

A N N U A L
N A R R A T I V E R E P O R T
Y U M A C O U N T Y

December 1, 1944

November 30, 1945

AGRICULTURAL EXTENSION SERVICE

Robert J. Moody,

County Agricultural Agent.

TABLE OF CONTENTS

	Page
Summary of Agricultural Extension Work	1a
General Agricultural Situation in Yuma County	1
Prospects for 1946	2
Yuma County Extension Organization	3
Yuma County Farm Bureau	3
Organization of Extension Projects	3
Office Reorganization	4
Newspaper Publicity	4
Farm and Home News Letters	4
Radio Programs	5
Farm Meetings	5
Farm Census	5
Assistant County Agricultural Agent	5
Emergency Farm Labor Program	6
German Prisoners of War	6
Yuma Camp	6
Roll-Wellton	7
Parker	8
Mexican National Program	8
4-H Club Work	9
4-H Program	9
4-H Newsletters	10
4-H Requirements	10
4-H Events, Awards and Contests	13
Annual 4-H Club Contests	13
Junior Leaders	13
James M. Dudley, Outstanding 4-H Leader	14
4-H Club Camp	15
War Bond Sales	16
Junior Fair	17
4-H Club Program	17
1945 Fall Organization	17
Returning Service Men	19
Noxious Weed Control	20
Selective Weed Control	20
General Purpose Weed Killers	21
Other Tests with General Purpose Weed Killers	21
Insects and Disease	23
Grasshopper Control Program	23
Lygus Control	24
Lygus Control by Sabadilla and DDT	25
Worms in Alfalfa and Lettuce	31
Crickets in Mung Beans	32
Corn Ear Worm Control	33
Recommendations on the Use of DDT	33
Disease of Potatoes	33
Rosette Disease in Lettuce	34

TABLE OF CONTENTS

	Page
Alfalfa Seed and Hay	35
General Situation	35
Increase in Certified Acreage of Alfalfa	35
Chilean 21-5-3	36
India	36
African	37
Ranger	37
Change in Planting Regulations	37
Certification of Small Grains	38
Permanent Pasture	39
Range Grasses for Seed	39
Salt Resistant Grasses and Legumes	39
Bermuda Grass	40
Citrus	41
Flax Management	42
Soils and Irrigation	43
Soil Problems	43
Hanford Ranch Leaching Test	43
J. S. McCraw--Wellton	43
Pete Stathis--North Gila Valley	44
Yuma Mesa	44
N. A. Cypert, Fertilization of Sudan Grass	44
Ditch Sealing	45
Pecans	46
Dates	47
Irish Potatoes	48
Cotton	51
Poultry Management	52
New Vegetable Varieties	53
Rural Sociology	54
Deciduous Fruit Trees	55
Development of New Farm Lands	56
Dairy	57
Bang's Testing Program	57
Dairy Herd Improvement	57
New Field Crops	58
Mung Beans	58
#4188 Wheat	58

SUMMARY

The past year has been profitable for most Yuma County farmers, on some 80,000 acres of irrigated land. These crops which were most profitable during the year, Flax, Alfalfa, and Winter and Spring Vegetables increased in acreage in the Fall of 1945. More cattle and sheep are on feed this Fall than during the past year, but the number of cattle on feed is still below that of prewar days.

Word has been received that the Bureau of Reclamation, Gila Project has been approved for the construction of canals to irrigate 150,000 acres of land on the Yuma Mesa and in the Gila River Bottom in the Wellton-Mohawk area.

The County Agent reorganized both the office and agricultural projects during the past year, building partitions into the office, and rearranging the projects so as to concentrate on some on which work is needed.

Fine cooperation was obtained through the local papers and the local radio station in furnishing the County Agent with publicity and an outlet for agricultural information whenever requested to do so.

In the Emergency Farm Labor Program a German prisoner of war camp was constructed on the Yuma Mesa at a cost of \$25,000. The 400 prisoners housed in this camp have been used by vegetable growers, irrigation organizations, and general crop farmers for all types of farm work. The Mexican National Program was continued and from 200 to 700 Mexicans were employed by vegetable growers in the Yuma area. Farmers in the Roll-Wellton area used from 100 to 175 German prisoners for the harvest of two crops of alfalfa and Bermuda Grass seed, and Parker farmers are using 175 Germans for cotton picking. The number of transient laborers has increased a great deal, but the quality of this labor is generally low, and the wages they demand are usually too high for farm work.

Ten 4-H clubs were active in the County in agricultural projects. The Agent met monthly with each club, required that records be kept up to date, gave instruction in agricultural projects, and held Achievement Days to give credit to completing club members. One of Yuma County's Club Leaders, James M. Dudley received the Outstanding Leader Award for 1945, and a Yuma County Club member, James Dewhurst received one of the top State poultry

SUMMARY (cont'd)

awards for 1945. Yuma County Club members were active in two War Loan drives, the Cadson Club in particular making a good showing by selling more than \$35,000 worth of War Bonds in the two drives.

The County Agent corresponded with returning service men who requested information on Yuma County farming, advising them of the possibilities, problems, and probable costs. Where service men called on the Agent personally their problems were worked out individually and in most cases they were advised to work for some local farmer until they had acquired sufficient knowledge of irrigation in this area.

Tests and result demonstrations were made with selective weed killers which resulted in the spraying of 5000 acres of flax and alfalfa for control of annual weeds. This was the first time that weed killers of this type had been used successfully in this area. Successful tests were conducted with the new weed killer 2,4-d to determine the effectiveness on such noxious weeds as horse nettle, and wild morning glory.

The use of poisoned bran bait in the grasshopper control was continued in 1945, and 10,000 acres of alfalfa were baited in the Roll-Wellton area and the South Gila Valley. Good results were obtained on mexicanus and differentialis species of grasshoppers but no control was obtained on the large green bird grasshopper. Arsenicals were used on the bird grasshopper with fair results.

Tests were made in the Spring with a new insecticide Sabadilla, for the control of lygus in alfalfa, with good results. Result demonstrations were conducted on a commercial scale and approximately 10,000 acres of alfalfa was dusted for lygus control. Yields were increased from 100 to 200 pounds per acre as a result of using Sabadilla. This insecticide is the first material found which is economically practical to use for the control of lygus in alfalfa in this area.

Serious damage was experienced by alfalfa and lettuce growers from various types of green worms. Tests were made with several insecticides of which DDT and Sabadilla showed promise of controlling the worms. More tests will be conducted on this program.

Robert J. Moody, Yuma County, Arizona, 1945.

SUMMARY (cont'd)

The new varieties of alfalfa, India, Africa, Ranger, and Chilean 21-5-3 produced good crops of seed in the first crop, higher than yields obtained from older varieties of Chilean and Hairy Peruvian. The increase of alfalfa acreage in the County was largely in the new varieties listed above.

Some tests were started in developing a permanent pasture mixture containing salt resistant grasses and legumes which can be used in the Roll-Wellton area, and in other areas of the County where a cash crop is needed while soil is being reclaimed from alkali.

Bermuda grass growers were aided in the formation of a Holding Pool, through which they could market Bermuda Grass in an orderly manner, and prevent the fluctuation of the price of this commodity.

Recommendations were made to citrus growers for the use of nicotine sulphate to control the citrus thrip when it was found that the thrip had developed an immunity to the tartar emetic spray formerly used.

As a result of finding Fusarium of flax scattered throughout the County it was recommended that further spread of this disease be controlled by seed treatment before planting.

Soil leaching tests were conducted in the Roll-Wellton area, and recommendations for reclamation by leaching and by the addition of sulphur and gypsum, and a combination of both materials were made in the Roll-Wellton area and in the North Gila and South Gila Valleys.

Ditch sealing and water loss tests on the Yuma Mesa were started in which Bentonite, fuel oil, and Bitumuls are being used.

Attempts were made to work out recommended cultural practices for such specialty crops as pecans and dates.

Regular observations were made of the growth of potatoes on the Yuma Mesa from the standpoint of cultural practices, disease control, and fertilization in hopes of obtaining information which would be of future value in growing the same crop. Few recommendations were made because of the lack of knowledge of methods of handling the land on the Yuma Mesa, but following the harvest of potatoes some recommendations were worked out by the Extension Service Specialist, the County Agent and farmers who had grown potatoes on the Mesa in 1944-45.

SUMMARY (cont'd)

Cotton growers in the northern part of the county were helped with cultural practices, pure seed, and control of insects.

A new hatchery was started by a returned service man. The County Agent cooperated in helping to locate the hatchery, a source of hatching eggs and acquaint the hatcheryman with local poultrymen. Demonstrations were held in Somerton on the vaccination of chickens against fowl pox, and in Yuma on caponizing.

Arrangements were made to try out a new lettuce variety Imperial #410 developed by the University of Arizona.

Deciduous fruit tree tests were continued with three local cooperators with some success wherever good soil conditions existed and partial shade was available.

Alfalfa land on the Gila Project was leased to private individuals with little success, and private operators obtained good results in producing summer cover crops on the Yuma mesa where pre-inoculation of seed and phosphate fertilization recommendations were followed.

Most commercial dairy herds came under the Bang's Disease testing program and only a small number of reactors were found. Plans were made to start cow testing in three commercial dairies.

Mung beans were grown for the first time, and production of seed per acre was low due to difficulty in harvesting without shattering. The crop shows promise of being an excellent summer cover crop.

Wheat is being grown for the Montana Seed Growers' Association by two farmers, to increase Montana's #4188 variety, which is resistant to the Saw Fly, so that the increase can be planted in Montana in May of 1946.

GENERAL AGRICULTURAL SITUATION IN YUMA COUNTY

The year 1945 has been profitable for most Yuma County farmers. Prices have continued on all the farm products produced in the county, except for short periods when there were temporary surpluses of such products as alfalfa hay, bermuda grass seed, and fall lettuce. Crop yields were not high in most crops as weather conditions were unfavorable from early spring throughout the year. High winds and late frost hurt early spring crops, a long cool spring helped to lower alfalfa and bermuda seed yields, and hot weather through September caused loss in early Fall vegetable plantings.

The farm labor situation continued to be difficult but toward the end of the year the trend of transient laborers toward the farm became apparent.

Because of the poor results obtained in last Spring's potato crop only a small acreage of potatoes have been planted this Fall on the Yuma Mesa. The acreage of flax will increase slightly over that of a year ago because of added price incentives. High prices of fall and early spring vegetables have resulted in increased acreages of fall vegetables, in some cases nearly double those of a year ago.

There has been an increase in the number of cattle on irrigated pasture, and in feed pens, and a great increase in the number of sheep on irrigated pasture.

The Bureau of Plant Industry has established an experiment station on the Yuma mesa, the purpose of which is to determine what crops can be produced economically on the Yuma Mesa, and also to deal with problems on other lands irrigated from the Colorado and Gila Rivers in Yuma County.

Toward the end of the year word was received that the Gila Project of the Bureau of Reclamation had received word to proceed with construction of laterals and other structures, and begin the levelling of land on the Yuma Mesa and along the Gila River in the Wellton-Mohawk area. A total of 150,000 acres will be put under irrigation on this project.

Following is a list of the principle crops grown in Yuma County in 1945, and the acreage of each.

Alfalfa	29,000 acres
Flax	15,600 acres
Permanent Pasture	2,000 acres
Bermuda Grass	1,200 acres.

GENERAL AGRICULTURAL SITUATION IN YUMA COUNTY (cont'd)

Grain Sorghums	1,700 acres
Barley	6,300 acres
Wheat	1,300 acres
Short Staple Cotton	1,300 acres
Rice	130 acres
Commercial Vegetables	18,000 acres
Potatoes	1,200 acres
Citrus	1,400 acres
Pecans	<u>1,000</u> acres
	80,130 acres

Prospects for 1946

It is expected that the vegetable acreage will increase further in 1946, both in the Spring and Fall. An increase acreage of alfalfa has been planted particularly in the extremely non-hardy varieties, and in the new hardy northern variety, Ranger. The 1946 crop of flax will have a greater acreage harvested than in 1945. There will be a general increase in the acres of farm land under cultivation with development of the Gila Project.

YUMA COUNTY EXTENSION ORGANIZATION

Yuma County Farm Bureau

The Yuma County Farm Bureau continues to be the official organization in Yuma County cooperating with the University in the conduct of Extension work. Partly as a result of the state reorganization of this organization there has been an increase in the county membership. This is particularly true in the Roll-Wellton area where there are now approximately 70 members. The county membership in the Farm Bureau exceeds 100 members.

Organization of Extension Projects:

Organization of Extension projects were changed early in the year. Some old projects were discontinued, or became inactive for the present time, and some new projects were added. A list of projects was made, on which some time should be spent in the coming year, and new numbers were given all projects, listing them in the order in which the Agent expected to devote time to them, during 1945. Because of the number of important projects it was not possible to spend a great deal of time on many of the projects listed below. Following is a list of Extension projects.

<u>Project Number</u>	<u>Project</u>
0	Organization
	Farm Labor
1	Boy's 4-H Club Work
2	Returning Service Men
3	Noxious Weeds
4	Insects and Disease
5	Alfalfa Seed and Hay
6	Permanent Pasture
7	Bermuda Grass
8	Citrus
9	Flax Management
10	Soils and Irrigation
11	Pecans
12	Dates
13	Irish Potatoes
14	Cotton
15	Poultry Management
16	New Vegetable Varieties
17	Rural Sociology
18	Deciduous Fruit Trees
19	Development of New Farm Lands

YUMA COUNTY EXTENSION ORGANIZATION (Cont'd)

Organization of Extension Projects (Cont'd)

Of the projects listed above the Agent concentrated the most effort during the year on Farm Labor, 4-H Club work, Control of Noxious Weeds, Insects and Disease, Alfalfa Seed and Hay, Soils and Irrigation and Irish Potatoes.

Office Reorganization:

The office of the County Agricultural Agent and Agricultural Adjustment Administration have been together since the beginning of the latter program. Personnel of both organizations have occupied the same room, and during the increased activity of both offices during the war years this arrangement has become rather crowded. The County Agricultural Agent and the Secretary of the Agricultural Adjustment Administration worked out a plan to partition the room into two private offices, one each for the Agent and the Secretary of the AAA, and one large office for the stenographers. With the approval of the Yuma County Board of Supervisors these partitions were installed in April. The cost of the partitions was borne by the Board of Supervisors.

During the latter part of the year the Agent had a large cupboard built which holds bulletin files, and other equipment, and makes more office space available.

Newspaper Publicity:

Local newspapers cooperated with the County Agent in printing agricultural information whenever the Agent furnished material for publicity purposes. The Yuma Daily Sun made a special effort to place information from the County Agent's Office in a prominent place, and in many cases used special dark type to attract attention to this agricultural information. The Somerton Star also cooperated in printing important agricultural news stories. The Star is a weekly and because of its size the Agent summarized stories so that the necessary information could be presented in the minimum amount of space.

Farm and Home News Letters:

The practice of distribution of a Farm and Home Newsletter was carried out during the year. These newsletters contained news of current interest in agriculture and homemaking, recommended practices, and other information of local value. In addition to the newsletters some information was distributed to all farmers in the form of circular letters under single subject matter heads.

YUMA COUNTY EXTENSION ORGANIZATION (Cont'd)

Radio Programs:

Both the County Agent and the Home Demonstration Agent took advantage of an opportunity to present agricultural and homemaking information over the local radio station during the year. A local agricultural implement dealer offered his advertising time to the Extension Service for the presentation of agricultural and homemaking information before and after the program. The program on which this information was presented was the H. V. Kaltenborn newscast, to which the large majority of people listen.

Farm Meetings:

One series of Farm Meetings was held in which the subject matter was of general nature. Part of the material presented at these meetings was a sound movie entitled "New Ways in Farming," and the second sound movie feature was Walt Disney's "South of the border". Before the showing of the agricultural film, the Agent gave a short talk telling of the new developments which would effect local farmers, and telling of the trend toward farming with machinery instead of hand labor. The attendance at these meetings was approximately 100% greater than the normal attendance at meetings of this type. Meetings were held at Yuma, Rood, Gadsden, and at the Mohawk Valley School.

Farm Census:

For three months during the early part of the year, the County Agent helped officials of the Bureau of the Census and their local enumerators in organizing the County for the enumeration of the 1945 Farm Census. Because of the diversified farming, the large area to cover, and the diversified ownerships of some of the large operators both enumerators and state officials had a difficult time in obtaining all the necessary information.

Assistant County Agricultural Agent:

In November of 1945, Albert R. Face was appointed Assistant County Agricultural Agent for Yuma County. The Assistant County Agent will concentrate his efforts on the 4-H Club program, and upon such other projects as it is possible to carry without interfering with his 4-H work.

EMERGENCY FARM LABOR PROGRAM

The Farm Labor program continued under the direction of B. N. Collins, County Farm Labor Assistant. The County Agent helped Mr. Collins work out problems of administration, and in planning the program. Mr. Collins has been a farmer in Yuma County for 35 years, and has been able to use his past experience in operating this program efficiently.

The program increased in complexity during the year as in addition to Mexican Nationals, a large prisoner of war camp was established in the Yuma area. The number of transient workers also increased following the closing of war plants in the Pacific Coast area, and the problem of placing these workers was very difficult as most of them were unwilling to accept farm wages.

With the exception of short periods when there were not enough laborers to meet all demands for farm workers the program operated smoothly and most farmers expressed satisfaction with the results obtained.

German Prisoners of War:

Yuma Camp:

Plans were laid last December for the construction of a German Prisoner of War camp in the Yuma area. Through the cooperation of Colonel William A. Holden, of the Papago Park Prisoner of War Camp, the old CCC camp located north of the Yuma Army Air Field was obtained as a site for the prisoner of war camp and a stockade, towers and other necessary improvements were installed. The cost of this first camp was small, and it was for this reason that vegetable growers in the Yuma area agreed to use the prisoners, being under the belief at that time that their total obligation would not be great.

Plans for establishing the camp were changed suddenly in January when objections were raised by the Commanding Officer of the the Yuma Army Air Base to having a camp of this type located so close to a military installation. At the conclusion of conferences with Colonel Herbert W. Anderson, the Yuma Army Air Base Commanding Officer a satisfactory site was selected and arrangements were made with the Army Engineers to move the buildings in the camp to the new location. The camp was completed in March and was occupied immediately. Vegetable growers suffered the loss of some lettuce and carrots during the January and February while the change was being made. Camp construction continued throughout the Spring until two compounds which hold approximately 800 men were completed. The cost of this camp was higher than had been estimated by the Army Engineers, totalling over \$25,000.

During the Spring months German Prisoners were used in the Yuma area to harvest late winter vegetables, to do certain cultural practices in Spring melons, and to harvest melons. They were also used throughout the year by the Bureau of Reclamation, Gila Project to install concrete turn-outsouts in farm ditches, and by the Bureau of Reclamation in the Yuma Valley to clean ditches. General crop farmers used the prisoners in ditch cleaning, fence building and general farm work during the Spring, and in the harvest of alfalfa seed during the Summer. The rate of pay was set on a piece work rate wherever possible, and by hourly wage when it was impossible to set up piece work rates. The Farm Labor Assistant, and farmers using the prisoners worked out the piece work rates which were in turn approved and used by the Army.

The Yuma Producers' Cooperative Association constructed the prisoner of war camp in the Yuma area, and charged each of its members a deposit to cover the cost of the camp. Members of the Association and others who used the prisoners were then charged 2¢ per man hour to defray the cost of the camp. Those who had made deposits applied this charge against their deposits.

During the first half of the year farmers in the Yuma area used the prisoners under individual contracts. A change was made in the form of the contract during the summer which made it most practical for the prisoners to be used under one contract. The Yuma Producers' Cooperative Association took the contract and all operators using prisoners from the Yuma Camp joined this Association.

During the Fall the German prisoners have been used for lettuce thinning, weeding of lettuce and carrots, picking dates, picking pecans, general farm work, and in the harvest of lettuce and carrots.

At the end of November approximately 400 prisoners were available for farm work. This number has fluctuated with need for the prisoners. There has been only one time since the start of this program that enough prisoners could not be obtained. This was during the early Fall, when German prisoners were being used in the northern States. Local vegetable growers suffered during September and October, because of this labor shortage, and all other users of prisoners were cut to a minimum.

Roll-Wellton:

German war prisoners were used for the harvest of alfalfa and bermuda grass seed, and for some general farm work in the Roll-Wellton area during July and August, and during November. Farmers were well satisfied with their work during both seed crops. A total of 160 prisoners were used during the summer crop, and 100 were used in November.

EMERGENCY FARM LABOR PROGRAM (cont'd)

Parker:

German prisoners are now engaged in harvesting 1000 acres of cotton in northern Yuma County. Approximately 175 prisoners are working in that area, 150 being used by local farmers for cotton picking and 25 by the Colorado River Indian Agency in ditch cleaning work. Prisoners are averaging more than 100 pounds of cotton per man at the present time.

Mexican National Program:

The popularity of the Mexican National program fluctuated among Yuma farmers throughout the year. Early in 1945 the Mexicans did not work out satisfactorily, struck for high wages and better working conditions. They also continually expressed dissatisfaction with their food and housing conditions at the War Food Administration Migratory Camp at Somerton. The Agent inspected the facilities on several occasions and found them to be very satisfactory. Most of the Mexicans who worked in this area in the Spring either returned to Mexico or went to the northern States. During the late Spring and summer there were slightly over 200 Mexican Nationals employed. Since the need for Mexicans has slackened in the northern States, more have been brought into this area and at the present time about 700 Mexicans are working in vegetables in the Yuma area.

The increase of Mexican laborers this Fall has largely been due to the fact that local growers know that the German prisoner program will be discontinued early in 1946, and that they will not have that source of labor to depend on for their Spring crops.

Mexican Nationals who have been brought in from northern States are so far working out very satisfactorily in Fall and Winter vegetable work.

4-H CLUB WORK

The 4-H Club program was carried on in ten communities in Yuma County during the past year. All the clubs met in rural schools, and in most cases school time was allotted to the club program. This arrangement worked out fairly well during the year, except for the fact that in most schools the Agent could not complete the necessary contacts with club members in the period allotted to 4-H club work, during monthly visits to the clubs. It was also noted when enrollments were made for the 1945-46 club year that there was a big loss of older club members who attended high school and were unable to attend 4-H meetings held in rural elementary schools. Many of the boys and girls would continue their club work if meeting times could be arranged for them. It will always be necessary to hold club meetings during school hours in some communities if the program is to operate in communities where club members live great distances apart.

Agricultural Clubs were located in Gadsden, Somerton, Rood, Crane, Wellton, Roll, Quartzsite, Salome, Wenden, and Parker in 1945, and enrollments have been made for the same clubs for the 1945-46 club year. In addition to the clubs named, Bouse is taking an active part in club work this year.

The 4-H Program:

During the past year the County Agent has so far as possible visited all agricultural clubs in the County once a month, with the exception of the northern clubs which were visited once every two months. At the time of these club visits the Agent discussed individual problems with club members, relating to their projects, their record books, and general club information. A conference was always held with the leader before meeting with the club members to acquaint the Agent with problems which the Leader had been faced with since last contacting the County Agent. This plan worked out very well and helped to maintain interest in both club members and leaders in the 4-H program.

Subject matter was presented to club members on each visit which would be of practical value to them in future agricultural work in this area. Among the subjects covered during the year were the following:

Instructions in the Selection of Proper Types of Beef, Swine, and Sheep. Breeds of Chicksn Adapted to this Area. Instruction in the Keeping of Records and Method of Completion. Care of Livestock Projects During the the Summer Months. Instruction in the Care of Fall, Winter, and Spring Vegetable Gardens.

4-H CLUB WORK (cont'd)

The 4-H Program (cont'd)

Tours were taken in three clubs where the County Agent accompanied club members on a visit to their projects, and to agricultural operations in the communities. These tours were taken by the Rood, Somerton, and Parker clubs.

In addition to personal visits to 4-H clubs and club members the Agent carried on regular correspondence with Leaders on club members' problems, and furnished club members with informational material and record books throughout the year as well as at the time that enrollments were first made.

4-H Newsletters:

A 4-H Club newsletter was distributed regularly throughout the 1945 club year. This newsletter contained information from the County Agent and the Home Demonstration Agent, and information of club activities in each club. Each club had a club Reporter who wrote up the activities of the members. These reports were summarized, illustrated in some cases through the use of cartoons, and were included in the Newsletter.

4-H Club Requirements:

At the beginning of the 1945-46 club year the County Agent set up definite requirements which constituted a completed 4-H project. Each club member was required to carry an agricultural project which would be of economic value to him, and from which he would learn agricultural information which would help him in the future. This provided wide latitude in the type of club projects carried and allowed club members to have projects of their own choosing. The size of the project varied with the experience of the club members and the facilities available. In addition to carrying an agricultural project all club members were required to keep an up to date record of their project activities, expenses, and returns. These records were turned in to the County Agents' Office in May. Only club members who carried approved projects and completed records on their projects were given credit for completion.

A permanent record file was set up at the completion of club projects in May. An envelope containing the completed record book was placed in the file for each completing club member, with information on the outside of the envelope showing the name of the club member, the project records contained, and the year of club work the member completed. Additional records will be added at the end of each year, and these records will provide a permanent file of club members records.

4-H CLUB WORK (cont'd)

4-H Club Requirements (cont'd)

The following table shows the number of club members who received credit for agricultural 4-H club work in 1945, according to projects and club members completing by clubs. Each of these club members was presented with a 4-H pin, and with a certificate showing just what projects each member had completed.

4-H CLUB WORK (cont'd)

4-H Club Requirement (cont'd)

CLUB	NUMBER OF 4-H COMPLETIONS IN 1944-45 BY CLUBS, AND PROJECTS										NUMBER COMPLETIONS
	POULTRY	SWINE	BEEF CALF	DAIRY CALF	RABBITS	CITRUS	GARDEN	HANDI CRAFT	SHEEP BOATS		
Wellton	2	2	3								7
Quartzsite						1					1
Somerton	2	2	2	5	2						11
Rood	3	8	3	1	2	1					18
Gadsden	13		2		1	3	1				20
Crane	6	2	4	5	1			2			20
Salome						1					1
Parker	1		2			1					4
Roll		1	2								3
Total Completions											85

4-H CLUB WORK (cont'd)

4-H Events, Awards and Contests:

Achievement Days:

Local Achievement Days were held in all active clubs in the County, ten in all. In some cases club members brought exhibits from their projects and the projects were judged and ribbons were awarded. Achievement Days held at the Rood 4-H Club and at the Gadsden 4-H Club were particularly outstanding, and approached the size of a small fair. The Parker club did not present an exhibit but arranged a nice program for the whole school which was carried on by club members. In other clubs the County Agent and the Home Demonstration Agent congratulated club members on their work of the past year, and presented completing members with pins and certificate of achievement.

Annual 4-H Club Contests:

During the past summer all club members who had completed their projects in 1945, and whose project and club work had been outstanding, were notified that they had an opportunity to try out for any one of a number of 4-H club contests. Club members who entered these contests were judged during the Fall, and winners were selected to win County and State awards.

James Dewhurst of the Rood 4-H Club, who had been in club work for five years received one of the three top State awards for work with poultry. This award was a \$25.00 Victory Bond. Other members who won County awards were as follows:

Victory Gardening	Kent Drysdale, Rood Fred Gloria, Gadsden Audine Tate, Crane Neal White, Parker
Poultry	George Gallaher, Somerton Roy Nelson, Gadsden Charles Devine, Crane
Dairy Production	Raymond Ali, Crane Hannes Johannsen, Rood
Meat Animal	Bernice Cornell, Parker

Junior Leaders:

Older 4-H boys who had completed three years of club work, were fourteen years of age, and who were in the

4-H CLUB WORK (cont'd)

Junior Leaders (Cont'd)

opinion of the club leaders outstanding and capable of helping younger club members with problems of keeping records, and minor project problems were nominated at the beginning of the club year to act as Junior Leaders. Twelve of these boys were nominated and at the close of the year nine of them were presented the Junior Leadership Award. This award was a felt Junior Leadership badge, accompanied by a letter of congratulations from the Director of the Agricultural Extension Service, and the State 4-H Club Leader. Following is a list of the boys who received this award in 1945.

Kent Drysdale, Rood
James Dewhurst, Rood
George Nunnally, Rood
Charles Devine, Crane
Kenneth Clark, Crane
Roy Nelson, Gadsden
Pete Segulja, Gadsden
Alvin Kizer, Gadsden
Jack Smith, Somerton

James M. Dudley, Outstanding 4-H Leader

A Yuma County 4-H Club Leader, James M. Dudley, has been selected as one of five outstanding 4-H Club Leaders in Arizona, in 1945. Mr. Dudley who was 4-H Leader of the Rood 4-H Club last year will receive as his award a 4-H Club Leadership pin mounted in pearls. This award is presented by the Arizona Bankers Association.

Mr. Dudley has been outstanding in leadership work for many years. Both he and Mrs. Dudley have been leading clubs in Arizona and California for the past twenty years. Mrs. Dudley is now in her 20th year as a 4-H Club Leader and Mr. Dudley has been a 4-H Club Leader for 21 years. The Arizona Bankers Association award was presented to Mrs. Dudley in 1943 for her outstanding work as a 4-H leader.

Mr. Dudley started his 4-H club leadership work in Missouri back in 1921 where he led the boys' Livestock and Corn Club in the rural school of Winnegan, Missouri. In 1925 Mr. Dudley went to Parker Valley School in this State and was a leader there for fourteen years. His groups specialized in the raising of vegetable gardens, beef and dairy calves and flowers. The last year Mr. Dudley was at Parker, one of his boys, Mike Martinez, won the State Meat Animal award and the trip to the 4-H Club Congress in Chicago.

Robert J. Moody, Yuma County, Arizona, 1945.

4-H CLUB WORK (cont'd)

James M. Dudley, Outstanding 4-H Leader (cont'd)

In 1940 the Dudleys left Arizona and Mr. Dudley took charge of 4-H agricultural work at Bard, California, where he was principal, winning among other awards the Imperial County Silver Cup with a Demonstration Team on the subject "We Want Better Milk". During the four years he was at Bard his club won high awards.

Both Mr. and Mrs. Dudley returned to Arizona in 1944 and took care of a large part of the 4-H Club work at Rood School in Yuma Valley. At the present time they are at Roll, where 4-H Club work will be an important part of their program. The type of 4-H work conducted by James M. Dudley is of the greatest benefit to club members under his leadership and to the County Agricultural Agents as well. Because of his many years of experience and his outstanding ability in organizing and completing 4-H work which he supervises Mr. Dudley requires very little guidance and has much to offer both the community in which he is working and the Extension Agents who work with him. Mr. Dudley believes in developing responsibility among club members and the ability to report on their projects as each club member makes regular oral reports on their project's progress in their club meetings. Regular checks are made of record books to see that they are being kept up to date and completed in time to receive credit. Wherever possible Mr. Dudley makes regular tours with his club members so that he and the club members have an opportunity to constructively criticize the various projects.

The 4-H Club program is very fortunate to have two such unselfish workers in Mr. and Mrs. James M. Dudley, who help 4-H boys and girls to appreciate the importance of this program and to give them the opportunity of learning by doing for themselves. Mr. Dudley once stated that he believes any rural leader or teacher who is not in 4-H Club Work is missing a great opportunity to help boys and girls realize their natural "urges". They are absorbing a type of knowledge which they can not learn in books. He also feels that girls and boys given responsibilities and duties such as are required in 4-H Club work rarely cause juvenile delinquency problems.

4-H Club Camp:

A state 4-H Club Camp was held in August, and was attended by 17 club members from Yuma County, and the Home Demonstration Agent. Plans to hold this camp were not announced until late in the Spring and many club members had already made other camp and vacation plans. It is the belief of the County Agent.

4-H CLUB WORK (cont'd)

4-H Club Camp (cont'd)

from this contact with club members in Yuma County that between 50 and 75 4-H club members would attend a club camp from this County if the camp was held during the latter part of July or August when temperatures are so high in this area.

War Bond Sales:

4-H Club members took an active part in the sale of War Bonds in both the 6th and 7th War Loan Drives. During the 6th War Loan 4-H members all over Arizona were very active in the sale of bonds. Yuma County Club members placed second in the State in total sales, selling a total of \$65,379.00 of bonds.

Records were kept of the individual sales by clubs and club members and a larger "thermometer" was placed in the office of the County Agent, showing the total sales of bonds by club members from day to day. There was considerable competition among club members and between clubs. War Bond prizes were offered to high salesmen by Arizona banks, and in Yuma County outstanding clubs were presented 4-H club banners and flags.

Following are the final standings by clubs and by individual sales by club members in the 6th War Loan Drive:

Gadsden	\$18,104.00
Crane	14,650.00
Wellton	12,225.00
Salome	7,550.00
Mohawk Valley	6,375.00
Rood	4,225.00
Somerton	1,950.00
Wenden	300.00

The six highest bond salesmen among Yuma County Club Members in the 6th War Loan Drive were:

Jimmie Lou Liles, Wellton	10,608.00
Carrlene Hopper, Gadsden	8,550.00
Jeanette Simpson, Salome	5,275.00
Mona Berry, Mohawk Valley	5,250.00
Dixie Hamilton, Crane	4,125.00
Raymond Lovett, Crane	3,050.00

The Seventh War Loan Drive was held close to the end of school in the Spring, and some of the 4-H clubs decided not

4-H CLUB WORK (cont'd)

War Bond Sales (cont'd)

to participate actively due to school closing and club members being out of contact with each other and their leaders. Among the clubs which participated in this drive, the Gadsden Club alone made an outstanding showing. Gadsden lead the County, as was the case in the 6th War Loan Drive. The Gadsden Club sold a total of \$17,503 in War Bonds, out of a County total of \$21,944.

Club members who made the greatest amount of sales in the Seventh War Loan Drive were the following:

Betty Jo Frauenfelder, Gadsden	\$6800
Mary Lott, Gadsden	6800
Roy Nelson, Gadsden	1900
Colleen Masters, Gadsden	1500
Billie Jo McAna, Parker	1100
Gladys Webb, Salome	956
Maurice Walker, Rood	900
Mary Ruth Hargus, Parker	758

Junior Fair:

The County Agent contacted the Agricultural Committee of the Yuma County Chamber of Commerce early in 1945 with regard to sponsoring a Junior Fair. The Agricultural Committee agreed to the idea, and during the early Fall had the County Agent present the plan to the Board of Directors of the Chamber of Commerce. This group recognized the importance of 4-H work, and agreed to sponsor the Fair which is to be held in March at one of the larger rural schools in the Yuma Valley.

4-H Club Radio Program:

The Home Demonstration Agent and the County Agent prepared a 30 minute radio program, featuring 4-H club work, in which Yuma County's State and National winners, several outstanding club members, and the Choral Group from the Crane 4-H club took part. First announcement of the junior Fair was also made on this program.

1945 Fall Organization:

During September the County Agent contacted all 4-H Club Leaders to start 4-H club work with the first of school, so that club members will have the best possible opportunity to complete their club program before the close of school in the Spring. All club leaders and members were visited in October, and enrollments of club members were made.

Robert J. Moody, Yuma County, Arizona, 1945.

4-H CLUB WORK (cont'd)

1945 Fall Organization (cont'd)

The County Agent held one instruction meeting in several clubs in the County in which club members were instructed in the care of baby chicks, their brooding, and the construction of a practical electric brooder.

Arrangements were made with the only large local hatchery to provide high quality baby chicks to 4-H club members at wholesale prices in order for club members to improve on the quality of their poultry projects.

The County Agent also attended meetings in most of the clubs in the County with the Assistant County Agent, Albert R. Face, to acquaint the Assistant Agent with the area, and with the leaders and club members with which he will be working.

RETURNING SERVICE MEN

During the past year the County Agent has answered inquiries from service men located in all parts of the World, regarding farming in the Yuma area, and particularly with regard to the Gila project on the Yuma Mesa and in the Wellton-Mohawk area. A number of service men have called personally in the County Agent's Office for agricultural information. The County Agent attempted to work out each individual case to find out how much the prospective farmer knew about irrigated farming in this area before making recommendations. Where the service man in question was not experienced the Agent recommended that he works for someone else for at least a year, to determine how he liked farm work, and how well he could adapt himself to this climate. In cases where the service men wished to settle on the Yuma Mesa and buy private land the County Agent worked out as nearly as possible what the costs per acre would be for the land, land levelling, and the construction charge on the canals. At present prices these costs are so high that no further recommendation was necessary. Wherever service men wishes to apply for farm land under the Gila Project they were given general agricultural information about the area and referred to the Bureau of Reclamation to make an application.

Considerable time was spent with one discharged Marine veteran, M. K. Gruffs, who during the year started a large hatchery in the Yuma Valley. The Agent helped Mr. Grubbs with general information on poultry, in becoming acquainted with local poultrymen, and in selecting a site for the location of his hatchery. The hatchery produces about 60,000 baby chicks a month.

NOXIOUS WEED CONTROL

Selective Weed Control:

Field tests for the selective control of annual weeds were conducted on the John Bretz farm in the South Gila Valley during December and January.

There has been considerable alarm in flax growing area of Yuma County regarding the seriousness of the infestation of certain annual weeds such as knot-weed, wild oats, mustard, and wild lettuce. As one way of cutting down on the weed population the County Agent contacted several chemical companies who in the past have manufactured chemicals for weed control and was able to obtain two materials to be used as selective weed killers, and another material which will destroy weed seeds and small plants when applied to the soil before planting time.

The last mentioned material is Calcium Cyanamid and is a nitrogen fertilizer which has a caustic action when first applied which causes the destruction of seeds and small plants. This material was tried in several parts of the County in varying amounts, but the best results seem to have been obtained when 500 pounds per acre were applied about a month before planting time, and disced and irrigated into the ground. While this material killed a large percent of the Polygonum the control was not sufficient to prevent weed damage in the flax. The County Agent noted that in addition to the killing action on young weeds and weed seeds that the Cyanamid showed very good results as a fertilizer both on flax and on barley.

The two selective weed killers tested on the Bretz farm in the South Gila Valley during January were Sinox and Dow Selective Weed Killer. The materials were used in varying strengths to determine just what concentration would be most effective in this area. After making several applications a concentration of $\frac{1}{4}\%$ solution applied at the rate of 125 gallons of water as an activator was found to be most effective. A weaker solution of both materials produced some kill on the weeds but results were not complete enough. A stronger solution of Sinox damaged the flax and the $\frac{1}{4}\%$ solution of the Dow chemical caused some damage to the flax.

At the conclusion of the test work the County Agent held a result demonstration on the Bretz farm using Sinox and recommended the practice of selective weed control in flax through the use of newspapers and radio, and in circular letters..

Since the first tests and result demonstration in January approximately 5000 acres of flax were sprayed for selective weed control with Sinox, and in addition this material has been used to control weeds in alfalfa, and bermuda grass fields. No selective weed control has been practiced successfully in Yuma County prior to these tests.

NOXIOUS WEED CONTROL (cont'd)

Selective Weed Control (cont'd)

Not all the results were good where the selective weed killers were used. In some cases the operators of the spray machines applied too much to the acre, in other cases they overlapped and sprayed an area twice in the same day. In both cases there was severe damage to flax. In some cases the flax has grown so large that there was more mechanical damage from the wheels of the tractor and spray rig, and bigger flax seemed to get more of a set back than was the case when the flax was sprayed when it was about six inches high. The best control of weeds was obtained when the weeds were about three inches high, and growing rapidly.

General Purpose Weed Killers:

Early in 1945 the County Agent first heard of a new general purpose weed killer, 2,4-D, which kills broad leafed weeds by translocation of the herbicide through the leaves to the roots of the plant. Letters were written to all major herbicide companies and material was obtained from eight of these companies for test work.

The County Agent and the Extension Agronomist ran tests on horse nettle plots in the Yuma Valley, and the Agent used the material on horse nettle in the Mohawk Valley, and Wild Morning Glory in several parts of the County. So far as the Agent is able to tell all the materials used were effective in the control of the two weeds on which tests were made.

The material did not become available commercially until the hottest part of the summer, when both wild morning glory, and horse nettle bloomed and went to seed. All manufacturers of the product recommended its use before bloom stage, and when the plant was growing more actively. Since the first materials have been issued the price of this material has dropped considerably, and the Agent plans to recommend the use of this material in the early Spring when active growth starts again.

Other Tests with General Purpose Weed Killers:

A year ago the County Agent and the Extension Agronomist laid out a series of test plots using all available general purpose herbicides for the control of horse nettle, wild morning glory, and Johnson Grass. In all the tests the Johnson Grass, and Wild Morning Glory recovered completely and in most cases the Horse Nettle also recovered. In one plot on the L.M. McLaren farm on 8th St. the Horse Nettle never recovered in the plots

NOXIOUS WEED CONTROL (cont'd)

Other Tests with General Purpose Weed Killers (cont'd)

treated with one and one half pounds of Atlacide to one square rod. The tests were made in the Fall of 1944, and in November 1945 the soil was still sterile not only to horse nettle but to other crops as well.

The County Agent spent considerable time with Paul Pertuit at Roll, testing herbicides on the horse nettle in Pertuit's alfalfa field. With the exception of the 2,4-D which was tried for the first time in 1945 all other herbicides were not successful in controlling the horsenettle. During the past summer and early fall Mr. Pertuit hit upon the idea of digging up the horse-nettle as deeply as possible and pouring fuel oil on the broken root tip. Mr. Pertuit thought for a time that this method of treatment would provide a permanent control, but during the late Fall all the horse nettle recovered.

INSECTS AND DISEASE

Grasshopper Control Program

During the past year grasshopper infestations in both the Roll-Wellton areas, and in the South Gila Valley continued to be serious. As a result of early egg surveys farmers in both areas were prepared for heavy infestations, and started poisoning early. The situation was aggravated this year by an increase in both the *Differentialis* species, and the Green Bird Grasshopper. The *Differentialis* is hard to poison with bran, and practically no results were obtained with bran poison on the Bird Grasshopper.

Farmers in the Roll-Wellton area continued to mix their bran-bait at the Pioneer Seed Warehouse. A new mixer was constructed this year according to plans furnished by the Division of Grasshopper Control which saved farmers a lot of time and labor mixing their poisoned bait. South Gila Valley farmers used their old mixer in 1945, but have decided to make a new one before the start of the poison program next year.

The peak of the grasshopper infestation in the Spring occurred in April. All the grasshopper present in large numbers were the common, Red-Leg, or the *mexicanus* species of grasshopper. The poisoned bran bait worked very satisfactorily on this grasshopper and this infestation was brought under control. It was noted this Spring that the percentage of kill varied considerably even when the same farmer used the bran in the same field. One application of bait would not obtain any noticeable kill, and the next application might eradicate the grasshoppers. The County Agent recommended that two applications be made, and in some cases three on the same place when there was only a small amount of green growth, in order to be sure of obtaining a control.

The grasshopper poisoning program was discontinued during the summer months while the seed crop was being harvested, but when green growth started again in the latter part of the summer a serious infestation of both the *differentialis* species, and the Green Bird grasshopper appeared. The Extension Entomologist and officials of the Division of Grasshopper Control made surveys in the area, and the Extension Entomologist spent part of the month of August in running field tests with various insecticides in the Roll area in an effort to obtain some control over these two grasshoppers. The *differentialis* was not easily poisoned through the use of bran, and the Green Bird Grasshopper would not eat the bran poison. Both species were killed through the use of arsenicals, but the Bird grasshopper did not originate in the alfalfa and bermuda fields, and flew in from the uncultivated areas faster than it could be controlled.

INSECTS AND DISEASE (Continued)

Grasshopper Control Program (Continued)

As a result of the infestation by the grasshoppers and other insects very little alfalfa seed was made in the area during the fall.

During the past year farmers in both the Roll-Wellton Area and the South Gila Valley used the following amounts of poison materials:

Bran-----	1800 sacks
Sawdust-----	78 tons
Mixed Bait-----	935 Tons
Sodium Fluosilicate-----	13,000 pounds
Sodium Arsenite-----	700 gallons

Approximately 10,000 acres of alfalfa and bermuda grass land was baited by 55 farmers in the two areas.

During the first part of the year farmers in the Roll-Wellton area used Sodium fluosilicate as a poison to mix with their bran. Considerable trouble with this material was experienced by mixing station foremen, and in one case a foreman was severely burned by the Sodium Fluosilicate. Partly because of this trouble, and because farmers felt that a lower percentage of kill was being obtained with the Sodium Fluosilicate than had been obtained with Sodium Arsenite, the Agent arranged for Sodium Arsenite to be used in the future in this area.

Lygus Control

Cooperative Cutting Progress: One of the most serious problems in the production of alfalfa seed in the Yuma area is the control of insect pests, the most serious of which are the lygus and the stinkbug. For several years test work was conducted in the Mohawk Valley in natural methods of lygus control, and a satisfactory plan was worked out whereby every farmer in the Roll and Wellton communities cut their last cutting of alfalfa hay in the Spring within a 10 day period, and got rid of all green weeds on ditch banks and fence borders. This practice did away with all green vegetation which normally hark the lygus, and a large number of adult lygus were killed because they had no protection. Roll and Wellton farmers agreed in 1941 to carry out this practice but because of weather conditions, personal opinions, and shortages of farm labor, the last cutting in the Spring was made over a period of about six weeks with the result that adult lygus flew from one field to another and were not controlled.

INSECTS AND DISEASE (cont'd)

Lygus Control by Sabadilla and DDT:

Field tests conducted by the County Agent in the use of Sabadilla for the control of lygus in alfalfa fields became worthwhile result demonstrations and Yuma County farmers benefitted from this insecticide. Sabadilla is the first material tested which is economically practical to use for lygus control in alfalfa. As a result of these tests and result demonstrations conducted during May and June, Yuma County farmers dusted approximately 10,000 acres of alfalfa in the bud stage ready to bloom for seed production.

Early in the Spring of 1945 a local dealer of insecticides, Sam Wick, presented information of a new insecticide which had been used successfully by the University of Wisconsin for the control of lygus and grasshoppers. Enough of this material was obtained early in May for test work under field conditions in Yuma County for the control of lygus on alfalfa, and test program was planned by the Extension Entomologists and the County Agent.

Farmers who were experienced in the control of lygus and the damage caused by this insect were consulted early in the Spring, and these men helped immeasurably in planning the tests so that they would have the best commercial application. Those in particular who helped in this work are Frank Batley and Wayne Wright, both farmers in the Mohawk Valley near Roll. Frank Batley, because of his long experience in working with lygus in alfalfa, and because of his fine cooperation in helping other farmers in lygus control work, was designated as the official representative of the Agricultural Extension Service in the Roll and Wellton communities in carrying on test work and keeping results of these tests.

Observations were made throughout the Spring so that the tests could be started when alfalfa started to bloom and when the lygus count was high enough to make the tests worthwhile.

The first test was made early in May on the John Bretz farm in the South Gila Valley. In order that Sabadilla could be tested, Mr. Bretz left two acres of alfalfa uncut when he cut hay. Approximately three-fourths of this piece was dusted, and the remainder left for a check plot. The duster used was the small gasoline duster owned by the Extension Service. The dust was applied at 7:00 A.M. This test was not as promising as later ones, and it is believed that the dust was put on unevenly and that not enough dust was applied

INSECTS AND DISEASE (cont'd)

Lygus Control by Sabadilla and DDT (cont'd)

because of lack of experience in handling the duster. Also, the plot was dusted one day after the surrounding fields were cut, and it is believed that lygus were still moving in from these cut fields. All these things helped to destroy the accuracy of the test. In a later test on this same field where 40 pounds of Sabadilla was applied at 6:00 A.M., approximately 98% control was obtained over all lygus. The results even extended to the test area where a decrease was noted, probably because the adult lygus moved back and forth in the field.

Further tests were run on the J. E. Thomas ranch in the South Gila Valley for the control of grasshoppers. Two tests were run, 40 pounds per acre being applied each time. Very poor results were obtained with Sabadilla, although there was some evidence of a decrease in population for about 48 hours. No dead grasshoppers were found.

In addition to the early applications listed above, small tests were run on the Sid Johnson farm at Somerton and the Pete Segulja farm at Gadsden. In both cases there was good control of lygus, ranging from 80% to 90%.

In the middle of May commercial tests were started on the following farms: H. P. Fites, South Gila Valley; Laura Killman, Roll; Wayne Wright, Roll; and Frank Batley, Roll. Results on all these farms were favorable. Following is a tabulation of the lygus counts before and after dusting on the H. P. Fites farm which was the first tests of commercial size. Before dusting we recommended that Mr. Fites cut all his hay which was not to be turned for seed, about two days before dusting. This gave adult lygus a chance to complete their movement from the cut fields to the green fields, after which the uncut fields were dusted. Altogether 160 acres of alfalfa was dusted by airplane on the Fites ranch, applying 40 pounds of Sabadilla per acre each of the first and second application, and 25 pounds the third application.

INSECTS AND DISEASES (cont'd)

Lygus Control by Sabadilla and DDT (cont'd)

H. P. Rites Results Table

Lygus per 100 sweeps

	<u>Adults</u>	<u>Nymphs</u>
May 7- before treatment	197	883
12 hours	0	128
24 hours	7	45
36 hours	2	298
38 hours	2	282
72 hours	10	238
May 11 96 hours	5	303
May 12 120 hours	5	243
14 168 hours	15	183
15 192 hours	58	505
May 16	400	1400
May 16 - Second Dusting		33
17 - 12 hours	3	
18 - 36 hours	23	133
25 9 days	163	147
26 10 days	70	63
June 2 17 days	70	20
6	150	90
6 third dusting-25 pounds per acre		
7 24 hours	5	23

Early in June W. R. Whitman, a grower in the South Gila Valley who had dusted his alfalfa with Sabadilla, informed the Agent that tests were being conducted at Blythe by the California Agricultural Extension Service, and that Sabadilla was giving very poor results as compared with DDT. A conference was held between members of the California Agricultural Extension Service, Frank Batley, Sam Wick, W. R. Whitman, and the County Agent in which our methods of testing Sabadilla were fully explained, and in which the California people explained their results. Following this discussion, we agreed to run a test along the same lines as followed in the California tests, with the exception that our test would be on a large scale, involving 80 acres of land.

W. R. Whitman agreed to run this test, dusting 30 acres with 30 pounds of 5% DDT, 30 acres with 40 pounds of 10% Sabadilla, and leaving 20 acres in the middle of the field as a check. The test was started on June 18, and the first few days results were checked by Dr. J. N. Roney, Extension Entomologist for Arizona. In this test the Sabadilla behaved as it

INSECTS AND DISEASES (cont'd)

Lygus Control by Sabadilla and DDT (cont'd)

had in the past, causing an immediate kill of Lygus. The DDT killed less lygus at the start but had a longer after dusting effect. Following is a table which shows the results of this test.

INSECTS AND DISEASES (cont'd)

Lygus Control by Sabadilla and DDT (cont'd)

	June 17	June 18	June 18	June 19	June 19	June 20	June 20	June 20	June 25	June 28	July 8										
Pre Dust		12 hr.	24 hr.	36 hr.	48 hr.	60 hr.	72 hr.	7 days													
A	N	A	N	A	N	A	N	A	N	A	N										
20 A	58	159	60	237	82	357	94	335	62	310	62	216	77	241	81.5	155	243	360	177	129	
30 A	60	169	1.5	27	.8	15	2.5	26	1.7	31	8.3	31.7	7.0	34	18.5	153.5	30	325	190	40	
Sabadilla																					
10% - 40#/a																					
30A DDT	62	170	41	149	23	104	40	100	11	46	40	105	16	81	60.0	7.0	88	13.5	170	49	
5% - 33#/a																					

W. R. WHITMAN - LYGUS CONTROL TEST

June, 1945

INSECTS AND DISEASES (cont'd)

Lygus Control by Sabadilla and DDT (cont'd)

Conclusions:

1. All fields and weeds not to be dusted, which are adjacent to fields to be dusted should be mowed two days before dusting to remove any green growth to which adult lygus might move after dusting.
2. Fields too badly infested to make seed should be dusted before cutting to prevent lygus from moving to other fields after cutting.
3. Sabadilla works better when daytime temperatures are high.
4. Dusting should start when there are about 30 lygus, either adults or nymphs, to each 100 sweeps with a bug net.
5. The first application of Sabadilla should be about 30 pounds per acre, depending on temperatures, lygus counts, and size of the hay. 30 pounds or less can be used in succeeding applications.
6. The control of adult lygus with Sabadilla is 100%. This is very important because when all adults are killed, the egg supply is controlled. Development of nymphs should regulate second and third dustings.
7. Every farmer using this dust should make daily checks in his field to determine predusting and after-dusting lygus populations so that he will know when the second application is necessary. In general, it has been found necessary to give the second application about five days after the first one.
8. Dust should be applied at daylight and dusting should be discontinued when heat waves and wind cause the dust to rise and shift.
9. Dusting should be done when alfalfa is in the bud stage, starting to bloom, if lygus counts warrant the application of the dust.
10. Other dusts may prove more effective, but Sabadilla is the best ever tried in this area which is, or has been commercially available.
11. From the results of the Whitman test in which Sabadilla caused an immediate kill on lygus adults and DDT a long-time control of lygus nymphs, it seems likely that a combination of these two materials should be tested.

INSECTS AND DISEASES (cont'd)

Lygus Control by Sabadilla and DDT (cont'd)

12. A community insect control program is essential in the application of insecticides, and the use of other control measures should be planned and carried out uniformly.

After the completion of the harvest of the summer crop of alfalfa seed the County Agent made a survey of farmers who used Sabadilla for lygus control and found that where other conditions were equal, proper use of Sabadilla increased the alfalfa seed from 100 to 200 pounds per acre. As three dustings cost approximately \$20.00, and alfalfa seed this year brought at least thirty five cents a pound, this dusting proved economically practical.

At the end of the lygus control program for 1945 the County Agent was informed by the manufacturers of Sabadilla that the best results had been obtained with this insecticide in Yuma County of any area in the United States. It is believed that the effectiveness of the material was increased by the warm climate.

Worms in Alfalfa and Lettuce:

Just after the conclusion of the harvest of the first crop of alfalfa seed in the latter part of July there was a serious infestation of several types of green worms in the alfalfa growing areas of the County. Field tests were conducted by the Extension Entomologists and the County Agent using different insecticides, and while some of these materials showed some promise of controlling worms effectively the population of these worms and other insects was so great that the second alfalfa seed crop in most of Yuma County was a failure.

The Extension Entomologist and Mr. Frank Batley, a farmer in the Roll area planned and executed test on the farm of Mr. Phillip Dunn at Roll. The test included the control of worms, stinkbugs, and lygus. Dusts applied included a cotton dust of 15% Paris Green and 85% Sulphur; a dust composed of 19% Paris Green and 25% Calcium Arsenate with the balance sulphur and a 10% Sabadilla dust. The materials were applied with the Extension Service Power Duster. The following table gives the results of these dusts taken 24 hours after application.

Robert J. Moody, Yuma County, Arizona, Arizona, 1945.

INSECTS AND DISEASES (cont'd)

Worms in Alfalfa and Lettuce: (cont'd)

Insects per 100 sweepings

	<u>Lygus</u>	<u>Worms</u>	<u>Stink Bugs</u>
<u>Cotton Dust</u>			
12:00 M	12	7	6
5:30 P.M.	16	10	6
<u>Sabadilla</u>			
12:00 M	0	12	0
5:30 P.M.	2	20	2
<u>Calcium Arsenate-Paris</u>			
12:00 M	Green 16	18	10
5:30 P.M.	16	6	8
<u>Check:</u>			
12:30 P.M.	40	108	11
5:30 P.M.	85	125	16

Results taken twenty four hours later were about the same as shown in the table.

Early lettuce in the Yuma Valley was severely damaged by green worms. Lettuce growers dusted the crop as rapidly as possible but the infestation was so serious that it was impossible to cover all the fields with the dusting facilities available. Approximately 1000 acres out of a total of 7000 acres of early lettuce was destroyed by the worms.

Lettuce growers dusted their fields with various strengths of calcium arsenate and cryolite. Wherever the arsenicals were put on early in the morning good results were obtained, but dusts applied during the middle of the day were for the most part ineffective. Toward the end of the year some growers were able to obtain 5% DDD dust and reported very good results from the use of this material.

Crickets in Mung Beans:

This year for the first time about 200 acres of mung beans were planted in the Yuma Valley. Part of this acreage was grown on heavy land, which cracked badly when it dried and which harbored a heavy infestation of crickets in the cracks. The leaves, blossoms and young pods of the beans suffered severe damage from the crickets. As the growth of beans was very heavy and succulent the Agent recommended the use of 70% calcium arsenate to control the crickets, instead of the apple peel bait commonly used. One check was treated with a pelleted bait, to determine the effect of type of poison in a rank growth of this type.

INSECTS AND DISEASES (cont'd)

Crickets in Mung Beans (cont'd)

The 70% calcium arsenate produced a good kill on crickets, and a good control was also obtained by the use of the pellets. The calcium arsenate either produced a slower kill, or set the beans back as the plot which was treated with the pellets ripened a few days earlier.

The calcium arsenate also produced a slight burn on some of the younger leaves of the beans. This burn looked very severe until the Agent noticed that most of the leaves damaged had opened since the dusting. The presence of a Fusarium disease was reported by the Plant Pathology Department of the University from samples sent to them for examination.

Corn Ear Worm Control:

A new insecticide was tested for the control of the corn ear worm in sweet corn. This new material Basic Copper Arsenate was applied at weekly intervals on a 10 acre field of Golden Cross Bantam being grown in the Yuma Valley by Bill Bailey. The test was started late and some of the damage had gone too far to stop, but results of the dusting were fairly good, and more tests will be conducted with the same material on sweet corn grown in the early Spring.

Recommendations on the Use of DDT

At the time that DDT was first made available to the public, the County Agent distributed mimeographed circulars which had been prepared by the Extension Entomologist. Further publicity on this insecticide was given through the radio and in daily newspapers and farm newsletters. Extreme caution in its use was urged, and no recommendations have been made for its use where the product on which the material is to be applied will be consumed either by animals or human beings. The Agent has recommended that DDT be used on young lettuce as this part of the lettuce plant is not eaten.

Diseases of Potatoes:

Approximately 800 acres of Irish potatoes were grown on the Yuma Mesa during the late winter and early spring, and about 400 acres of potatoes were grown in the North and South Gila Valleys in the Spring.

INSECTS AND DISEASES (cont'd)

Diseases of Potatoes: (cont'd)

In nearly all cases the seed potatoes were certified either from the State of California, Oregon and Colorado. The White Rose variety grown on the Yuma Mesa showed a high percentage of disease, and the Bliss Triumph potatoes grown in the North Gila Valley had a considerable amount of disease. The land on which most of these potatoes were grown was virgin soil, so it is quite probable that the disease was in the seed potatoes. The County Agent took regular samples of these potatoes and had the diseases identified by the University of Arizona Plant Pathology Department. Among the diseases most commonly found were Rhizoctonia, Bacterial Ring Rot, and several stage of mosaic.

Rosette Disease in Lettuce

A new disease of lettuce was reported during the early part of the year. On first examination the leaves appeared to be burned on the outer edges, as though too strong an insecticide had been used. Identification of the disease was made by the Extension Entomologist. The Rosette disease has not caused serious damage as the plants recover from the disease before making heads.

ALFALFA SEED AND HAY

General Situation:

The past year has been fairly profitable for producers of alfalfa hay and alfalfa seed as prices of both of these products have held up well. Hay yields were high throughout the early months of the year as cool growing weather lasted until July. Alfalfa seed yields were also high for the first crop, partly because some of the improved varieties yielded higher than the standard Chilean and Hairy Peruvian varieties, and because alfalfa seed growers who dusted their fields with Sabadilla increased seed yields considerably.

Among the seed growers who made outstanding yields were the following; all of whom dusted for lygus control, and grew recently introduced varieties.

Sid Johnson of Somerton produced over 600 pounds of India alfalfa seed per acre in the first seed crop, and about 200 pounds per acre the second crop, on a total of 40 acres of alfalfa.

The Ranger alfalfa grown by Wayne Wright at Roll produced over 500 pounds of number one seed per acre the first crop, on a net acreage of 10 acres.

The Chilean 21-5-3 raised by John Bretz in the South Gila Valley produced more than 300 pounds per acre on the average, and a small acreage of Chilean 21-5-4 which was planted in March produced a considerable amount of seed in August.

Marcel Forman planted fourteen acres of African alfalfa in February in the Yuma Valley. This alfalfa produced about 200 pounds of seed per acre in September.

ARIZONA CROP IMPROVEMENT ASSOCIATION

Increase in Certified Acreage of Alfalfa:

The past year saw a big increase in the acreage of alfalfa in the Crop Improvement Program of certified seed. Varieties increased included Chilean 21-5-3, Indian, African, and Ranger. The total increase subject to certification was 2000 acres.

ALFALFA SEED AND HAY

Chilean 21-5-3:

During the past year the popularity of the Chilean 21-5-3 strain of alfalfa has increased both in acreage subject to certification, and acreage outside of the Crop Improvement program. This alfalfa showed a distinct superiority over regular Chilean Alfalfa both in hay and seed production. Among the growers who planted Chilean 21-5-3 for certification under the Crop Improvement Association program were the following:

Gunther & Shirley, South Gila Valley	600 acres
John Morrish, South Gila Valley	80 acres
John Bretz, South Gila Valley	7 acres (21-5-
Joseph Higgins, Yuma Valley	40 acres
Bureau of Reclamation, Gila Project--Undetermined acreage being planted, part of which will be certified.	

India

As a result of the high seed yield made by India Alfalfa shown by Sid Johnson at Somerton a large acreage of this variety is being planted during the Fall and Winter of 1945. Mr. Johnson is cooperating in the Crop Improvement Association program, in that he is requiring each grower who buys this seed to plant it for certification. Growers who are planting India alfalfa in the Fall and Winter of 1945 are as follows:

James Beshears	Somerton	15 acres
E. F. Sanguinetti	Yuma	80 acres
Pete Carstens	Somerton	45 acres
Sid Johnson	Somerton	40 acres
B. C. Smith	Somerton	40 acres
Dave Johnson	Somerton	30 acres
Frank Johnson	Somerton	20 acres
J. R. Barclay	Yuma	80 acres
J. Phillips	Somerton	30 acres
Floyd Jones	North Gila Valley	90 acres
John Bretz	South Gila Valley	20 acres
Cravens and Salyer	Gadsden	20 acres
John C. Smith	Gadsden	15 acres
Claude Baker	Somerton	12 acres
Charles Johnson	Gadsden	40 acres
James Greer	Somerton	220 acres
Charles Cargo	Gadsden	4 acres
Total		<u>791 acres</u>

ALFALFA SEED AND HAY (cont'd)

India (cont'd)

The County Agent inspected the acreages in which the alfalfa being planted to determine the eligibility of the location for the growing of pure seed.

African:

Marcel Forman, in the Yuma Valley, planted fourteen acres of Registered African alfalfa, which was obtained from the Bureau of Plant Industry Experiment Station at Bard, California. The entire increase from this alfalfa was planted by W. R. Whitman on 140 acres in the South Gila Valley. The County Agent inspected both these plantings for certification and has requested the Arizona Crop Improvement Association to re-register the Whitman planting so that it will be possible to increase the certified acreage of this alfalfa in the years to come.

Ranger:

Interest in the production of Ranger Alfalfa for sale of seed to northern states increased a great deal during the year. The County Agent has received requests for enough seed to plant about 1400 acres of this variety in the Roll-Wellton area and in the South Gila Valley. The Montana Seed Growers' Association shipped 2000 pounds of Syn 1 seed early in October, and approximately 500 acres of Ranger alfalfa was planted at the rate of three pounds of seed per acre from this shipment. Growers has found it possible to get a good stand of alfalfa by seeding it in rows in bermuda grass sod by planting a very small amount per acre. Among the growers who planted Ranger alfalfa in the Fall of 1945 are the following:

Snyder Ranch, Mohawk Valley
Frank Batley, Roll
R. H. McElhaney, Wellton
Wayne Wright, Roll
John Bretz, South Gila Valley

Change in Planting Regulations:

Due to the fact that Ranger Alfalfa is practically dormant during the cooler months of the year, when common types of alfalfa are growing vigorously, which makes it possible to rogue fields of Ranger alfalfa during the middle of the winter, a change was effected in the International Crop Improvement Association Regulations. This change permits the planting of alfalfa for certification after the land on which the alfalfa is to be planted has been out of alfalfa for one year.

ALFALFA SEED AND HAY (cont'd)

Change in Planting Regulations (cont'd)

This change worked out very well as the Extension Agronomist and the County Agent inspected the Ranger Alfalfa field of Wayne Wright at Roll in January and found the Ranger alfalfa to be inactive. A few Hairy Peruvian plants in the field were growing vigorously. Colored pictures of the comparison between these plants were made and sent to the Secretary of the Montana Seed Growers' Association, from which the Ranger alfalfa seed is obtained; to Dr. H. M. Tysdal Senior Agronomist in Charge of Alfalfa Breeding Work; and to the Secretary of the Arizona Crop Improvement Association. Due to a lack of facilities to have black and white prints made of this picture it was impossible to include this picture in this report.

Certification of Small Grains:

The County Agent spent two days inspecting small grain fields in Imperial and Yuma Counties. The Extension Agronomist Mrs. Earl Parsons, Secretary of the California Crop Improvement Association; Mr. Suves, who is in charge of all small grain improvement work in the western states for the U.S.D.A., and A. T. Bartel of the University of Arizona Agronomy Department also inspected these fields.

A 70 acre planting of Arivat Barley, grown by John Bretz in the South Gila Valley was reregistered because of the condition of the field, the freedom from weeds, and the absence of off type plants. The field averaged 100 bushels of grain to the acre.

Also inspected was a 20 acre field of White Federation #38 wheat, grown by Hans Holling of Somerton. The Holling field was originally a certified field but because of the exceptional clean condition of the field and the uniformity of the stand the field was classified as registered.

PERMANENT PASTURE

During the past year there has been little increase in the acreage in permanent pasture in the County. Outstanding pastures continued to carry about three head of cattle per acre for ten months of the year. This was especially true of the Jones-Huss farm in the North Gila Valley, where a sandy soil made frequent irrigation and pasturing possible. Until this Fall there has been less pasturing of cattle than before the War, and the growing of permanent pasture has been partly held back by the lack of this type of feeding.

Range Grasses for Seed:

During the past year small plantings of Giant Panicum, and *Eragrostis curvula* were made by Carl Hearn at Roll, and Frank Hartman in the South Gila Valley. These plantings were made late in the Spring and no seed was produced in 1945. Further plantings of Giant Panicum, Harding Grass, and *Eragrostis curvula* were also made by Alfred Hess in the Yuma Valley. The seed for these plantings was furnished by the Soil Conservation Service.

Salt Resistant Grasses and Legumes:

Plans were made by the Extension Soils Specialist, The Extension Agronomist, and the County Agent to test salt resistant grasses and legumes in areas where the soil and water have a high salt content. The Extension Soils Specialist believes that a permanent pasture made up of plants of this type may furnish farmers in areas where the soil has a high salt content with a crop which can be pastured, and provide the operator with some cash income while the salt is being leached from the soil by heavy irrigation. He also believes that there is a slight acidifying action in the decomposition of organic matter from these plants and in the process of transpiration carried on by the plants.

Salt resistant legumes are being tested on the Joe Reilly farm at Roll, and a permanent pasture mixture will be planted in the Roll area in the Spring, and on the Ray Thompson farm on the Bill Williams River in the northern part of the County.

BERMUDA GRASS

Marketing Organization:

The market for Bermuda Grass seed was not as active in 1945 as previously, due to the fact that the government did not buy as much of this seed for airports and army posts as was the case in the early years of the War. It is believed that this condition is temporary and that the demand will increase to some extent when civilian airports, parks, and home building increases.

Through the foresight of several Yuma County farmers and seed dealers a holding pool organization was formed to take care of the 1944-45 Bermuda seed crop, both in Yuma County and in the Blythe area, the purpose of the pool being to market the seed in an orderly manner and to advertise the use of Bermuda Grass seed through the south. Farmers who were particularly active in forming this pool were Wayne Wright, and Harold Woodhouse of Roll; W. R. Whitman, of the Whitman Seed Co; Claire Peterkin of the Yuma County Farmers' Marketing Association; and R. H. McElhanev of Wellton. The County Agent met with bermuda seed growers several times to help in forming this organization.

CITRUS

The Agent met with Yuma Mesa Citrus Growers once during the year to discuss the value of growing cover crops in the summer time in grapefruit groves to cut down on the amount of nitrogen available to the tree at that time of year, and to improve the quality of the fruit by this practice.

The County Agent and the Extension Entomologist spent some time in surveying the damage done by citrus thrips on Yuma Mesa groves, and in determining the effectiveness of the tartar emetic spray for the control of citrus thrips. When it was found that the thrips are developing an immunity to this spray the Agent and the Extension Entomologist recommended the use of a new type of spray containing nicotine sulphate, for the control of the citrus thrip.

FLAX MANAGEMENT

During the past Spring the County Agent inspected disease damage in several flax field in the County. In all cases the disease isolated from the samples sent to the Plant Pathology Department for identification was a type of Fusarium. This disease can be controlled in areas where the disease has not become serious by seed treatment of seed which may carry the disease.

The disease did not reach commercial proportions in 1945, and the Agent recommended that all flax growers treat their seed before planting in the Fall of 1945 in order to prevent the spread of this disease. These recommendations were made personally, and in form of circular letters to flax growers.

SOILS AND IRRIGATION

Soil Problems:

Several areas in Yuma County have a severe salt problem, part of it caused by natural alkaline condition of the soil, some by improper irrigation, and some aggravated by the use of water with a high salt content. The County Agent worked on all three phases of this problem during the past year, and on some soils where a combination of conditions exists.

The Extension Soils Specialist and the County Agent made a survey of soils problems early in the year, making field inspections of problem areas, and discussing soil problems and treatments with farmers in all irrigated areas of southern Yuma County.

Hanford Ranch Leaching Test:

The Soils Specialist and the County Agent outlined a test for the reclamation of soil on the Hanford farm at Roll, by the use of leaching and combination of leaching and chemicals. Several two acre plots were laid out in duplicate, and the materials were applied by Joe Reilly, the farm manager. Following is the layout of this test.

1. Straight leaching.
2. Leaching plus 1000 pounds of sulphur.
3. Leaching plus 200 pounds of aluminum sulphate.
4. Leaching plus 200 pounds sulphur and 1000 pounds gypsum.
5. Leaching plus 2000 pounds of gypsum.

The irrigation water used in this test has a high salt content, which will make leaching difficult. The soil is well drained and took water to a depth of six feet, which was deep as soil augur tests were made. Soil samples from the surface to a depth of six feet were taken by the Agent in March at the start of the test, and in October after the land had been irrigated heavily at least once a month since the start of the test. No results can be shown so far in this test. Total salts and pH values both remain high.

J. S. McCraw--Wellton:

Soil samples were taken on the J. S. McCraw farm near Wellton, and the irrigation well was analyzed. The well was found to contain more than 7000 parts of salt per million, and some parts of salt per million, and some parts of the farm had become so salty that they would no longer grow Bermuda Grass. In spite of the high salt content of the water Bermuda Grass

SOILS AND IRRIGATION

J. S. McCraw--Wellton: (cont'd)

grew well on the ditches. The County Agent and the Extension Soils Specialist recommended that the borders be built up and that irrigation water be ponded in these borders to force the salt down and keep the salts in solution as much as possible in order to get Bermuda Grass started.

Pete Stathis--North Gila Valley:

Soil in the Pete Stathis farm is a good river bottom silt which contains some alkali. The irrigation water for this farm is obtained from the Gila Canal, and is Colorado River water. The land has been in cultivation for two years, and potatoes and other row crops are the only crops that have been grown on the land. The first year a good crop of potatoes was raised on the land, but the second year the accumulation of salt in the tops of the beds cut the potato yield to 100 sacks per acre and less. Soil samples showed that the pH value and the salt content of the soil was high. The County Agent recommended that the soil be levelled and leached by several irrigations during the summer, and that alfalfa be planted during the Fall so that continued border irrigation would leach the soil and the organic matter added from growing alfalfa would improve the soil for future vegetable crops. Instead of following this recommendation Mr. Stathis planted carrots in the Fall and intends to grow potatoes again in the Spring. The salt condition still exists in the tops of the carrot beds, and will continue to be aggravated by row crops.

Yuma Mesa:

Potatoes were grown in the Yuma Mesa for the first time in 1944-45. Because the soil was practically without either nitrogen or phosphorus heavy applications of these fertilizers had to be added to the soil. The same trouble was experienced on the Yuma Mesa as a result of growing row crops as on the Stathis farm. Salt built up in the tops of the potato beds, and the pH of the land also built up.

N. A. Cypert, Fertilization of Sudan Grass:

Soil samples were taken from the young Sudan Grass field of N. A. Cypert in the Yuma Valley. Although this land had been constantly pastured by dairy cattle the phosphate and nitrate content of the soil was very low. The county

SOILS AND IRRIGATION (cont'd)

N. A. Cypert, Fertilization of Sudan Grass (cont'd)

agent recommended the application of liquid nitrogen as the land was in crop and dry fertilizer could not be applied. The Sudan Grass responded to this fertilizer to such an extent that Mr. Cypert had to cut hay to keep the growth under control, in addition to pasturing the acreage.

Ditch Sealing:

Plans were made for ditch sealing tests on the Yuma Mesa to be conducted by the Acting Irrigation Specialist, who during the early part of the year made water loss tests in some of the ditches of the Yuma Mesa in preparation for the ditch sealing work.

Materials which were obtained for these tests included Bentonite, Bitumuls, and heavy fuel oil. The Bentonite was applied in the ditch of H. H. Roberts on the Yuma Mesa, but this material was washed out soon after it was applied due to a breakage in the ditch above the treated area. Later in the year fuel was applied on the Roberts ditch, and results of this work are still in question as water has just been run in the ditch at the time of the report. Plans were made for the use of Bitumuls on 100 feet of the Roberts ditch, and this material will be applied early in 1946.

PECANS

The quality of the 1945 crop of Yuma pecans was high, but the yield per acre was low this year, particularly in the Mahan variety.

The Extension Horticulturist, The Superintendent of the University of Arizona Experimental Farm at Yuma, and the County Agent spent one day in surveying pecan groves, discussing yield problems with growers, and attempting to determine some way in which annual yields of pecans could be standardized and raised.

DATES

The County Agent and the Superintendent of the University of Arizona Experimental Farm at Yuma spent one day in the Coachella Valley going over the Bureau of Plant Industry Date Garden, visiting commercial groves and packing sheds and in attending the National Date Institute.

Several visits were made to the Persian Gardens date garden on the Yuma Mesa, inspecting damage done to dates by a small spider, and by the date mite. Dusting the grove with sulphur to control the mite was recommended after contacting the Indio Date Garden, and the Extension Entomologist.

During the past year the acreage of dates packed commercially increased. One packing plant was improved to take care of an increased crop and two new packing plants were built. Most of the date gardens of any size were cleaned up, pollinated, and the dates picked and shipped. The use of German war prisoners by two growers and shippers for all the cultural practices from the taking off of offshoots, to picking made it possible to handle all the date gardens of any size. The date crop in the Yuma area was better than average during the past year.

IRISH POTATOES

During the early Fall of 1944 approximately 1000 acres of land was levelled in the vicinity of the Yuma Army Air Base, preparatory to the planting of Irish potatoes.

Most of the growers who planted potatoes on the Yuma Mesa were growers from the large potato district located at Edison near Bakersfield, California. Some local growers also made plantings.

Prior to the planting of the potatoes the County Agent, and the Extension Entomologist met with potato growers and discussed precautions against disease and cultural practices. Very few definite recommendations as to cultural practices could be given because of the lack of information on the Yuma Mesa.

Most of the growers planting the White Rose Variety and potatoes were planted during December and January with two row potato planters which planted and fertilized at the same time. A total of 800 acres were planted.

The ground was fertilized heavily at planting time with a balanced nitrogen, phosphorus fertilizer. Potassium was not used as previous experimental work with other crops indicated that this element was present in sufficient amounts in the soil. Some question was also raised as to the need for magnesium, but plenty of this element is present in both the soil and irrigation water. Following the first fertilization more nitrogen fertilizer was added during the latter part of February, and a small amount was added continually in the form of liquid nitrogen and ammonium sulphate until shortly before the potatoes were dug. At the end of the season it was found that in some cases 190 units of nitrogen and 80 units of phosphorus had been applied to the acre.

Potato growers had trouble from the start. Soon after the crop was planted a series of rains cooled the weather and in several cases packed the soil over unsprouted potatoes so that they were unable to break the crust until the ground had been cultivated. In spite of the fact that the soil is very sandy there is some caliche in it, and this material caused the baking after the rain. Cold weather continued for most of the growing period, and during February and March winds which were the most severe in more than 20 years blew constantly. A considerable acreage of land had been levelled by the Bureau of Reclamation surrounding the potato fields, and because of a shortage of labor this land had not been planted to alfalfa. Sand from these cleared

IRISH POTATOES (cont'd)

fields caused severe damage to the young potato plants and in some cases the winds blew so hard that potato vines were cut entirely off. Disease caused a lot of loss in all the fields on the Yuma Mesa, as was discussed in the disease section of this report, and some damage resulted from an infestation of aphids. The aphid infestation however was short lived as natural enemies eradicated them before they caused much damage.

Yuma Mesa potatoes were harvested during April and yields ran from 23 to 40 sacks per acre. In one case where the land had previously been in cultivation and silty water had been applied the yield was 100 sacks per

In an effort to determine why potato yields were so low the County Agent took soil and plant samples from many of the fields on the Yuma Mesa, both on the land being cropped for the first time, and on the land on which silty water had previously been applied. Soil analysis showed the presence of very little nitrogen or phosphorous after the harvesting of the crop in spite of the excessive amounts used. Plant analysis showed the presence of plenty of all kinds of the elements required for the growing of potatoes, and in some cases an excess of these elements. It was noted that the amount of potassium on the soil where silt had previously been applied was excessive, and that plants from new sandy soil had less potassium, but still had a sufficient amount for normal plant requirements.

Soon after the harvesting of the potatoes the County Agent met with the Extension Horticulturist, the Extension Entomologist, the Extension Soils Specialist and Yuma Mesa potato growers to discuss problems of the past year's crop in an effort to make some recommendations which might be followed in future potato crops. No definite decisions were reached, but the following points were agreed upon.

1. That soil improvement was needed, and could best be added through the use of green manure cover crops.
2. That some type of wind breaks were needed to cut down the wind damage.
3. That soil temperatures could be raised and less fertilizer be lost by less frequent irrigations.
4. That potatoes should be planted earlier than December on the Yuma Mesa so that they could get a good start before cold weather.

IRISH POTATOES (cont'd)

Other potato plantings were also made in the South Gila Valley and the North Gila Valley. Yields on these plantings ranged from 100 sacks per acre to 200 sacks per acre. Both the White Rose and Bliss Triumph varieties were planted in the valleys.

COTTON

Approximately 1200 acres of cotton were raised in 1945 in Yuma County, all of it located in the northern end of the County in the Parker Valley. The County Agent made several trips to Parker on various phases of Extension work and always spent some time with cotton growers in the area.

One meeting was held in February with cotton farmers in the Parker area, to discuss planting plans, cotton varieties, yield results and quality of fiber in other parts of the country, insect control, and irrigation practices. Four specialists from the Agricultural Experiment Station and the Agricultural Extension Service spoke on the subjects listed above. Specialists who spoke at the Parker meeting were R. L. Matlock, Extension Agronomist, E. H. Pressley, Plant Breeder; J. N. Roney, Extension Entomologist; and Karl Harris, Irrigation Engineer.

One grower in the Parker area raised 35 acres of Registered San Tan Acala cotton for seed for other growers in the area. Because of the fact that this field suffered considerable damage from root rot it was decided not to save the seed for planting.

The County Agent made arrangements to continue the cotton classing and Market News Service Program at Parker. Mr. M. F. McVey continued as head of the Parker One Crop Cotton Improvement Association.

The Extension Entomologist and the County Agent made insect surveys, and collected some of the injurious insects on cotton. These collections were shown to farmers at a night meeting where the Extension Entomologist discussed control of cotton insects.

POULTRY MANAGEMENT

There are very few commercial poultry flocks in Yuma County, but most farmers have small home flocks, most of which are in need of improvement in the quality of the chickens, and in the housing.

Early in the year the Agent was contacted by a returned service man, M. K. Grubbs about going into the hatchery business in Yuma. Mr. Grubbs was encouraged by the Agent because of the need for this industry in this area, and helped Mr. Grubbs to locate a place for his hatchery, a source of hatching eggs, and to become acquainted with local poultrymen who might help in the production of hatching eggs. The Extension Poultry Specialist also spent some time with Mr. Grubbs while the hatchery was being constructed and after it was put in operation acquainting Mr. Grubbs with the Arizona Poultry Improvement Program, and making general recommendations.

The County Agent and the Extension Poultry Specialist visited commercial poultry producers once during the year to become acquainted with the poultry situation, and to make general recommendations for improvement of the poultry program in this area.

The County Agent held a demonstration in the Somerton area on the vaccination of chickens for fowl pox. Local poultrymen, 4-H club boys and M. K. Grubbs attended the demonstration where 1000 white leghorn pullets were vaccinated by the County Agent, M. K. Grubbs, M. A. Gallaher and his two boys.

A caponizing demonstration was held in Yuma during November at the home of Miss Helen Yost for the benefit of people who wish to raise large fliers inside the city limits where there is a City Ordinance against the raising of roosters.

NEW VEGETABLE VARIETIES

Information was received in the late Fall of a new variety of lettuce, known as Imperial #410, which was developed by the Agricultural Experiment Station of the University of Arizona. The County Agent notified all vegetable growers of this lettuce, and obtained seed for one grower, Howard P. Fites, who wished to make a test planting of the variety.

RURAL SOCIOLOGY

During one week in February, Dr. E. D. Tetreau, Rural Sociologist for the Agricultural Experiment Station conducted research work in Yuma County, obtaining material which was used in his last publication. Several weeks before his trip to Yuma, Dr. Tetreau offered to make public appearances wherever they could be arranged. During the week he was in Yuma he appeared at six different meetings speaking on the same subject at each Meeting. The subject chosen was "The Community our Returning Men will Find". Dr. Tetreau's talks were well accepted and each one was a little different, according to the type of group he was addressing. Following is a list of the meetings at which these talks were presented.

February 19: Luncheon Meeting of Farm and Home Leaders.
February 20: Yuma Rotary Club
February 20: Yuma-El Centro, National Farm Loan Association.
February 22: Yuma Kiwanis Club
February 23: Gadsden Farm Bureau
February 24: Roll-Wellton Farm Bureau.

A total of 260 people attended the meetings at which Dr. Tetreau appeared.

DECIDUOUS FRUIT TREES

In the Fall of 1944 test plantings of selected varieties of apples, pears, nectarines, peaches, apricots, and quinces were made on three farms in the Yuma Valley. In all cases the farmers cooperating were anxious to establish deciduous fruit orchards, and realized the limitations of this project because of the high summer temperatures and lack of an adequate winter dormant period.

The original plantings were completed in January. Observations were made by the County Agent and the Extension Horticulturist at regular intervals throughout the year, and it was found that where the soil was fertile and there was partial shade the trees thrived. Where the soil had a high salt content only such trees as apples, pears, and quinces survived.

Some of the trees grew as much as six feet during the past year, and will have to be pruned during the winter.

DEVELOPMENT OF NEW FARM LANDS

During the early part of the year the Bureau of Reclamation, Gila Project, offered alfalfa fields on the Yuma Mesa for lease to Yuma County farmers. These leases were one one and two year old alfalfa and run for one year. The lessee had to assume cost of water, and all operational expenses for the period of the lease. It is not known how profitable these leases turned out for the lessees, but it is believed from field observations that the most of the lessees did not make much profit on this venture.

In the opinion of the County Agent it is a good idea to lease this land as this practice will determine just how practically this land can be operated by private operators.

The County Agent worked with two farmers who this past year levelled farm land on the Yuma Mesa. In both cases potatoes were grown on the land in the winter and spring with poor results. In order to improve the water hold capacity and the fertility of the soil the Agent recommended that cover crops of sesbania be grown, which had been pre-innoculated with bacteria, and in which the land had been fertilized with phosphates. H. H. Roberts who is developing 160 acres on the Mesa followed these recommendations and grew a good crop of Sesbania, which in some cases attained a height of eight feet it was turned under. The other farmer, Frank Rhew did not fertilize his land as he believed that the fertilizer left from the potatoes would be sufficient. His crop was very poor.

DAIRY

Bang's Testing Program:

The County Agent cooperated with the office of the State Veterinarian in urging all dairymen to cooperate in the program of testing for Bang's Disease. Most of the commercial dairies in the County are cooperating in this program, and Dr. Edwin Balle, of the State Veterinarian's Office spent nearly two weeks in January testing dairy herds for Bang's Disease and Tuberculosis. A comparatively small number of reactors were found. Later on in the year Dr. Robert McCord, a local veterinarian took over this program as the official state representative and is making regular tests on commercial herds and on family cows whenever he is requested to do so.

Dairy Herd Improvement:

The County Agent contacted Dr. Robert McCord with regard to acting as a part time cow tester in order to make it possible for the three commercial dairy herds in the Yuma area to be brought under monthly test. There are not enough commercial herds in the County to hire a cow tester full time. Dr. McCord expressed willingness to carry on this program and the Agent contacted all dairymen during October to give them a preliminary explanation of this program, and again during November with the Extension Dairy Specialist to give a fuller explanation to the program and make arrangements for starting testing work. The largest dairy, owned by Parks and MacGregor plan to start testing at once, and the other two dairies, owned by N. A. Cypert, and James Garrett plan to start testing work soon after the first of the year.

NEW FIELD CROPS

Mung Beans:

This year for the first time about 200 acres of mung beans were planted in the Yuma Valley by Julian Cannon, and Ernest Johannsen. These beans which were planted in late July were ready for harvest in 60 days after planting.

Several problems were experienced in the growing of the beans, among which were damage by crickets, and harvesting the crop without losing most of the crop by shattering. Both of the growers obtained small yields of the beans because of loss during combining.

The mung beans were raised for use as bean sprouts, and growers received a fairly good price for the beans for this purpose. After seeing their rapid growth it is the opinion of the Agent and others that these beans may be of considerable value as a summer cover crop in this area. Because of their rapid growth they could be grown between flax crops and two crops of them could be grown between other crops.

#4188 Wheat:

At the request of the Montana Seed Growers' Association two Yuma County farmers are growing 110 acres of seed wheat. This variety of wheat, # 4188, was obtained in Canada by Montana growers when they found all their varieties suffering heavily from damage by the Saw Fly. The #4188 wheat is resistant to Saw Fly damage. The two Yuma County farmers are John Bretz in the South Gila Valley, who is growing 100 acres, and Joe Reilly at Roll, who is growing 10 acres.

This wheat was planted early in order to have it mature early in May. The wheat will be harvested and shipped thresher run to Montana so that it can be planted there in May. This arrangement will save Montana seed growers one season in the increase of this wheat.