A N N U A L N A R R A T I V E R E P O R T

December 1, 1943

to

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By

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County Agricultural Agent

Agricultural Extension Service

COCONINO COUNTY

ARIZONA

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SUMMARY

The County Farm Bureau was reorganized with a paid membership of twenty-eight.

The Extension Service is a clearing house for matters pertaining to agriculture. Eleven different governmental agencies consulted with us during the year.

More time than usual was devoted to potato, orcharding and farm labor problems. With respect to potatoes, meetings were held to point out and demonstrate the importance of good, disease free certified seed, and protecting it from infection in handling and storage. A potato fertilizer plot and two variety yield test plots were conducted.

The Idaho early pinto bean was grown again this year by cooperators. Seed of proven adapted small grain varieties was increased. Smut control was stressed. Canadian field peas were again grown for hay and to increase the potato crop following. Orchardists were helped with practical insect and disease control problems. They also followed out recommendations in applying harmone spray to prevent apple drop, and also in managing non-bearing trees to bring them into bearing. They have been advised as to the cause of rosetting and are planning to adopt our control recommendation.

During the harvest alone we placed 156 farm laborers. We assisted in the control of grasshoppers, blister beetles, cut worms and other insects of lesser importance. We have aided farmers in rodent control. Dairymen and rangemen received timely economic information along with other feed and warble control information. We were consulted about dairy barn and poultry house construction. One successful 4-H Club enterprise was carried through.

ORGANIZATION

The Farm Bureau is the sponsoring organization of the Agricultural Extension Service in Coconino County. At present it has a paid up membership of twenty-eight. The local organization, with this twenty-eight membership, is part of the State Farm Bureau Federation, the twenty-eight members having paid their dues to both county and state organizations. Because the organization had, in a sense, broken apart, a reorganization meeting was called for May 4, 1944. Forty-eight attended, mostly farmers, with a few townsmen. Black Bill Park, Doney Park, Cosnino, Winona, Munds Park, Sedona, Red Lake, Oak Creek and Pitman Valley were represented. It was brought out in a discussion in the beginning that the purpose of the organization was to promote farmers' interests, including the promotion of the Extension Service as of past years. The organization went on record unanimously requesting the authorized officers to arrange with the County Board of Supervisors for a budget to maintain this service.

The officers elected were:

W. C. Steele, President
Roy Crum, Vice President
C. R. Monroe, Secretary-Treasurer

In a sense, the Agricultural Extension office in Flagstaff still remains a clearing house consulted by other government agencies, though in a less degree than a few years ago, due to so many other agencies here endeavoring to serve agriculture. The following have called and advised with us:

United States Forest Service
State Entomologist Office
Farm Security Administration
Emergency Crop Loan Supervisor
Agricultural Adjustment Agency
Soil Conservation Service
Federal Land Bank of Berkeley
American Red Cross
U. S. Plant Quarantine Service
Fish and Wildlife Service
U. S. Weather Bureau

The Agricultural Agent attended the County Agents' Conference in Phoenix, January 5-8, and still another County Agents' Conference in Phoenix, April 11-12. September 6-8 he also attended a conference of the County Agricultural Agents of higher elevation counties in Springerville. October 25-28 he participated in a tour to study soils and methods of sampling soils, and analyzing reports by the soil chemist.

REPORTS

Reports of various kinds and to various agencies and people, including the state office, are requiring an increased amount of time.

WAR ACTIVITIES

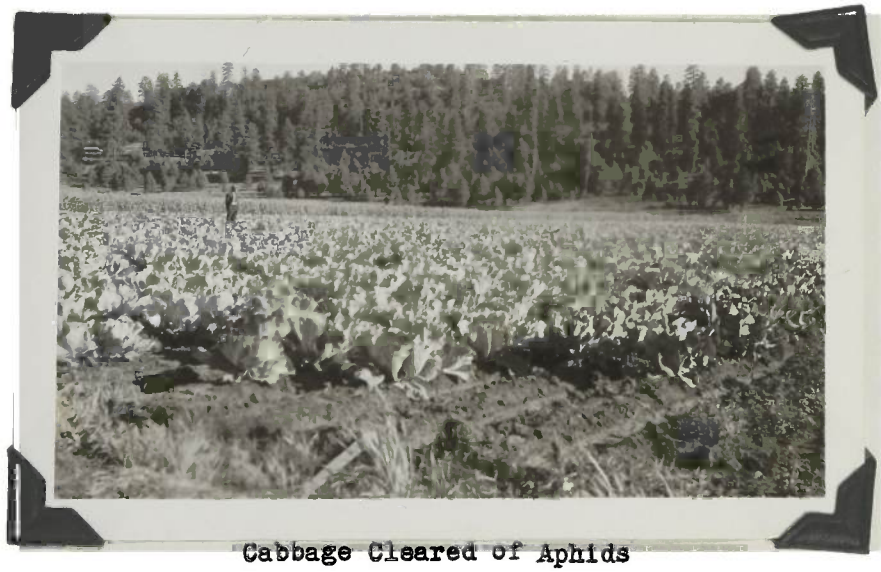
Practically the entire Extension program may be regarded as a war activity at this time, since the emphasis is on abundant production and saving the crop from the ravages of disease and insects. Towards all, the Extension Service is lending every aid.

The farm labor program is distinctly a war activity to the end that through it the writer has been able to provide necessary timely labor to save the matured crops from wasting.

The writer has carried out in Coconino County a program in farm and home fire and accident prevention.

All bond drives have been lent assistance. Several post-war planning meetings were attended by the writer. A. B. Ballantyne and Dr. E. D. Tetreau met with the Rotary Club, where Dr. Tetreau discussed a phase of that problem.

Potatoes - Pontiac left - Katahdin right



Cabbage Cleared of Aphids

FARM CROPS

POTATOES

History

About 700 acres of potatoes were grown in Coconino County this year. Farmers intentions of planting, according to AAA, was 712.

Last year the yield was good. Then the farmers found market difficulties at the beginning of the marketing season. One of the reasons for the marketing difficulties was the increased evidence of bacterial ring rot. The consumers discriminated against the table stock and former purchasers of seed in this area became suspicious and bought their seed elsewhere or used their own.

Program

The situation offered an opportunity for extension teaching. A definite plan was outlined and followed from seed to storage.

1. Meetings were held December 13, 1943, and March 7, 1944. A total of 72 growers attended these meetings.

2. A circular letter proposing the December meeting was sent to all growers November 12, 1943, and a circular letter dated December 9, 1943, was sent out giving notice of the December meeting.

3. A circular letter under date of May 15, 1944, including a bulletin prepared by the Maine Experiment station, giving detailed instructions for the control of bacterial ring rot in their two-year plan of eradication, was sent out to all growers.

4. A circular letter by Dr. J. N. Roney, concerning ring rot and seed certification, was sent to all growers February 1, 1944.

5. March 1st a letter was sent to dealers as to source of potato duster.

6. September 26, just before harvest, a circular letter was sent to all growers giving full instructions concerning disinfecting storage houses.

7. A moving picture prepared by DuPont on the potato industry was shown at a meeting December 13, 1943.

8. Colored charts, prepared by the Canadian Department of Agriculture, demonstrating potato diseases, where shown to 72 growers at the December 13, 1943, and March 7, 1944, meetings.

9. Slides mounted and demonstrating the ring rot bacteria by Dr. Wm. G. Hoyman, were viewed by those in attendance at the December meeting.

10. Tubers, showing bacterial ring rot in various stages, were exhibited at the December 13 and again at the March 7 meetings.

11. At both meetings good certified seed was also exhibited.

12. Pictures and figures of yield, comparing the yields of good certified adapted seed with that of other varieties and qualities were demonstrated.

13. At the meetings, in letters and news articles, with charts, picture slides, moving pictures, tuber exhibits and yield results, the need of good, adapted, disease free, certified seed, seed treatment, separate seed plots, roguing the seed plot, spraying; disinfecting the cutting knife, equipment and storage house, were all stressed.

Dr. J. N. Roney, our Extension Entomologist, Mr. H. F. Tate, Extension Horticulturist, and Dr. Wm. G. Hoyman, Plant Pathologist, of the University of Arizona, helped in bringing all of these before the group in the December meeting, and Dr. Roney again re-emphasized these matters in the March 7 meeting. Handbills prepared by the Canadian Department on the subject of ring rot control were also handed out at the above mentioned meetings, and to callers at the office.

Seed Treatment

Three demonstrations were given in treating seed potatoes. At one, the old standard Mercuric Chloride treatment was employed. Semesan Bell was used at another, and at another the hot formaldehyde treatment was demonstrated at the request of Dr. J. N. Roney. The moving picture by DuPont, already mentioned, also presented a pictorial demonstration of treating seed potatoes.

From evidence here and elsewhere we shall likely return to the old standard Mercuric Chloride treatment entirely. Research pathologists of Nebraska and Colorado at a meeting at Fort Collins, Colorado, in August of this year, seemed to recommend Mercuric Chloride only.

The formaldehyde treatment we found messy, slow and tedious, and the results were unsatisfactory. Five of us one afternoon treated ten sacks of potatoes in a quarter of a day. We had ample equipment and used our best endeavor to keep the temperature between 124° and 126° fahrenheit and emersed the seed for three minutes. Our cooperator, Ernest Burrus, reports that the stand was reduced materially and consequently the yield.

Disease

Ring rot, rhizoctonia, scab, early blight, and blackleg constituted, in the order given, the diseases affecting the potato industry in Coconino County.

The control measures recommended are good seed, as above indicated, treating that with Mercuric Chloride according to instructions, disinfecting the cutting knife and equipment, plant separate seed plots, roguing that seed plot, spraying, disinfecting the storage house, and storing seed separately.

Insects

Psyllids, it seems, are the only insects affecting the potato yield in Coconino County. For psyllid control the lime-sulphur spray, one gallon of liquid lime-sulphur, 32 deg. Baume in forty gallons of water under 250 pounds pressure, at the rate of 110 to 120 gallons to the acre, is still recommended.

The Colorado potato beetle has been seen in limited numbers in the Red Lake district. It has also been reported in the Spring Valley area. It has, in past years, done serious damage to a few small garden potato plots in Garland Prairie. It hasn't been a problem, at least in the last fifteen years, for the commercial potato producers in Coconino County.

A dusting demonstration was observed in the Salt River Valley by the writer, and consequently in keeping with advice by Dr. J. N. Roney, our Extension Entomologist, dusting with sulphur is also recommended. Two new dusters were bought. These, and a good spray equipment, were in readiness in event the psyllid appeared in menacing numbers. The County Agent kept a close check on psyllid population, and since they did not occur in numbers to constitute a danger as in past years, he recommended no treatment. This was a saving in itself, especially this year, because of the poor potato yield due to the drouth.

Variety Test Plots

Two variety test plots were planted, one by Thomas Marlar in Pumpkin Center, and the other by the County Agricultural Agent.

Mr. Marlar planted White Rose, Pontiac, Katahdin, Blue Victor, British Queen, and Bliss Triumph. To date no accurate yield figures have been received, but Mr. Marlar states that it is apparent that the Pontiac is outyielding all other varieties.

The County Agricultural Agent planted a variety test plot of eighteen rows, with thirty hills to the row, as follows, with yields added:

Row No.	Variety	Yield
1	British Queen, 29 hills, late numerous tubers, very small,	54 lbs.
2	Katahdin, 29 hills, early, nearly all markets, smooth	65 "
3	Pontiac, 29 hills, early enough, yield good, smooth, nearly all markets	83 "
4	Pawnee, 28 hills, earliest with Blue Victor, smooth tubers, marketable	59 "
5	Blue Victor, 29 hills, earliest, fair marketable	55 "
6	Sequoyah, 29 hills, many tubers, gnarly, very small, many markets	88 "
7	White Rose, 29 hills, irregular shapes, gnarly	50 "
8	British Queen, 30 hills, gnarly, very small, many markets	97 "
9	Katahdin, 29 hills (as above 2)	75 "
10	Pontiac, 29 hills (as above 3)	90 "
11	Pawnee (as above 4)	49 "
12	Blue Victor, 28 hills (as above 5)	44 "
13	British Queen, 30 hills (as above 6)	89 "
14	Katahdin, 28 hills (as above 2)	75 "
15	Pontiac, 30 hills (as above 3)	108 "
16	Pawnee, 29 hills (as above 4)	54 "
17	Blue Victor, 28 hills (as above 5)	43 "
18	Pontiac, 28 hills (as above 3)	78 "

The Blue Victor and the Pawnee were the earliest. The Katahdin and Pontiac were early enough. The British Queen was the latest of all. The Pawnee made nice tubers, growing at wide range from the plant. The Katahdin as usual yielded well, but the Pontiac outyielded it. The light yield of the Blue Victor may be explained by the fact that a little sprinkling was applied late in the season. The season was dry. Sprinkling was resorted to in order to supply the moisture usual for the average year.

Fertilizer

Potato fertilizer experiment was carried out by Ernest Burrus on his farm in lower Doney Park, in cooperation with our service. Results seemed to be negative because of the dry season, but it is believed that marked results would have been achieved if we had had a wet season, or a season of normal rainfall. The experiment will be repeated next year. Data on the experiment is as follows:

Fertilizer or Treatment	Lbs. Field-run Tubers	Yield lbs. per acre
16-20-0 - 250 lbs. per acre in band at time of planting	894	4917-414.5
11-48-0 - 250 lbs. per acre in band at time of planting	928	5101-598.5
Nitrate of soda at rate of 250 lbs. per acre in bands at time of planting	829	440.5-38
Check	825	4502.5

Sulphur at rate of 250 lbs. per acre at time of planting 10-20-0 at rate of 250 lbs. per acre at time of planting	915	5032.5-530.0

Marketing

Potatoes were a drug on the local market last fall and winter. In December three cars were shipped to the quartermaster center building in Phoenix at $2.60 per 100. All offers at ceiling prices of $2.70 were rejected by the agency mentioned. Later in the spring and early summer a local shortage facilitated the marketing at ceiling prices.

PINTO BEANS

Acreage

The bean acreage for this year was approximately 8,000 acres. Because of the dry season the yield was light, averaging perhaps less than four sacks to the acre.

Varieties

The early Idaho Pinto, which we introduced in 1943, and which that year yielded only approximately a third as much as the local Pinto Bean, has this year outyielded the local variety, according to Ernest Burrus. Perhaps this is accounted for by the fact that we had good moisture at the beginning of the growing season, and that consequently this early Idaho pinto was virtually made before the drouth limited the full development of the local pinto. A number of cooperators will again grow the Idaho pinto next year.

Seed Treatment

At a meeting held March 7 Dr. Robert L. Matlock recommended to the bean growers that they treat their bean seed as an insurance against dry root rot. Later the County Agent in a letter re-emphasized F. M. Gotleib's recommendation of a few years ago and the more recent findings by W. J. Henderson, Plant Pathologist of the Colorado Extension Service. Both recommended seed treatment. As a result of the foregoing, all chemicals locally available for treating seed beans were bought up before planting.

Marketing

Not until 1943 were the marketing arrangements made a year earlier by H. R. Baker, Extension Economist, put into effect. Two cars were shipped in December, 1943, after samples were obtained and sent to Los Angeles for grading. The grade which followed was sub-standard because the rock content was .08 per cent. These beans were left on the track in Greeley, Colorado, the property of the shipper, and resold to a dealer.

The State Chairman of the AAA in a meeting promised the thirty growers present that the AAA would pay for U. S. No. 1, $6.50 per 100, f. o. b. cars or warehouse Flagstaff, recleaned and sacked. Later, growers were advised to sell to shippers. The shippers then received the above guaranteed price, the growers receiving twenty-five cents under the above figure. No serious complaints were registered by the growers because of this charge.

SMALL GRAIN

According to the AAA, intention of farmers to plant small grain this spring was as follows:

Wheat	2,222 acres
Oats	5,548 "
Rye	1,841 "
Barley	549 "

Considering that our chief cash crops, those of beans and potatoes are given as 8,211 and 712 acres respectively, the small grain acreage constitutes an appreciable part of our agriculture. The small grain crop yields averaged better in this dry year than did the mentioned cash crops.

Varieties

In 1943 Ed Keith produced a Markton oats crop of seventy-two bushels per acre on dry land. This is worthy of note. It is extraordinary, but this is thresher's weights and the producer paid for the threshing at that rate, consequently the figure would seem to be dependable.

This Markton oats variety was first introduced into our variety test plot plantings and proven, and subsequently introduced by ourselves and increased in field plantings for general distribution. This remarkable crop was principally sold for seed to remain in the community to the following: Andrew Pringle, Henry Burrus, Ernest Burrus, Jim Tomlinson, Roy Keith, M. F. Ferrell, F. O. Witte, W. L. Hostetter, Ernest Smith and others. It was saved for seed and planted largely through our efforts.

Henry Burrus raised forty acres of this variety and threshed it all for seed. The superiority of the Markton over the Texas Red was demonstrated by Henry Burrus, the two varieties growing side by side. Unfortunately the yield weights are not available.

John Gunzenhauser planted for increase some certified Colorado 37, which has also been proven here by the Extension Service in variety plot plantings. This, too, will be used for seed next year.

Durham wheat also introduced and proven in our variety plots and in field plantings is grown for increase and distribution by Mr. Gunzenhauser. He is doing the same with Reliance wheat, likewise tested and proved in both variety plots and field plantings by us some years ago.

Markton oats and Reliance wheat are at the top of the list on our recommendations for those species.

H. C. Sandlin produced and is holding for seed a field of Bart 38.

J. C. Bond likewise grew and is holding for seed a field of Colorado 37 oats.

Thomas Marlar has available some victory oats seed proven for his high altitude west of Kendrick Mountain.

Disease

Smut continues to take a toll in our wheat, oats and barley fields. We have brought this to the attention of our farmers at every opportunity; have sent a circular letter on the subject to the farmers, have had short articles in the newspapers, and have had it called especially to their attention by Dr. Robert L. Matlock, our Extension Agronomist, in two meetings of March 7 and April 17. Seed treatment was recommended. Apparently some are still taking a chance by not doing a thorough job of treating, because we again had too much smut this fall.

LEGUMES

Alfalfa

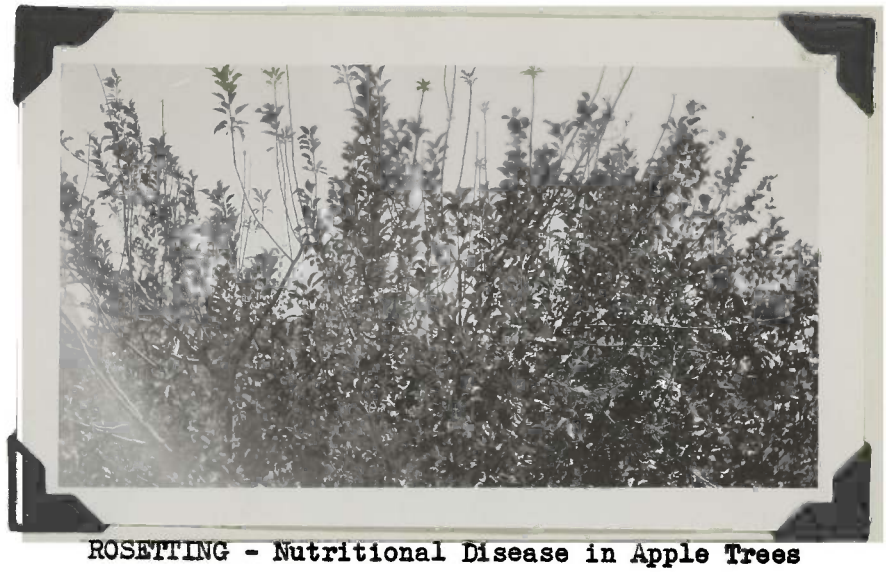
The alfalfa acreage in Coconino County, according to the AAA figures, is 484. It is not an important crop for the county as a whole, but it is an important crop for a few farmers in the Fredonia area. It is grown under irrigation and the crop is mostly grown for hay. Some seed is produced. The seed is used locally or sold to Utah distributors. The hay is all fed in the Fredonia area.

The writer has endeavored to interest farmers in the principal dry farming area in the county to attempt to experiment with growing alfalfa in rows. Information was given them regarding the success which C. E. Crater, of Yellow Jacket, Colorado, under similar conditions as ours, is having with alfalfa grown in rows. Two farmers have indicated a willingness to try it. Seed will be secured for next year's planting.

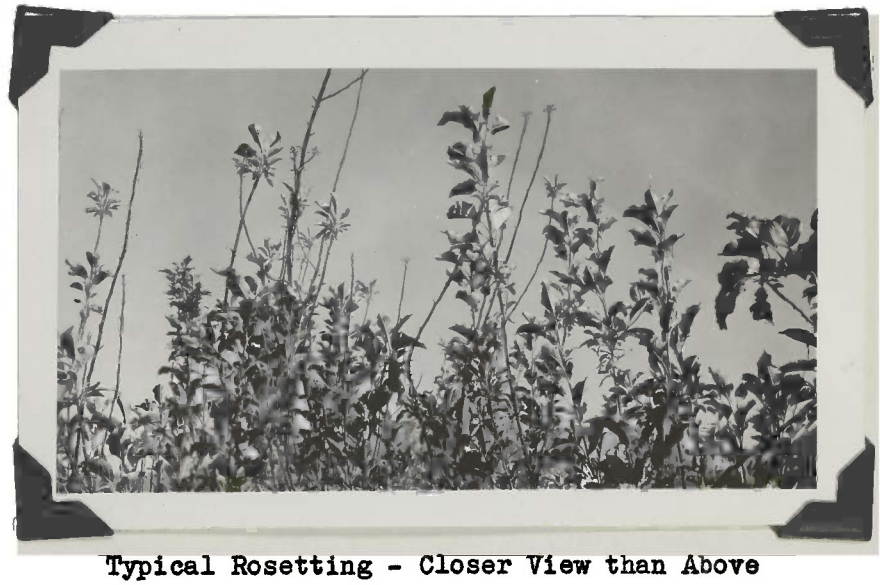
Canadian field peas are grown by R. B. Rountree as in past years. He grows them for the purpose of producing a legume hay mixed with either oats or barley, and for increasing his potato yield the year following on the Canadian field pea land.

For the last two years this crop has been grown by Lewis Hoskins in Doney Park, but apparently it is having no appeal as yet to any of his neighbors.

Guar, a new legume introduced in the Salt River Valley, will be tried by Dr. A. J. Mackey and Charlie Rice to ascertain if it may have a part in farming in this area.



ROSETTING - Nutritional Disease in Apple Trees



Typical Rosetting - Closer View than Above

ORCHARDING

APPLES

Cover Crop

Frank Pendley is extending our recommendation for using a legume as an orchard cover crop. We are observing Black Medic especially at this time. It is spreading naturally throughout his orchard by irrigation water and by cultivation. In addition, Dan Freeman, of the Soil Conservation District, embracing that area, has promised to provide Mr. Pendley with twenty pounds of Black Medic seed to spread thinly where a start has still not been made. Previously Mr. Pendley had done something with sweet clover and alfalfa, but thinks that perhaps Black Medic might suit better. It isn't so tall and consequently does not interfere with workers harvesting fruit.

Irrigation

Mr. Pendley is maintaining the irrigation system planned in cooperation with ourselves some years ago. The ditches carry the water on a slight grade to where needed, instead of dropping the water from an upper ditch across the orchard as formerly.

Fertilizer

Mr. Pendley was assisted particularly by Harvey F. Tate, our Extension Horticulturist, in selecting the proper commercial fertilizer for his orchard. A dealer had sold him a fertilizer high in phosphorus whereas Mr. Pendley only needed a nitrogen fertilizer. This he obtained upon consulting with Mr. Tate, thereby saving a useless expenditure of money.

Bees

At the request of some of the growers a source of bees for the purpose of aiding in pollinization was obtained. Harry Whitcombe, Route #1, Box 125-B, Davis, California, supplies bees housed particularly for that purpose only.

Non-bearing Fruit Trees

In past years orchardists at times have had a number of trees, sometimes a whole block of trees, which failed to bear over a period of years. We were asked for assistance in the solution of this. Mr. Harvey F. Tate, Extension Horticulturist, consulted with Dr. Finch,

head of the Horticulture Department of the University of Arizona, and transmitted to our growers at visits to the orchards their combined opinion. The County Agricultural Agent obtained a supply of United States Department of Agriculture leaflets, No. 172, entitled "Why Fruit Trees Fail to Bear," and sent copies to all the apple growers in Oak Creek Canyon. This leaflet lists the following as some of the causes why fruit trees fail to bear:

1. Continued cold weather, below 40° or 42° fahrenheit much of blossoming time, may not permit pollen to germinate.

2. Pistils and ovules may be adversely affected to prevent fertilization even though pollen be present.

3. A heavy rain may wash away the pollen.

4. Bees are not active if the temperature goes to within 10° of freezing, or if it is very windy.

5. Inadequate nitrogen supply at blossom. The remedy, four to five pounds nitrate of soda when buds swell.

6. Foliage injury or a heavy crop draft on the tree the year preceding at a time when the fruiting buds differentiate.

7. Overpruning.

Apple Drop

The plant harmones recommended a few years ago immediately upon the finding by Dr. L. P. Batjer, Dr. Frank E. Gardner, and Paul Marth, three horticulturists at the United States Station at Beltsville, Maryland, were applied by three Oak Creek growers this year. The three reported a total saving from this practice of $2,000. Directions were not carefully carried through in one case. Proper instructions have been given to avoid this error in the future. Publicity of these results has been given by circular letter, news articles and personal visits. Others have indicated that they will adopt this practice next year.

Insects

Coddling Moth control recommendations remain as reported in our 1934 annual narrative report, with arsenical sprays and tree banding. These practices have proved successful with our growers. Tree bands should be applied between June 1st and June 15th, and removed October 15th. A circular letter advising the orchardists regarding this was sent out in May and then again in November. In the meantime a news article regarding the removal of bands also appeared.

Thrips did not occur in menacing numbers this year, consequently no spray program was recommended. If and when they do reoccur, the controls reported in the 1943 annual narrative report will be re-emphasized as being successful.

Disease

Powdery Mildew. In the old orchards growers are experiencing an increasing difficulty with powdery mildew. It seems that it has been on the increase with one grower since he is using dry lime-sulphur instead of liquid lime-sulphur. Dr. J. N. Roney maintains that it is due to not having used sufficient strength of the dry lime-sulphur, and is now recommending a wettable sulphur, ten pounds to 100 gallons of water for the dormant spray, and eight pounds for the foliage spray. Mr. Pendley was using California wettable sulphur micronized 70 per cent. It was discontinued because of injury to foliage and fruit, and a standard sulphur was used instead.

Rosetting. The past year it was noticed that many of the long whips, principally in the tops of apple trees, did not leaf out. Some had just a little tuft of leaves at the top with no buds developing leaves for several feet below. Jonathan and Delicious apples are affected by rosetting; Grimes, Stamen and Rome Beauty are not. Dr. J. N. Roney and Harvey F. Tate made observations and recommended that the writer send specimens to the Extension Horticulturists in Washington, Colorado, and Oregon. Subsequently specimens were cut and pictures taken and sent as suggested.

W. F. McGee, of Colorado, pronounced this as a nutritional disease known as rosetting, and recommended for correction a dormant spray, before buds swell, consisting of twenty-five to fifty pounds of zinc sulfate in 100 gallons of water. J. A. Snyder, of Washington, made the same recommendation and in addition recommended twelve to twenty-five pounds of zinc sulfate as a foliage spray, and added that it would be more lasting if one to four per cent Boron were added, and one-third to one-half as much lime as zinc in the spray. He stated that the Yakima Valley successfully used this zinc lime formula: 10-5-100 (10 lbs. zinc sulfate, plus 5 lbs. lime to 100 gallons of water).

Frost Warning

In cooperation with W. L. Lampkin of the local weather bureau, frost warning service was attempted in behalf of Oak Creek fruit growers. Bulletins dealing with the subject were given out to interested persons. One, Walter Jordan, assisted in tabulating data for the weather bureau. Several times notices of a cold wave were given. This may have had a value in helping keep the

community conscious of frost danger during that period. Walter Jordan and J. T. Boutwell were the only two who needed to and did light up smudge pots.

Peaches

Much injury was done to peaches by cold weather previous to blossoming in Walter Jordan's orchard. He held the temperatures up during blossoming. However, injury had been done previously. The Alberta crop was entirely destroyed. The Hale-Berta was mostly destroyed. More resistant to cold are Bell of Georgia, Hale and Redbud Cling. These produced a fine crop.

INSECTS

Insect damage to farm and garden crops is as follows:

Cutworms as a rule do more or less damage to garden and corn crops, but this year it is reported that they have done considerable damage to oats and wheat, and some little damage to beans. The poison bran formula is recommended.

Grasshoppers damaged fields in Fredonia, Doney Park, Garland Prairie, and a grass range in Rogers Lake. The poison bran formula was recommended in every case.

The farmers were assisted in obtaining forty sacks of bran and forty gallons of Sodium Arsenite from D. E. Creighton, County Agricultural Agent at Holbrook. This was disposed of as follows:

H. C. Sandlin, ...	10 sacks
L. K. Davis	5 "
Cecil Miller	21 "
Ernest Burrus (in storage)	4 "

In addition, 250 pounds of Sodium Fluosilicate went to Cecil Miller, who furnished his own bran with this.

One hundred sacks of bran and 1278 pounds of Sodium Fluosilicate was sent by truck direct to Fredonia, unloaded and stored in readiness for use there. According to the latest report from Warren D. Judd, foreman of the local mixing station, forty sacks have been used and sixty are in storage, available for future use. Most likely this will be used next year since they have had a grasshopper outbreak in the Fredonia area regularly for a number of years.

Farmers have been instructed in mixing and applying the poison bait.

False Chinch Bugs were abundant on some bean plants on the L. K. Davis place north of the San Francisco Peaks. Mr. Davis felt they were injuring the beans, but likely no appreciable injury was done.

Mirids reported for the first time were doing apparently serious damage to a Moore River privet hedge at Will Compton's home. The hedge had leaved out and these insects attacked it in great numbers. The leaves and tender sprouts dried up as if from heavy frost or from scorching. A Rotenone dust was applied; this killed the insects. Subsequently the hedge made a new growth.

Blister Beetles occurred in spots, principally in the western part of the county farm area. This year they were doing serious injury to truck and farm crops two miles west and south of Parks on Fred Morgan's farm. Mr. Morgan was using a blow torch effectively

and consequently he was advised not to change to the acknowledged standard formulas, but rather to continue with what proved successful for him.

Flea Beetles destroyed much early tender garden plantings. They also sapped to some extent the vitality of field beans. Injury to farm crops wasn't sufficient to warrant control measures, but for garden crops it is important that the gardener be prepared to protect his tender plants from the ravages of this insect.

PLANT DISEASES

Ring Rot, Rhizoctonia, Scab, Black Leg, Mosaic and Blight are the principal potato diseases, and treatment is indicated under the subject of potatoes.

Powdery Mildew of apples, Apple Blight, and Rosetting of apples are the apple diseases found in Oak Creek Canyon. Pear Blight is also found there. These diseases are treated under the appropriate heading--Orcharding.

Western Yellows does more or less damage to tomatoes in Oak Creek Canyon. Control measures by Harvey F. Tate have been recommended.

Smut in small grain--wheat, oats, barley--take an annual toll. Control measures are treated under the heading of Small Grain.

Youngberries and Boysenberries

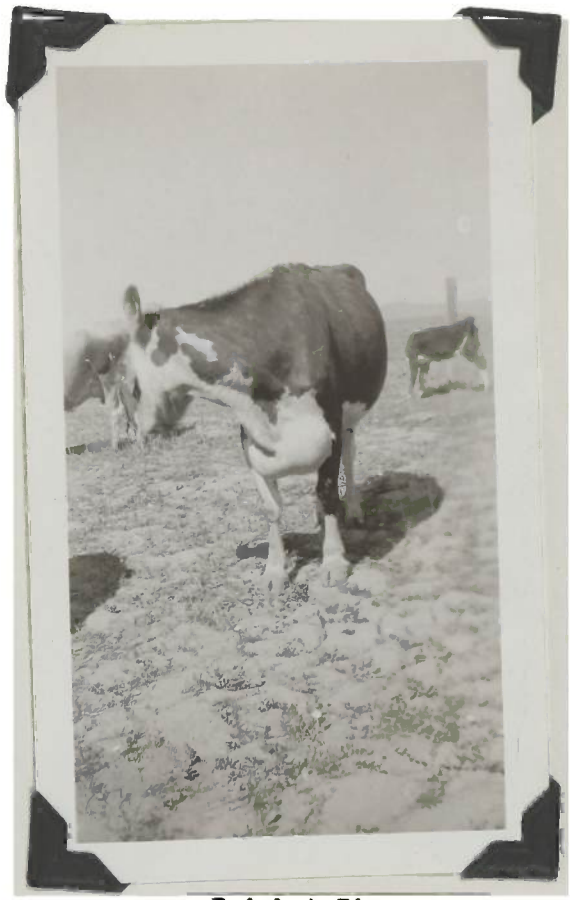
Anthractnose destroyed the Boysenberry and Youngberry crops for Miles Gibbons in Oak Creek near Sedona last year. He has a sizeable patch, well cared for. In 1942 and 1943 this fungus sapped the vitality of the canes so that they developed but little foliage and the blossoms dried. Upon using the Bordeaux spray recommended by Dr. J. G. Brown of the Plant Pathology Department of the University, the canes recovered and an abundant crop was harvested this year. Mr.Gibbons needs and is depending on us to keep him informed regarding the proper formula, the number and times of application.

RODENT CONTROL

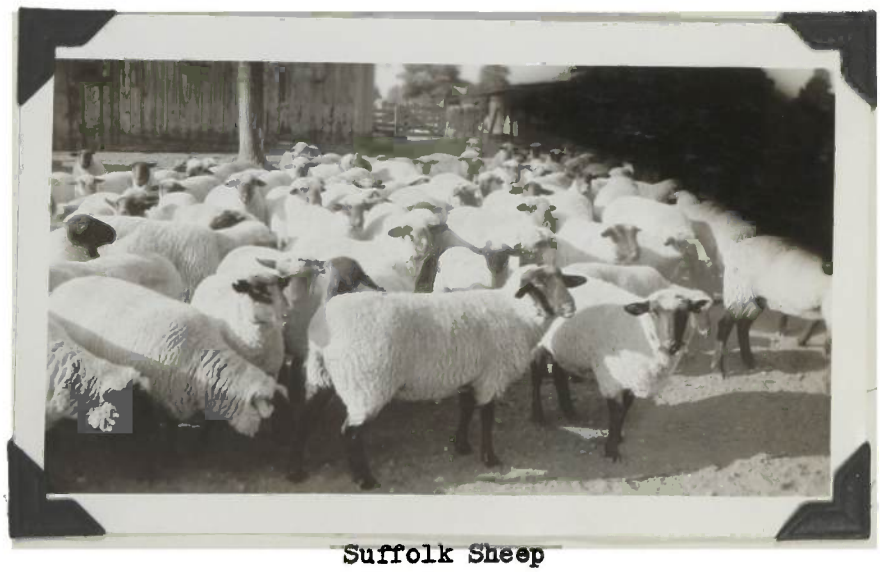
Farmers continue to call on the County Agricultural Agent for assistance in the control of rodents, principally prairie dogs, gophers and mice; prairie dogs and gophers injuring farm and garden crops, and mice damaging sacks and products in storage. The Agricultural Agent purchased from the Maricopa Farm Bureau in Phoenix, through the Fish and Wildlife Service, poison for the control of the aforementioned rodents. This is being dispensed in the Agricultural Agent's office at a charge to cover the invoice. Since this is the only agency rendering this sort of service, it would seem necessary to continue it, and that it is being appreciated.

Mack Taylor, a field man for the Fish and Wildlife Service, came to Coconino County in April. Through an arrangement with the Forest Service he, with help he could hire, poisoned prairie dogs on the forest range occupied by Joe Kellam. When he had finished that area he devoted his time to poisoning prairie dogs on farms. Because of newspaper stories and a few letters to farmers, twenty-two farmers filed requests in the County Agent's office for Mr. Taylor's services. Subsequently every request registered in the County Agent's office was served.

It may not be out of place to mention the fact that Mr. Taylor goes about his work in a most business like manner, and is accommodating and cooperative.



Brisket Disease



Suffolk Sheep

LIVESTOCK

Dairying

The Agricultural Agent assisted two dairymen in planning their feed producting program for their dairy herds. Timely information was sent dairymen from time to time as follows:

1. A circular letter calculated to help figure out dairy rations.

2. A circular letter regarding hay supply--where available and at what price.

3. A circular letter regarding experience of growing alfalfa in rows as a possible legume feed crop.

4. A circular letter to help in diagnosing and treating mastitis in its incipiency.

Two farmers' wives were assisted with information regarding butter making, and two with respect to cheese making.

Range Cattle

A circular letter went out to ninety-four stockmen giving an explanation of the life history of the warble, the damage from it, and control measure.

An outlook report prepared by Frank Armer advising stockmen concerning marketing and market outlook was sent to all range men. Instructions for supplemental range feeding were sent to fourteen range stockmen.

Sheep

Three were assisted in obtaining desired information regarding sheep raising.

Hogs

A year ago there were more hogs in Coconino County than there had been in more than a decade. Then it became unprofitable to feed and now there are fewer hogs than there have been in the time above mentioned. The writer was called upon to help one farmer figure out an impossible profitable feed ration.

Horses

Tractors have replaced horses. Only on a few farms in the better farm area are horses still used, and only one farmer is still depending on horses entirely for his farm work. One farmer has an extra good team of four horses, the progeny of an introduction by the writer of some years ago. He maintains they are profitable.

Poultry

Less interest has been manifest in poultry production this year, perhaps due to the fact that there were so many other things in which people could invest their time and labor profitably and because of labor scarcity.

Some inquiries came to our office regarding the buying of baby chicks and brooding and feeding, and information was given accordingly. More inquiries came to the office regarding poultry diseases, but not as many as in past years. In every instance these inquirers were promptly advised and helped.

One inquiry came to us regarding plans for building a new poultry house and still another regarding the remodeling of an old poultry house.

All eggs produced are sold in this area.

Veterinary Service

1. In the absence of an active practicing veterinarian, the Agricultural Agent is occasionally called upon in matters of a veterinary nature. He gave aid in three instances of calf scours, and in three instances of milk fever; one instance of wound infection, and one case of a valuable sick bull calf.

2. Government veterinarians, Thomas V. Coe, E. B. Osborn, and J. E. Coberly from the state office came to Flagstaff during the summer to test dairy cows, both commercial and farm family cows. Farmers registered their needs in this respect in the County Agent's office. The veterinarians came daily to get these requests and subsequently to take care of them.

FARM LABOR

Recruiting farm labor was more difficult this year than last, and was more time consuming. The Navajo Indians constituted the chief source of farm labor supply. Some few Hopis were secured and a few transient workers were employed. Very little farm labor was needed until harvest, excepting a little help required at potato planting.

The Navajo Indians without exception stay but a little while. They have no thought of helping a farmer finish the job. The Hopis seem somewhat imbued with the idea of getting the job done.

The farmers started out with paying $4.00 a day per person for Indians in groups where the Indians provided their own blankets and food. Much work was done at that rate. Where only a few Indians were needed on a job, the farmers were compelled to pay $4.00 a day and board.

It was difficult to hold these Indians long at this wage in view of the fact that the railroad was recruiting actively, were offering $6.40 per day locally, or were offering that and shipping the Indians out. The trip appealed to the Indians as well as the advanced wage. The Ordnance Depot was paying a similar wage scale and in addition, they provided an Indian camp, which had some attraction.

In June and July when the weather got hot in the Salt River Valley, we had a surplus of labor and it became more of a job to get work for this surplus labor than to supply farmers' needs.

Harvest work was interrupted a number of times by rain. At such times the Indians would leave and when the weather was again favorable, the recruiting had to be done all over again. Some extra cost was incurred at times when labor was insufficient to keep threshing machines working with the greatest efficiency. The job slowed up and as a result a few small jobs were not finished when winter set in the middle of November. Some apple drop occurred, too, because of labor shortage at picking time. In some instances needed labor could not be placed because the farmer didn't have adequate housing.

As a whole, we were able to supply such labor as was requested of us within a day or two after the request was made. We recruited this labor on the streets of Flagstaff and the highways near by. As an example of our success: In September we had fifty-one requests from farmers and we supplied fifty.

We helped Edward C. Clark recruit fifteen Indians to send to Wyoming and Nevada. When these Indians returned, we sent them back to the reservation, managing to do that at a minimum cost. During the crop and harvest season we recruited a total of 156.

THE SEDONA BUSY BEES
4-H Club Members

OATS - Pumpkin Center

4-H CLUBS

Two clubs were organized early in the year, one at Fredonia and one at Sedona. The leader of the Fredonia club was called by the draft board and no leader was found to take his place, consequently the club disintegrated. At Sedona the club was organized in two groups--girls' work and boys' work. The boys' work, for some reason, was never carried through but the girls' work, under the leadership of Mrs. George Jordan, continued its usually good work.

The total enrollment in Mrs. Jordan's girls' club, called "The Sedona Busy Bees," was nineteen. Fourteen completed projects, some of these completing projects in first, second and third-year sewing. Canning and cooking projects were also completed.

An Achievement Day program was presented September 23 by "The Sedona Busy Bees." A display was arranged comparable to a community fair of numerous articles made by the club members. Miss Jean Stewart, State Leader of Home Demonstration Work, acted as judge. The event went far towards stimulating a still greater interest in 4-H Club Work in the Sedona district. Another thing which should help stimulate a greater interest is the fact that one of the Sedona club girls, Nellie May Hart, won the Chicago Santa Fe trip for this year. She and her parents are pleased and the community considers it a very fine tribute to Mrs. George Jordan's persistent, continuous 4-H Club leadership over a period of four years.

MISCELLANEOUS

A number of inquiries have come to the office and have been answered which we think proper to classify under this heading.

Five local farmers have been advised and assisted in renting land. Numerous out of county and state inquiries have been answered during the year regarding this subject. Three local people have come for advice regarding buying land here. Seven have consulted us regarding planning of crop acreages; five have consulted with us regarding tillage practices. In several instances farmers and stockbuyers were brought together.

Two farmers were assisted with farm account keeping. Two have consulted us regarding ceiling of reservoirs to prevent seepage; two have consulted us regarding plans for building potato cellars; one concerning the building of a residence, and one person was given information on the building of a septic tank.

Dr. George W. Barr's economic outlook was sent to twenty-six farm leaders.

The writer had occasion to visit potato fields, orchard and truck crops in Colorado during the year. We studied Peach Mosaic, Apricot Rot, Western Yellows of tomatoes, Thrip injury to tomatoes, Red-node of beans, Coddling Moth and its control, Potato Psyllids and control measures.

SOILS

A study of dry farming is being undertaken by subject matter specialists and the writer. The purpose of this is not only to ascertain what practices are feasible and more practical, but also to learn what are the underlying causes of difference in dry farming areas and practices so that dry farming areas may be catalogued and sound recommendations made. But little progress has been made to date. Matters are only in the speculative or planning stage.

Green Manure

As reported in previous years, R. B. Rountree in Fort Valley claims that he has had an increase of fifty per cent on potato land following Canadian field peas in comparison with land where potatoes followed other crops. Canadian field peas in every case have been harvested for hay. Had they been turned under as a green manure crop the increase might have been even better.

Ernest Burrus, in years past, plowed under rye preceding a potato crop. The practice, he maintains, netted satisfactory returns.

This practice has not been adopted in the pinto bean growing area perhaps because the pinto bean crop has been so profitable.

Strip Cropping

Strip cropping for checking wind erosion has been recommended by the Agricultural Agent for many years. Observations from demonstrations by Messrs. Smelser, Monroe, Hoskins, Lawson and Burrus seem to confirm this. It is the writer's opinion that this will prove in the long run more successful than tree planting undertaken by the writer in cooperation with Mr. Emil Engblom in Doney Park four years ago. The Soil Conservation Service is extending this experiment at the present time.

Terracing

From the beginning of his tenure here, the Agricultural Extension Agent has recommended terracing for the purpose of checking sheet and gully erosion on all land in Doney Park, where erosion was in evidence. It took years to bring farmers around to this. Nevertheless, through the Extension Agent's efforts, before the Soil Conservation District was formed here, 765 acres of farm land had been terraced. Now, since all the good land that is subject to erosion is within the San Francisco Peaks Soil Conservation District, this activity has been taken over by that local SCS agency.

Weed Control by Fallow

Weed Control. Distant View of Above

Weeds

Noxious perennial weeds constitute a serious soil problem in Coconino County, and recommendations of former years are adopted more and more by the farmers. For small spot infestation an application of Sodium Chlorate is recommended, and for larger field areas clean cultivation is recommended.

Sodium Chlorate, dry application, six pounds to the square rod on heavy soils, based on experiments conducted by Dr. Charles Davis of the University, is recommended. On the lighter soils, four to five pounds will suffice, according to Dr. Davis. If Sodium Chlorate is applied with a spray, one and a half pounds of the chemical to a gallon of water, spraying to wet thoroughly both sides of the leaves and stems is recommended.

The writer assisted farmers in securing 2100 pounds of Sodium Chlorate during the year. The larger users of this are: P. E. Butler, Henry Burrus, Emil Engblom, Ernest Smith, Claude Smith, Rufus Rountree, F. E. Wells, Henry Hutchison, Charlie Marshall and Pete Michelbach.

Clean cultivation if persisted in for three years, will rid soils of bindweeds. The perennial rag weed is eliminated more easily, but due to the shortness of the growing season two years cultivation will likely not suffice for that. More and more this method of weed eradication is made use of. During the last year P. E. Butler, William Warfield, R. B.Rountree, James Copeland, John Gunzenhauser, Henry Hutchison and Andy Matson, employed this method of weed eradication. Andy Matson was the pioneer in this method of weed eradication on a larger scale. He adopted a three-year program employing this method on one piece of land. Later he used that same method on still another piece of land and now is starting on a third tract.

Soil Conservation Service

The County Agricultural Agent's activities with respect to soil work has become restricted since the Soil Conservation Service has taken up headquarters here. They have men, money and equipment in abundance, and can do engineering free of cost, and other work at a nominal cost. When the two soil conservation districts were organized they emphasized terracing, strip cropping and listing--soil conservation primarily and water conservation secondarily. Now listing, it seems, is abandoned here, and less emphasis is given to terracing and strip cropping, the chief emphasis being put on subsoiling. It may be recorded here that by the advent of bigger farm power equipment a fair beginning has been made with respect to this practice. A. C. Crisp by contract had subsoiled 100 acres or more in 1937. Floyd Copeland, too, had made a beginning about that time. Next, in the fall of 1942 Floyd Copeland and George Veit each subsoiled about 40 acres. In the spring following the Soil

Conservation Service with their large caterpillar tractor subsoiled a tract of land for Lewis Hoskins and in the fall of that same year a piece of land was subsoiled by the SCS for Ernest Burrus. At the time Ernest Burrus reported that it cost him about seventy-five cents per acre. That is much cheaper than a farmer can do it himself, and subsequently we recommended to the farmers that it was only good business on their part to have this done for them.

Mr. Stambaugh, of the local SCS, in figuring profits as a result of subsoiling, uses the figure of $1.14 per acre cost of subsoiling. This still is cheaper than the farmer can have it done by contract and less than the farmer can do it for himself and only about half of the payment for this practice by the AAA. Consequently it is still better business for the farmer; he gets a job done which is better than plowing for nothing, and moreover, he gets government cash money in his pocket in addition.

In connection with the purely soil work which has shifted from soil conservation to soil moisture conservation and then to soil management, the SCS has chartered a course in farm planning and has entered upon written agreement with the farmer. This agreement constitutes only a moral obligation on the part of the producer, it seems. This agreement does include phases of crop production. It would seem therefore that the SCS may ask for undisputed rights in matters that pertain to the field of agronomy which concern its cooperators within the district and finally all affairs within the district.

If the Extension Service and the College of Agriculture are to remain the educational and informational agencies concerning these matters, we should keep in close touch with what is being done, and more than that, how it is being done. Perhaps we may be permitted a choice in what constitutes sound information.

As a matter of record, data furnished us by the SCS on moisture precipitation on yields, methods of determining these yields and possible advantages obtainable from adopting the subsoiling practice, are as follows:

COMPARISON OF YIELDS OF SUBSOILED VS. OTHER TREATMENT
Yields in Pounds per Acre _ Dry Beans

Farms	Subsoiled		Plowed		Yield Increase
	Spring	Fall	Spring	Fall	
A. C. Crisp	752			648	104
Ernest Burrus		487	374		113
		670	565		105
Lewis Stalhut		461	427		34
Means	592.5		503.5		89.0

RAINFALL RECORD IN HUNDREDTHS INCHES OF THE 1944 SUMMER GROWING SEASON

Ernest Burrus - Doney Park

May	10	17	26				
	.56	.18	.16				.90
June	30						
	.08						.08
July	2	3	19	20	21	22	
	.40	.72	.16	.26	.27	.25	2.06
August	8	9	17	18	19		
	.03	.04	.24	.30	.56		1.17
September	16	23	25	26	27	28	
	.11	.02	.48	1.02	.19	.07	1.89
October	1	10	27	28			
	.03	.20	.19	.05			.47
							6. 57

A. C. Crisp - Black Bill Park

May	None												
June	None												
July	4	12	19	22									
	.39	.30	.38	.27									1.34
August	7	17	19	22	23	24	25	26	27	28	29	31	
	.28	.16	.70	.50	1.00	.50	.50	1.00	.50	.50	.50	.46	6.60
September	18	26	29										
	1.35	.50	.34										2.19
October	8	11											
	.50	.50											1.00
													11.12

Wm. G. Adams - Winona, Arizona

May	10	16	20	26	
	.65	.10	.06	.02	.83
June	None				
July	1	2	20	22	
	.10	.15	.30	.09	.64
August	7				
	.43				.43
Sept.	24-26				
	1.44				1.44
Oct.	28				
	.10				.10
					3.44

BEAN YIELDS 1944 CROP SEASON

SAN FRANCISCO PEAKS SOIL CONSERVATION DISTRICT

LEWIS STALHUT FARM - DONEY PARK 9-2344

In the Fall of 1943 approximately 120.5 acres were subsoiled to a depth of 14 inches with heavy equipment. A nine tooth chisel tooth cultivator was used with teeth spaced 12 inches apart. This subsoiling was done on the contour following the terraces and in a north-south direction across the filed.

One check strip through the middle of the field and between two terraces weas left to be spring plowed. An area at the Eastern end of the field was left for plowing because of the presence of large volcanic clinkers which made subsoiling impractical.

In selection of areas for yield checks the areas between terraces and in the center of the strips were chosen in an effort to secure uniformity and comparability of samples.

Since each shock row represents four rows of beans two shock rows in each strip (plowed and subsoiled) were used as samples.

The check strip sample covered an area 20 feet wide by 1309 feet in length or 26,180 sq. ft. or .601 acres.

The harvested yield on this strip was 257 lbs. or 427 lbs. per acre.

The subsoiled strip sample covered an area 20 ft. wide by 1332 ft. in length or 26640 sq. ft. or .611 acres.

The harvested yield on this strip was 282 lbs. or 461 lbs. per acre.

From the above yields the subsoiled land gave an increase in yield of 34 lbs. per acre over the plowed land or an increase of 7.96 per cent.

With beans selling at about .0625 per lb. this increased yield amounts to $2.12 per acre or a total of $235.46 on 120.5 acres.

The total cost of subsoiling this field was $138.21 or $1.14 per acre.

The net profit amounts to $ .98 per acre or a total of $118.09 for the 120.5 acres.

Mr. Stalhut's final yield was 42,500 lbs. of clean beans from 120.5 acres or 353 lbs. per acre. This lowered yield was probably

due to the fact that a large percentage of the beans were lost through the cleaning process.

The sampling was done prior to any precipitation while the bulk of the crop received four showers before harvest. There was also a large percentage of small immature beans which would be removed in cleaning.

ERNEST BURRUS FARM - DONEY PARK

In October 1943 approximately 140 acres were subsoiled using an RD-7 Caterpillar tractor and heavy chisel tooth cultivator. The subsoiled field had been previously terraced and the subsoiling was confined to the areas between the terraces.

Using nine points on the cultivator gave a spacing of 12 inches between furrows and a depth of 14 inches was obtained. This narrow spacing gave complete breakage of the ground between furrows and permitted maximum moisture penetration and accumulation throughout the winter.

Two of these terraced strips were chosen for comparative yield studies, one being spring plowed to check against the adjoining subsoiled one.

To eliminate any influence in the results from the terraces two shock rows comprising 8 bean rows each were selected through the center of each strip as comparable samples. These rows in the check or plowed strip occupied 1.93 acres while in the subsoiled strip the sample covered 2.20 acres.

The trashing in the check strip produced 721.5 lbs. or 374.1 lbs. per acre.

The yield from the subsoiled sample was 1074 lbs. or 487.3 lbs. per acre.

The difference in yield per acre between the subsoiled and non-subsoiled strips was 113.2 lbs.

This increase through subsoiling applied to the 140 acres subsoiled amounted to 15848 lbs. above the normal yield.

15,848 lbs. would return to the operator a profit of $989.50 at a market price of $6.25 per hundred.

Since Mr. Burrus farmed an additional 200 acres to beans and applying the 113.2 lbs. increased yield through subsoiling, had he subsoiled the 200 acres his gross return above the normal yield would have been $1,415.00 or a total for his entire bean acreage of $2,404.50.

Mr. Burrus made additional yield checks in the lower part of the field which gave an average increase for subsoiled land of 110 lbs. per strip over the plowed area. The area of each strip was 1.2 acres. However, the total yields in the lower strip were 670.1 lbs. per acre for subsoiled ground as against 565.4 lbs. per acre for the plowed area giving a difference of 104.7 lbs. per acre. This total increase can be accredited presumably to soil texture which accounted for a considerable increase in moisture holding capacity.

The discrepancy between the two differences in yields for the upper and lower portions of the field might also be attributed to the fact that barnyard manure was added to the upper check strip.

THE A. C. CRISP FARM

In October 1943, Mr. Crisp plowed the north half of a 60 acre field to be used in checking subsoiling results.

In May 1944 he subsoiled the south half of this field using the same equipment as was used on the Burrus and Stalhut farms. The plowing and subsoiling were done in an east-west direction and in June crops were planted in rows north and south.

The fall plowed land was compared with the spring subsoiled area in October 1944 at the time of harvest. A strip 640 ft. by 40 ft. was arbitrarily selected through the subsoiled section planted to beans from north to south. This strip amounted to .58 acres and gave a yield of 422 lbs. or a yield per acre of 752 lbs.

The check strip or fall plowed strip measuring the same as the subsoiled strip gave a yield of 381 lbs. or a yield per acre of 648 lbs.

The increase in yield due to subsoiling amounted to 104 lbs. per acre.

OUTLOOK

Managing the soil is still the most important problem of the farmer, orchardist and perhaps the rangeman, too. The chief danger lies in sheet, gully and wind erosion, and in the spread of noxious perennial weeds. Farm practices in some areas put nothing back into the soil, and consequently the soil is deficient in humus.

Pinto beans constitute the most important cash crop. Success depends on equipment and management. We have brought in a new early Idaho strain of pintos. Last year they yielded less, and this year more than our native strain. We have urged growers to treat their seed to prevent a loss from dry rot.

The potato is the next important cash crop. It requires more knowledge and better management for success than do other dry farm crops. None of the varieties are now grown which were grown commercially in 1924, as reported in A. F. Kinnison's bulletin. We are going over to newer and more productive varieties. Variety yield test plots continue to point out the best adapted variety. Ring rot is the most serious menace to successful potato growing. Growers spread this and other diseases with the cutting knives, planters, and with other equipment, and in storage. For the most part farmers are prepared to control psyllids but like to depend on us to check psyllid population and advise regarding materials, how and when to apply them.

Small grain farmers are becoming more conscious of the importance of growing proven adapted varieties. Our variety test plots have helped in this. We still have too much loss from smut.

Orchardists have to be ever on the alert to prevent injury to their crops from coddling moths, thrips, subterranean woolly aphids, and powdery mildew. They especially are appreciative of help from the Extension Service. They are being helped in the control of these. Our control of the woolly aphids and the spray recommended to prevent apple drop, saves thousands of dollars annually.

There is an overlapping in the activities of agricultural agencies which is confusing and wasteful in expenditure of time and money.

RECOMMENDATIONS

The orchardist can be assisted in the control of powdery mildew, thrip, coddling moths, subterranean form of Woolly aphis and twig borer; he can be helped in planning his orchard spray program, including the spray to prevent apple drop. As this year orchardists can be aided materially in orchard commercial fertilizer problems.

Potato variety yield test plots and fertilizer experiments should be continued, that we may give out definite information rather than opinions. A potato disease control program, including all growers, should be planned and carried through. The value of a legume green manure crop in a potato rotation should be demonstrated. Growers should be advised in advance regarding psyllid control--equipment, materials, how applied and when. Field demonstration meetings should be part of the entire potato program.

Small grain variety test plots should be continued. Proven varieties should be increased, and smut control information should be mailed to all farmers previous to planting.

Insect and disease control information should be available to truck growers and gardeners. Timely outlook and warble control information should be given to dairymen and stockmen.

An experiment station of two five-acre blocks in each of the two principal dry farming types in Coconino County could be a continuous source of new knowledge useful to and appreciated by successful farmers.

Soil research, as related to crop production in our dry farming area, should be carried on as a basis of sound information to be given out to farmers. Soil sheet and gully erosion controls should be extended. Noxious perennial weed control is an important part of the soil program.