Miniature Farm On U of A Campus

Continuous Cropping Effects Are Studied

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Agricultural Chemistry and Soils

Few people know that the Department of Agricultural Chemistry and Soils has operated a miniature farm on the main campus of the University of Arizona since 1930. The fields are contained in lysimeters or concrete tanks, each of which is four feet square. All are provided with drains so that any water leaching through the soil may be collected and returned to the surface of each tank. In this way no plant food can be lost by leaching.

The experiment was started to gain some idea of the source of nitrogen in our soils. Another objective was to see how long the soils would maintain satisfactory yields without the use of fertilizers when used for growing crops under a rotation common in Arizona, and when double cropped to wheat and Hegari.

The rotations used are as follows:

Rotations Used in Test.

	Rotation I	Rotation II
First year	Alfalfa	
Second year	Alfalfa	
Third year	Alfalfa	Wheat—hegari rotation
Fourth year	Cotton—wheat	
Fifth year	Hegari	
Sixth year	Wheat	

The soils chosen to fill the lysimeters represent two of the major soil groups found in Arizona. Half of the tanks were filled with Gila clay loam, a river bottom soil, while the remainder were filled with Mohave clay loam, a Red Desert soil. The Gila clay loam seemed rich and friable in comparison to the Mohave soil.

Cropped Since 1930

After planting an initial wheat crop in 1930 to determine the uniformity of the crop producing power of the soils in each set of lysimeters, crops were planted every year according to the above rotation. Yields and nitrogen measurements have been made on each crop since that time. A glance at the charts and accompanying photographs will show the extent of the decline in yields in the lysimeters which have been double cropped to wheat and hegari each year since 1931 with both soil types. (Compare Tank 6 with Tank 12.)

In noting the yields of wheat in the tanks containing the Gila and Mohave soils (Tanks 1 and 7) it is quite obvious that the crop yield on the Mohave soil is much less than the one grown on the more fertile river bottom soil. This phase of the work shows very clearly the value of rotation and the superiority of alluvial soils for continued satisfactory crop production. It shows, too, that a permanent agriculture cannot be built on desert soils without the use of added fertilizer. Apparently a most significant element in this case is nitrogen.

In the virgin state the Gila soil contained much more nitrogen than the

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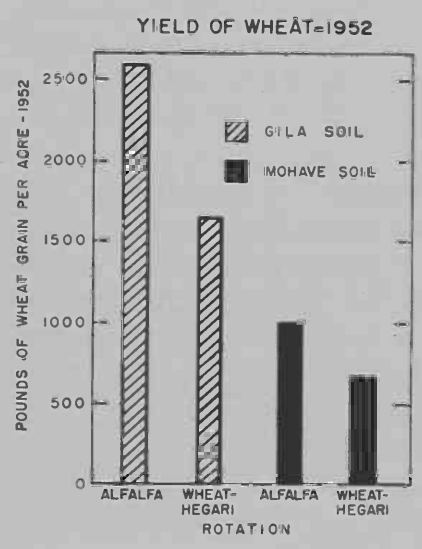
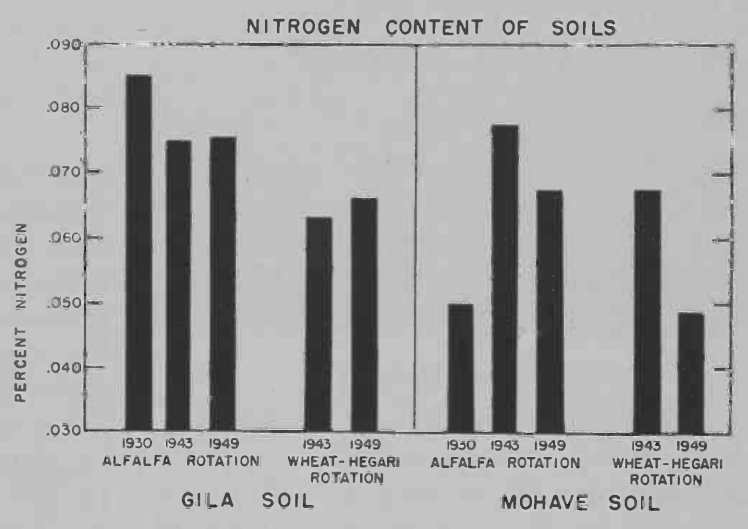




1952 Wheat Crop Grown on Gila Clay Loam.

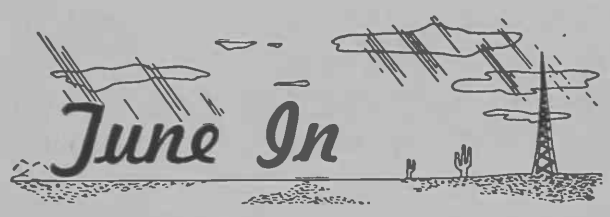
Tank I
Alfalfa rotation

Tank VI
Wheat-hegari rotation

1952 Wheat Crop Grown on Mohave Clay Loam.

Tank VII
Alfalfa rotation

Tank XII
Wheat-hegari rotation



DAILY (EXCEPT SUNDAY)

KTAR, Phoenix, 6:15 a.m. — Farm Front — Maricopa County Extension Agent. (6:10 a.m. on Saturdays)

MONDAYS

KYMA, Yuma, 7:00 a.m. — On the Farm Front.

MONDAY THROUGH FRIDAY

KYUM, Yuma, 7:20 a.m. — Yuma County Agricultural Extension Service Radio Program.

TUESDAYS AND THURSDAYS

KCLS, Flagstaff, 6:15 a.m. — Your County Agent Reports.

FRIDAYS

KCKY, Coolidge,Casa Grande, 4:00 p.m. — Pinal County Farm and Home Program.

SATURDAYS

KGLU, Safford, 1:00 p.m. — Stepping Along with the Agricultural Extension Service.

Does Arizona 44 Meet Trade Needs?

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tiplied by Arizona's 1952 Upland production of 904,200 500-pound bales, this shows an increased return to Arizona producers of $678,150 due to the greater staple length of A-44.

Fringe Benefit

A benefit more difficult to measure, but not less important, is the increased interest of mills in Arizona cotton evidenced by the increasing number of salaried representatives of Eastern merchants appearing in the Phoenix market. These buyers have direct mill outlets for large quantities of Arizona cotton, and their presence has resulted in substantial improvements in the buying basis during the past year. If Arizona is able to continue her volume of A-44, and to eliminate undesirable varieties from production, these buyers will continue to come into the Phoenix market to buy Arizona cotton.

Cantaloup Pests Have Enemies, Too

(From page 8)

cifically to control an infestation occurring on the crop at the time, and not as a preventive measure. It is not desirable to make routine applications when the plants have reached a certain stage of development.

Take Care!

Parathion is extremely toxic to humans and should be used only by a trained operator who will assume full responsibility and enforce the precautions prescribed by the manufacturers.

Pima S-1 Cotton

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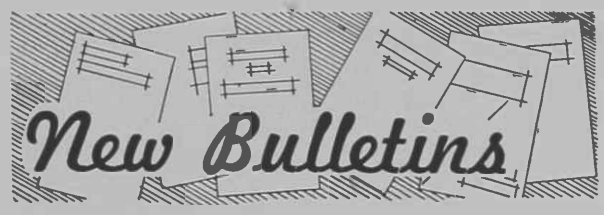
equal to Egyptian Karnak cotton, but not quite as good as Pima 32 or Amsak.

Type of Plant. Pima S-1 was bred originally for a plant height of 40 to 50 inches at Tucson on a medium heavy soil with normal irrigation. Pima S-1, when grown under these conditions, produces a plant which can be harvested with the cotton picker, provided defoliation is sufficiently complete.

But when Pima S-1 is grown on a heavy, fertile soil, such as alfalfa sod and irrigated heavily, it may grow considerably higher than 50 inches, as has happened in the Salt River and Yuma valleys. Under such conditions it is no longer a "Dwarf Pima," but even here it does not grow as high as Pima 32 or Amsak.

Present Status. Considering the lint yield per acre, lint quality, spinning performance and growth adaptation, Pima S-1 seems to have some promise as a commercial variety and the seed is being increased for a more extended acreage. With more experience in growing Pima S-1, it may be possible to obtain maximum yields of lint without at the same time growing too tall a plant.



Ask your County Agricultural Agent for a copy of any of these new bulletins or circulars. They are free to Arizona farmers and stockmen.

Experiment Station

Bulletin 246, "Cost of Pumping Irrigation Water, Pinal County, 1951."

Forty wells in Pinal County were used in this detailed survey of pumping costs by electric and gas powered pumps. Data are shown by graphs and tables. Procedures and results are covered in the text.

Extension Service

Circular 148-Revised, "Fruit Insect Control Hints."

This is a 1953 revision of the extension recommendations for control of deciduous fruit-tree pests in Arizona. Specific information is given.

Circular 179-Revised, "Cotton Insect Control, 1953."

Complete, up-to-date cotton insect control information is supplied, including hints on airplane application of insecticides.

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Mohave soil. After cropping these soils for thirteen years, the nitrogen content of the two reached a temporary equilibrium point midway between that of the virgin soils. After another six years the nitrogen content of the Gila soil associated with the alfalfa rotation had remained constant while that of the Mohave soil had shown a serious slump. In both cases the soils in the "wheat-hegari" rotation had an unfavorably low nitrogen content.

The low nitrogen content of wheat grown on soils depleted in nitrogen is a direct reflection of the fertility of the soil. Certainly the discriminating buyer will choose the wheat with the highest protein content. This can only be grown on ground well supplied with nitrogen. The nitrogen content of the wheat grown on Gila soil in the wheat-hegari rotation was reduced by 50% during 23 years of cropping as a result of using a rotation lacking a legume. When it is realized that wheat is priced on the basis of its protein content the importance of maintaining a high nitrogen content in the soil becomes apparent.

Nitrogen Content of Wheat Grain
Gila Soil — 1952

	% nitrogen	% protein
Alfalfa rotation	2.5	15.6
Wheat—hegari rotation	1.25	7.8

This experiment disproves the old saying that only water is required to make a desert soil bloom. Experiments and practice have shown that desert soils cannot maintain a high level of productivity without the use of good cropping and fertilization practices. Inasmuch as Arizona's agriculture is becoming of age and most of the cropped land consists of Red Desert Soils it appears that fertilization must become a standard practice on these soils to maintain high yields and to insure crops of high nutritional quality.

Circular 203-Revised, "Defoliating Cotton in Arizona, 1953."

This is a complete revision of last year's circular. Latest available information on defoliating is included.

Circular 204-Revised, "Requirements for Arizona 4-H Club Work."

This circular lists in detail the requirements for all 4-H projects available in the state. It is for use of 4-H members and leaders.