ft. Tuthill. This was the largest and best Fair ever to be held in this County.

The Livestock department was well represented by beef, dairy, sheep, swine, horses, and goats. The Angus and Hereford beef animals were top quality. Among some of the top exhibitors were Russell Sweitzer of Flagstaff, Earl Van Deren of Sedona, and John Evans of Phoenix. Mr. Al Lane, Extension Livestock Specialist, judged the animals.

The Horticulture and Crops departments were very outstanding. More exhibitors were there and a higher quality exhibit was noticed. Mr. A. E. Thompson of Oak Creek, Mr. H. H. Longfellow of Sedona, and Mr. Peter Michelbach of Flagstaff were top exhibitors.

The Poultry and Rabbit departments were small but larger than the 1955 show.

All other departments were larger than 1955. Attendance for the three day Fair was 21,000.
II. ORGANIZATION (continued)

6. Navajo County Fair Judging:

In the past couple of years the County Agents from various counties in Arizona have been asked to judge different departments at County Fairs. This has been necessitated because of the heavy burden on the Extension Specialists.

This year this County Agent was asked to assist in judging at Holbrook at the Navajo County Fair. The Horticultural section of Fruits and Vegetables was the departments assigned to this Agent. The Vegetable department was perhaps the largest in the County's history and required a large amount of study in doing the judging. The Fruit department was about average size but quality was good. This Agent enjoyed the long but profitable day and is looking forward to judging other Counties of the state in the coming years.

7. Arizona State Fair:

Coconino County was again well represented Agriculturally in the Arizona State Fair held November 3-12, in Phoenix. Mr. Al Grasmoen, County and State Fair Director, took the Agricultural exhibits to the Fair and was also in charge of setting up the County Agricultural booth. Coconino County again won the blue ribbon for the top Agricultural booth. This is the sixth time out of seven that this County has won this award during the seven years this Agent has been in this County. The County also won second in the best and most complete Agricultural exhibits. The picture below shows the Agricultural booth. The theme this year for the booth was "Thanksgiving".
II. ORGANIZATION (continued)

8. Brucellosis Program:

Brucellosis is a very serious and costly disease. Arizona has been trying for many years to enact legislation that would eventually eradicate this disease. Each year the proposed bill is defeated in the State Legislature. This year the State Veterinarian's office initiated a program where each County in Arizona would establish a County Brucellosis Committee. There would also be one State Brucellosis Committee. The sole purpose of these committees is to educate the public on Brucellosis in hopes that they will in turn demand the passing of legislation to eradicate this disease.

The County Agent's office was requested by the State Brucellosis Committee and the State Veterinarian's office to assist in selecting the County Committee and also to assist in calling the initial meeting of this County Brucellosis Committee. Such a committee was selected and this office assisted in setting the initial meeting in March. Representatives of the State Committee and State Veterinarian's office attended this meeting. The film "Triple Threat" was shown the group. After the film, an explanation of the purpose of the committee was given by Dr. Woosley of the Animal Disease Eradication Office in Phoenix.

One other meeting of this Committee was held in mid-summer which the County Agent attended.

9. College Conservation Class:

The local Arizona State College offers each summer a conservation class to its summer school students. This class attempts to explain to the students the purpose and necessity of Agricultural Conservation work. The students are taken on tours to see conservation at work. The instructor also asks local Agricultural Agencies to participate in this instruction by presenting to this group their particular part in the Agricultural Conservation work.

This Agent has been asked for the past several years to contribute to this class. This year this office was asked to speak on "Service Available Through the Agricultural Extension Service". In order to give the group a clear picture on this subject, the Agent worked out a full day's duty of a County Agent. The Agent told the group he would take them on this day's trip to show what type of service the Extension Service offers. Of course the Agent told of the trip, and didn't take the group. In this day's work many parts of the Extension Program were brought in such as Farming, Poultry, Livestock, Home Economics, Diseases, Orcharding, and h-i-i.

The Agent felt that this was successful because of the great amount of questions asked following the talk and also the many students that visited the Agent's office later on during the Conservation Course.
III. PROGRAM PLANNING

Program Planning in Coconino County is conducted somewhat differently than in most Counties. The small amount of agricultural land in the County makes it quite simple for the County Agent to visit individuals and deal with their problems directly. Community-wide meetings for outlining a year's work has never proven satisfactory in this County.

The procedure followed by this Agent is to survey the past year's work during the winter months. From this a list of problems or situations are compiled. Then the Agent contacts the individual or group of individuals having such problems and discusses possible solutions that this office might be able to assist in. Other problems that perhaps the County Agent did not realize existed are often also brought up and discussed.

From these discussions the County Agent then outlines his work for the year and requests the assistance of the Extension Specialists when needed. When the Specialist comes to the County, the Agent discusses the problem with him before going out into the field. The Specialist and Agent also outline additional work that must be done at a later meeting.

This arrangement has proven quite satisfactory the past two years and will be used again for 1957.
IV. INFORMATION PROGRAM

A. NEWSPAPERS -

The two local Flagstaff newspapers, the Daily Sun and the Cococino Sun which is a weekly, have been very cooperative with this office in publishing all news articles given them by this office.

This year the County Agent has used the newspapers a great amount. The Agent usually takes the picture for the story with his office camera and then the newspaper office will develop and print the correct size for the paper. Many stories have occupied the front pages this year and many have had front page pictures.

The Annual County Fair was again given excellent publicity this year. Many pictures, especially 4-H pictures, were used. Equal coverage was given all Extension sponsored meetings held in Flagstaff.

The editor and publisher of the local papers, Mr. Platt Cline, works very closely with this office on all Agricultural or Home Economics stories. Any story pertaining to the above that is not submitted through this office is usually cleared by the editor through this Agent before publishing.

B. MAGAZINES -

State farm magazines are used considerably by this Agent on Agricultural and 4-H stories. The Arizona Farmer, a Phoenix published farm magazine, is very cooperative in publishing articles about Coconino County Agriculture. The Arizona Cattlelog, also a Phoenix publication and printed by the Arizona Cattlemen's Association, has used all articles submitted by this office.

C. RADIO -

Radio is being used to a great advantage in Coconino County. The time of broadcast is very important if you expect to reach a large portion of the people. In most all cases an early morning broadcast reaches more agriculture people than any other time.

In 1956 this Agent again had his bi-weekly program. This five minute broadcast originates directly from the County Agent's office and is heard each Tuesday and Thursday morning at 6:00 o'clock over radio station KCLS. During special events in the County, additional broadcasts are made. Over 100 such broadcasts were made by this Agent in 1956.

Radio has assisted the Agent very much in announcing meetings and special programs. Most all farmers and ranchers living any distance
IV. INFORMATION PROGRAM

from a town listen to these broadcasts for such messages. The Agent always tries to include on these programs timely subjects. As an example, this summer when the fall army worm was invading the bean fields the Agent told of the damage these worms were doing and would do if they were not controlled. Control measures were also given the farmers. As another example, the information on the Emergency Hay Program was given over these programs. Ranchers at first traveled great distances to Flagstaff to find out about this program. They were told to listen to the County Agent's broadcast for the latest information thus saving them a special trip to town.

D. CIRCULAR LETTERS -

Circular letters are another media used to convey information to the rural people. This office has used this means considerably during 1956. It has been found and proven that a circular letter will be read only when you have some important message to give the people. It is also important to make this message as short as possible yet thoroughly cover the subject. Some animation on circular letters will hold the reader's attention a little longer. Always be specific and to the point when sending a message by circular letter.

The County Agent uses the circular letter in announcing national programs such as Fire Prevention Week, National 4-H Week, etc. This form of letter is also used in announcing a special event or meeting in the County. You will find one of these letters on the next page.

E. COUNTY CIRCULARS -

This Agent believes that County circulars are very important in this County. Conditions are greatly different from the other Counties, consequently the state bulletins often times do not apply to this County. It is the hopes of this Agent to prepare more County circulars in 1957.

In 1956 one County circular was written, "Insect and Disease Control Recommendations" for the County fruit orchards. This information was secured from the Extension Specialist and from results received from the County Agent's work in the fruit orchards. The circular was very popular and aided the orchardist in having an excellent season in insect and disease control. This circular was revised in October for the 1957 season. A copy of this circular is attached.

Two other County circulars, "Weed Control in Coconino County" and "Farming in Coconino County" were revised in October. These circulars have been a great help to the farmer and rancher. The latter has been especially helpful in answering the many inquiries this Agent has about Agriculture in this County.
Dear Friend:

If you will........

**INSPECT** homes and farms to detect fire hazards;

**PREVENT** fire losses by removing fire hazards and avoiding fire risks;

**PROTECT** lives, property, and business, with fire fighting equipment, water supply, and telephones;

then **YOU** will be doing your part in preventing millions of dollars worth of property damage and the loss of thousands of lives because of fire.

Very truly yours,

[Signature]

William H. Brechan
County Agricultural Agent

NATIONAL FIRE PREVENTION

OCTOBER 7-13
INSECT & DISEASE CONTROL

1957

Recommendations

FIGHT INSECTS, WORMS, AND DISEASE
Dear Orchardist:

It will be the policy of this office each fall to send you a list of the latest recommendations for control of various insects and diseases. These recommendations are not the only ones that will work, but they are the ones that I feel have proven to be most successful and practical this past growing season.

Be sure that you always purchase your materials from a reliable company and remember the thoroughness, and timeliness, of your spraying is the difference between success or failure of your control program.

Very truly yours,

William M. Brechan
County Agricultural Agent
INSECTS

RED SPIDER AND TWO SPOTTED MITES

1. Winter Dormant Sprays:

Apply four to six pounds of Polysulphide to 100 gallons of water and spray in late December and late February. These TWO sprays are very essential for a successful summer control program.

2. Summer Sprays:

Use four pounds of Aramite 15-W to 100 gallons of water for the first spray. Start your spray program when you find from 2 to 4 mites on a leaf. Repeat sprays every 15 to 18 days, using three pounds of Aramite to 100 gallons of water.

COLDING MOTH

Use three pounds of 50% wettable DDT to 100 gallons of water. Start your spray schedule at the calyx stage or when the moths emerge from screen cages. Repeat every 15 to 18 days throughout the season.

PEACH TWIG BORER

Use two to four pounds of 50% wettable DDT to 100 gallons of water. Spray when blooms are in the pink stage or just prior to opening. Only one spray is necessary.

THrips

Use six to eight pounds of 50% wettable DDT to 100 gallons of water. Apply first spray when thrips are present on buds just opening. A second application may be necessary about 5 to 7 days later.

WOOLY APPLE APHIS (Aerial)

Use 1\(\frac{1}{2}\) to 2 pints Blackleaf 40 to 100 gallons of water. Spray when noticeable in trees. Repeat as necessary.

WOOLY APPLE APHIS (Root)

Use 1\(\frac{1}{2}\) to 2 pints Blackleaf 40 to 100 gallons of water. Inject spray in root system with high pressure sprayer. Apply about 15 to 20 gallons of spray per tree. Make about 15 to 30 separate injections for each tree. This spray should be used during the dormant season.
DISEASES

FIREBLIGHT (Apples and Pears)

Field observations indicate that severe blossom blight results when maximum daily temperatures are above 65° F together with rain or high humidity.

To prevent such infections, the diseased wood should be removed during the dormant season and the following sprays should be applied in orchards where fireblight has been a problem.

First Application (when trees are 30-50 percent bloom)

Streptomycin Sulfate - 100 p.p.m. per 100 gallons of spray.

(Agrimycin - 100 = 9 3/4 ounces per 100 gallons)

Second Application (7 days later)

Streptomycin Sulfate - 100 p.p.m. per 100 gallons of spray.

PEACH MOSAIC

No further information has been released for the control of the mite which has been found to spread this disease. At present it is only known as a very small unidentified mite which was found under the bud scales. The only present control is to systematically remove all trees that have become poor producers due to this disease. Purchase new trees from a nursery free of this disease.

NEMATODES

Soil fumigation has been quite successful in Oak Creek Canyon for vegetable gardeners. The fumigants should be used in that area in early spring, about late March or early April. A period of 3 to 4 weeks should lapse after treatment before you plant the vegetables. "DD" or "N40" was used in 1956 to good advantage. Apply one cup to 65 sq. feet; 1 quart to 340 sq. feet; or 1 gallon to 1360 sq. feet.

No recommendation of these fumigants on fruit trees can be made at this time. We do know it has not harmed peach trees but it is still questionable on apple trees. Work is going to be done in 1956-57 on apple trees.

If you are to use any soil fumigant for nematode control, be sure and secure the bulletin "Controlling Nematodes in the Home Garden" from your County Agricultural Agent's office.
APPLE POWDERY MILDEW

Several apple varieties are susceptible to powdery mildew. Jonathan, Grimes Golden, and Rome Beauty are very susceptible. These varieties should be given a powdery mildew control each season. Most of the remaining varieties which are grown in the Oak Creek area are more resistant and controls are not so necessary.

Dormant sprays for mite control will reduce the amount of powdery mildew carried over from the previous season.

Sulfur (5#) and Karathane (1#) are both effective in checking mildew. Neither will eradicate. Karathane is expensive but may give a better finish. Sulfur is low-priced. Rusting may occur from sprays during or preceding periods of high temperature with either sulfur or Karathane.

**First Application:** Pink spray (just before blossoms open)

- 5 lbs. actual sulfur to 100 gallons of water
- or
- 1 lb. of 25% Karathane plus a non-oil spreader to 100 gallons of water.

On Pears: Anjou $\frac{1}{2}$ lb./100 gallons
Bartletts $\frac{3}{4}$ lb./100 gallons) 25% Karathane

**Second Application:** Calyx Spray (when most petals have dropped)

- 2 to 4 lbs. of actual sulfur to 100 gallons of water
- or
- 1 lb. of 25% Karathane plus a non-oil spreader to 100 gallons of water.

On Pears: Anjou $\frac{1}{2}$ lb./100 gallons
Bartletts $\frac{3}{4}$ lb./100 gallons) 25% Karathane

**Third Application:** 14 to 21 days after Calyx Spray

- 2 to 4 lbs. of actual sulfur to 100 gallons of water.
- In light mildew years the third application may be delayed.
- Karathane is not compatible with malathion in a spray.

WESTERN X

The only present control is to systematically remove all trees that show symptoms of this disease and have become poor producers. Replace removed trees with stock from a nursery free of this disease.
IV. INFORMATION PROGRAM (continued)

F. CIRCULAR DISTRIBUTION -

Bulletin and circular distribution has been very high again this year. The Agent has publicised the large bulletin board through his radio programs which has greatly increased the number given out. A large number of new people have come to Flagstaff this year and they have especially wanted bulletins on homes, lawns, gardens, cooking, and insect control. This year the Extension office has two bulletin boards, one large one for general Agricultural bulletins and a smaller one for Home Economics. This has made it easier for the people to locate their particular bulletin and has also increased the number this office has distributed.

G. VISUAL AIDS -

Visual aids that were used this year by the County Agent in the Extension program were the 35mm color slide camera, black and white camera, slide projector, and movie projector.

The color slide camera was used to secure additional pictures of the County 4-H Camp. These and slides made in 1955 now make up a complete story of the Coconino County 4-H Camp.

The black and white camera was used a great amount this year for newspaper pictures and also for general information pictures. This office has made a new picture file whereby each picture and negative is filed under its correct subject.

The slide projector and screen and movie projector were used a number of times this year at meetings.
V. PROJECTS

3. HORTICULTURE -

A. Apple Orcharding -

1. Apple conditions of 1956:

Oak Creek apples commanded perhaps the highest price throughout the entire season this year than ever before. The set of apples in the lower Oak Creek area was exceptionally heavy this year. Upper Oak Creek had lots of apples but not as many as 1955. The extreme hot and dry conditions that prevailed throughout the summer caused most of the apples to mature about 10 days early. This enabled the growers to get their fruit on the market before the Pacific Northwest apples were ripe. Normally this fruit from the northwest will hit the Arizona markets about October first. However, this year they had a small crop and their fruit was late in maturing. This enabled the Oak Creek apple growers to command a top price for their apples all season. Apples ranged in price from 17 cents to 14 cents a pound in the orchard. Normally the price starts at 17 cents but drops to about 7 to 8 cents by October.

Walter Jordan, the largest apple grower in Oak Creek, had a very heavy crop this year. His orchard is in good soil and he uses a sprinkler system. The picture below shows a portion of this orchard being irrigated. His main variety of apple is the Double Red Delicious.
V. PROJECTS (continued)

2. Insect Control:

Insects are still a constant threat to the apple crop if a successful control program is not practiced. This year the growers had excellent success in controlling most of the insects in their apple orchards. The new mimeographed circular prepared in this office on the control of insects that is sent the grower each winter contributed a lot to this success.

The Red Spider Mite was again the main insect in the apple orchards. It appears as if all natural enemies of this mite have been destroyed by use of various insecticides. This year the County Agent was able to impress on all growers the importance in applying two dormant polysulphide sprays, one in December and one in February. This is a new form of a dormant spray control for the red spider and is much cheaper and easier to handle. The populations of red spider increased to a number that required spraying in late May and early June. Four pounds of Aramite 15-W to a hundred gallons of water was recommended. After the first spray the Aramite was cut to three pounds and was applied every 15 to 18 days. This schedule was continued until early September. Excellent control was secured on all orchards following these recommendations.

The Codling Moth caused very little damage this year to apples. The orchardists had to carry out a good control program, however, to keep the damage low. Codling moths appeared in the orchards soon after petal fall and growers were urged to start their control program. Three pounds of 50% wettable DDT to one hundred gallons of water was recommended. This spray was applied every 15 to 18 days, the same as the Aramite for red spider control. The two sprays were mixed together and applied as one spray. The codling moth spray was also used until early September when harvest started. The amount of wormy apples at harvest was very low, probably not over 2%.

The Wooly Apple Aphids, both the root and aerial form, were very heavy this year in the apple orchards. Evidently the warm dry summer was ideal for this insect. The root form of this insect can only be successfully treated by injecting the insecticide into the ground with a pressure gun. Black leaf - H0 is recommended, 1/2 pints to 100 gallons of water. About 15 to 30 separate injections should be made under each tree. This will require about 20 to 25 gallons per tree. This should be done in the dormant season, from December through February. Only one grower treated for the root form this past year and he only treated a small number of his trees. After such a heavy infestation this summer, however, most all growers are planning to treat the root form this winter.

The aerial form of the wooly apple aphids which occurs mostly during the growing season, was also quite severe this year.
V. PROJECTS (continued)

This insect attacks the terminal ends of the new growth and prevents normal growth of this area. They also attach themselves on other parts of the tree. During apple harvest time, they create a problem by staining the pickers as they fall on them or as the picker rubs against them. They also stain the apples when they fall into the boxes or picking sacks and are crushed. Good control of this aphid can be secured by spraying Black leaf-10 over the tree. The recommended amount is 1½ pints to one hundred gallons of water. This will give only a temporary control unless the root form is also treated.

3. Disease Control:

One of the most common diseases of apples in Oak Creek is Fire-blight. This bacterial disease has existed in this area ever since fruit trees were first planted. The severity of this disease varies with each year. Some years a large percentage of the apples will have a new infestation, like in 1954. This year very little was noticed in the area. One method of controlling fireblight is to cut out all diseased wood and burn it. Extreme caution must be taken when cutting, as a person can spread this disease by cutting tools if they are not properly disinfected. A more recent method that is now being recommended in orchards where this disease is quite common is the use of streptomycin-sulphate. This is used during the bloom period to prevent the spread of the disease. Fireblight is more infectious during the bloom period and is spread very readily by the honey bees. It is recommended that the trees are sprayed the first time when they are about 30 to 50% in bloom. At this time use 100ppm of streptomycin-sulphate to one hundred gallons of water. The second application should follow seven days later using the same amount.

Powdery Mildew is a fungi disease that attacks certain varieties of apples quite severely in Oak Creek. This disease attacks the young growing portions of the trees and will completely kill these terminal ends if it is not controlled. Up until about three years ago the only control was to spray sulphur on the trees during the growing season. This only gave a partial control and often times caused severe burning of the leaves. Dormant sprays of lime sulphur usually reduced the disease but never eradicated it. Karathane was released for apple powder mildew control in 1955 and has done a remarkable job in controlling it on the susceptible varieties such as Jonathan, Crines Golden, and Rome Beauty. This is also sprayed during the bloom period. Three applications are recommended. The first is applied just before the blooms open. One pound of 25% Karathane plus a non-oil spreader to one hundred gallons of water is recommended. The second application is the same and is applied at the calyx stage or when most of the petals have fallen. The third application is also the same and is applied fourteen to twenty-one days after the calyx spray. If the mildew is very light, the third spray can be eliminated. Growers have had excellent success with Karathane in Oak Creek for apple powdery mildew.
V. PROJECTS (continued)

Nematodes, which sometimes are classed under insects, are definitely a disease. The microscopic eel-like worms attach themselves to the roots and will weaken the plant to a point where it may stop yielding fruit or even die. Most all of Oak Creek soil is ideal for nematodes - sandy. It has only been the past two years that they have found out that they are causing damage to the apple trees. This year one orchard was investigated and it was found that two varieties of nematodes were definitely damaging the mature apple trees. These two varieties were the meadow nematode and the stubby-root nematode. The latter had never been found to be of economic importance in Arizona until discovered in Oak Creek this year. Dr. Ivan J. Shields, Extension Plant Pathologist, and Dr. Harold Reynolds, U.S.D.A. nematologist, conducted some study this year in this orchard and a result demonstration was set up in November. Nemagon, a new fumigant that controls the nematode, was used. Two types of treatments were used, liquid and granular nemagon. The first treatment of the granular form was applied to two mature apple trees at a rate of eight pounds to each one thousand square feet. The second treatment, with liquid nemagon, was also applied to two mature apple trees at a rate of five gallons per acre. The results from these demonstrations may determine if the nematodes can be successfully controlled by this chemical in apple orchards.

B. Peach Orcharding

There are not as many peach trees in Oak Creek as apples but some of the best peaches in the west come from this area. Our largest grower has about twelve acres. There are several varieties grown but the main ones are Rio Csa Gem, Early and Late Elberta, and Hale and Halberta. This is the first year in five years that the growers have had a set of fruit. Spring freezes have been very disastrous the past years and have completely ruined the peach crop. This year mild weather prevailed most all spring. The largest grower only had to use smudge pots once. A very heavy set of peaches was established as can be seen in the picture on the next page. Mr. Walter Jordan said it was the heaviest set of fruit he had ever experienced in his thirty years of orcharding. Peaches normally drop a large amount of their fruit in early June so when the fruit is thinned in May, more fruit than is expected to mature is left on the tree. Usually one thinning and the June drop will leave the correct amount of fruit on the trees. For some reason this year there was not a June drop, all the fruit set. This required the growers to have to thin the peaches a second time. The number of peaches that had to be pulled off that normally drop off is shown on the ground from one tree in the bottom picture on the next page.

The peach market was good this year. All peaches were either sold at the packing sheds or in Phoenix. Quality was very good and yields ran exceptionally high. Prices ranged from 10 to 15 cents a pound at the shed.
V. PROJECTS (continued)
V. PROJECTS (continued)

1. Insect Control:

Insects have not been too serious in the peach orchards in Oak Creek. Thrips have in past years caused a great amount of damage but the past few years hardly one of these insects could be found.

The Peach Twig Borer was quite serious in 1955. This insect, during the growing season, will go into the fruit and also eat or destroy the growing tips of branches. Growers were told to spray this spring for this borer because of the damage inflicted in 1955. Spraying is done when the blooms are in full pink stage or just prior to opening. Two to four pounds of 50% wettable DDT to one hundred gallons of water is recommended. Only one spray is necessary. Hardly any evidence of the peach twig borer could be found during this year. Growers are planning to spray again in the spring of 1957.

2. Disease Control:

Peach Mosaic which is a virus disease has, and still is, threatening the peach growers in Oak Creek. This disease has long been identified but only last year was it discovered that a microscopic mite was the spreader of this disease. Each year more and more previously uninfected trees show up with peach mosaic. The picture below gives a comparison of a healthy tree on the left to a diseased tree on the right.
V. PROJECTS (continued)

Once a tree has become heavily infected it should be pulled out and burned. The disease has no definite pattern of spreading. It will jump from one tree to another which may be one hundred yards away and yet the adjoining trees will remain healthy. To date no control has been discovered. The County Agent recommends that once a tree becomes infected it be marked. Only one limb may first show the disease. If this limb is removed, the remainder of the tree may produce normal fruit from one to three years before the entire tree becomes diseased. Once the tree becomes an unprofitable producer it is recommended that the grower remove the tree. This is the only practical method to cope with this destructive disease. New trees can be planted in the area where the diseased one was removed. However, they should not be placed in the same holes.

Western-X is also a virus disease and within the past five years has become as destructive as peach mosaic in Oak Creek. This disease can be spread by a leaf-hopper and it too has no definite pattern in its spreading. This disease is different than mosaic as it infects the entire tree all at once. The leaves will appear as if they have been shot full of holes and will all shed. There is no known cure for this disease. Once a tree has become infected it should be removed and burned. New trees should be secured from nurseries that grow trees from Western-X free areas. The Walter Jordan orchard is heavily infected with this disease. He has pulled many trees and will have to pull more out this winter.

C. Other Fruits and Berries

Other fruits raised in Oak Creek include pears, apricots, plums, cherries, and nectarines. Insects do not bother these fruits like they do the apples and peaches. Pears are bothered quite seriously by fireblight. An average amount occurred this year in the pears. Cutting out of the diseased wood is still recommended as they do in apples. Streptomycin-sulphate is working very well in preventing the spread of this disease during the bloom period. The first application is made when the trees are 30-50% in bloom. Recommended dose is 100ppm per one hundred gallons of water. The second application is made seven days later and is of the same amount. This spray has worked well on pears in Oak Creek.

There are only a few trees of apricots, plums, and nectarines in Oak Creek. They had excellent fruit crops this year like all other fruits. A light frost in early spring gave these fruits only a good thinning.

There was a heavy cherry crop this year. However, hardly a cherry was picked. The extreme drought conditions that have existed in this area all last winter and summer caused an almost complete failure of
any wild fruit or berries in the forests. Consequently all the wild birds and small animals moved in on the cherry crop and took it all. This often happens when a poor set of wild berries and fruit occurs in this area.

Oak Creek is famous for raising almost anything and berries are no exception. This year excellent crops of blackberries, boysenberries, raspberries, and strawberries were raised. All these berries are sold from roadside stands. The demand far exceeds the supply as the new highway from Phoenix now travels through Oak Creek and traffic has increased greatly.

D. Orchard Fertilizing

Commercial fertilizing of fruit orchards in Oak Creek was only started about five years ago. Prior to this, manures were used entirely and once in a while commercial fertilizer was used on a few trees. This agent initiated a fertilizer program in 1952 and from that time the main growers have been following the recommendations of this office.

This year growers were urged to continue the use of poultry manure around their large trees but to also again mix commercial fertilizer with it. Large mature apple trees received from 15 to 25 pounds of 33 1/3% ammonium nitrate per tree. Smaller apple trees received from 5 to 15 pounds. Trebelsuperphosphate (49%) was applied at a rate from 20 to 40 pounds per tree on the large trees and 15 to 25 pounds on the smaller trees. This amount of commercial fertilizer has increased the apple yields in orchards following this program about 25%. It has also eliminated the "no fruit year" after a heavy crop. This was the main thing this Agent was trying to prove. A good fruit set can be had each year, barring freezes, if the trees are vigorous and have an ample supply of reserve food available. The main factor to watch in commercial fertilizing of fruit is not to apply too much nitrogen in comparison to phosphate. This Agent has recommended that the grower apply twice the amount of phosphate in the form of P2O5 as actual nitrate nitrogen. To date this has not delayed maturity of the fruit. All growers are going ahead with their fertilizer program for 1957.

The largest peach grower is going to fertilize his peach orchard this year for the first time. This office is recommending 15 pounds of ammonium nitrate (33 1/3%) and 30 pounds of trebelsuperphosphate (49%) per tree. In addition to this a liberal application of poultry manure is being spread in the orchard. This Agent believes a commercial fertilizer program is a must in all fruit orchards that can be irrigated.
V. PROJECTS (continued)

E. Pruning

Many new families are moving into the Oak Creek area. Each of these new families either have or will plant a small number of fruit trees. The majority of people know nothing about pruning. The Agent tries to have a pruning demonstration each spring mainly for the benefit of these families.

This year a very successful demonstration was held in February at the George Walz orchard. Mr. Harvey Tate, Extension Horticulturist, and this Agent demonstrated the correct method of pruning apple, peach, pear, plum, raspberry, and blackberry trees and vines. There were thirty-four people who attended this demonstration that we were sure went home and tried their ability on their trees and vines.

F. Home Gardening

Here in northern Arizona almost everyone will plant a small vegetable garden during the short growing season from June to September. This office is called upon many times throughout the summer to assist in many problems of these small gardeners. In the early spring this Agent will use the radio to convey soil preparation methods, varieties to plant, and time to plant to this group. The bulletin on "Arizona Home Gardening" is widely publicized and is of great assistance to the gardener.

Insect control creates perhaps the most inquiries from this office. The aphid is a very common trouble maker but can easily be handled with either malethion or nicotine sulphate. Cut worms, caterpillars, and other worms of all sizes continually keep the gardener phoning or calling for control information. Sweet corn is another favorite backyard vegetable. This office has strived to inform these people how nice it is to have worm-free corn. The recommended application of 5% DDT-sulphur dust is given them verbally, by radio, and newspaper. It is now getting difficult to find a wormy ear of corn in these backyard gardens.

G. Landscaping

This office assisted in landscaping the County Court House this year. All new lawn, shrubbery, vines, and flowers were planted. Mrs. Charles Sechrist, a local garden enthusiast and well versed on all types of landscaping, supervised the work.

There has been a great amount of home building this year in and around Flagstaff. The early part of the summer many people were planning lawns and planting flowers. This Agent assisted many and talked

24
V. PROJECTS (continued)

to two different garden clubs in this area on such plantings. The severe drought forced the City of Flagstaff to prohibit the use of water for anything except home use. This immediately stopped all plantings. If water is available next summer it appears there will be a great amount of work as there will be about 200 new homes occupied by that time with no type of landscaping about them.

The new bulletin "Flowers for Northern Arizona" which this Agent assisted in writing, was widely distributed this year. Two other bulletins that are new this year aided the home landscaper a great deal. They are, "Rose Growing in Arizona" and "Planting and Pruning Roses".

4. LIVESTOCK -

A. Permanent Pastures -

As the dry years continue and cattle prices remain low, ranchers and farmers are realizing more and more the importance of good permanent pastures. This Agent could see as far back as six years ago that the land in small forest meadows could be put into a good permanent pasture and perhaps be a life saver for feed if severe drought conditions occurred and all forest native grasses were poor. Many ranchers have planted pastures and are realizing good returns. Others are planting. This year several ranchers planted new pastures. One rancher planted over 600 acres on forest land that has been nothing but worthless sage brush. This office recommends a mixture of six pounds of crested wheatgrass, six pounds of intermediate wheatgrass, three pounds of bromegrass, and one pound of yellow or white perennial sweet clover per acre. This seed should be planted in mid-July just prior to the summer rains. Pasturing is not recommended on this new pasture until the following September or fourteen months later, and then only a light pasturing. Wonderful success has been secured by everyone planting permanent pastures in this area. Some farmers are planning to put their entire farms into permanent pastures through participation in the Soil Bank program. It is the belief of this Agent and several ranchers and farmers that more profit can be realized from this land in this County from grazing cattle on pasture than growing cash crops.

B. Commercial Fertilizing of Pasture Grasses -

1. Permanent Pasture Grasses:

This Agent conducted some work in commercial fertilizing of permanent pasture grasses in 1955 and excellent results were reached. Many farmers and ranchers observed this fertilizing. Mr. Fred Lavin, Range Conservationist of the USDA, Agricultural Research Service, became very interested in these results and asked that this Agent assist
V. PROJECTS (continued)

in establishing a field demonstration in Ft. Valley on an intermediate wheatgrass pasture. All arrangements were worked out but due to excessive work, Mr. Lavin requested that the fertilizer be applied in the fall instead of the spring that was originally planned. Such a demonstration was established in early November. A large number of different amounts and combinations of nitrogen, phosphate, potash were applied by a surface spreader. These results will be accurately recorded so some type of a publication can be released late next winter.

2. Commercial Fertilizing of Native Forest Grasses:

Commercial fertilizing of native grasses in this state has never been tried. Very few areas have sufficient moisture from summer rains to make this practical. Coconino County is a county having enough rainfall to use commercial fertilizer. The big question is, can a rancher afford to use it. This office secured all the information it could from California where this is being done. Arrangements were then made with the Kaibab Forest Supervisor, Mr. F. M. Hodgins, to conduct this demonstration on a forest meadow. Such a location was set up for this work. A meadow on the north Kaibab Forest known as V.T. Park was ideally situated. Elevation was 8,500 feet and there were several types of grasses in the meadow. Fertilizer was secured from a dealer in Phoenix at no charge. This demonstration was all ready to go by early summer.

The Agent, with the assistance of the Kaibab Forest Ranger and the fertilizer dealer, applied this fertilizer on July 16th. A plane from Phoenix applied the fertilizer. The picture below shows the County Agent and Mr. Lynn Mellor of the fertilizer company loading the plane.
V. PROJECTS (continued)

Six $\frac{1}{4}$ acre strips $258' \times 42'$ were staked out. The following amounts of fertilizer were applied to the plots.

<table>
<thead>
<tr>
<th>Plot</th>
<th>Fertilizer Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40-20-0 per acre</td>
</tr>
<tr>
<td>2</td>
<td>40-50-0 per acre</td>
</tr>
<tr>
<td>3</td>
<td>Check</td>
</tr>
<tr>
<td>4</td>
<td>40-0-0 per acre</td>
</tr>
<tr>
<td>5</td>
<td>60-0-0 per acre</td>
</tr>
<tr>
<td>6</td>
<td>20-0-0 per acre</td>
</tr>
</tbody>
</table>

A fence made it possible to have one half of each plot within a fence so cattle could not graze it and the other half outside where cattle could graze it. Both areas, however, were accessible to deer. The picture below shows the plane spreading the fertilizer.

There are several varieties of grass in the plots which are Beardless Bunch, Sheep Fescue, Bromes, Mountain Muhly, and Mountain Clover. In addition to these are many varieties of weeds.

Some rainfall came in this area during the summer but nothing close to normal. The plots were observed in August and a very distinct band of green could be noticed on the fertilized areas. Very little growth occurred during the summer because of lack of moisture. In September this Agent took forage samples and soil samples from the plots. Forage weight samples were not to be recorded this summer as growth was too far from normal and results would be worthless.
V. PROJECTS (continued)

It was hoped a definite difference could be found in the analysis of the grasses but the finding did not show too much. The protein and phosphorus analysis were as follows:

<table>
<thead>
<tr>
<th>Plot</th>
<th>Protein</th>
<th>Phosphorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inside Fence</td>
<td>6.1</td>
<td>0.05</td>
</tr>
<tr>
<td>Outside Fence</td>
<td>6.5</td>
<td>0.06</td>
</tr>
<tr>
<td>2. Inside Fence</td>
<td>5.9</td>
<td>0.07</td>
</tr>
<tr>
<td>Outside Fence</td>
<td>7.3</td>
<td>0.06</td>
</tr>
<tr>
<td>3. Inside Fence</td>
<td>7.5</td>
<td>0.08</td>
</tr>
<tr>
<td>Outside Fence</td>
<td>6.5</td>
<td>0.10</td>
</tr>
<tr>
<td>4. Inside Fence</td>
<td>6.3</td>
<td>0.12</td>
</tr>
<tr>
<td>Outside Fence</td>
<td>6.8</td>
<td>0.11</td>
</tr>
<tr>
<td>5. Inside Fence</td>
<td>9.0</td>
<td>0.13</td>
</tr>
<tr>
<td>Outside Fence</td>
<td>9.3</td>
<td>0.09</td>
</tr>
<tr>
<td>6. Inside Fence</td>
<td>6.0</td>
<td>0.11</td>
</tr>
<tr>
<td>Outside Fence</td>
<td>6.4</td>
<td>0.12</td>
</tr>
</tbody>
</table>

From these analysis you can really only see one plot that shows a significantly different analysis, that is plot 5. This plot definitely has a greater amount of protein and was also the plot receiving the largest amount of nitrogen, 50 pounds. The three plots showing the largest amount of phosphorus are all that received nitrogen and no phosphate.

In the soil analysis tests here too very little useful information was secured this year. One thing that was uniform in the soil tests was the pH, all soil samples ranged between 5.0 to 5.6, or all acid soils. One thing that was somewhat surprising was that all samples only showed a trace of nitrogen. Even with a strong application of nitrogen as was the case in plot 5, only a trace showed up in the soil. Apparently the soil is very deficient in this plant food. The phosphate ran low and in some plots, very low. Its range was from 3-18 ppm. The potassium was good in all plots ranging from 45-70 ppm.

The only conclusion this Agent could make at this time, and it is really only an indication, is that the soils are very deficient in nitrogen and phosphate. What nitrogen that was applied was immediately used up by the grasses. Perhaps with further applications of commercial fertilizer the soils may be able to be built up in these foods. With normal weather conditions perhaps this can be answered in 1957.

C. Drought Conditions and Programs

Weather conditions have been all but satisfactory to the livestock industry here in Coconino County the last couple of years. The past winter was very mild and very little snow fell. The spring runoff in some areas was almost nothing. This, of course, did not fill
any stock tanks, and the spring and summer grasses were not given their normal start of growth. Many livestockmen had to start hauling water in May and June but had hopes of the summer rains coming and filling their tanks. The droughty conditions increased as the summer came and in June conditions became so critical that the Forest Service had to close all National Forests to public use because of the extreme dry conditions. The cattlemen became more alarmed as this condition continued. Summer rains did come in early July and some areas received fair moisture. The rainfall was very spotty, however, and only a very few stock tanks caught any water. The rains tapered off in early August and then stopped much earlier than normal. No more moisture of any significance has fallen since that time. Needless to say the cattlemen had to continue hauling water all summer in some areas which is a very expensive item. Grasses began to dry up and older cattle began to show a shrinking condition. The cattlemen then realized that there was no feed on their winter ranges and no prospect of getting any at that late date. Drought emergency committees were put into motion hoping to find relief for the cattlemen. In October the U.S.D.A. set aside one million dollars for drought relief in Arizona for the livestock industry. This was to be used in reducing feed grains $1.50 CWT and also giving $7.50 credit certificates on each ton of hay purchased. If the cattlemen shipped their hay interstate and by rail, they were given a 50% reduction in the rail freight. All these emergency feeds were to be fed only to the breeding herd.

This program was of some assistance but all cattlemen had to reduce their breeding herd as much as 50%. Good cows about six years old carrying calves were sold for $50.00 per head in this County. The cattlemen are still uncertain of the outcome of this drought. If it is prolonged through this coming winter many cattlemen are going to have to sell still more of their breeding herd in order to survive. One good factor that has come out of this drought is that cattlemen have culled animals from their breeding herd that should have been culled earlier. Only the very best animals are being kept. It is the opinion of the cattlemen that when drought conditions do stop, cattle are going to be worth money.

D. Prairie Dog Control

Prairie dogs at one time did a great amount of damage to the ranges. Control and eradication programs supervised by the U.S. Fish and Wildlife Service all but eradicated the prairie dog. Every year, however, small colonies appear over the County.

This year Mr. Ike Rogers of the U.S. Fish and Wildlife Service, was called into the County by this Agent to poison some colonies of prairie dogs. Several new colonies were appearing north of the San Francisco Peaks in the "Dead Man's Flat" area. Poison was spread over
V. PROJECTS (continued)

about four sections of range in this area. Good results were secured. There were also some dogs poisoned south of Flagstaff. These colonies have been there for many years. It has been impossible to eradicate these.

E. National Hereford Congress -

This year the National Hereford Congress was held in Tucson. This Agent attended this meeting from April 4th to 6th. A very outstanding meeting was held and information was given that would ordinarily take years to secure.

The keynote of the Congress was an address by the Honorable Ezra Taft Benson, Secretary of Agriculture. His remarks were well accepted and set the Congress' off to a very successful meeting.

The most outstanding part of the program was the panel discussions. These panels were made up of men throughout the United States and other countries that were top authorities in the livestock industry. Interesting subjects such as "Who Makes Money from Range to Range", "What the Commercial Cattlemen Expect from the Registered Breeders", and "How Can You Make Money in the Cattle Business Today" were discussed. These discussions were very thorough and many questions came from the floor. Another highlight of the Congress was fat steer judging. Live animals were first judged by the country's finest judges and then the animals were slaughtered. The following day the carcasses were displayed and re-judged by the U.S.D.A. meat judges. It was very educational to see that the top steer on the hoof did not mean he was the top dressed carcass.

The Congress was termed a great success and everyone went home feeling they had gained valuable information.

F. Arizona Cattle Growers Ranch School -

In 1955, the Arizona Cattle Growers' Association started a Ranch School that was held in conjunction with one of their quarterly meetings. At these schools the cattlemen were actually shown how to do some particular job that is done on the ranches such as branding, feeding, disease control, insect control, etc. This school was well accepted by the Association members so a second such school was held this summer in Flagstaff.

The second Annual Ranch School was held August 16th to 18th in conjunction with the quarterly meeting of the Association. Panel discussions on various important subjects were conducted by men trained in their field. One morning was used by giving outside demonstrations.
V. PROJECTS (continued)

The latest methods and equipment were demonstrated in dehorning and castrating. Spaying of heifers was demonstrated on two heifers. A discussion on this practice preceded the demonstration. This practice is fairly new and it was believed that spayed heifers would command the same price as steers when sold off the ranges. Results of studies revealed that spayed heifers did not command the same price and they did not gain as much as unspayed heifers. It was also revealed that a heifer will gain more efficiently than a steer. The conclusion was that it did not pay to spay heifers under the present conditions. A color slide lecture was given on cancer eye removal and a demonstration on spraying cattle for fly control was conducted by Dr. J. N. Roney, Extension Entomologist.

G. Weight for Age Program

A new program was introduced into Arizona three years ago by Al Lane, Extension Livestock Specialist, called Weight for Age Classification of Calves. This program simply classifies the calf when it is between four to six months old. To do this you first give the calf a number rating, the smaller the number, the higher the rating. Fancy is rated 1, high choice 2, low choice 3, high good 4, low good 5, etc. Then each calf is weighed. This weight is adjusted for all calves to 253 days. This adjusted weight is computed by dividing the calf’s days of age into its actual weight which gives the weight-per-day-of-age. Then multiply this by 253. From this adjusted weight you have a direct comparison of the productive ability of the calf’s dam and sire. This also tells you what kind of a milk producer the dam is which is surely an important factor when selecting heifer replacements.

Mr. Rod Graves of Williams, who has a top registered herd of herefords, asked to have his calves classified this fall. Mr. Al Lane and this Agent did this in late November. Twenty-six calves were classified. The calves were exceptionally high in score for such a dry year. Calves carrying the highest scores were all from cows that are good milkers. It also showed that early calves were, in almost all cases, classed higher than late spring calves. It also showed that one bull sired all the early calves. Mr. Graves will continue this program with this office cooperating.

H. Sheep

Almost all the sheep in this county are here only during the summer. They move into the Forests in June and leave in October. Each year there are always inquiries on poisonous weeds that kill quite a number of sheep. It is almost impossible to prevent some loss as there are a great number of poisonous weeds all over the mountain ranges.
V. PROJECTS (continued)

The Agent has on display in his office a collection of the more common poisonous weeds found in this County. Sheepmen often come in and look these over when they are suspicious of a weed on their range.

There is one sheep farmer who keeps a small breeding herd of about 100 ewes the year round in this area. He used to be a bean farmer but decided the bean market was too low and no prospects of it improving. He started building up this small herd three years ago. He raises his own feed and puts up a sizable amount of silage for winter feeding. This year he had about a 110% lamb crop but his lambs, which he sells in early December, will be light because of the drought conditions. Pasture has been very poor all summer. He still says lambs will make more money than beans. The picture below shows his flock of ewes and lambs gathered around his homemade silo which will hold one hundred tons.
V. PROJECTS (continued)

6. POULTRY -

A. General Poultry Conditions -

Poultry raising is quite small in this County. There are only two or three growers that could be classified as large poultry raisers. There are a great number of small back yard flocks. These are the ones that create most of the problems for this office. Each spring there will be the regular run of colds and coccidiosis.

One poultryman, Mr. O. H. Rowland, has one thousand birds in cages and is doing very well. Mr. Rowland was only a small backyard poultryman until three years ago when he decided to go into cages. He has increased his flock until he now has one thousand layers. He raises his own replacements. He has constructed his own building which is heavily insulated and has windows on the east and west sides as shown in the picture below.

He has built a large 10,000 gallon water tank in the north end of the building to catch water off the galvanized roof for the poultry drinking water. This Agent has assisted Mr. Rowland in building up this cage system and has worked closely with him on his feeding, disease, and management problems. His egg production has been good and he has far greater demand for his eggs than he has supply.
V. PROJECTS (continued)

B. Dubbing -

Dubbing of white leghorns, especially in cage systems and in cold climates, is becoming a generally accepted practice. Records show that pullets dubbed between the ages of 8 to 12 weeks will eat less feed and produce more eggs. The dubbing apparently reduces the loss of body heat through the comb and wattles and the bird requires less feed to maintain its normal body heat.

This Agent discussed this new practice with two of the larger poultrymen and arrangements were made to dub a small number of their birds and watch the results. Mr. O. H. Rowland dubbed about one hundred of his young pullets and said he will dub all replacements to his cages. Mr. John Hausman dubbed about twenty-five of his pullets. He runs his birds on the ground. Both poultrymen agree that the dubbing is a good practice. Mr. Rowland states that his dubbed pullets do not waste feed and water like his birds with large wattles and combs. The undubbed birds flip the feed and water out with their large combs and wattles. No accurate results have been reached on egg production but the dubbed birds seemed to start laying earlier than the other birds.

C. Housing -

One main point that probably prevents more people from being in the poultry business in Coconino County is the need for very substantial poultry housing. Extreme cold and windy weather make good housing a must in poultry raising.

This year Mr. Ted Welchert, Extension Engineer, worked with this Agent in getting facts and figures together for the type of poultry housing that is required for this County. Mr. Welchert is preparing a Poultry Housing bulletin for all Arizona in which he will discuss requirements for each particular area. Information on houses for cage systems and floor systems were checked in this area. The need for such a bulletin is great in all of Arizona.

7. AGRONOMY -

A. Pinto Bean Situation -

The pinto bean farmer in Coconino County completed another near disastrous year in 1956. Soil moisture at planting time was poor and very light spotty rain fell during the summer. Insects damaged what crop there was and support price fell from $5.88, to $5.83. An open market demand is a thing of the past. Most bean farmers are very discouraged and many will not raise beans in 1957. The Soil Bank seems to be the only answer for many of the farmers.
V. PROJECTS (continued)

B. Pinto Bean Cleaning, Storage, and Marketing -

The need for a pinto bean cleaning, storage, and marketing plant has been very great in this area for many years. Through the information given the farmers from this office, such a concern was established in late 1955. The Flagstaff Bean Company was formed by Ike Fleming, Russell Fleming, and Pete Crisp. This plant was built on the Russell Fleming farm. The plant will handle over two hundred sacks of beans a day. It is equipped with the latest machinery. A large percentage of the pinto bean crop of 1956 was cleaned at this plant. The picture below shows the portion of the building where the beans are run through the picker and cleaner and then sacked.

In 1956 the three farmers had planned to enlarge their building as soon as they had their crop planted. These plans were temporarily postponed because planting conditions were so poor it appeared a much smaller crop would be harvested in 1956 than 1955. The lack of sufficient rainfall all summer also convinced the farmers that a larger plant was not going to be needed in the fall. If pinto bean yields do increase in the future years the plant will be enlarged to take care of the crop. Almost all the pinto beans harvested in the County this year are being cleaned and stored by the Flagstaff Bean Company.
V. PROJECTS (continued)

This company as yet has not done much in marketing. The quality of the pinto bean has been poor in 1955 and 1956. All beans have or will be sold to the Government for these two years. It is the intention of the company to sell the crop to large retail stores. When this is done, the beans will be guaranteed as no. 1 beans and will be sacked in whatever type and size sack the buyer desires. The plant is large enough now to store over ten thousand bags of beans. The picture below shows only a small portion of the beans that were stored during the winter of 1955-56.

C. Pinto Bean Insects -

Pinto beans have never had any amount of insect damage until this year. This year the fall army worm moved into the fields in mid-August. The bean crop was already very light from lack of moisture and these worms preceded to injure the crop still more. The Agent and farmers discussed control measures and approximate costs. No one in this area had any dusting equipment which meant either buying new equipment or hiring it done. The approximate cost for the entire job would be about $5.00 per acre. The pinto bean farmer figured there was only a very light crop possible this year and they still did not know whether or not an early frost might ruin the light crop. Their decision was to not invest anymore into the crop even if it meant loosing this year's crop to the worms.
V. PROJECTS (continued)

When the beans were harvested it was estimated the army worms had reduced the yields about 25% and also had damaged another 25% of the beans. These latter beans only had small cuts in them and would not clean out. This means most all re-cleaned beans will have these cut beans in them which will reduce their grade to no. 2 or possibly no. 3.

D. Small Grain Situation

Small grains raised in this County are Oats, Wheat, Barley, and Rye. They usually cover the largest crop acreage in the County and rank second to pinto beans as the most important cash crop. Oats and barley are usually planted in the spring and wheat and rye in the fall. Winter wheat acreage, however, is becoming less and less. The last few years have been very dry and during the months of May and June when the winter wheat is in the boot stage and needs rainfall. This has caused an almost complete failure of the winter wheat crop for several years. This year, hardly an acre of winter wheat was planted.

Oats is by far the largest crop of small grain that is planted. The crop is usually cut for grain but the last two years more and more is being grown for hay and pasture. This year was a very poor year because of the drought. Many fields were pastured because of such a light stand. No one cut oats for hay this year although the demand was very great. Only one or two farmers really had an average oat crop. These fields were fortunate and received more rainfall during the summer.

It appears that rye is to become a very popular crop in 1957. The A.S.C. County Committeemen have approved this as a satisfactory cover crop in the County Soil Bank Program. Of course this grain will not be harvested but perhaps it will show many farmers that rye is a good cover crop and pasture.

E. Small Grain Commercial Fertilizing

Commercial fertilizing of small grains was started here in 1950. In the past six years some valuable information has been discovered. There has not, however, been a definite rate per acre application decided upon. Each year the results have been different because of soil moisture at planting, rainfall, and organic matter in the soil. It has been concluded, however, that it does pay to apply a limited amount each year at planting time.

This year another demonstration was conducted with the cooperation of Mr. Oscar Ryberg of Garland Prairie. Mr. Ryberg raises about 300 acres of oats each year and has cooperated with this Agent in commercial fertilizer work. Large acreages were fertilized with three different amounts and combinations. One piece received 50 pounds of actual nitrogen per acre and yielded 1300 pounds per acre. The second
V. PROJECTS (continued)

application was 16 pounds of nitrogen and 72 pounds of actual P₂O₅ and this gave a yield of 1400 pounds per acre. The third application was 64 pounds of nitrogen and 80 pounds of phosphate which gave 1650 pounds per acre. The check gave 940 pounds per acre. This very definitely shows the fertilizer gave results but in most cases it was not enough to compensate for the cost of the fertilizer and labor. A summer fallowing field on the same farm yielded 1542 pounds per acre. This indicates that summer fallowing would be more practical than commercial fertilizing. This Agent believes both practices are essential and if a choice was to be made, summer fallowing would be recommended.

F. Sorghums

Field corn has been grown in this County for many ears. The old common variety is Lawson's White Dent, developed especially for this short growing season. This Agent has been testing the hybrids and has had fair success. They usually grow to a good height but frosts most always come before the ear reaches the dent stage which is the correct stage for ensilage.

This year Mr. Ray Smith grew considerable field corn to be cut for ensilage. He planted mostly Lawson's White Dent but also planted four rows each of Funk's Hybrids G-16-A and G-1A-RF. Both of these varieties grew much larger than the Lawson's. Extreme dry weather reduced growth on all varieties. At the time of harvest, the hybrids were much larger in stalk and ear. The corn was cut early because of no moisture and the fear of the corn loosing too much moisture and reducing the quality of the silage. Mr. Smith put his ensilage in a large one hundred ton capacity above ground silo and feeds it to his sheep. A feeding gate is used and this eliminates hauling the silage to the sheep. The picture on the next page shows the gate. The sheep reach through and the gate is moved inward as the silage is fed. Mr. Smith puts up about 90 tons of ensilage this year. Some was Sudan and Oats.

Sweet Sudan has been tried here for seed and ensilage the past two years. It has produced well in both cases. The Sudan is planted in rows the same as pinto beans and is usually cultivated once. This year Ray Smith planted Tift Sweet Sudan and with the dry weather, it still grew about five feet tall. It was all cut for ensilage. It makes an excellent ensilage and he gets a good yield from this sorghum.
V. PROJECTS (continued)

G. Alfalfa -

The Fredonia area is the only farming district in this County that grows alfalfa. They have a limited amount of irrigation water from Kanab Creek. The farmers used to raise one cutting of hay in early summer and then get one seed crop in late September. Two years ago the spotted alfalfa aphid hit this area and has prevented the growers from getting a seed crop.

This year the spotted alfalfa aphid again was as serious as ever. With this insect and almost no irrigation water because of the drought, the farmers did not have much of a hay crop. The growers have not practiced a control program on this insect. They had hoped natural enemies would eventually do the controlling. This did not happen and the farmers asked that this office assist in setting up a control program for this insect. The County Agent and Extension Entomologist met with these farmers this fall and outlined a control program. The farmers will start dusting in early spring just as soon as the spotted alfalfa aphid shows up in the fields.
V. PROJECTS (continued)

H. Crop Rotation Program -

Crop rotations have always been a good recommended practice in this County. Very few farmers, however, practice it because they believe they must grow only one cash crop in order to secure the highest net return per acre. The farmers that do practice a crop rotation have much higher yields of cash crops and during stress years such as the last few in this County, they are about the only ones that have a normal crop.

This year Mr. Lyman Amburgey, Extension Soil Specialist, and this Agent discussed the possibility of securing a piece of land and setting up a crop rotation program. This would show the farmer that a good rotation will definitely pay. If such a demonstration is started, this is somewhat of the program that will be carried out. The land will all be plowed this winter or very early spring. Two plots of four acres each will be divided into eight quarter acre plots to each large plot. The first plot will have green manure (papago peas) unfertilized and pinto beans fertilized. The second large plot will have part fallow and the rest in pinto beans not fertilized. These will all be rotated on a four year basis. The extreme unnormal dry season in 1956 may require this demonstration to be postponed at least one year. It would not be fair to start the demonstration on land in the condition it is now.

12. RURAL SOCIOLOGY -

A. Safety -

This office has always emphasized safety throughout the entire year. This Agent feels this is just as important as an insect control program or some other project.

In 1956 two National programs were brought to the people's attention. They were National Farm Safety Week and National Fire Prevention Week. Circular letters on these programs were mailed to the entire mailing list. The Agent stressed these programs on his bi-weekly radio program. Farmers and homes were called upon to make a check of all things about the farm and home that might cause a fire or an accident.

This Agent has called special attention to farmers and orchardists to be sure and keep all insecticides out of reach of children. Three accidents in Arizona and Utah that caused deaths to adults and children were described over the radio by this Agent. The Agent also stresses a farm and home clean-up prior to winter snows. So often objects are covered by snow and are then stepped on and will cause injury.
V. PROJECTS (continued)

B. Farm - City Week -

National Farm City Week, which is sponsored by National Kiwanians, is quite a new program. This office cooperated in 1955 with the local Kiwanis Club in the celebration of this event in this community.

This year the Flagstaff Kiwanis Club again asked this Agent to assist their club in the program. The Agent invited several farmers and ranchers in the County to the local Kiwanis luncheon. A sort of roundtable discussion followed the luncheon. Agriculture programs were fully discussed. Businessmen asked many questions concerning the local farmers' and ranchers' problems. The Flagstaff Kiwanians left the meeting feeling they understood the many problems and hardships the local farmers and ranchers are facing in this drought and low agriculture price period.

13. AGRICULTURAL ECONOMICS -

A. Livestock Market Reporting -

This office, in the past three years, has become more closely related to the cattlemen in his marketing program. This office has assisted and advised many cattlemen on their selling of cattle and has directed buyers to the ranchers.

In 1956, this office continued this program, and also enlarged on it considerably. A weekly livestock market review from Phoenix was given every week by this Agent over his radio program. This was done during the months when ranchers and farmers were selling their cattle. Several buyers contacted this office and were directed to ranchers having cattle to sell. The Agent kept a list of small herds of cattle for sale and would assist in finding a market for these animals. Several comments were given this office on their assistance in the marketing of cattle during the fall of 1956. This program will be continued in 1957 and this Agent will attempt to make the program even more useful to the livestockmen.