

ANNUAL REPORT
of
ROBERT L. MATLOCK
Specialist in Agronomy

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December 1, 1944 - November 30, 1945

Agricultural Extension Service
University of Arizona
Tucson, Arizona

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I. SUMMARY

In several respects the year 1945 has been busier than any in the writer's experience as a Specialist. During the forepart of the year the war was still in progress. All of our Extension programs were developed to win the war and we knew that food and fiber production would have a real part in getting the job done.

The writer gave assistance to research workers in his field in carrying to growers the results of research work. Considerable field and office time has been used this year in carrying out cooperative field plantings of corn, small grains, and sorghums in those counties not served by Experiment Station farms. Very satisfactory results were secured from several of those plantings. Now we are able to make quite sound recommendations to growers through our county agents to guide them in their selection of strains and varieties. In several cases yield advantages were found amounting to as much as 100 percent above strains or varieties being grown in some areas.

Another important contribution of the writer has been in connection with the seed certification program. It is pointed out under Section V A of this report that we fell short this year in our production of certified seed of alfalfa and small grains. Environmental factors materially reduced the alfalfa seed crop. With the small grains considerable amounts of potential certified seed continue to be sold and planted without final certification tags. Such seed, of course, for all practical purposes is as good as certified seed.

Aside from the pure seed work probably the writer's most important service to our cotton enterprise has been through the classing program. With strong emphasis on higher grades of cotton for war use an attempt has been made to keep county agents and ginners aware of the main factors affecting grades. Among those are control of lint damaging insects, earlier harvesting, and adoption of improved ginning methods. Mechanical harvesting of our cotton seems assured by necessity and effort has been made to bring to the agents late information about this process.

Our hay and pasture program has been held back by a lack of experimental information. Because of the wide difference in growing conditions in Arizona it is difficult to carry out a complete research program on pasture production. By working with the Soil Conservation Service, however, we have been able to accumulate considerable information to guide our county agents in their pasture work

with farmers. This past fall numerous new pastures were seeded in 4 or 5 of the intermediate altitude (2500 to 5000 feet) counties with the guidance of county agents who used information prepared by this Specialist.

The writer believes that his most important contribution to the Soil Productivity and Management phase has been in helping the Soils Specialist to promote cooperative soil studies in the field. In this program the Specialists have worked closely both in the laboratory and in the field with research men in the Department of Agricultural Chemistry and Soils.

Weed Control work made some real advance during the year with the 2,4-D weed killers. No Arizona research work was available to guide such a new program. By making use of U.S.D.A. information and by putting out field trials, however, the Specialist has been able to give direct assistance on this program to all county agent counties. While there are some limitations to the use of 2,4-D materials and while further experimental work is needed, we believe that the new products offer real possibilities in controlling several of our serious weed pests.

Cooperation with other agencies during the year has been limited to working with State and Regional offices of the Soil Conservation Service on our pasture and grass seed production programs, with the AAA as a member of its State Technical Committee, and with cotton and forage crops research workers in the Bureau of Plant Industry, Soils and Agricultural Engineering.

In the following pages are given more complete details of the writer's program as it was conducted during the past year.

STATISTICAL SUMMARY
1944-45

Month	Days on Duty		Result Dem.		Method Dem.		Other Meet.		Letters Written	Circ. Letters	News Stories	Farm Ranch Visit	Visits With Co. Workers
	Field	Office	No.	Attend.	No.	Attend.	No.	Attend.					
Dec. 1944	8	15					2	70	50	7		0	1
Jan. 1945	8½	17½					8	259	66	6		0	3
Feb.	11½	12½					14	209	56	1		7	5
Mar.	7½	17½					6	99	64	5		9	6
Apr.	6	14					1	11	99	9	1	18	5
May	13½	10½							79	6		7	6
June	9	10					2	18	38	6		9	6
July	8½	16½					1	5	60	8	1	51	5
Aug.	15½	11½			1	4	2	20	70	4	2	14	9
Sept.	11	5½	1	6			3	92	29	2		8	6
Oct.	12½	14½	1	6			2	120	101	11		45	7
Nov.	7	17	1	15			2	6				9	4
Totals	118½	162	3	27	1	4	43	909	712	65	4	177	63

II. PERSONNEL

The same Specialist, Robert L. Matlock, has been in charge of the Extension program in Agronomy from September 1, 1938, through the current report year.

III. CHANGES IN ORGANIZATION

The only change in organization of this project has been to give rather less emphasis to the soils phase during the past year than was done before E.S. Turville took over the work of Soils Specialist. All other specific crops subprojects have been continued.

IV. OUTLINE OF SUBPROJECTS

As indicated above, subproject titles have been carried this year as follows:

- A. Arizona Crop Improvement Association
- B. Cooperative Crop Demonstrations and Tests
- C. Cotton Improvement
- D. Hay and Pasture Improvement
- E. Soil Productivity and Management
- F. Weed Control
- G. Cooperation with Other Agencies

No major changes are anticipated for 1946. Crop production goals for next year are being considered by FMA through the State Technical Committee as this report is being written (December 17, 1945). Some acreage changes are probable yet major shifts seem unlikely. The production-for-war emphasis has disappeared and cotton production controls have been removed. Still such uncertain factors as water supply and labor for harvesting are likely to govern any possible changes in cotton acreage.

With rather favorable prices current for alfalfa hay and feed grains coupled with their lower labor requirement it seems likely that there may be a continued trend to increased acreages of those crops.

Data for 1945 are not available yet, but Table I indicates the relative cash income received from the major field crops during recent years.

TABLE I
CASH INCOME FROM ARIZONA FARM AND RANCH PRODUCTION
(In millions of dollars)

<u>Commodity</u>	<u>1944</u>	<u>1943</u>	<u>1934-43 av.</u>
Cotton - lint and seed	\$18.0	\$21.0	\$16.0
Alfalfa and other hay	9.0	8.0	2.9
Alfalfa and Bermuda seed	1.65	3.0	1.8
Commercial seed grains	5.0	3.0	1.1
All other, including Conservation payments	<u>90.35</u>	<u>85.0</u>	<u>46.2</u>
Total	\$124.0	\$124.0	\$68.0

V. DISCUSSION OF SUBPROJECTS

A. Arizona Crop Improvement Association

1. Factors which determined inclusion

This program continues to serve as a good basis for a crops extension program. By helping to maintain a supply of good planting seed more farmers can be influenced than by almost any other practical means. Also an association of growers offers a most satisfactory method for perpetuating improved strains and varieties as they are developed by Federal and State research workers.

2. Ultimate objectives

These are as follows:

- a. To provide a source of pure and reliable field crop seed for sale to Arizona farmers.
- b. To increase the income of Arizona farmers producing seed for sale in other states.
- c. Accomplishment of objectives is measurable in terms of the number of growers taking part in the pure seed program, and in the amount of pure seed produced.

3. Goals for the Year

	<u>1945</u> <u>Goals</u>	<u>1945</u> <u>Accomplishments</u>
Number of alfalfa pure seed growers	40	34
Acres of alfalfa pure seed	3500	3367
Number of small grain and flax pure seed growers	30	20
Acres of small grain and flax pure seed	6000	783
Number of sorghum pure seed growers	75	76
Acres sorghum pure seed	10000	9211
Number SxP Cotton pure seed growers	5	0
Acres SxP Cotton pure seed	500	0
Number Acala Cotton pure seed growers	25	37
Acres Acala Cotton pure seed	3500	6721

It is noticeable, from the above tabulation that our goals were not accomplished with respect to numbers of growers of alfalfa, small grains, and SxP cotton. Also, as a consequence, we failed to secure the acreage desired of those crops. The writer was disappointed in the small grain situation but the alfalfa picture is not serious. So far as SxP cotton is concerned, grower interest in that variety practically disappeared during this past year.

It is interesting to state that our total number of different growers of certified seed this year has been 166 or just slightly more than the 160 we had in 1944. With fewer growers of small grains, and about the same number of sorghum growers, the total increase is due to more interest in upland cotton.

Based on the calculations shown in Table II it is apparent that from our 1944 crop we had enough certified seed to plant acreage percentages in 1945 as follows: alfalfa, about 20% of new seedings; corn, about 25% of the Mexican June acreage; upland cotton, 30%; small grains, only 7%; and sorghums, 100%, with enough surplus to plant some $3\frac{1}{2}$ million acres in other states. It should be stated that a considerable amount of small grain seed eligible to certification is planted without completing certification, i.e., without getting final tags.

TABLE II
SUMMARY OF PURE SEED PROGRAM IN ARIZONA
With some comparisons

Crop and Variety	Number of		Number of		Estimated Acres Tagged Seed Would Plant
	Accepted Growers	Acres Accepted 1944	Accepted 1945	Tags Issued 1944 Crop	
<u>Alfalfa</u>					
Chilean	16	3,376	2,304	1,265	7,590
Chilean 21-5	5	173	541	315	1,890
Hairy Peruvian	6	299	411	461	2,766
Buffalo	2	0	5	0	0
Ranger	2	12	52	66	396
India	1	40	40	0	0
African	2	0	14	0	0
Ladak		6	0	2	12
Totals			<u>3,367</u>	<u>2,109</u>	<u>12,654</u>
<u>Corn</u>					
Mexican June	2	30	60	335	3,350
<u>Cotton</u>					
SXP		385	0	0	
California & Santan					
Acala	18	3,540	6,177	11,907	39,300
New Mexico 1517					
Acala	19	275	544	1,762	5,700
Totals			<u>6,721</u>	<u>13,669</u>	<u>45,000</u>
<u>Flax</u>					
Punjab	2	0	60	0	
<u>Small Grains</u>					
Arivat Barley	6	271	279	5,869	5,870
Vaughn Barley		1,725	0	6,133	6,135
California Red Oats	5	328	314	1,897	2,000
Markton Oats	4	11	75	191	200
Baart 38 wheat	1	126	37	435	450
White Federation					
wheat	1	0	16	0	0
Haanchen Barley	1	0	2	0	0
Totals			<u>783</u>	<u>14,525</u>	<u>14,655</u>
<u>Sorghums</u>					
Hegari	37	8,862	5,574	131,959	2,640,000
Double Dwarf 38					
milo	7	3,024	428	19,762	300,000
Martin	19	1,159	2,187	20,900	420,000
Plainsman	3	850	364	9,800	200,000
Early Hegari	4	95	432	2,628	55,000
Hegari 13	1	0	10	0	
Bonita	1	165	50	1,520	33,000
Imperial Kafir	1	29	35	835	16,000
Caprock	1	0	55	0	
Midland	1	0	35	0	
Sumac 1712 (Red					
Top Sorgo)	1	0	40	0	
Sweet Sudan	0	20	0	50	200
Totals			<u>9,211</u>	<u>187,454</u>	<u>3,664,200</u>



Two views showing bagging of sorghum heads at Mesa Experiment Farm to provide foundation seed for 1946 plantings.

4. Methods and Accomplishments

The Specialist serves as Secretary-Treasurer of the Crop Improvement Association, but with all funds received and disbursed by the University Business Office.

Money received by the Secretary-Treasurer from December 1, 1944, through November 30, 1945, amounted to \$7,904.35. The unencumbered balance on hand as of December 1, 1945 was \$4482.00. In addition the Association owns war bonds having a maturity value of \$1000.00.

Two important steps were taken during the year to improve our sorghum certification program. One was to make arrangements to produce at the Mesa Experiment Farm foundation seed of all our current varieties by a bagging program. As a result of that work, all paid for by the Association, we have a good supply of seed from which to grow registered seed in 1946 for general planting for certification in 1947.

The other improvement was to institute a program of a mid-summer sorghum field inspection to result in better control of Johnson grass. We believe that additional inspection has resulted in a definite improvement in our 1945 sorghum seed.

We believe that another valuable development in our program is the production of Ranger alfalfa seed for sale to Northern areas. That new variety has been developed by the U.S.D.A. and various state agencies to combat bacterial wilt, a disease causing serious losses in many states. Several hundred pounds of Arizona certified Ranger seed were produced in 1944, and a few thousand pounds in 1945. This past fall additional seed stocks were secured from Montana and by next fall we should have about 1000 acres growing to produce such seed.

We have also a small acreage of Buffalo alfalfa, another wilt resistant variety, and we hope to increase our plantings of that as soon as eligible seed stocks become available.

The writer believes that Arizona growers can be of real service to the alfalfa industry in the Northern states by producing seed of these promising and important new varieties. A strong demand exists already for Buffalo and Ranger seed, hence, our growers should find a more ready sale for them than for our standard southwestern varieties. Expansion of our program, of course, is dependent upon stocks of eligible planting seed which we have to bring in from certain Northern states.

a. Assistance given county agents might be summarized as follows:

- (1) The Specialist furnishes each agent with a list of all pure seed growers in the state.
- (2) He attempts to give an idea of the approximate acreage of the different crops needed.
- (3) He supplies the agents with information regarding carryover of various kinds of Registered and Certified seed.
- (4) He assists in supervising roguing of Registered fields, and directs and helps with field inspection of all crops in all counties.
- (5) He keeps in touch with commercial seed dealers in all counties to acquaint them with details and progress of the program.
- (6) He prepares publicity material to arouse interest in the pure seed work and to let the general public know what is being done.

b. Assistance given State and Federal agencies:

As indicated before, this program furnishes the best known medium to our State Experiment Station and to various Federal workers in perpetuating improved crop strain and varieties and in maintaining good stocks of commercial planting seed. Arizona crop production in 1945 has been lower than in 1944 but environmental factors rather than seed shortages have been responsible.

As a director in the International Crop Improvement Association the writer has had a part in carrying on a coordinated seed certification program in some 35 states. The value of that work is difficult to estimate, but it certainly has played an important part in our 1945 crop production program.

c. Teaching materials used:

Regular reports are issued to all pure seed growers covering the crops they are growing. Such reports go also to county agents and interested seed dealers.

The Specialist prepares a monthly News Letter which is issued to all certified seed growers, to seed dealers, county agents, and Federal agencies. A typical issue is presented on pages 11, 12 and 13 of this report. Through this medium the writer sends out considerable information of an agronomic nature other than just facts about seed certification.

On pages 14 and 15 are shown tabular and graphic data indicating some changes which have occurred in acreages of some of our certified crop varieties during recent years.

ARIZONA CROP IMPROVEMENT ASSOCIATION

NEWS LETTER

Vol. 5, No. 11

November, 1945

Timely Topics

Harvest Time: It's here again! The time of year when the morning air feels nippy, and a jacket feels good. Stoves are being set up, or furnaces turned on--and farm people sort of "take stock" of their year's accomplishments. Then there's deer hunting and quail shooting to help relieve the daily routine. It's a great time to be alive!

Your Sec: Has just returned from a most interesting trip over to State College, New Mexico, to have a part on the program of the annual meeting of their association.

Travelling to and from El Paso by plane I was gone from Tucson only about 48 hours. Still I spent two full half days and one night at State College, Las Cruces. We had a most interesting field trip to look over experimental work being done (with cotton) at the U.S. Field Station and the college. The New Mexico 1517 Acala is furnishing workers over there with a fine quality cotton for improvement work. Over there it opens and picks very well, yields very well, and staples out 1-1/8 inches and better.

Their big problem is verticillium wilt. Through careful selection and testing they've found some promising strains of 1517 with which to lessen the wilt damage. This next year one of those new strains will be released for increase with a few N.M.C.I.A. members.

Also on the program was Mr. R.E. Karper premier sorghum improvement worker from the Lubbock, Texas, Station. He explained the procedure followed in developing some of the varieties such as Bonita, Caprock, Early hegari, Plainsman, etc. They know what they want; they're working elaborate tricks to produce it, but Texas growers just can't be sure of producing the seed. Their weather is too tricky--and that's where we come in. Arizona has the weather for good sorghum seed production! (Karper admitted our advantage--and that's going some for a Texan!) Northwest Texas seems to prefer such varieties as Caprock, Early hegari, Mertin, and Plainsman. In that area our regular hegari is a bit uncertain. But it's well-liked still in much of that big state.

Cotton is the big crop for certification in New Mexico and their Association is doing a good job with it.

Certificates of Transfer: Please be sure to send in those report forms. Every grower must complete a set for each and every crop and for each lot of seed harvested or ginned. County agents, gins, and seed firms have the blank forms.

Final tags can't be issued until we receive the certificate--even though the seed remains at the grower's farm.

Alfalfa

Ranger Seed Here: We've received a nice stock of Montana grown registered Ranger. Some 500 acres more Ranger will be seeded in the Roll-Wellton and South Gila Valley areas this fall. Plans call for from 500 to 800 more acres to be seeded in 1946. All this increase will be seeded in rows.

Growers of this new variety must be prepared to do plenty of roguing work in January and February, 1946: Volunteer Chilean and/or Hairy Peruvian plants will soon stick their heads above the Ranger.

Buffalo No Go: Can't seem to find anyone in our seed producing area who is interested and can provide isolation for this variety. We'd like to get a Buffalo seed area in Maricopa County. Yuma County already has too many varieties of alfalfa. In that county isolation, thresher and cleaning-plant inspections are going to keep 'em busy. At various points down there we're now certifying African, Chilean, Chilean 21-5, Hairy Peruvian, India, and Ranger--that's plenty.

Buffalo offers some growers a good bet for seed production and it should produce more hay than the Ranger.

India Increase: County Agent Bob Moody reports some 780 acres of India being planted for seed mostly in Yuma Valley. Those plantings are being made from the original Sid Johnson registered seed increase.

As mentioned last month, Arizona hay growers in the lower valleys (Yuma, Maricopa, and Pinal counties) should watch with interest these non-hardy varieties such as African, India and Chilean 21-5. They show promise of being superior to Hairy Peruvian and ordinary Chilean in hay yields, and perhaps in seed setting. But they are quite distinctly winter growers and probably will be quite susceptible to winter cold injury.

Cotton

Delinting Seed: We're trying to work out a new arrangement this year for handling certified seed which goes to the acid-delinting plant at Phoenix. In past years various lots of fuzzy seed have been tested in our laboratory, final tags were issued, then the seed was delinted. That process generally changes both the germination and purity of any lot of seed--both are improved.

We believe there should be a laboratory test run on the delinted seed and that those results should be the ones shown on our final tags. This procedure may cause some delay in securing final tags but it should improve our set-up. I wish that any growers or ginners who plan to delint certified (or registered) seed would discuss this idea with their county agent and with Mr. Feffer at the Dastco plant.

Small Grains and Flax

Foundation Seed: All the Foundation Arivat and Vaughn barley have been allotted. There is still some California Red oats (about 3800 lbs.) and Markton oats (about 1200 lbs.) available at the Mesa Farm. That foundation seed is the purest seed available and I hope all of it goes out for increase. It should be planted for grain use--we don't like to have first year registered fields pastured. There's too much danger of contamination from weeds and other crops and varieties.

If you have any interest in the oats you'd better get the seed soon. With the California Red especially best yields are secured from plantings made in late November or early December.

Sorghums

Registered Seed Production: Should this important work be given some financial help by our association? The registered class of seed is basic to our certification

program. It's production has been made more difficult as we have increased the number of varieties we certify. There's the problem of providing full isolation from other varieties, the extra roguing required for some varieties, then the fact that yields may be lower than for hegari, for example, and finally the problem of knowing how much registered seed to provide for some of the out-of-state varieties.

Before long we hope to call the sorghum committee together to discuss this question. In the meantime I wish that growers who have produced registered seed in past years would study the problem. If you have any suggestions, send them to me or to your county agent. We should try to work out a better plan before the 1946 season rolls around.

Recap on 1945 Acreages: Final acreage acceptance figures, as best we can total them, are as follows:

Bonita	50	
Caprock	55	
Double Dwarf 38 Milo	428	
Early hegari	432	
Hegari	5599	
Imperial kafir	35	
Martin	2187	
Midland	35	
Plainsman	364	
Total Grain Sorghum		9185
Sumac sorgo	40	
Total sorgo		40
Grand Total		9225

We estimate that from the above acreage our growers should produce enough certified sorghum seed to plant around 4 million acres. Of course most of that acreage will be elsewhere than in Arizona.

A Real Yield: The past 2-year president of the New Mexico Crop Improvement Association operates a farm near Deming. He has been growing Early hegari--his only sorghum. He told me he had produced as much as 6,000 pounds of seed per acre and has another fine crop this year. Maybe we could learn some secrets from him--Mr. Will Haas--a premier seed grower!

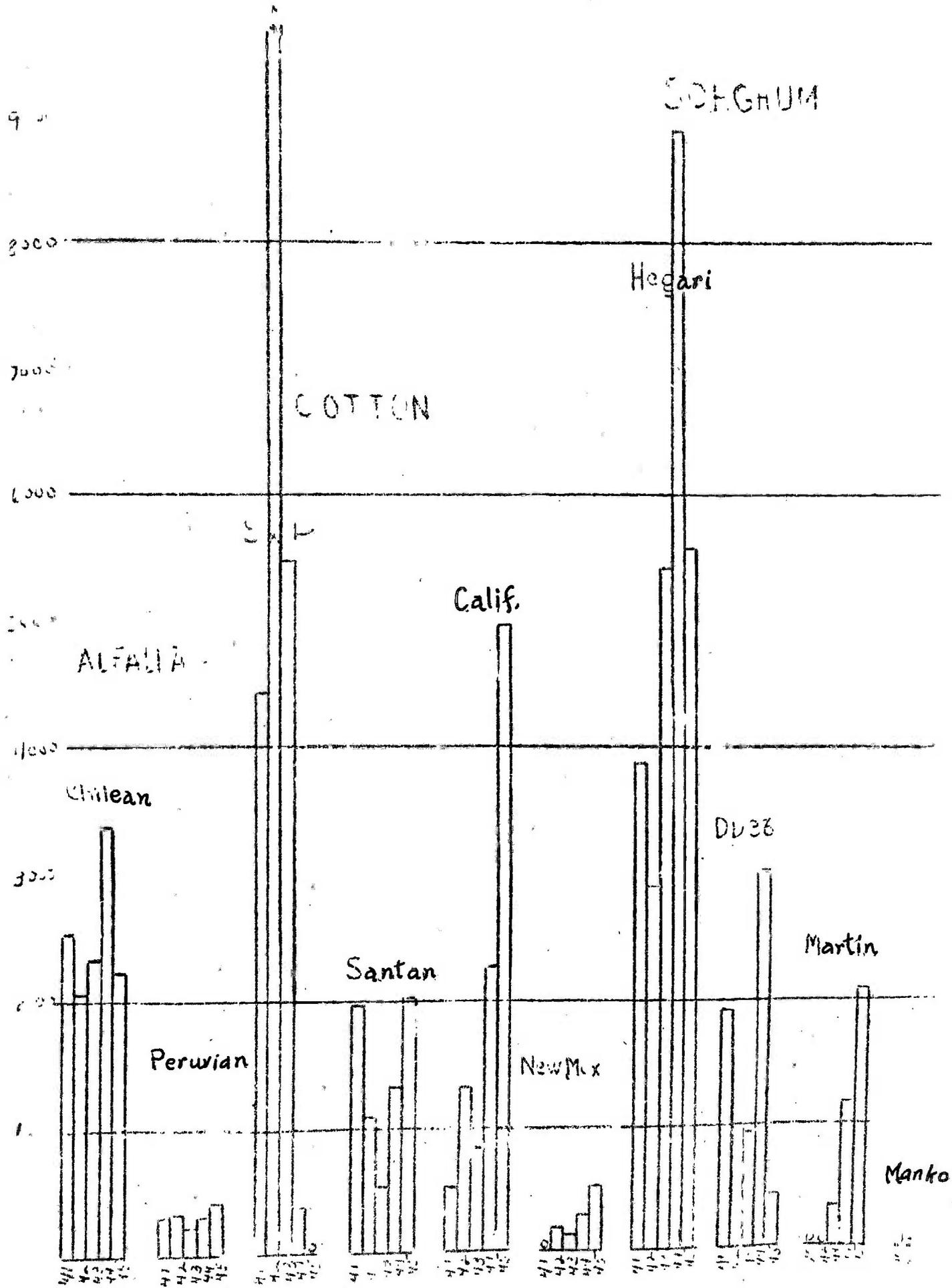
Yours for better crops,



R. L. Matlock
Secretary - Treasurer

TRENDS IN ACREAGES OF SOME CERTIFIED CROPS
IN ARIZONA
1941 -- 1945

	1941		1942		1943		1944		1945	
	Reg.	Cert.								
<u>ALFALFA</u>										
Chilean	280	2243	210	1846	234	2094	314	3062	315	1933
Chilean 21-5	85	-	-	-	-	-	75	98	116	425
Peruvian	57	249	96	217	86	140	86	220	151	255
India	-	-	-	-	-	-	40	-	40	-
Ranger	-	-	-	-	-	-	-	-	-	52
<u>COTTON</u>										
S x P	879	3571	2942	8488	2227	3270	135	251	-	-
Santan <i>Acala</i>	635	1338	374	709	329	215	401	906	1062	968
California "	25	493	-	1331	-	828	78	2205	1775	3217
New Mexico "	-	-	128	67	79	46	39	236	68	476
<u>SORGHUM</u>										
Hegari	60	3811	38	2865	60	5348	145	8727	80	5495
DD 38	89	1817	23	975	39	876	38	2966	45	383
Martin	-	-	-	-	-	306	-	1159	40	2147
Mank's Milo	7	201	27	21	-	106	-	-	-	-



B. Cooperative Crop Demonstrations and Tests

1. Factors which determined inclusion

This line of work was continued during the past year in a further effort to provide teaching information having a more wide-spread application throughout Arizona. Some lines of work can't be carried along efficiently or on a sufficient scale on the established Experiment Station farms, all of which are located in the lower irrigated valleys. Limited funds also make it impossible to conduct all types of nursery work on the farms which are maintained solely for research work.

In order to broaden the basis of checking varieties and strains, therefore, a regular attempt is made each year to make a limited number of demonstration-test plantings, especially in outlying counties. This work is always done in cooperation with Experiment Station workers.

2. Ultimate objectives

These are listed in the writer's Plan of Work as:

- a. Determine the suitability of new and improved varieties of field crops in areas not served by Experiment Station farms.
- b. Secure adoption of the new and improved varieties in areas where adapted.

3. Goals for the year

Interest was keen for this type of work again this year, particularly in hybrid corn, small grains, and sorghums. Feed production continues to be a major problem in the counties at intermediate and higher elevations. In several of those counties local feed supplies are inadequate to take care of demands from the dairy and beef cattle feeders and from poultrymen. Grains are particularly scarce and always high in price.

In his Plan of Work the writer estimated that 50 adult farmers might have a direct part in this line of work. As shown in the accompanying table, fewer growers than estimated had a direct part in our cooperative program. Many more than 50, however, will benefit from the results secured.

The following table indicates goals as set up and actual accomplishments:

TABLE III - Comparisons Between Goals Set and Actual Accomplishments, Cooperative Crop Demonstrations and Tests, 1945

<u>Crop</u>	<u>Goals Set</u>	<u>Accomplishments</u>
Alfalfa	6	3
Corn	12	10
Cotton	10	0
Small Grains	5	5
Soybeans	5	0
Sorghums	0	10

Neither growers, county agents, nor reaserch workers seemed to be interested this year in cotton or soybean trials, hence, none were made on a cooperative basis. After the Plan of Work was developed considerable interest was shown in comparing corn with the sorghums at some of the higher elevations. Because of that we put out 10 cooperative plantings.

As has been our experience in previous years several of our plantings, especially at the higher elevations, failed to mature crops which could be harvested for comparative yields.

4. Methods and Accomplishments

The Specialist worked closely with members of the Experiment Station staff and with county agents concerned in this subproject. The agents secured cooperators and made arrangements for the plantings. Research workers suggested varieties, strains, etc., and in most cases, secured seed stocks.

In several instances the Specialist worked with research men in getting plantings established, in taking notes during the growing season, and in harvesting and tabulating results.

Among the hazards encountered in our cooperative plantings this year were the following as shown by crops and by counties:

<u>County & Crop</u>	<u>Dry Seed-bed</u>	<u>Drought</u>	<u>Spring Frost</u>	<u>Animals</u>	<u>Birds</u>	<u>Stalk Borers</u>	<u>Fall Frost</u>
<u>Graham</u>							
Corn				X		X	
Sorghums					X		
<u>Cochise</u>							
Corn					X	X	
Sorghums	X				X		
<u>Gila (dry-farm)</u>							
Corn		X			X		X
Sorghums	X				X		
<u>Navajo</u>							
Corn		X					X
Sorghums	X						X
Small grains	X						X
<u>Coconino (dry-farm)</u>							
Corn	X	X		X			X
Sorghums	X	X					X
Small grains	X						
<u>Apache</u>							
Corn			X				X
Sorghums			X				
Small grains					X		X

Even though we secured usable yield data from only about 60% of our plantings, those together with observations, plant growth, etc., will make it possible for us to make some recommendations to growers. And those we make will be more sound than ones made during recent previous years. Copies of all yield data were furnished the various county agents by the research workers.

It is hoped that before next planting season a small circular can be prepared on hybrid corn for the higher elevations in Arizona. In conclusion it is worthwhile to state that in one corn planting in Cochise county 80% of the hybrids produced more than 100 bushels per acre on a uniform 14% moisture basis. Only one hybrid exceeded our old Mexican June variety. That result suggests the possibility of having our plant breeders "top-cross" a few of the best hybrids onto Mexican June.



Neighboring farmers who helped harvest hybrid corn plots at Frank Skinner ranch, Graham County, November, 1945.



Dr. T. J. Smith and County Agent A. Mark Bliss weighing hybrid corn harvest on George Anderson ranch, Cochise County, November, 1945.

Several strains yielded over 100 bushels per acre in this test.



Dr. T. J. Smith, County Agent D. W. Rogers and helper weighing hybrid corn harvest, Melvin Crosby ranch, Eagar, October, 1945.

C. Cotton Improvement

1. Factors which determined inclusion

Interest in cotton growing showed some further decline in older farming areas in 1945 - again largely as a result of anticipated harvest labor shortages. There was, however, some increase in total acreage as a result of new land development, mainly in Pinal county. The accompanying tabulations shows cotton acreage changes during the war years:

<u>Kind of Cotton</u>	<u>Arizona Cotton Acreages</u>			
	<u>1942</u>	<u>1943</u>	<u>1944</u>	<u>1945</u>
Upland	142,000	107,000	138,000	150,000
American-Egyptian	129,000	96,000	8,400	5,000

The 1944 cotton crop produced lint and seed valued at 18 million dollars or about 14.5% of the total cash value of farm and ranch products as shown in Table I. That is a drop of about 2½ percent from the previous year. Yet, in 5 counties - Pinal, Maricopa, Graham, Pima, and Greenlee - cotton still occupies a major position in our cropping program. It is probable that cotton should occupy an important place in our extension program for many years. That is especially true if we can learn how to control damaging insects and can perfect mechanical harvesting methods.

2. Ultimate Objectives

In the writer's Plan of Work, objectives in this subproject are set forth as follows:

- a. Help growers secure information to guide them in adapting their cotton production to changing market demands.
- b. To increase cotton yields and quality of Arizona upland and American-Egyptian cotton.
- c. To improve grower incomes by helping them to get the classing service and market information which will guide them in selling their crop of cotton.

3. Goals for the year

Early in the season in a meeting with cotton pure seed growers it was decided to repeat our regular series of cotton "schools" which had been discontinued in 1944. All producing counties were to be contacted in this manner.

We hoped to contact some 1300 growers through our schools and our cotton improvement group program. As Table 4 shows, however, we have only about 740 growers this year practically all of whom are members of a one-variety improvement group.

So far as is known all gins in the state are participating in the cotton classing program and they make the regular market news service available to their growers.

TABLE IV - Numbers of Growers and Bales of Cotton Classed for Organized Groups, by Counties - 1945 -46

County	No. Growers	UPLAND	
		Number of Acres Adopted Variety	No. Bales Classed through November 30
Graham	177	14098	7891
Greenlee	44	938	592
Maricopa	170	40743	12037
Pima	33	8000	4235
Pinal	273	84005	31954
Yuma	43	1308	91
Totals	740	149092	56800

AMERICAN-EGYPTIAN			
Graham	87	2987	Data not summarized.
Maricopa	21	980	
Pima	1	1000	
Totals	109	4967	

4. Methods and Accomplishments

Assistance was given to all counties in forming their one-variety community organizations. Then the writer prepared reports which were issued to county agents, ginners, group officers, finance companies, etc. to keep them informed about the quality of the current crop. A typical example of one of those reports is shown on pages 22 through 34. Comments from various sources have shown that those reports are used and well received.

For the cotton schools this year we developed a program around the idea of mechanical harvesting. Emphasis was placed on the thought that for cotton to maintain a place of major importance in Arizona, growers would have to maintain or improve lint quality. At the same time, it was pointed out, we must cheapen production further by mechanization, including use of the mechanical harvester to lessen our dependence on transient-picker labor.

The writer secured the help of other specialists from the Extension Service, the State Experiment Station, the U. S. Field Station at Sacaton, and the AAA to assist with the subject matter presentation. A film showing a mechanical harvester in operation in Arizona also was shown at all night meetings.

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
State of Arizona
Tucson

University of Arizona
College of Agriculture and
U. S. Department of Agriculture
Cooperating

Agricultural Extension Service
Agronomy

May 25, 1945

Notes on Cotton Classing
in Arizona
Upland and American-Egyptian
February, March, April and Totals of the Season, 1945

This story is one I don't like to tell. Some of you have asked for the information, however, so here it is. All of you ginners ought to study the report carefully. It contains information which may help you and your growers in the coming season.

Upland Cotton

1. This was one of the poorest crops, from the quality standpoint, that we have ever produced here in Arizona. The summary sheets by counties reveal the following:

a. Grades were generally very low. Preparation was generally good. Staple lengths were quite uniform, with most of our cotton being classed as 1-1/32 and 1-1/16 inches long.

b. On the basis of grades of White and Extra White Middling and better, on freedom from Spotted grades, and on the percentage of 1-1/16 and longer cotton, the 6 counties ranked as follows:

	<u>% Middling and better</u>	<u>Freedom from Spotted grades</u>	<u>% 1-1/16 inches and longer</u>
Graham	5th	3rd	3rd
Greenlee	1st	1st	1st
Maricopa	6th	6th	6th
Pima	4th	4th	2nd
Pinal	3rd	5th	4th
Yuma	2nd	2nd	5th

Within the counties some interesting (and puzzling) results are seen:

1. Some groups in Maricopa County had none, or very little, classed in the Strict Middling White and Extra White grades. On the other hand, 2 or 3 groups had about 20% of those superior grades.

2. In Maricopa County 2 or 3 groups had only about 1/3 of their cotton classed as Spotted, but two groups in the Chandler-Gilbert area ran to around 80% of Spotted cotton - considerably higher than the Buckeye-Litchfield area where insect damage used to be highest.

3. Staple lengths ran shorter generally in the Avondale-Buckeye-Litchfield area than elsewhere in Maricopa County.

4. In Pima County the two groups were quite different in respect to grade quality; whereas, in staple lengths there was no significant difference.

5. The Eloy area in Pinal County had less Spotted cotton than the other areas in that county, yet the whole county showed more low-grade and off-color cotton than is normal.

6. Pinal groups generally produced longer cotton than was true for Maricopa.

7. A poor showing on preparation was made by only one group in Pinal County; however, some in Maricopa had a larger proportion of below-normal preparation.

8. Graham County data throughout the season have reflected the influence of the early fall storm. White cotton was scarce and there was more Spotted than this writer has ever known for that county.

9. Staple lengths in Graham were down all year - due to the shift away from New Mexico 1517 and Coker Wilds cottons.

10. Greenlee County has been outstanding. They didn't turn out much Strict Middling cotton, but neither did they have much low-grade White or enough Spotted to mention. And please note that almost all their cotton was classed as 1-1/16 inches and longer.

11. Let's hope our record for 1945-46 will be better! It can be if we work together - and get some breaks on weather and pickers!

American-Egyptian

1. Only 2 gins in Maricopa County ginned over 100 bales of SxP! That statement shows how nearly "long staple" left the scene in Arizona last year. Pinal County had only about 200 bales classed; Pima County, 900; while in Graham there were about 3000 bales classed.

2. The largest Maricopa County group turned out almost 78% of high grade SxP, so the county average was higher than for Graham County - an unusual result.

3. Shortest SxP staples were in Maricopa County, still in Pinal there was a lower percentage which stapled 1-1/2 inches and longer.

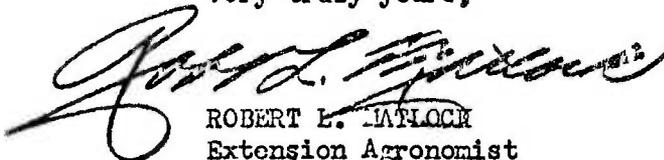
4. Graham County had the best SxP staple lengths, with about 58% in the 1-1/2 in. and longer groups.

5. Preparation of SxP was best in Maricopa and Pima Counties; however, in no case was there very much poorly prepared American-Egyptian.

* * * * *

If these reports are of any value to you, please let me know and I'll try to continue them next fall.

Very truly yours,



ROBERT L. MATLOCK
Extension Agronomist

UPLAND COTTON
MONTHLY SUMMARY CLASSIFIED
FOR COTTON IMPROVEMENT GROUPS IN YUMA

Compiled from figures released by the Phoenix Office,
Cotton and Fiber Division, F. D. A.

February - March - April - 1945

Code No.	No. of Bales	Grade and Color					Preparation		Staple Length (in inches)				
		White & Extra White		Spotted, etc.			Normal %	Below Normal %	31/32 & less %	1" & 1-1/32 %	1-1/16 & 1-3/32 %	1-1/8 & 1-5/32 %	1-3/16 & over %
		SM & above %	M & SLM %	LM & below %	M & up %	SLM & down %							
YUMA													
1													
Feb.	28	-	44.9	6.4	44.9	3.8	97.4	2.6	7.7	84.6	7.7	-	-
Mar.	None												
Apr.	None												
S T *	639	22.7	56.6	2.6	17.2	.9	99.1	.9	1.2	71.7	27.1	-	-
MARICOPA													
2													
Feb.	1041	-	.4	64.9	10.8	23.9	99.7	.3	64.8	33.1	2.1	-	-
Mar.	None												
Apr.	None												
S T	2858	-	7.2	46.3	27.8	20.7	99.6	.4	30.1	53.3	16.4	.2	-
3													
Feb.	557	.3	17.0	45.5	22.6	14.6	99.8	.2	38.2	60.3	1.5	-	-
Mar.	179	-	.6	67.0	24.0	8.4	98.9	1.1	87.2	12.8	-	-	-
Apr.	220	-	-	80.0	9.5	10.5	100.0	-	68.2	31.8	-	-	-
S T	1577	2.3	23.0	37.0	28.6	9.1	96.6	3.4	32.9	55.0	12.1	-	-
4													
Feb.	604	-	5.1	55.3	27.5	12.1	94.5	5.5	36.7	63.1	.2	-	-
Mar.	532	-	-	69.0	14.5	16.5	94.2	5.8	86.5	13.5	-	-	-
Apr.	None												
S T	2122	.1	9.2	38.5	41.5	10.6	95.4	4.6	34.4	64.0	1.6	-	-
5													
Feb.	920	-	3.6	32.7	45.0	18.7	99.8	.2	14.7	85.0	.3	-	-
Mar.	455	-	.7	30.7	13.2	55.4	100.0	-	58.7	41.3	-	-	-
Apr.	159	-	-	42.8	19.5	37.7	100.0	-	45.9	54.1	-	-	-
S T	4861	6.4	30.3	11.3	41.4	10.6	99.8	.2	9.8	67.5	22.7	-	-

* Season Total

UPLAND COTTON - February, March, April, 1945

Code No.	No. of Bales	Grade and Color					Preparation		Staple Length (in inches)				
		White & Extra White		Spotted, Etc.			Normal %	Below Normal %	31/32 & less %	1" & 1-1/32 %	1-1/16 1-3/32 %	1-1/8 & 1-5/32 %	1-3/16 & over %
		SI & above %	M & SLM %	LM & below %	M & up %	SLI & down %							
Maricopa													
Feb.	2006	-	4.7	72.3	16.6	6.4	99.4	.2	62.0	37.9	.1	-	-
Mar.	712	-	.1	53.2	43.3	3.4	100.0	-	92.3	7.7	-	-	-
Apr.	62	-	-	46.8	48.4	4.8	100.0	-	91.9	8.1	-	-	-
T	6713	1.4	22.7	33.5	39.3	3.1	99.6	.4	29.2	47.0	23.8	-	-
Feb.	441	-	-	66.9	2.5	30.6	89.1	10.9	46.7	53.3	-	-	-
Mar.	112	-	-	47.3	18.8	33.9	98.2	1.8	100.0	-	-	-	-
Apr.	None												
T	1913	2.8	16.3	24.4	40.9	15.6	86.4	13.6	17.6	69.3	13.1	-	-
Feb.	57	-	8.8	78.9	1.8	10.5	100.0	-	7.0	93.0	-	-	-
Mar.	31	-	-	93.5	-	6.5	96.8	3.2	58.1	41.9	-	-	-
Apr.	None												
T	470	22.8	24.9	19.5	30.0	2.8	99.6	.4	4.7	53.8	41.5	-	-
Feb.	130	-	36.9	6.2	53.8	3.1	100.0	-	-	84.6	15.4	-	-
Mar.	139	-	2.2	18.0	12.9	66.9	100.0	-	65.5	34.5	-	-	-
Apr.	None												
T	645	12.3	21.2	5.4	46.1	15.0	99.2	.8	14.3	74.3	11.4	-	-
Feb.	143	4.2	41.3	7.0	46.1	1.4	97.9	2.1	.9	71.3	27.8	-	-
Mar.	125	-	3.2	36.8	48.0	12.0	100.0	-	87.2	12.8	-	-	-
Apr.	None												
T	1119	18.5	29.5	5.6	42.6	3.8	97.3	2.7	11.8	55.9	32.3	-	-

UPLAND COTTON - February March, April, 1947

Code No.	No. of Bales	Grade and Color					Preparation		Staple Length (in inches)				
		White & Extra White			Spotted, Etc.		Normal	Below Normal	31/32	1" &	1-1/16	1-1/8 &	1-3/16
		SM & above	M & SLM	LM & below	M & up	SLM & down			& less	1-1/32	1-3/32	1-5/32	& over
%	%	%	%	%	%	%	%	%	%	%	%	%	
Maricopa													
14 Feb.	61	3.3	8.2	65.5	-	23.0	100.0	-	50.8	49.2	-	-	-
Mar.	6	-	-	66.7	-	33.3	100.0	-	100.0	-	-	-	-
Apr.	None												
S T	350	19.7	20.0	16.6	38.0	5.7	99.7	.3	11.1	64.3	24.6	-	-
16 Feb.	110	-	3.6	43.6	11.8	40.9	96.4	3.6	60.0	36.4	3.6	-	-
Mar.	28	-	-	10.7	-	89.3	100.0	-	71.4	29.6	-	-	-
Apr.	None												
S T	822	10.6	22.3	9.9	47.0	10.2	99.3	.7	10.5	54.0	35.5	-	-
17 Feb.	230	1.3	65.2	5.7	22.1	5.7	100.0	-	3.5	90.4	6.1	-	-
Mar.	423	-	14.4	22.5	35.9	27.2	99.5	.5	24.1	67.1	8.7	-	-
Apr.	None												
S T	1356	6.5	51.3	8.6	24.1	9.5	98.2	1.8	8.1	63.0	28.9	-	-
18 Feb.	382	-	8.9	37.2	17.0	36.9	100.0	-	14.7	69.9	15.4	-	-
Mar.	66	-	-	16.7	24.2	59.1	100.0	-	84.8	15.2	-	-	-
Apr.	None												
S T	1151	1.0	33.1	18.7	27.8	19.4	99.5	.5	9.7	53.2	37.1	-	-
20 Feb.	100	-	-	62.0	10.0	28.0	100.0	-	16.0	64.0	20.0	-	-
Mar.	649	-	-	55.2	24.5	20.5	100.0	-	93.7	6.3	-	-	-
Apr.	None												
S T	1265	-	.9	45.6	37.6	15.9	99.9	.1	50.4	39.5	10.1	-	-
22 Feb.	66	-	1.5	47.0	34.8	16.7	95.5	4.5	86.4	13.6	-	-	-
Mar.	71	-	2.8	28.2	43.7	25.3	100.0	-	85.9	14.1	-	-	-
Apr.	None												
S T	705	2.0	30.5	10.2	50.4	6.9	99.6	.4	18.9	67.1	14.0	-	-

UPLAND COTTON - February, March, April, 1945

Code No.	No. of Sales	Grade and Color					Preparation		Staple Length (in inches)					
		White & Extra White		Spotted, Etc.			Normal %	Below Normal %	31/32 & less %	1" & 1-1/32 %	1-1/16 & 1-3/32 %	1-1/8 & 1-5/32 %	1-3/4 & over %	
		SI & above %	LI & SLM %	LI & below %	LI & up %	SLI & down %								
Maricopa														
23	Feb.	23	-	8.7	65.2	-	26.1	100.0	-	69.6	30.4	-	-	-
		87	-	-	63.2	33.3	3.5	100.0	-	80.5	18.4	1.1	-	-
	Apr.	11	-	-	99.1	-	.9	100.0	-	100.0	-	-	-	-
S T		814	.9	14.5	25.3	54.3	5.0	95.9	4.1	15.8	80.0	4.2	-	-
24	Feb.	1009	-	8.0	74.3	12.9	4.8	99.6	.4	20.6	77.8	1.6	-	-
	Mar.	549	-	2.9	63.4	25.3	8.4	98.9	1.1	55.6	44.4	-	-	-
	Apr.	260	-	-	72.3	21.5	6.2	99.2	.8	59.2	40.8	-	-	-
S T		3209	.5	17.3	48.2	29.9	4.1	98.9	1.1	20.8	63.2	16.0	-	-
25	Feb.	1111	-	2.2	46.1	33.4	18.3	90.4	.6	83.7	16.3	-	-	-
	Mar.	15	-	-	66.7	-	33.3	100.0	-	100.0	-	-	-	-
	Apr.	229	-	5.2	67.7	10.9	16.2	100.0	-	66.8	33.2	-	-	-
S T		2773	3.4	11.5	24.8	50.8	9.5	94.8	5.2	43.9	54.1	2.0	-	-
26	Feb.	100	-	1.0	36.0	27.0	36.0	100.0	-	-	92.0	8.0	-	-
	Mar.	36	-	-	8.3	22.2	69.4	94.4	5.6	63.9	36.1	-	-	-
	Apr.	None												
S T		341	1.5	8.5	11.7	58.1	20.2	97.9	2.1	6.7	68.3	24.9	-	-
27	Feb.	94	-	11.7	-	19.1	69.2	100.0	-	76.6	13.8	9.6	-	-
	Mar.	40	-	-	45.0	-	55.0	100.0	-	87.5	12.5	-	-	-
	Apr.	85	-	3.5	15.3	8.2	72.9	100.0	-	75.3	24.7	-	-	-
S		364	.6	6.6	9.1	35.7	48.0	100.0	-	47.3	41.2	11.5	-	-

UPLAND COTTON - February, March, April, 1945

Code No.	No. of Bales	Grade and Color					Preparation		Staple Length (in in hes)				
		White & Extra White		Spotted, Etc.			Normal %	Below Normal %	31/32 & less %	1" & 1-1/32 %	1-1/16 & 1-3/32 %	1-1/8 & 1-5/32 %	1-3/16 & over %
		SM & above %	M & SLM %	LM & below %	M & up %	SLM & down %							
PIMA													
28 Feb.	313	-	-	63.6	6.1	30.3	99.4	.6	31.9	61.7	6.4	-	-
	37	-	-	67.6	21.6	10.8	100.0	-	8.1	83.8	8.1	-	-
Apr.	None												
S T	3876	3.1	37.3	42.3	9.2	8.1	99.4	.6	5.1	33.9	54.2	5.4	1.4
PIMA													
29 Feb.	810	-	.9	42.2	40.4	16.5	100.0	-	45.8	53.5	.7	-	-
Mar.	None												
Apr.	None												
S T	8054	11.9	21.1	21.3	42.1	3.5	99.2	.8	4.6	42.2	53.2	-	-
PINAL													
30 Feb.	797	5.3	32.4	17.1	31.9	13.3	98.4	1.6	16.9	64.2	18.8	-	-
Mar.	702	-	3.4	32.8	43.9	19.9	99.2	.8	13.8	82.5	3.7	-	-
Apr.	None												
S T	3045	13.5	25.8	15.3	36.7	8.7	98.3	1.7	7.6	56.7	35.7	-	-
PINAL													
31 Feb.	497	.3	3.2	36.2	37.2	23.1	99.7	.3	24.9	67.2	7.9	-	-
Mar.	42	-	-	2.4	59.5	38.1	100.0	-	95.2	4.8	-	-	-
Apr.	None												
S T	6545	6.6	39.4	15.8	29.0	9.2	99.5	.5	3.9	47.5	43.5	.05	-
PINAL													
Feb.	171	-	1.2	15.2	26.9	56.7	100.0	-	11.1	84.8	4.1	-	-
Mar.	52	-	-	9.6	34.6	55.8	100.0	-	17.3	76.9	5.8	-	-
Apr.	None												
S T	4339	5.4	29.8	12.7	34.8	17.3	99.3	.7	2.5	60.7	36.9	-	-
PINAL													
Feb.	249	-	36.5	16.1	41.0	6.4	99.6	.4	.4	69.5	30.1	-	-
Mar.	719	-	3.1	34.4	30.5	32.0	99.7	.3	22.1	77.7	.2	-	-
Apr.	None												
S T	3133	7.9	36.4	13.2	32.3	10.2	99.4	.6	5.1	52.7	42.2	-	-

UPLAND COTTON - February, March, April, 1945

Code No.	No. of Sales	Grade and Color					Preparation		Staple Length (in inches)					
		White & Extra White			Spotted, Etc.		Normal %	Below Normal %	31/32 & less	1" & 1-1/32	1-1/16 & 1-3/32	1-1/8 & 1-5/32	1-3/16 & over	
		SLI & above %	M & SLM %	LM & below %	M & up %	SLM & down %			%	%	%	%	%	%
Pinal														
55														
Feb.	737	-	3.5	54.8	28.6	13.1	9.6	1.4	21.7	76.8	1.5	-	-	-
Mar.	498	-	.4	73.7	3.2	22.7	97.8	2.2	51.6	48.4	-	-	-	-
Apr.	1	-	-	100.0	-	-	100.0	-	100.0	-	-	-	-	-
T	3376	8.2	25.8	34.5	24.0	7.5	96.3	3.7	13.0	52.6	34.4	-	-	-
56														
Feb.	1413	-	7.4	48.7	34.8	9.1	99.9	.1	7.3	84.6	8.1	-	-	-
Mar.	1386	-	5.5	56.2	19.2	19.1	98.9	1.1	35.6	55.5	8.9	-	-	-
Apr.	839	-	1.3	65.8	4.3	28.6	97.0	3.0	47.9	51.4	.7	-	-	-
T	5739	1.7	23.8	39.0	24.1	11.4	98.9	1.1	17.4	53.0	29.6	-	-	-
57														
Feb.	1007	-	.4	75.2	9.6	14.8	99.6	.4	53.7	46.3	-	-	-	-
Mar.	1777	-	.9	74.7	10.0	14.4	99.5	.5	39.1	59.4	.7	.7	.1	.1
Apr.	188	-	6.4	71.3	9.0	13.3	100.0	-	16.5	81.4	2.1	-	-	-
T	7309	14.5	21.9	37.6	19.4	6.6	98.4	1.6	17.3	38.3	43.6	.2	.5	.5
58														
Feb.	1613	-	15.0	4.3	70.4	10.3	99.1	.9	10.8	89.2	-	-	-	-
Mar.	1	-	-	-	100.0	-	100.0	-	-	100.0	-	-	-	-
Apr.	73	-	10.4	26.0	8.2	49.3	100.0	-	9.6	89.0	1.4	-	-	-
T	3080	10.8	29.1	4.6	50.8	1.7	99.3	.7	3.9	64.9	31.2	-	-	-
59														
Feb.	None													
Mar.	3430	-	10.2	32.3	36.0	21.4	99.2	.8	13.7	84.3	1.9	.1		
Apr.	None													
T	6597	8.7	27.4	19.5	32.5	11.9	99.2	.8	7.1	58.7	34.1	.1	-	-
60														
Feb.	1953	.1	17.8	18.9	50.8	12.4	99.9	.1	11.7	87.2	1.1	-	-	-
Mar.	686	-	4.2	24.2	39.9	31.6	99.9	.1	11.1	85.7	3.2	-	-	-
Apr.	694	-	5.0	14.4	56.5	24.1	98.3	1.4	11.4	86.7	1.9	-	-	-
T	7665	10.8	35.4	8.7	36.8	8.2	99.3	.7	5.0	51.6	40.5	.01	.01	.01

WYOMING - 1947

No. of Inches	Grade and Color					Preparation		Standard (1947)				
	White & Extra White	Spotted, etc.	Normal	Below Normal	31/32 & loss	1" & 1-1/2"	1 7/8"	2-1/2"	3"	4"		
268	-	-	20.1	31.6	40.3	100.0	-	37.8	49.0	13.2	-	-
70	-	-	8.6	57.1	34.3	100.0	-	18.6	70.0	11.4	-	-
None												
2997	14.1	44.0	7.5	27.2	7.2	99.9	1	4.6	42.5	52.9	-	-
778	-	.4	62.2	16.2	21.2	99.7	.3	26.9	72.6	.5	-	-
340	-	.2	82.4	-	17.4	100.0	-	85.6	14.4	-	-	-
None												
2770	5.0	29.1	35.7	19.8	10.4	99.6	.4	18.0	46.1	35.3	-	-

GFANIAM

103	-	11.9	42.5	26.9	18.7	100.0	-	14.5	73.6	11.9	-	-
168	.7	12.5	45.2	20.8	20.8	100.0	-	4.8	46.3	43.2	.7	-
None												
1050	6.5	46.9	21.9	19.8	4.9	99.9	.1	2.1	27.9	67.2	2.7	.7
551	-	.7	46.3	15.4	37.6	100.0	-	25.0	64.1	10.9	-	-
116	-	-	38.8	13.8	47.4	100.0	-	37.1	60.3	2.6	-	-
None												
2871	2.4	21.0	29.0	27.0	20.6	99.95	.05	6.8	49.8	13.2	2	-
532	-	2.8	61.7	14.7	20.8	99.8	.2	18.4	70.9	9.6	1.1	-
403	-	1.0	55.6	5.4	38.0	99.8	.2	29.5	56.8	7.4	6.3	-
None												
3013	.9	32.1	31.5	22.4	13.1	99.8	.2	6.0	45.3	48.1	4.5	-
321	-	.6	57.6	30.2	11.5	100.0	-	18.4	79.4	2.2	-	-
121	-	7.4	67.8	10.7	14.0	100.0	-	14.0	82.6	.8	2.6	-
None												
2404	4.1	29.0	37.7	24.3	4.9	99.95	.05	3.5	47.0	43.4	.7	-

GREEN LEE

38	-	65.8	23.7	10.5	-	97.6	2.4	-	5.3	94.7	-	-
28	-	64.3	35.7	-	-	100.0	-	-	3.6	96.4	-	-
None												
1239	7.8	64.6	5.2	2.4	-	99.8	.2	-	.6	92.1	7.7	-

UPLAND COTTON

1945 Season Totals by Counties

No. of Sales	Grade and Color					Preparation		Staple Length in inches				
	White & Extra White		Spotted, Etc.			Normal	Below Normal	31/32 & loss	1" &	1-1/16	1-1/8	1 /
	SM & above	M & SLM	LM & below	M & up	SLM & down				1-1/32	1-3/32	1-5/32	1 /
%	%	%	%	%	%	%	%	%	%	%	%	

YUMA

639	22.7	56.6	2.6	17.2	.9	99.1	.9	1.2	71.7	27.1	-	-
-----	------	------	-----	------	----	------	----	-----	------	------	---	---

MARICOPA

35428	3.6	20.5	27.7	38.3	9.9	98.2	1.8	23.85	58.0	18.1	.05	-
-------	-----	------	------	------	-----	------	-----	-------	------	------	-----	---

PIMA

11930	9.1	26.4	28.1	31.4	5.0	99.3	.7	4.8	39.5	53.5	1.7	-
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PINAL

56603	8.9	30.3	21.1	30.1	9.5	99.0	1.0	9.0	51.8	39.1	.03	-
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GRAHAM

11098	2.9	31.0	30.6	23.6	11.9	99.9	.1	5.0	43.2	50.1	1.5	-
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GREENLEE

1239	7.8	84.6	5.2	2.4	-	99.8	.2	-	0	92.1	7	-
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AMERICAN EGYPTIAN COTTON
MONTHLY SUMMARY CLASSING
FOR COTTON IMPROVEMENT GROUPS IN ARIZONA

Compiled from figures released by the Phoenix Office,
Cotton and Fiber Division, F. D. A.

February, March, April - 1945

Code No	No. of Bales	Grade				Preparation		Staple Length (in inches)				
		1 & 1½	2 & 2½	3	3½ Down	Normal & above	Below Normal	Less than 1-3/8	1-3/8	1-7/16	1-1/2	1-9/16 & longer
		%	%	%	%	%	%	%	%	%	%	%

MARICOPA

1	Feb	None										
	Mar	15	-	6.7	-	93.3	100.0	-	-	60.0	40.0	-
	Apr	21	-	-	4.8	95.2	100.0	-	-	66.7	33.3	-
	S T*	51	5.9	25.5	1.9	66.7	100.0	-	-	74.5	25.5	-
2	Feb	None										
	Mar	1	-	-	-	100.0	100.0	-	-	-	100.0	-
	Apr	None										
	S T	86	38.4	53.5	4.7	3.4	100.0	-	-	15.1	80.2	4.7
3		None since January										
	S T	89	43.8	42.7	13.5	-	100.0	-	-	3.3	74.2	22.5
4	Feb	9	-	44.4	22.2	33.3	100.0	-	-	-	100.0	-
	Mar	10	-	-	10.0	90.0	100.0	-	-	-	30.0	70.0
	Apr	None										
	S T	36	27.8	22.2	16.7	33.3	100.0	-	-	8.3	91.7	-
5	Feb	1	-	100.0	-	-	100.0	-	-	-	100.0	-
		None in Mar and Apr										
		20	-	35.0	55.0	10.0	100.0	-	-	-	85.0	15.0
		None in Feb and Mar										
	Apr	10	-	-	40.0	60.0	100.0	-	-	-	50.0	50.0
	S T	648	77.9	17.7	2.5	1.9	100.0	-	-	-	28.1	71.9
7		None since Jan										
	S T	108	70.4	18.5	9.3	1.8	100.0	-	-	19.4	68.5	12.1

* Season Total

AMERICAN EGYPTIAN COTTON
February, March, April - 1945

Code No.	No. of Balos	Grade				Preparation		Staple Length (in inches)				
		1 & 1 $\frac{1}{2}$	2 & 2 $\frac{1}{2}$	3	3 $\frac{1}{2}$ & down	Normal & above	Below Normal	Less than 1-3/8	1-3/8	1-7/16	1-1/2	1-9/16 & 1-5/8
		%	%	%	%	%	%	%	%	%	%	%
PIMA												
Feb	67	-	-	3.0	97.0	100.0	-	-	-	68.7	31.3	-
	None in Mar and Apr											
S T	906	26.0	14.5	3.1	56.4	100.0	-	-	-	45.3	54.7	-
PINAL												
9 Feb	1	-	-	-	100.0	100.0	-	-	100.0	-	-	-
	None in Mar and Apr											
S T	54	51.9	37.0	7.4	3.7	98.1	1.9	-	13.0	81.5	5.5	-
10 Feb	29	3.4	6.9	55.2	34.5	100.0	-	-	-	89.7	10.3	-
Mar	3	-	-	33.3	66.7	100.0	-	-	-	100.0	-	-
Apr	None											
S T	103	31.1	18.4	27.2	23.3	100.0	-	-	1.9	91.3	6.8	-
11 Feb	None											
Mar	38	-	-	7.9	92.1	100.0	-	-	-	94.7	5.3	-
S T	Same as Mar, only month any classed											
GRAHALL												
12 Feb	83	-	-	6.0	94.0	100.0	-	-	2.4	79.5	18.1	-
Mar	32	-	-	3.1	96.9	100.0	-	-	-	84.4	15.6	-
Apr	None											
S T	1627	2.0	25.0	27.9	45.1	100.0	-	-	.3	50.7	49.0	-
13 Feb	307	-	2.6	21.2	76.2	95.8	4.2	-	.7	73.9	25.1	-
Mar	101	-	4.9	16.8	78.2	99.9	.1	-	.1	69.3	30.6	-
Apr	None											
S T	1424	5.0	25.7	23.5	45.8	98.7	1.3	-	.2	31.5	67.4	-

AMERICAN EGYPTIAN COTTON

1945 Season Totals by Counties

No. of Bales	Grade				Preparation		Staple Length (in inches)				
	1 & 1 $\frac{1}{2}$	2 & 2 $\frac{1}{2}$	3	3 $\frac{1}{2}$ & Down	Normal & above	Below Normal	Less than 1-3/8	1-3/8	1-7/16	1-1/2	1-9/16 & longer
	%	%	%	%	%	%	%	%	%	%	%
MARICOPA											
1038	64.2	23.8	5.8	6.2	100.0	-	-	7.5	43.7	48.7	-
PIMA											
906	26.0	14.5	3.1	56.4	100.0	-	-	-	45.3	54.7	-
PINAL											
195	30.8	20.0	17.9	31.3	99.5	.5	-	4.6	89.2	6.2	-
GRAHAM											
3051	3.4	25.3	25.9	45.4	99.4	.6	-	.2	41.8	57.7	.3

At our various meetings we had an attendance of 200 people representing over 25% of the growers in 1945. Quite an active interest was shown in all ideas presented for control of lint damaging insects and in the mechanical harvesters.

A further effort to improve ginning quality was made during the early fall. A series of two meetings was arranged for in our two main producing counties. Mr. Charles A. Bennett, USDA Ginning Research Specialist from Stoneville, Mississippi, was here to help us as was Mr. A. M. Pendleton, USDA Extension Ginning Specialist, from Dallas, Texas.

Mr. Pendleton pointed out a number of general improvements that should be made in quality of ginning some of which can be influenced by the grower, such as earlier harvesting with the mechanical pickers. Mr. Bennett called attention to several improved ginning methods worked out at the Stoneville Laboratory. He discussed also current work being done in Arizona and elsewhere to determine the best way to add moisture to our very dry irrigated-area cotton to improve its ginning and spinning qualities. This moistening program seems to offer real promise in improving the spinability of our southwestern cotton.

Some 90 growers, ginners, and county agents were present at the two meetings. Particular interest was shown in the flame weeder and mechanical harvester, presented in films by Mr. Pendleton, and in the idea of adding moisture to cotton during ginning, as discussed by Mr. Bennett.

We plan to secure through Mr. Pendleton additional help from Stoneville and elsewhere for our 1946 cotton program.

D. Hay and Pasture Improvement

1. Factors which determine inclusion

"Tame Hay" has occupied some 300,000 acres of cropland in Arizona during the past year. That means that roughly 35% of our cropland has been used for hay crops. Of course the biggest share of that hay acreage is alfalfa. Other minor hay crops are Sudan grass and various small grains.

The continued emphasis on production of foods such as meat, milk, eggs, etc., coupled with the extreme labor shortage has influenced many farmers to grow hay crops. Those crops to a considerable extent in recent years have been pastured off rather than cut for hay - further to save labor.

In some sections of the state it is considered unwise to pasture alfalfa because of the bloat hazard. Mixtures of grasses and legumes, such as sweet and alsike clover, have proved successful in some of those areas so there has been considerable interest developed in our so-called permanent pasture mixtures. No data are available but it is estimated that today we have some 5,000 to 7,000 acres of such pastures, mostly at elevations above 2500 feet. At the lower elevations the water requirement of such pasture mixtures seems to be a factor limiting their use.

2. Ultimate objectives

There has been no change in the ultimate objectives of this subproject which are listed in the writer's Plan of Work as follows:

- a. Improve the financial condition of producers of hay for market purposes.
- b. Encourage practices which tend to lower costs of production without reducing the feeding quality of alfalfa hay.
- c. Develop practices which will provide satisfactory year-round pasture for the lower irrigated valleys.
- d. Provide feed for the relatively untillable land often found near the farm house site in the areas at higher elevations.
- e. Develop seed supplies for some of the new grasses found suited to range and irrigated farm use in Arizona.

3. Goals for the year

It was planned to have at least 90 farmers take part in this project during the year. According to the interest reported by county agents in 4 or 5 counties, fully that many growers have been influenced by our pasture work.

In the writer's Plan of Work a goal was set up of 20 pasture demonstrations and 40 growers of alfalfa pure seed. We have had 34 growers of certified alfalfa seed this past year plus some 15 new growers

in Yuma and Maricopa counties the past fall. With the pasture work, however, the demonstration stage seems to have been passed and the mixed pasture idea is being adopted as a result of observations made of pastures already established.



Hereford "purebreds" on irrigated grass-legume "permanent" pasture, upper Pima county, November 1945.



Hereford heifers on "permanent" grass-legume irrigated pasture near Tucson, November, 1945. This pasture consisted mainly of dallis grass, rye grass, and meadow fescue with a little sweet and bur clover, and some alfalfa.

4. Methods and Accomplishments

In order to promote the use of such new wilt resistant alfalfa as Buffalo and Ranger, seed of those varieties was secured and sent to county agents in 5 counties where wilt is a menace and where such hardy varieties are adapted. Along with those will be planted 3 or 4 of our southwestern non-hardy varieties, such as Chilean 21-5, African, and India. A considerable acreage of those latter varieties has been planted for seed production in Yuma county. We need definite information regarding the suitability of those varieties to our cold-winter areas where some of the seed may be sold.

During the early summer the writer secured the cooperation of the local Soil Conservation Nursery Manager to check over and revise our pasture-mixture recommendations for 1945 plantings. Those recommendations were drawn up for 5 different irrigated areas based on elevation and for one dry farm area.

The recommended mixtures were dittoed and copies sent to county agents, seed dealers, Soil Conservation and AAA offices as well as to several growers who wrote in or called on the writer personally.

In August the Specialist prepared an article concerned with pasture production and it was published in the Arizona Farmer. (See pages 40 and 41.)

Only a few growers have been interested in the grass seed production program. Some of those who have made plantings of grasses such as *Eragrostis curvula*, *E. lehmanniana*, *Bromus unioloides*, and *Phalaris tuberosa*, have found a ready sale for the seed produced. The enterprise is new and different, however, and it has been difficult during the war period to interest farmers in uncertain programs.

Arizona can produce high quality seed of many things and with the growing interest in range and pasture seeding, probably this seed production program should be stressed more.

Again this year the writer was called on by the Dairy Specialist to help with the 8-Point Dairy Program. The first point in that program was "Grow an Abundance of High Quality Roughage". Another was "Take Care of Your Land". For those two the writer prepared both a radio script and an article for publication in Arizona Farmer. (See page 42.)

A brief statement in those two subjects also was prepared for inclusion by Mr. Van Sant, Dairy Specialist, in the folder shown on page 43.

It is believed by the writer that perhaps his most important contribution to this subproject was accomplished in connection with the Annual Extension Conference. One full day of the conference was devoted to a consideration of problems on alfalfa. The problems were collected and classified into subject matter fields. Then well in advance of the conference the problems were turned over to various members of the Experiment Station staff for solution and discussion with the Extension workers.

Some of the problems could not be answered and incomplete answers were available for others. A committee of Extension and Experiment Station workers summarized the discussions and listed problems on alfalfa which seemed to call for further experimental work. It is thought that much benefit to our extension program can grow out of this cooperative effort between the two divisions of our College of Agriculture.

It's Pasture Planting Time

By R. L. MATLOCK
(Extension Agronomist)

INTEREST in pasture crops is growing among Arizona farmers. Scarcely a week passes that the writer



does not get a phone call, an office call, or a letter from someone wanting to get "the dope" about pastures. Included in those interested are cattlemen who have farmland, dairymen, and suburban farmers who have just a cow or

two and a small acreage.

I'm still a pasture enthusiast myself. After a few years of rather close contact with the pasture program, however, I realize we haven't all the answers yet — not by any means. Some of the questions go like this:

1. Should I try some permanent pasture?
2. When shall I plant?
3. How should it be planted?
4. Where can I get the seed?
5. How much does it cost?
6. How should I irrigate?
7. Is irrigating all I have to do after I get the pasture started?

As best I can, I'll give our answers to some of those questions. Further experimenting and experience is necessary before good, sound answers can be given to all the questions you growers can ask.

First of all—I believe this: If you have a reasonably good year-round water supply, you can do a satisfactory job of growing a permanent pasture. I should emphasize the fact that to produce feed practically every month in the year, as can be done in our lowest valleys, requires a good bit of water. Frequently irrigation is necessary; but if you have your land properly prepared, you won't need a lot of water at any one irrigation. Most of the species included in our irrigated mixtures love plenty of water, but they're quite shallow-rooted. On the average a 2 to 3-foot penetration is plenty.

For most soils an irrigation every two weeks during the summer is enough. Light soils may need water more frequently—heavy soils may go longer.

Planting

Planting time is a very important factor in your success. For the lower areas our mixtures contain both summer and winter growing species. It's something of a problem to seed early enough in the fall to get the summer growers started, yet late enough to avoid starting too much Bermuda grass, seed of which lies in most of our fields, and late enough to strike weather cool enough to germinate the winter growers. I'll not attempt to tell you in this article what we consider best seeding dates for all areas in the state. For that, and other specific questions, you had better talk with your county agent or with Soil Conservation workers.

Some growers have tried a suggestion we offered last year, namely, to plant dallis grass, the main summer grower in the low valley mixtures in midsummer in rows 24 to 30 inches apart. Then in the fall they broadcast in the other species. With that plan the dallis grass probably would have to be cultivated a few times to keep down weeds. That cultivation would leave a prepared seedbed for the fall seeding. Just broadcast the other seed and harrow or cultipack afterwards.

Planting method also may be very important. There is some indication that flat planting with border checks may not be too satisfactory. On some soils you may find it much easier to get a stand by broadcasting the seed on a furrowed or bedded seedbed. To do that, I suggest you prepare fairly shallow beds (not over 5 or 6 inches for most soils), and with a top width of 12 to 18 inches, depending on the "subbing" properties of your soil. Then run a cultipacker across the beds to firm them, scatter the seed, then cover it just with another cross-bed cultipacking.

Irrigation Tips

Pasture management is something each grower must learn for himself. In the first place, you should plan to be able to divide your pasture into several fields—at least three and perhaps more, depending on its size and on the number of animals you expect to pasture. By having a divided field you can handle the irrigating much better.

If you have to irrigate after seeding, as you no doubt will, the furrows will help you control the water. Run it slowly to avoid washing away the seed.

It is my belief, and experience, that a field for a pasture should have quite a little more fall or slope than for practically any other crop we grow. Remember, frequent, rather light irrigating is what is wanted. Now if you have the land too flat, then get a good stand of grass, you'll

find it takes lots of "push" to get the water through. Of course, if you have quite a fall, you'll have to be very careful with your first waterings not to use too big a head or you'll wash out furrows and seed.

Seed Costs and Sources

Seed costs per acre are rather high. I haven't learned yet how much the prices will be for this season. Last year, however, per acre costs ranged from about \$10 to \$14 for seed. That is for our recommended Arizona mixtures and we have found them quite satisfactory. Several firms in Salt River Valley and perhaps others in outlying counties will be able to furnish reliable seed at reasonable prices. Some growers, of course, may prefer to pay much higher prices for highly advertised seed from out-of-state sources.

Fertility Needs

To grow a lot of feed you need plenty of plant food as well as lots of water. A good application of manure (7 or 8 tons per acre) and superphosphate (100 pounds treble super or its equivalent) before seeding will pay on most soils. The manure will feed all the plants and improve the soil structure. The phosphate will help the legumes especially. To spread manure and phosphate together is one of the best ways to get most good out of both fertilizers.

Nitrogen for pastures can be recommended for almost any conditions. It really boosts the grasses, especially during cool weather. An early fall and an early spring application of 20 to 30 pounds of nitrogen can be counted on to more than pay for itself. Most commercial nitrogen fertilizers can be applied to pastures through the irrigation water, or of course they can be spread broadcast and followed by an irrigation. If not washed off the plants fairly promptly, the dry nitrogen fertilizers may cause some leaf burning.

Another idea: plan to harrow your pasture a few times a year to break up and spread animal droppings. Do that after an irrigation and you'll find it works—and it pays.

Management Hints

By all means rotate your animals from one part of the pasture to another. Use temporary (electric) fences and you'll be repaid. If you can throw several animals onto a fairly small area, they'll eat the feed off quickly with less waste from trampling. Also they'll graze the feed off more evenly which they won't do if they run over too large an area.

Without doubt you'll find it pays to mow your pasture. Of course, you may have to cut off a hay crop during the peak-growth season should you find you have too much feed. But in any event, you'll have some weeds. The animals probably won't eat them and unless you mow 'em they'll go to seed. You may need to mow it once in early spring, again in late summer. Even though you have few weeds, mowing may prove very helpful to keep all species in the mixture growing at a more uniform rate.

Don't wait too long to begin grazing. If the average height is from 8 to 10 inches the crop is ready for pasturing. Remember, young plant growth is more palatable and far richer in nutrients than is old, mature growth.

On the other hand, don't let the pasture be grazed down too short. ~~Over-close~~ grazing weakens the plants, makes them slow to recover, and gives weeds their opening to invade the stand.

Don't let stock run on the field when it is sticky-wet from irrigation or rain. Use of divided fields will help you to avoid soil puddling. Take stock off a field, irrigate it, let it dry up and regrow, then turn back onto it.

Questions Invited

I hope I may have answered some of your questions about permanent pastures in Arizona. I'd like to see more pastures used. Pasture farming saves labor, improves land, provides better feed. Interested readers are invited to contact their county agents, Soil Conservation men, or the writer for more specific information.

Plenty Feed, Mr. Dairyman!

By ROBERT L. MATLOCK
(Extension Agronomist)

WORD comes to me from Extension Dairy Specialist Ralph VanSant that we have another 8-Point Dairy Program for 1945. I'm not much of a dairyman, but every one of those eight points sounds sensible to me.



The lead-off point is: Grow an Abundance of High-Quality Roughage. Now you dairymen don't have to be told how im-

portant that is. You know that you can't produce a lot of milk from hungry cows. Nor can you get a good milk flow from low-quality feed.

What I'd like to emphasize is that you can do a bigger and better job of growing high-quality roughage, in Southern Arizona especially, than can dairymen in almost any other state. That's a real advantage.

In the following outline I'll try to give some ideas about the Why, What and How of growing an abundance of good roughage. The ideas may fit best in the southern counties, but that's where most of our milk is produced.

The Why of Point No. 1

First and foremost, our country needs more milk. But for Dairymen Brown and Jones there must be some profit in the business, or else (just period). High-quality roughage will spell profit for you.

Roughage includes all sorts of coarse feeds. For the profit-producing Arizona dairy cow it ought to include mainly food alfalfa, good pasturage, and good ensilage. Probably some dairymen will argue that they don't need all three kinds. That may be true, but I know they're all good milk-makers. I'll leave it to Ralph to carry on my argument for and

against the Big 3:

ALFALFA—From ⁶⁰ 300 acres we can expect a hay crop of 300 tons a year, or enough for 60 cows. This will not allow much pasturing of your alfalfa.

PASTURE (temporary)—For summer, Sudan grass. For winter, oats and Hubam clover; barley and Hubam; annual ryegrass and Hubam.

PASTURE—(permanent) — Up to 2,000 feet, Arizona No. 1 mixture; 2,000 to 3,600 feet, Arizona No. 2; 3,600 to 5,000, Arizona No. 3; 5,000 and above, Arizona No. 4.

ENSILAGE — Below 4,500 feet, hegarí will yield 12 to 15 tons an acre on good land. Manko is liked by some at 3,000 to 3,600 feet. Sorghos are more certain than grain sorghums above 4,500 feet. Atlas is about like hegarí in yield and miscellaneous "cane" will yield eight to twelve tons. Corn is generally better than sorghums above 3,000 feet. Plant Mexican June below 3,600, other varieties at higher elevations.

How to Grow 'Em

I've heard it said that few dairymen are good farmers. That statement I doubt. But to do a good job with this feed production program, you must do some figuring and planning. You must feed and manage your land just as you feed and manage those 10,000-pound cows.

If questions are raised by some of my "how to grow it" suggestions, your county agent will do his best to help you. If I can help you with anything, write or call on me at the University of Arizona.

ALFALFA—Get and maintain a good stand by planting clean, adapted seed in a firm, fertile seedbed. If possible, spread eight to ten tons of manure in advance. Apply phosphate to many soils. Don't pasture, except to graze off low-quality mid-winter and midsummer growth. Cut at the one-fourth bloom stage. Rake and cure quickly. Bale so as to hold leaves . . . Top-dress with manure in winter and perhaps with phosphate and/or nitrogen fertilizer. (Some evidence indicates that it may be best to use manure on Sudan grass and small grain pastures ahead of alfalfa). Fill the soil with water in winter.

PASTURE (summer)—Sudan grass is hard to beat and it responds to high fertility. Plant 25 to 35 pounds of seed per acre. Make two or three plantings to provide best grazing through summer and early fall. Don't plant until the nights produce no frost. On fertile land plan on about 10 acres for 15 mature cows. Divide the pasture and graze in rotation. Young growth is highest in protein, so graze when eight to fifteen inches tall.

PASTURE (winter, spring)—Oats are the best of the small grains and Markton is the best pasture oat. Plant Sept. 20-25 in Salt River Valley, earlier at higher elevations. By planting a second field in the valley about Jan. 15, we can provide grazing until the first Sudan is ready. Oats or Vaughn barley and Hubam clover can be planted together (75 pounds grain, 6 to 8 pounds clover) in early fall. When well handled, clover will provide grazing well into the summer. Practice the same grazing system as for Sudan . . . Annual ryegrass (10 pounds) and Hubam (8 pounds) make a good mixture for late September plantings in Salt River Valley . . . Any of these pasture crops will respond to manure and some use commercial nitrogen successfully.

PASTURE (permanent)—We don't know how long these mixtures will last, but with good management and plenty of water they should last several years. Our standard Arizona mixes are as good as any we've seen and are cheaper than some commercial mixes. Plant as early in the fall as possible—on or before Oct. 1 in Salt River Valley. Get planting, irrigation and management information from the local county agent. Every dairyman up to about 4,500 feet, with a good water supply, should try a small permanent pasture planting.

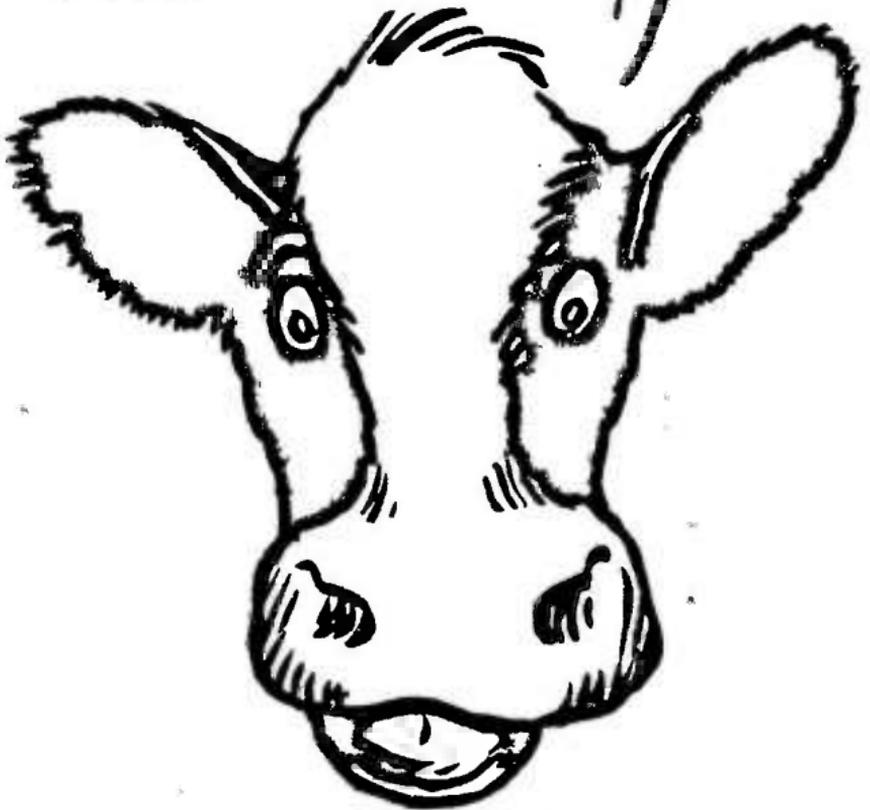
ENSILAGE—This is the answer to a hungry cow's prayer, a basic feed in any good dairy program. Corn ensilage is excellent where corn grows well. Sorghums have distinct advantages in the lower valleys. An acre of good corn or sorghum should provide enough ensilage for two cows every day in the year . . . Your county agent can help you decide what variety to plant . . . Buying silage may be practical if it can be put into the silo at one-third the price of good alfalfa hay.

What Will Happen

Do you know what I think, Arizona dairymen? I think that if only 25% of you will adopt this high-quality roughage program, Arizona will go over the top in a big way in 1945.

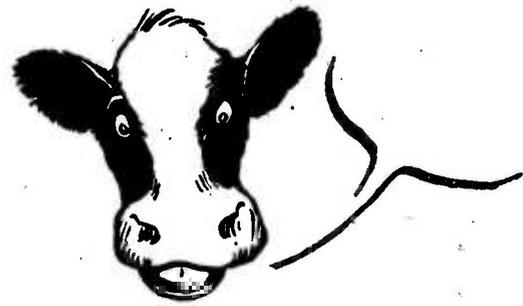
To YOU
Arizona Dairyman

This **8-POINT**
DAIRY PROGRAM
means something!



EFFICIENCY PAYS

Cooperative Extension Work in Agriculture and Home Economics, the University of Arizona College of Agriculture and U. S. Department of Agriculture Cooperating.



It means **MORE MONEY** for **YOU**

▲ ▲ ▲ follow this **8-POINT** dairy program.

1. GROW PLENTY OF HIGH-QUALITY ROUGHAGE

You've got some good cows, have you? Okay! But if they're really good, they're always hungry! Do your part and they'll make the milk.

In our warm valleys in Arizona you can do a topnotch job of producing high-quality roughage. Most of our land is productive and you can make it better. You have soil moisture pretty well under your control. And who could ask for better growing weather than



we have for most of the year?

Alfalfa (for hay and some pasture), pasture crops, and ensilage . . . those three basic roughages . . . can be grown readily and of high quality in most of Arizona.

But remember — a good cow is like a good engine — she'll perform much better on good fuel. And your roughage will do a better job of keeping your herd healthy and productive if you do these things:

- (1) Produce clean, carly-cut, well-cured alfalfa hay.

- (2) Provide some young growth pasture (grasses and legumes) for every month in the year.
- (3) Grow (or buy) enough ensilage to feed from 15 to 30 pounds per day to each of your milking herd during the whole lactation period.

2. BALANCE YOUR HERD WITH YOUR FEED SUPPLY

That is a sound piece of advice. Fewer well-fed cows will produce more milk than a larger number poorly fed. Produce all the feed that you can and keep enough good cows to eat this feed. If the farm does not produce enough feed for the dairy herd, then buy it at harvest time. Every dairyman in Arizona should have 2 to 3 tons



of first or second cutting alfalfa hay in storage for each cow in the herd on the first day of October each year. Also, have local grown grains in storage to meet the needs from harvest to harvest. Provide ensilage: this is a basic feed in any good

feeding program and an excellent supplement when pastures are short. Cull the herd and feed the balance better.

3. KEEP PRODUCTION RECORDS ON EACH COW IN YOUR HERD

From the records of the Arizona Dairy Herd Improvement Association we have learned much regarding programs in the feeding and breeding of dairy cattle that are so essential for efficient



production. You, too, by weighing each cow's milk during a 24-hour period once each month, can get the information needed to determine the amount of grain feed required by each cow according to the amount of milk she is producing. This saves feed and increases the production of the herd.

Production Records will point out the poor producers that do not earn their feed. The less feed you waste in raising and supporting poor producers, the more profit you will show at the end of the year. It will give you the facts you need to plan the breeding of better cows.

4. PRACTICE DISEASE CONTROL METHODS

Healthy cows produce more and better milk. Keep careful check on all udders and separate



immediately all cows producing abnormal milk. Sanitation and isolation are absolutely necessary to control udder diseases. Watch feeding carefully and treat immediately all cattle off feed. It pays to anticipate troubles and prevent them. Treating requires time and lowers milk production.

5. PRODUCE MILK AND CREAM OF THE HIGHEST QUALITY

The essentials for producing good quality milk and cream are healthy cows, sanitation, good feed, prompt and efficient cooling, and frequent delivery. Good quality milk is essential for the production of high quality dairy products. Milk products must be of good quality to withstand the severe condi-

tions of transit and long storage for overseas shipment to our armed forces.



Better quality will increase consumption. Quality products command higher prices. Poor quality products must compete in price with substitutes that sell at a much lower price per pound. The prosperity of the dairy industry in Arizona is dependent upon qual-

ity milk and milk products.

6. ADOPT LABOR-SAVING METHODS

Next to the cost of feed, labor is the most expensive item in the cost of milk production.

It is often possible to save time by improvement of working methods and rearrangement of facilities. Every time a useless step can be eliminated, or a short cut found, it contributes to more profitable production. Better knowledge of improved methods of feeding, milking, and managing the herd saves time and labor.



7. TAKE CARE OF YOUR LAND

Arizona dairymen . . . think of your land in terms of this exclamation . . . **For Land's Sake, Use Manure!** About the only soil treatment agreed on by all research workers in Arizona is the use of manures.

Both animal manure and green manure (cover crops) are available or can be obtained on most every dairy farm.

Good water penetration is the greatest single factor limiting crop yields on much of your land. Nothing will do more to help get water into your soil than the regular addition of organic materials.

Plan and carry out a good program of adding organic materials and you'll be gratified with the results.

Improved soil tilth adds up to: bigger yields, better feed quality and lower all-around costs of producing milk.



8. DEVELOP A SOUND BREEDING PROGRAM

High producing cows make more money than low producers. Increased returns will result from a steadily improved herd. The best way to build a good herd and to be certain of good replacements is through a breeding program based on production

records. Good proved sires are best if they can be owned or if their services can be obtained. The next best alternative is the son of a good proved sire out of a high producing cow. Also . . . save only the heifers from the upper

half of the herd for replacements and feed them well for proper development.



Prepared by W. R. VanSant, Specialist in Poultry and Dairying; R. L. Matlock, Specialist in Agronomy; and Donald Hitch, Acting Specialist in Irrigation, Agricultural Extension Service, University of Arizona.

E. Soil Productivity and Management

1. Factors which determined inclusion

This subproject has undergone some change in emphasis during the year because most of the soils work was transferred to Specialist Turville. There remains a need for the Agronomy Specialist, however, to give some attention to the soil management phases. It is, of course, both impossible and impractical to dissociate completely the crop from the soil on which it is grown. Because we believe that is true the writer will continue to work closely with the Soils Specialist.

As has been indicated in previous reports, many soils problems are peculiar to our semi-desert areas. Much laboratory research work has been done, in Arizona and elsewhere, but in many cases that work has not been proved in the field. The specialist in crops and soils can and should help research men and county agents to carry out the needed field test-demonstrations.

Problems needing special attention have to do with the use of commercial fertilizers; with use of gypsum, sulfur, and manures as improvers of soil structure; and with tillage as it influences soil structure and thereby water penetration on our irrigated soils.

Crop response is the only complete measure of soil condition. If that idea is accepted, there must be a place for some soils work in an Extension Agronomist's program.

2. Ultimate objectives

Through work on this subproject the writer hopes to accomplish the following things:

To increase soil productivity by:

- a. Encouraging the adoption of better crop rotations.
- b. The use of more legume crops.
- c. Greater use of green manure and cover crops.
- d. More effective use of animal manures.
- e. Help answer problems in the use of commercial fertilizers.

3. Goals for the year

No specific numerical goals were set up for this subproject in the Plan of Work other than to suggest that 25 adult farmers would take part in soil management work. That goal was not reached but several soils study projects were started in three counties using various soil amendments. Several agents were helped also to establish commercial fertilizer demonstration-tests on alfalfa, pastures, and corn.

4. Methods and Accomplishments

Early in the year a series of meetings was held in two of the northern counties. Problems in soil management were discussed by the Agronomy Specialist while the Specialist in Horticulture and Livestock

discussed subject matter in their respective fields. The writer emphasized the basic importance of soil structure in any cropping program. Then the part that organic matter plays in improving soil structure was discussed.

A question and answer period revealed there was considerable interest in the problem of soil improvement especially in areas where water penetration is a problem.

In one county interest was aroused in the idea of irrigating during the winter months using the soil as a storage reservoir at a time when water is more readily available. The writer was asked to come back during the summer with Karl Harris, Irrigation Engineer, to discuss features of the plan further with the directors of the local irrigation district.

During the year the writer held several conferences with Specialist Turville to discuss the progress of special soil projects set up in Cochise and Navajo counties. In those projects, as mentioned earlier, an attempt is being made to determine the effectiveness of various soil amendments on water penetration on certain tight-soil areas.

Another bit of soils work done by the writer was in connection with the Dairy Specialists' 8-Point Dairy Program, referred to before. The accompanying article was prepared on the subject "Take Care of Your Land" and issued in Arizona Farmer. At the same time a radio script was prepared and broadcast with the help of a prominent dairyman and the Arizona Farmer editor.

Take Care of Your Land

By R. L. MATLOCK
(Extension Agronomist)

THIS has to do with Point No. 7 in the 1945 8-point Dairy Program. That point says: "Take care of your land!"



Have you realized that your soil is the very foundation of your dairy business? I'm sure that statement is correct for most of our Arizona dairymen. The idea surely fits with the 1945 Dairy slogan—Efficiency Pays.

You ask, how come? Here's how: When you lower the cost of producing a product like milk, you increase your chance of making a profit. Several factors enter into the cost of producing milk. One of the most important is feed costs—roughly 60% of the total.

I'm not sure, but I suppose most of you Arizona dairymen grow a major part of the feed you use. And you recognize that home-grown feed is cheaper than feed you buy. Of course, it takes labor to grow and harvest feed, but isn't labor the key word in dairying anyhow?

Hence, if you can do something to produce more feed from the same acreage of land and without using a lot more labor, you will increase your efficiency. Probably you will profit by doing it. One of the easiest ways to increase feed production is to do a better job of cropping. And you can't do a good job of producing crops unless you take care of your land!

Land Management

Often you dairy farmers find yourselves located on land that is hard to handle and not too well suited to general cropping. Such land may be too heavy or too light for some of our Arizona crops. With good management, however, most of our irrigated land can be made to produce abundant yields of your basic feed crops. I consider your basic crops to be alfalfa, grain sorghum, small grains, such as oats and barley, and pastures.

In the Extension Folder W-42 prepared for the 8-point program by Ralph Van Sant, dairy specialist, the following was stated: "Good water penetration is the greatest single factor limiting crop yields on much of our land." Now you dairymen have at hand the best aid to good water penetration. That aid is manure.

Animal manure and green crop manure are our best remedies for tight, dense soils. When plowed or worked into the soil, those substances serve many useful purposes. They furnish food for many helpful types of soil bacteria. The bacteria help to break down the organic materials. Plant foods are released from the material plowed down and acids are formed. Those acids improve the soil reaction, help produce a better soil structure, and they release plant foods held in an insoluble form in the soil. The humus produced as a product of organic decay gives the soil a better tilth and helps decidedly in getting water to soak into the soil root zone.

Every dairymen should work toward the idea of soil improvement for each acre of his land every year. Fields growing alfalfa are being improved in their organic matter content. For fields not in alfalfa, you should try to turn under some crop green manure or six to eight tons of animal manure per acre each year.

Pasture and Plow Down

Sweetclover can be grown for pasture, seeded in the fall with small grain or annual ryegrass. Then in the late spring when there is six to ten inches of refuse growth, that can be turned under to be followed by the sorghum crop. I know a few dairymen who are using this plan very successfully.

In the summer Sudan grass can be used much the same way. It can be allowed to grow back 10 to 12 inches high in late August. Then it can be followed with oats or barley and sweetclover for winter pasture. When turning under the Sudan, it may be found helpful to add 150 pounds per acre of some simple nitrogen fertilizer.

Each mature cow in your herd produces around six tons of manure yearly. Much of that, of course, is dropped

on the pastures and not lost. That part collected in barns and feed lots should be spread regularly, preferably with a manure spreader. When well distributed at six to eight tons per acre with a spreader it can be put on pasture or newly cut hay fields without spoiling the growing crop. And probably no crops respond better to manure than do hay and pasture crops.

If you have 50 to 60 cows in your herd, you should be able to cover 30 or 40 acres of your land each year. That, together with some alfalfa sod

turned under most every year and pasture refuse as mentioned above, should result in a constant improvement in your cropping program.

Experience and experiment have shown that better crop yields are secured after using land for pasture crops. The benefit probably is due to several factors. Some of it comes from the fresh, green material turned under; some, no doubt, is from the large amount of organic material of the roots. Then the effect of certain grasses on soil salts and alkali may be highly important.

In any event, you dairymen should plan your cropping program with the idea of rotating the crops. Grow alfalfa on a field three or four years, then use that field for grain crops or pasture, and move the alfalfa to another field. Don't keep the same field in pasture all the time just because it is handy to your corrals and milk barns.

Good Soil and Feed Quality

A point to consider in this discussion is the effect of high soil fertility on feed quality. Not much is known about the subject, but experimental work is being done on it all over the U. S.

It is known that the protein and phosphorus content of certain feed crops can be increased by applying phosphate fertilizers. That result has been had with alfalfa here in Arizona. To obtain such results would mean less alfalfa hay to provide the same amount of the highly important proteins, and hence, less need to buy protein concentrates.

Probably the same situation holds for other important feed constituents, such as minerals and vitamins.

Under some soil conditions you may find it extremely helpful to use some form of commercial fertilizer to boost both yields and quality.

Phosphates frequently have increased alfalfa yields and nitrogen fertilizers give good results on winter grains. Some growers seem to have had good results from using nitrogen on alfalfa and on grain sorghums. In general, however, the use of nitrogen on summer-growing crops to date, has not been so successful. We may need to find better methods or a better time to apply that plant nutrient.

Conclusion

Just to sum it all up in simple terms, Mr. Dairyman, feed your land better. It will feed your cows better, then your cows will feed you, and your family better.

F. Weed Control

1. Factors which determined inclusion

Among crop hazards in Arizona weeds continue to occupy a major position. As one result of more pasturing of alfalfa and small grain many troublesome annual and perennial weeds have become more abundant. Furthermore, labor has been lacking to do as much hand cutting and hoeing of weeds as had been done in earlier years.

During the past year the plant hormone material known as 2,4-D has come into the market as a weed killer. Several firms are offering this material under a variety of trade names and great claims have been made for them. That situation has made it necessary for us to conduct test-demonstrations on their use in the field.

The 2,4-D material seems to be ineffective on narrow-leaved grass-type plants. Because of that they are being tried in a selective capacity on weeds occurring in small grains, lawns, etc. It has been found, however, that there are some definite hazards in using the 2,4-D products and objective experience is needed to guide users.

2. Ultimate objectives

The long-time objective in this subproject is to institute effective and practical weed control measures so as to decrease production costs, increase crop yields, improve quality, and give farmers more satisfaction from their operations.

3. Goals for the year

We planned to contact 30 adult farmers in this sub-project during the year and to establish at least 10 weed control demonstrations. Every county-agent county was sent one or more samples of 2,4-D material and demonstrations were set up in all of those counties.

Some 20 or 25 different weed species were treated in the various counties with especial attention being given to such perennial noxious weeds as field bindweed, white horse nettle, Russian knapweed, Blue Sunflower, and Perennial ragweed.

4. Methods and Accomplishments

The whole weed control program was discussed with all county agents at the district conferences. At that time the writer handed out a circular which he had compiled from his own experiences in using 2,4-D materials and from other State and Federal workers. That material was discussed with the agents and plans were made for setting up control demonstrations. A sprayer was purchased for the Specialists' use and trips were made to seven counties to assist the agents select and establish control plots. Some 18 or 20 demonstrations were carried out with Specialist assistance and many others were set up by the agents themselves.

Reference was made several times during the year in the Crop Improvement News Letter to the new materials and methods being tried for weed control.

According to reports which have been received the 2,4-D products show real promise, still they have their limitations. It appears likely, for example, that at least two treatments may be needed for some of the deep-rooted perennials - all plants may not be killed with one treatment and/or new plants may arise from seeds or from underground root parts.

One of the very urgent needs in weed control is in the flax crop in Yuma county. There much trouble is experienced from a species of knotweed (*Polygonum* spp.) which germinates along with the flax and frequently by harvest time grows above the flax. It competes seriously with the flax, of course, for water, plant food and sunlight. Then at harvest time it delays maturity of the flax and causes losses in combine harvesting.

Considerable effort was made to control the weed by spraying the plants with Sinox and various other selectives. Flax, of course, has a more or less broad leaf but the leaf is quite waxy so the spray materials seem to affect it but little. The knotweed can be killed but to be effective the plants must be sprayed while they are quite young and small.

Some large acreages were treated with Sinox in Yuma county last spring, a few effectively, but with others results were disappointing, probably because the knotweed was too far advanced when sprayed. This program should receive more attention in 1946 if the flax crop is to remain a highly profitable enterprise in Yuma county.

G. Cooperation with other agencies

The writer has continued to cooperate with other agencies during the year as called upon and as opportunities arose in which the work in crop production could be improved.

As a member of the State AAA Technical Committee help was given in developing production goals for 1946. That was done, of course, while the war was still in progress. A committee set up by the State Chairman met in two different sessions to work out the goals and to prepare a report to justify the goals as set.

Some assistance was given by the writer to county AAA Committee in making their recommendation for changes in the 1946 Conservation Program.

As indicated in a previous section of this report, the writer worked at various times with Regional and State Soil Conservation personnel especially in our pasture and grass seed production program. County Soil Conservation workers make few if any requests for help from this Specialist.

There have been several chances for cooperation between the writer and research workers in the Bureau of Plant Industry, Soils, and Agricultural Engineering, both at the Federal and State Levels. This has been most common with our alfalfa, cotton, and seed certification programs. We regret to record herewith the death of C. J. King, former Superintendent of the U. S. Field Station at Sacaton, Arizona. Mr. King had been a most useful member of our State Pure Seed Advisory Committee and he had worked with the writer on various cotton improvement programs. His loss will be felt in various phases of Arizona Agriculture.

In the one-variety cotton improvement program the writer still serves as collaborator with the Cotton and Fiber Division, F.D.A. and as a member of the State Committee to consider applications from groups of growers wanting to form organizations to secure free classing and market news service. In that work pleasant relationships exist between the Specialist and the Phoenix Classing Office, and with the Regional Office in Bakersfield, California.

FIELD WORK STATISTICAL SUMMARY (DAYS)
 BY
 SUBPROJECTS AND COUNTIES
 1944-1945

County	Ariz. Crop Impr. Assoc.	Coop. Crop Demon. and Tests	Cotton Impr.	Hay and Pas- ture Impr.	Soil Prod. and Mgmt.	Weed Con- trol	Coop. with Other Agen- cies	Misc.	Totals
Apache		4½		½	1	½		6½	
Cochise		3		1½	½	1½	-	6½	
Coconino		3½		½	½	½	2½	7½	
Gila		3		½		½		4	
Graham	2	3½	2	½	½	1		9½	
Greenlee	2		1	½		1		4½	
Maricopa	13½	1	3	3	1½	2½	1½	26	
Navajo		5		½	½	½		6½	
Pima	2½	½	1	1	½	1	½	7	
Pinal	3½		2	½		1	½	7½	
Yavapai		1		1	½	1	2	5½	
Yuma	3	½	½	1½	½	1½		7½	
State	1½		1	1	1	½	2	2	9
Out-of-State	11								11
Totals	39	25½	10½	12½	7	13	4	7	118½

