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IN THIS ISSUE - *New Dairy Drink... What's New in Cotton Steamed-Rolled Milo... Nursery School... Yuma Citrus... Range Fertilization... Beef Imports Analysis... Pima County Story*

WORTHWHILE INVESTMENT

Any of us who saw a sign like that along the roadside, or such an advertisement in our newspaper, would be sure to look into it, with intent to invest. Thirteen hundred percent returns! Fantastic!

Actually, those are the sober, statistically ascertained figures reached by a very studious economist at the University of Chicago, a man with sound reputation in his field.

And the figures, published in the impressive AMERICAN ECONOMIC REVIEW, are based on a lengthy study supported by the National Science Foundation.

To get back to that 1300 percent return, and the expression "R & E," they are the economist's sober evaluation of the return from investment in research and extension activities of our Land-grant Colleges of Agriculture and also from industry. Even the Chicago economist, Dr. Zvi Griliches, admits that this 1300 percent "implies a fantastically high gross rate of return . . . for social investment in agricultural research and extension.

"Even if one allows that much of it is the result of research expenditures by private firms, mainly in the agricultural supplies industries, and that — due to our inability to solve the agricultural problem, the social value of additional agricultural output is only about half its market value — the gross social rate of return to research and extension expenditures is still about 300 percent," says Dr. Griliches.

We won't argue the point, 300 percent or 1300 percent. Either figure is amazing, and either one of them proves that the extension worker and the agricultural research scientist are well worth keeping on the job.

Harold E. Myers

Dean
College of Agriculture
and
School of Home Economics

OUR COVER PICTURE

At University of Arizona "open house" last April the Dairy Science and Poultry Science departments combined to produce a health-giving dairy-egg drink, with free samples for visitors. Some 1,000 persons sampled the drink, all of them praising it.

Because of this sudden popularity, it was asked that a report on this dairy drink be prepared for PROGRESSIVE AGRICULTURE.

Dr. J. Warren Stull, remembering the old American Dairy Assn. precept that "Nothing sells health like a pretty girl," also remembered that Pamela Blythe, manning the Agricultural Economics desk at open house, took time out to taste the new dairy-egg concoction.

So he asked Pam Blythe to drink another cup of the drink while the photographer stood by. The result is our cover picture for this issue.

PROGRESSIVE AGRICULTURE IN ARIZONA

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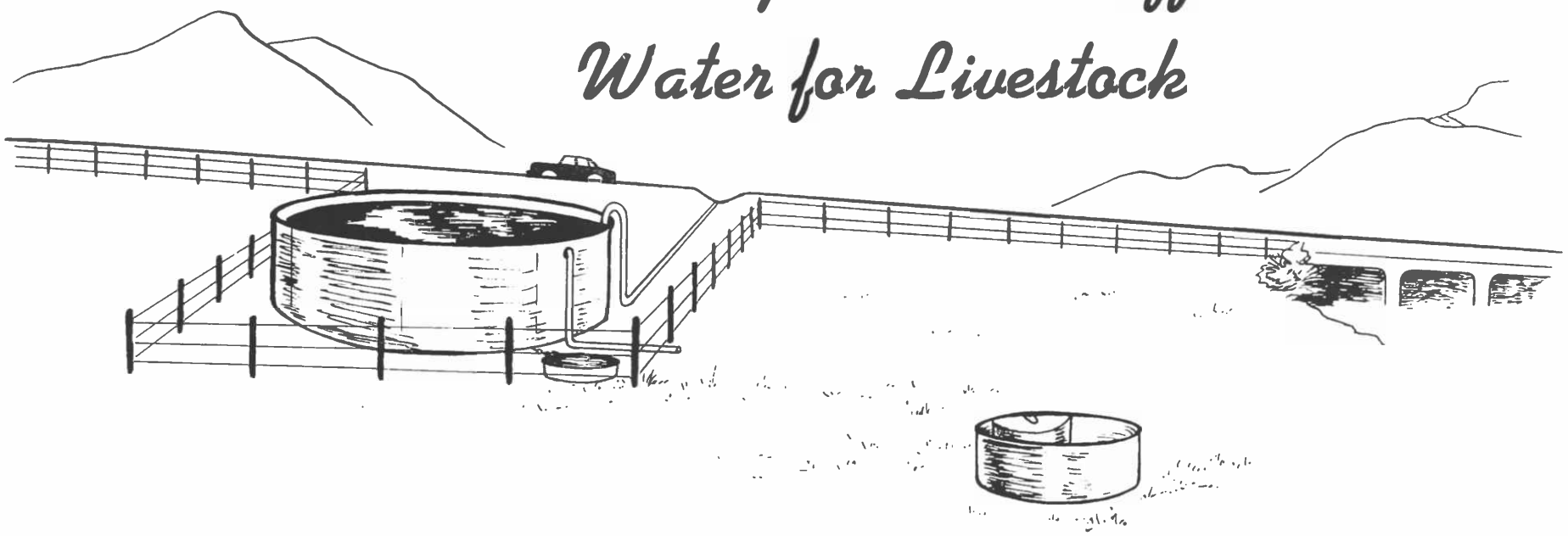
IN THIS ISSUE

Saving Road Runoff Water for Livestock



By W. T. Welchert and Robert G. Gray

Several years ago Gunter Prude, Head Stockman for the San Carlos Apache Indian Tribal Council, was touring with a visiting group on the Reservation. During a rainstorm someone remarked that it was too bad that they couldn't catch some of the run-off from the road and store it. Mr. Prude took this matter up with the BIA Land Operations Officer at San Carlos. As a result, a system was developed to intercept highway water run-off.

For those ranch areas fortunate enough to have a satisfactory site such as illustrated, this is a good way to develop a livestock water supply. During a rainstorm look for a point to intercept run-off from an area of 20,000 to 30,000 square feet. If the slope from the intercept to the tank and water trough is adequate, a fairly inexpensive stock water supply can be constructed.

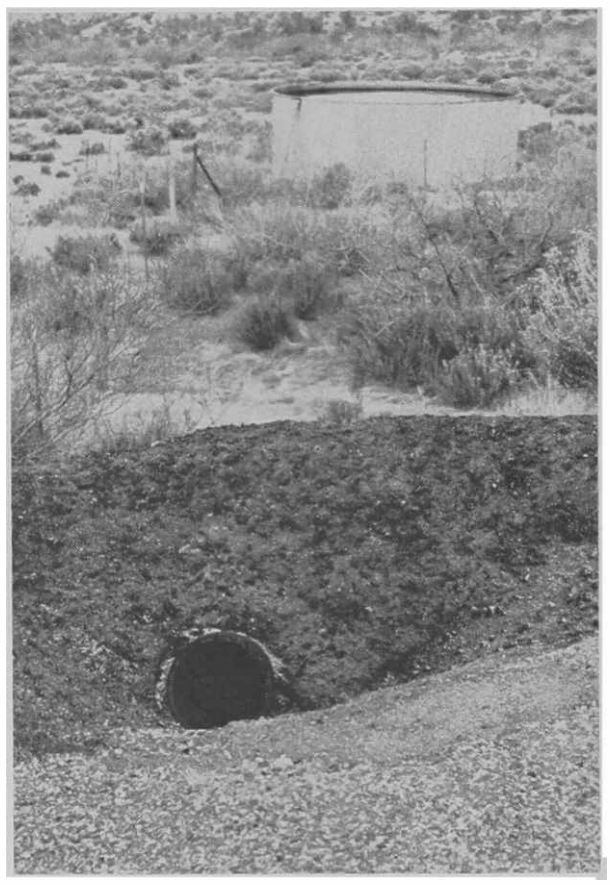
Get An Adequate Tank

Assuming that the catchment area is adequate, a 50,000 to 100,000 gallon storage tank is desirable. Tank storage capacity can be estimated by determining the range carrying capacity, the length of grazing season, and the character of the precipitation pattern.

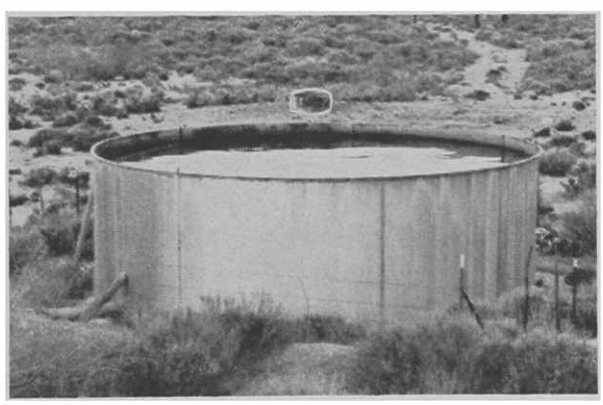
For example, assume that the storage will provide water for stock ranging out for one to 1½ miles in all directions (cattle pass under the road). This would include an area of about four sections. If the range will carry 8 head per section, water will have to be provided for 32 head plus calves. Taking 12 gallons per day as the average cow-calf daily water use, the total daily consumption is 384 gallons or 11,500 gallons per month.

Rainfall is related to elevation, but the frequency, intensity and distribution are difficult to predict. In most of the good range areas in the state, about 14 inches per year is expected. About half falls from April through September, and half from October through March. Uneven distribution may yield no water collection in a particular area for six or more months.

Six months of storage will require about 70,000 gallons. Should the grazing season be less than six months, storage capacity may be proportionately less. If several watering troughs are fed by gravity through a pipe distribution system some distance from the storage tank, a considerable area can be served by one storage tank. In that case, the storage tank should be that much larger.



THIS PHOTO SHOWS actual installation of the road catchment basin and storage tank. In foreground, on edge of blacktop roadway, is pipe opening, while in the background is the storage tank. This set-up is along highway 70, the Safford-Globe road, and located about 10 miles east of Globe.



CLOSER VIEW OF the 50,000 gallon storage tank shown above right. Note that tank, when photo was taken in late March, was full. Stock watering tank, as a small dark circle immediately behind the storage tank, can be seen in background. Fence around storage tank protects it from livestock.

Actual Rainfall Impressive

Few people realize how much water falls on an area of 10,000 square feet — an area 100 feet square, 100

(Continued on Next Page)

"Ted" Welchert, as he is popularly known by the many Arizonans who have profited from his capabilities, is agricultural engineer in the Extension Service. "Pat" Gray is county agent in Gila County. This is one of several practical schemes on which these two have collaborated. Others are cattle traps, horse corrals, and a variety of devices helpful to the cattleman and rancher.

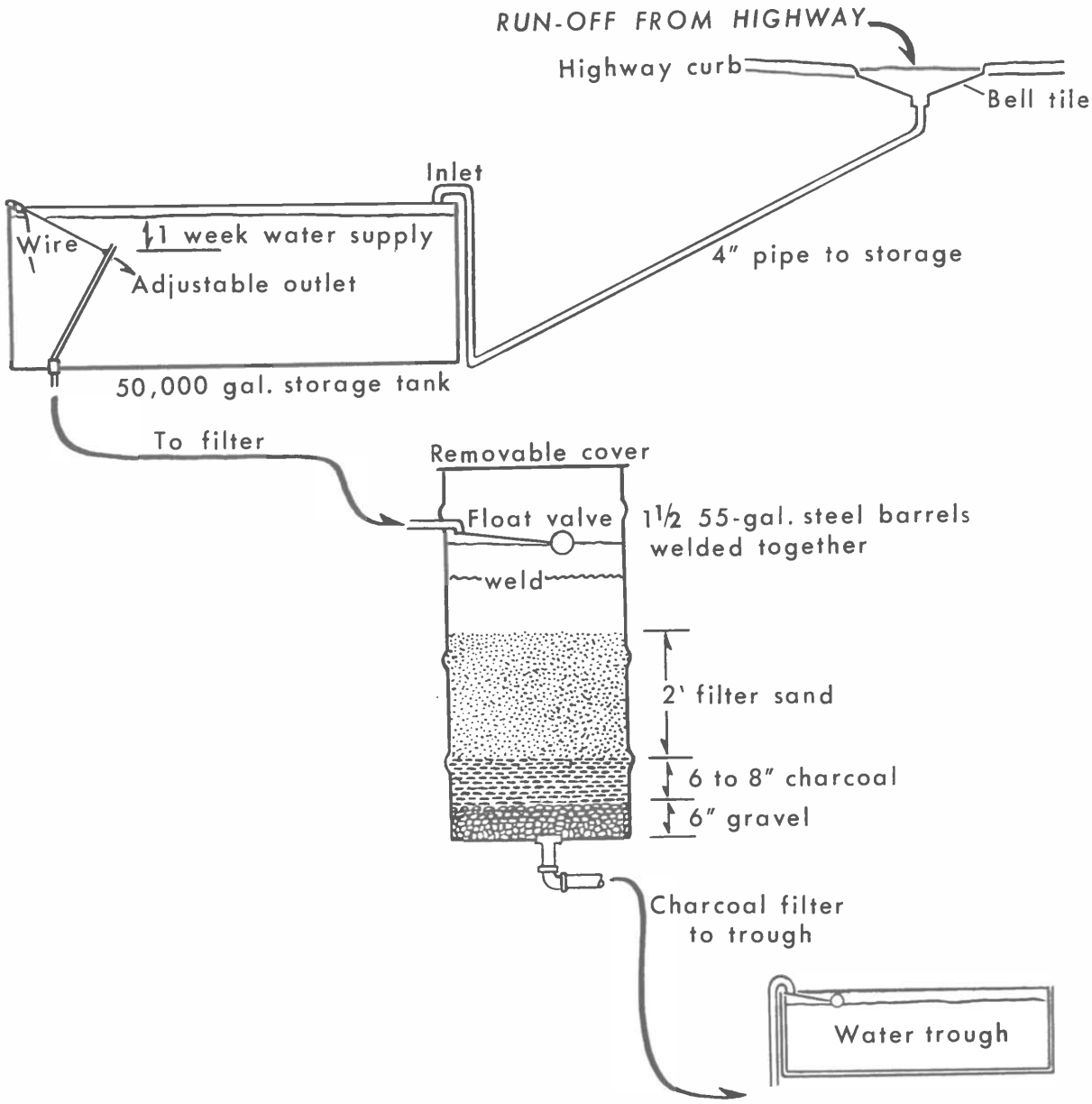


DIAGRAM ABOVE OUTLINES exact setup of entire operation, from highway runoff to storage tank, filter and thence to watering trough.

(Continued from Previous Page)

feet on each side. If the area is impermeable, shaped and sloped right so that all the water will run off, the total water collected is impressive. Eight inches of summer rains, assuming no loss, would total 50,000 gallons. Note the accompanying table.

In the device described here, the water inlet to storage should be large enough to handle road runoff. A minimum of 4-inch pipe is suggested. An overflow pipe may or may not be used to control the direction of excess water in case the storage cannot handle all of the run-off.

The outlet system should include provision for drainage and cleaning of the tank periodically. On steel tanks, a rubber gasket manhole cover in the side of the tank might be considered for easy cleanout.

The outlet may be screened and adjustable for various heights inside the tank. A float controlled tube is not as good as an adjustable elbow with pipe extension. (See diagram.) An adjustable pipe extension set about a foot below the surface, (or a week's water supply) has an advantage should the stock trough float fail.

Theoretical Storage from 10,000 Square Feet Run-off Area

Precip. (inches)	*Storage (gallons)*	*Precip. (inches)*	*Storage (gallons)*
0.1	625	1.0	6,250
0.2	1,250	2.0	12,500
0.3	1,875	3.0	18,750
0.4	2,500	4.0	25,000
0.5	3,125	5.0	31,250
0.6	3,750	6.0	37,500
0.7	4,375	7.0	43,750
0.8	5,000	8.0	50,000
0.9	5,625	9.0	56,250

Only a week's water supply is lost, whereas the entire water supply may be lost with other systems. All water supplies should be checked and adjusted at least twice a week. A shut-off valve near the tank is necessary for servicing components below the storage tank. An adjustable pipe outlet system can be used as a shut-off valve by raising the pipe extension above the water storage line.

Protect Float Valves

Float valves on both the filter and water trough should be protected. Normally the successful installation of such a system requires some water head differential between the bottom of the storage tank, and the top of the filter system, and again to the water trough. This can vary from 2 to 100 feet. One alternate that may work is to place the water trough at the same level as the filter. The filter float is then used to also control the water level of the trough.

A water palatability problem may develop on asphalt-covered catchment systems. Filters are used to remove solid materials from the water. Filtering does not necessarily remove bacteria. Good filters are made of fine sand, wood, charcoal, (the pieces averaging the size of wheat grains) and gravel.

The sand filters out solid materials, the charcoal removes color, taste and odor, and the gravel prevents the loss of sand and charcoal. The sand bed should be about 2 feet thick, the charcoal and gravel each about 6 inches. As the surface sand becomes clogged, half an inch should be scraped off. Do not allow the bed to be reduced less than one foot in thickness. The charcoal should be changed annually.

Between Storage and Use

One of the accompanying drawings illustrates a sand-charcoal-gravel filter. Such a filter should be installed between the storage tank and the water trough. The rate of flow through a filter of this type is about 10 gallons per hour per square foot.

A 55-gallon barrel, such as indicated in the diagram, has about three square feet of surface area, thus 30 gallons per hour could be expected to filter through to the stock tank.

This is about the expected usage of a stock water trough. However, the water trough should have a sufficient reserve capacity, estimated at 200 gallons — in order to take care of peak demands at morning and evening. Also, if the watering area is to be used as a stopping off spot for cattle drives, it would be necessary to have a larger water trough and also, in that case, larger filtering capacity.

INSECTS' RADAR DEFENSE

Researchers, trying to develop electronic devices that will send noises over farm fields to drive insects away, have been learning things from South Carolina experiments.

When bats hunt at night, they emit high-pitched cries and listen for echoes that bounce off their insect prey. But the insects can pick up the sound waves of the bat squeaks and take evasive action.

Scientists have now been able to reproduce sounds that make bollworm moths react as if to bat squeaks.

Cochise County

KAWT, Douglas—6:15 a.m. Mon. through Fri.
KHIL, Willcox — Mon. thru Fri., 6 a.m.

Coconino County

KCLS, Flagstaff—Tues. and Thurs., 8:20 a.m.
KCLS, Flagstaff (Home Agent) — Wed., 9:45 a.m.
KPGE, Page — Fri., 2:30 p.m.

Gila County

KIKO, Globe-Miami
Monday, 12:45 p.m.

Graham County

KATO, Safford — Sat., 9:30 a.m.
Mon. thru Fri., 12:45 p.m. (daily)

Maricopa County

KTAR, Phoenix — Mon. thru Fri., 5:55 a.m.
KOY, Phoenix — Tues. thru Sat., 5:40 a.m.
KOY, Phoenix — Sunday Garden Club of The Air, 8:35 a.m.
KPHO, Phoenix — Mon., Cotton Report, 12:40 p.m.
KPHO, Phoenix — Thurs., Dairy and Livestock Report, 12:40 p.m.
KUPD, Phoenix — Mon. thru Fri., 5:30 a.m. and 12:30 p.m.

Mohave County

KAAA, Kingman—Mon., 10:45 a.m. (Home Agent)

Navajo County

KDJI, Holbrook — Tues., 12:45 to 1 p.m.
KINO, Winslow — Sat., 9:45-10:00 a.m.

Pinal County

KPIN, Casa Grande — Mon. thru Sat., 6:55 a.m.; Mon. and Fri., 9:30 a.m.; Tues., Thurs. and Sat., 12:20 p.m.

Yavapai County

KYCA, Prescott — Mon., Wed., Thurs. and Fri., 4:15 p.m.
KNOT, Prescott — Mon., Wed and Fri., 6:25 a.m.

Yuma County

KVOY, Yuma — Mon. thru Fri., 5:45 a.m.
KYUM, Yuma — Mon. thru Fri., 6:25 a.m.
10:05 a.m., Sat.

YUMA CITRUS ACREAGE EXPANSION IS FORECAST

By R. E. Grounds

Irrigation districts along the lower Colorado River offer many well-suited lands for citrus expansion. These comprise six districts in Arizona — Yuma Valley, Yuma Mesa, North Gila, South Gila, Wellton Mohawk and Parker — and four in California — Imperial, Bard, Coachella and Blythe.

In addition to these districts using Colorado River water, there are several pump areas that show good possibilities for citrus development.

Cite Many Advantages

As a quick review, the advantages of citrus culture in the lower Colorado River area are lower land prices than in the coastal areas, quantity and quality of water necessary to grow good trees and produce fruit, warm weather in selected locations, low insect population, a more disease free area, highly colored fruits, high yields, low taxes, better labor supply, adequate marketing by most major companies, and research stations for future assistance.

The disadvantages are few, and will be lessened as growers change practices and become aware of damage that may occur to the tree and its crop. Some of these disadvantages are high light intensity and consequent sunburn; hot dry winds at certain times of the year; lack of adequate by-product facilities near by, and distance between the different growing areas.

Estimated Potentials

The potential citrus acreages mentioned below are only estimates based on information gathered about the specified areas. These new areas may change rather quickly with the economic situation of the United States, and with increased knowledge of water usage and new rootstocks.

Potential acreages in the Arizona water districts: Yuma Valley, 10,000 acres; Yuma Mesa, 1500 acres; North Gila, 3000 acres; South Gila, with recent drainage wells and improved water quality, 3000 acres; Wellton Mohawk Valley, Mesa area and Dome part of valley, 16,000 acres; Parker Mesa, 4000 acres when and if water is brought up.

Potential areas outside of the irrigation districts in Yuma County include the Hyder-Horn area, 8000 acres; the Aztec area, 3000 acres, and the South Yuma Mesa (below the district), 16,000 acres. All of these pump areas have water quality problems that need to be overcome by casing poor quality stratas off and handling the water correctly in cultural management to keep salt accumulations from developing.

These potentials, in the two paragraphs above, total 37,500 acres within Arizona water districts and 27,000 acres outside of the irrigation districts, or a grand total for Yuma County of 54,500. This impressive total compares with approximately 24,000 acres of citrus plantings in Yuma County at present.

Potential California Areas

Potential acreages in the California irrigation districts: Blythe area mesa, 17,000 acres if a Colorado River water source is used; Bard, 10,000 acres if high water corrections are employed; Imperial Valley, 20,000 acres in the warmer areas; Coachella, 6000 acres using river water and tile where necessary.

Pump areas outside of these districts are not well known, except the Borrego Springs area with a potential of 2000 acres. Many of these areas are already being pushed by subdivisions nearby and will most likely not reach their citrus acreage capacity.

With the continued influx of people into the coastal cities of California, the remaining citrus acreage will slowly diminish. As this occurs, a large proportion of this reduction will be planted in areas of the lower Colorado River. The development of salt tolerant rootstocks and improved varieties, along with freedom from diseases resulting from the new registration and certification programs in both Arizona and California, will help develop these areas.

Bob Grounds is county agricultural agent in Yuma County, and the man who keeps a constant running tally on citrus acreage in that lush and productive area. His article, reprinted here, appeared first in THE CALIFORNIA CITROGRAPH, and is reprinted through permission of Editor Gerald R. Strauss.

WOMEN

Had it Tough In the Old Days

By
Victor A. Christopherson

The most telling and tragic commentary on the nature of the male is the record of his dealings with women. After giving his rib for her creation, man, historically, has treated the woman as if she were still a part of his property — his to abuse, sell, favor, or confine as his whims dictated. Ray Baber reminds us ". . . how recently the husband was the sole member of the family who could hold property, make contracts, sue or be sued, vote, and hold offices, to say nothing of his right to demand the earnings of his wife and children. . ."

Perhaps the lens that brings the place of women into sharpest focus is the double standard. Historical sources are replete with examples, and the Bible is one of the most fruitful. Genesis tell us that women were sold into marriage for an established bride price even among God's chosen, the Hebrews.

In Deuteronomy, Chapter 22, we find that if a husband should suspicion that all was not as it should be with respect to his bride's virtue, the burden of proof was upon her. Should her evidence not be sufficiently convincing, she was to be stoned to death on her father's doorstep.

"Women Are Inferior . . ."

In the fourth and fifth centuries BC, Athens was the cultural and intellectual matrix of the Western world. Aristotle, whose models for logic and reasoning are still taught in philosophy classes, stated that "Women are by nature inferior to men and, as such, should obey men and perform their functions well."

In this so-called Golden Age of ancient Greece, a woman appeared to have two choices: She could either marry, manage a household, and bear children, or she could become an hetaera and entertain the husbands of other women. Demosthenes described this situation reflecting the double standard as follows: "Man has the hetaerae for erotic enjoyment, concubines for daily use, and wives of equal rank to bring up children and be faithful housewives."

Over the period of several hundred years, during which the wheel of fortune favored Rome over her cultural ancestor, Athens, women began to gain in status and legal rights. However, the Roman Cato stated in effect that an unfaithful wife might be put to death without further ado. On the other hand, should the man be the one who permitted his affections to wander, the wife had no right to raise so much as a finger against him.

A Long, Painful Period

In the interest of time and brevity, the matter of the vicissitudes in the welfare of women in the periods of Western history such as the early Christian period, the Dark Ages, the Medieval period, and the Renaissance cannot be considered. No reference is made, moreover, to the civilizations of the East — China, Japan, Korea, India, or the many other countries with their own traditions concerning the role, status, and treatment of women.

During the seventeenth century, women began to proclaim publicly their dissatisfaction with the double basis of treatment in such areas as occupation, recreation, politics, manners, and morals. In England, Mary Astell and later Mary Wollstonecraft were outstanding voices in the cause for women's rights. However, the early interest such individuals generated, began to wane in the nineteenth century as the influence of Queen Victoria of England became established.

Victoria's influence in Anglo-Saxon culture, characterized by sanction of the passive, domestic, traditional, and, insofar as possible, asexual roles for women, was a force to be reckoned with. Among other things the vestiges of Victorian influence have accomplished has been to keep psychiatrists' offices filled with guilt-ridden souls in whom their own inclinations and Victoria's admonitions have never achieved a happy reconciliation.

The Feminist Movement

The 1840's are the years when suffrage and feminist campaigns were launched in earnest. Lucretia Mott and Elizabeth Cady Stanton organized the first women's rights conference in 1848 at Seneca Falls, New York. Susan B. Anthony, Julia Ward Howe and Lucy Stone are other names that stand out in the history of the feminist movement.

Even though progress since the 1840's has been relatively continuous and oftentimes dramatic, temporary setbacks have occurred. Carrie Nation's raids on saloons and bars with ax in hand unfortunately were identified in the minds of many with the suffrage movement, and the gears of progress ground more slowly for a time. The suffrage movement culminated in the Nineteenth Amendment to the Constitution in 1920, which provided that all women in our country could vote. Since that time most of us have forgotten that suffrage was ever an issue. Using the record of history as an mnemonic device, however, we cannot help but be impressed with the progress in practically every sphere of life.

At present, for example, there are more than 23,000,000 women in the labor market, and practically all occupations are represented. The women who have been elected to Congress have achieved the third highest elective office in the United States. That such achievements on the part of women of our nation represent progress cannot be gainsaid. That the challenge is not over for those who would splinter a lance in the cause of further feminine progress and attenuation of the double standard is indicated by such figures as the following: Of the 435 representatives in Congress, only 11 are women; of the 422 federal judges, only 3 are women; only 2 women have ever held cabinet rank, i.e., Frances Perkins, Secretary of Labor under Franklin D. Roosevelt, and Oveta Culp Hobby, Secretary of Health, Education, and Welfare under Dwight D. Eisenhower.

There appears to have been much progress by women in Western society in almost all areas of endeavor. While much has been accomplished, much remains to be accomplished. We are in need of a frame of reference now that will integrate the past with the promise of the future — a perceptual lens that will bring clarity into the picture and that will point a firm path to equitable status in both domestic and occupational endeavor.

Dr. Christopherson is head of the division of child development and family relations in the School of Home Economics. This paper is condensed from his presentation before the convention of the American Home Economics Association.

DIFFICULT TO ADAPT

People do not quickly adapt themselves to a shift in their diets. Changing food habits takes time, say researchers at North Dakota State University. It took 200 years for the potato to be accepted in Europe, 100 years for the tomato, and, in more recent times, 30 years for the grapefruit to be accepted in Britain.

Table 1. Effect of Steam Processing Milo and Barley on Performance of Feedlot Steers (1964 Study)[a]

	Milo		*Barley*	
	DR[b]	*SP*[b]	*DR*[b]	*SP*[b]
Number of steers	15	16	16	16
Average initial weight, lb.	531	523	539	539
Average daily gain, lb.	2.76	3.04	2.75	2.95
Average daily feed, lb.	23.4	24.7	20.6	22.0
Feed/100 lb. gain, lb.	847	814	749	744
Feed cost/100 lb. gain, $	20.71	19.92	21.09	20.91

[a] All values reported with a 5% shrink on initial and final weights.
[b] Dry rolled or steam processed.

MILO, BARLEY IMPROVED BY STEAM PROCESSING

By W. H. Hale and Bruce Taylor

Performance and feed efficiency in feedlot cattle have shown marked improvement during the last 20 years. Several things have contributed to the improvement. Among these are additives such as stilbestrol, antibiotics, trace minerals, fat and the use of higher concentrate rations.

Recently the processing of grains has been receiving attention as a possibility for additional improvement in performance and feed efficiency. One of the most promising methods of grain processing appears to be a moist heat treatment prior to rolling. The present authors reported in Progressive Agriculture, May-June 1964 the results of the first experiment with steam processing milo and barley. The current report includes additional studies with milo, as well as experiments with steam processing barley.

This research at The University of Arizona has attempted to define the conditions of steam treatment of grains as contrasted to reports of studies elsewhere which do not specify the steam treatment.

Raises Moisture Content

The steam-processed grains used in the experiments reported in this paper were treated as follows: The grains were held in a tempering chamber and subjected to low pressure, high moisture steam until the moisture content of the grains was raised to 18 to 20%. This usually required approximately 20 minutes with temperatures ranging between 205° and 210° F. — the temperature at which steam will condense at the Tucson altitude.

The grain was then rolled and the moisture content and temperature of the grain coming from the rollers were similar to those of the grain in the chamber once the rollers became warm. The high moisture, low pressure steam was produced by an inexpensive steam generator similar to those used in dry cleaning plants.

Results of a feedlot trial conducted during the summer of 1964 at Tucson, comparing steam-processed to dry-rolled milo and barley are presented in Table 1.

Feed Efficiency Up 4 Percent

The rations used in this study are given in Table 2. All rations contained about 11% protein. Slightly different levels of milo and barley were used to equate the crude fiber level in the two rations. Steam-processed milo improved feed efficiency by 4% and performance by 0.28 pounds per day over the dry-rolled milo ration. This was a 10% increase in gain. While steam processing improved the feed efficiency of milo it did not make it equivalent to that of barley.

Steam processing the barley improved gains by 0.20 lb. per day but had no effect on feed efficiency. It appears that steam processing barley improves the physical property of the grain, which results in a higher feed intake by fattening steers. There may be no effect upon the nutritional quality of barley, as indicated by similar feed efficiency between the methods of processing. This is in contrast to milo, in which both an increased feed intake and an improvement in feed efficiency occurred due to steam processing. This method reduced the feed cost of gains by 79¢ per hundred pounds of gain as compared to dry-rolled milo.

A digestion trial was conducted with dry-rolled and steam-processed milo to determine if digestibility of some component of the grain was improved by steam processing. The rations used were similar to those in the feedlot study. The results are presented in Table 3. It is apparent from the digestion coefficients that steam processing of milo improves digestion of the nitrogen-free extract fraction. This is the fraction that includes the starch of the grain.

This improvement in digestibility of the nitrogen-free extract of the ration was 13%, which was equivalent to a 17% improvement in the digestibility of the nitrogen-free extract of the milo. Steam processing the milo apparently alters the starch to such an extent that it is more digestible to ruminants.

Protein digestibilty was not affected by the steam processing. Earlier

(Continued on Next Page)

Table 2. Experimental Rations

	Milo[a]	*Barley*[a]
Ground alfalfa[b]	5.00	5.00
Cottonseed hulls	15.00	10.00
Milo	68.35	—
Barley	—	74.85
Cottonseed pellets	4.50	3.00
Molasses	5.00	5.00
Dicalcium phosphate	0.50	0.60
Urea	0.60	0.50
Salt	0.50	0.50
Ground limestone	0.50	0.50
Trace minerals	0.05	0.05
	100.00	100.00
Vitamin A, 10,000 I.U./lb.	10 gm.	10 gm.

[a] Dry rolled or steam processed.
[b] Alfalfa was ground with 1% fat to control dust.

Table 3. Digestibilities of Steam Processed and Dry Rolled Milo

	Milo	
	SP[a]	*DR*[a]
Dry matter	69.7	61.6
Protein	51.4	49.6
Ether extract	59.0	67.3
Crude fiber	13.6	22.5
Nitrogen free extract	78.5	69.2
Gross energy	69.5	60.0
Total digestible nutrients	69.8	63.4

[a] Steam processed or dry rolled.

Dr. Hale is a professor of Animal Science and Dr. Taylor head of that department. A complete discussion of the steam rolling trials was given at the annual Feeders' Day early in May. Readers who wish additional information may write to Dr. Hale and obtain the complete printed report on this work and other research in livestock feeding.

(Continued from Previous Page)

studies indicated that a more drastic heat treatment than steam processing adversely affected digestibility of milo protein.

Digestibility Higher

The total digestible nutrients and gross energy digestibility were higher in the steam-processed milo than in the dry-rolled ration. While there was a decrease in the digestibility of ether extract and crude fiber of milo due to steam processing, these components make up such a small portion of a high grain ration that they do not materially influence the overall improvement of digestibility due to steam processing.

Additional studies are needed to determine the effect of varying moisture and temperature treatment of the grains while in the tempering chamber.

Freeman Medal Awarded To Sue Alexander

We really don't intend to have an item about Sue Alexander in every issue of this magazine, but if Sue keeps on getting honors and additional honors, what can we do?

Just before classes at The University of Arizona closed in May, announcement was made of the Merrill P. Freeman awards. The medals are given annually by the U of A administration to "the outstanding man and woman of the graduating class."

Our Sue — she has been a parttime student helper in this office — was named to receive the Freeman award in the distaff category. Male recipient was Warren Rustand, president of Associated Students and a basketball star.

The beautiful gold medals were presented to Miss Alexander and Mr. Rustand by President Richard A. Harvill.

Sue Alexander, a home economics major who won the Pillsbury awards contest last spring, began her year of on-the-job training with that company in June. She also attended, and addressed, the college club section of the American Home Economics Assn. national convention in Atlantic City.

Sue is the daughter of Mr. and Mrs. Karl F. Alexander of Tucson.

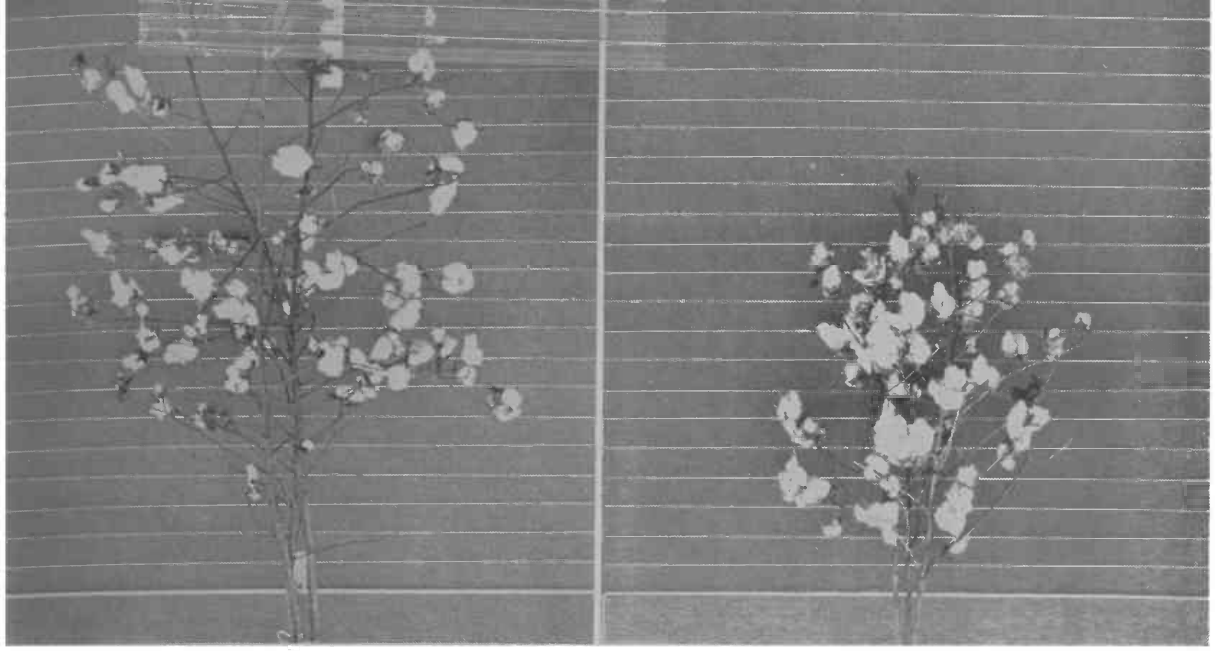
Arizona Maid of Cotton

The 1965–66 Arizona Maid of Cotton is Miss Pamela Arle, Phoenix, picked from a group of 15 finalists, to represent this state's rich cotton industry in national competition.

Pamela will represent the cotton industry in various events throughout the state, at fashion shows, before agricultural and civic groups, and then next December in the National Maid of Cotton contests at Memphis.

Of particular interest to this college, of course, is the fact that Pamela is the daughter of Mr. and Mrs. H. F. Arle, her father a USDA plant scientist working at the U of A Cotton Research Center in Tempe.

Pamela is a 19-year-old freshman at ASU, majoring in biology. She has been active in a variety of extracurricular activities in high school and college, and is a member of Kappa Kappa Gamma sorority.



AT LEFT IS SHOWN fruiting pattern of a low-altitude Pima cotton strain when grown at low altitude (left) and when grown at high altitude (right). At low altitude the fruiting begins early and relatively low on the plant, which continues fruiting through the season, thus yielding well. At high altitude the fruiting begins too low for efficient machine harvesting, and the strain is usually not the most productive.

Altitude Affects Performance Of Pima Cotton Strains

By Carl V. Feaster and E. L. Turcotte

Tests throughout the Pima Cotton Belt reveal that certain experimental strains are better adapted to low and others to high altitudes. During the fruiting season for the crop, the lower altitudes, ranging up to 1,500 feet, are characterized by high temperatures during both day and night.

At the higher altitudes, 2,500 feet and above, day temperatures are high but night temperatures are moderate. The minimum night temperatures in the 1,500-2,500-foot zone fluctuate from year to year between high and moderate levels.

Night Temperature Significant

The reaction of a strain to minimum night temperatures during the fruiting season seems to be one of the most important characteristics in determining its adaptation. Strains best adapted to low altitudes begin fruiting early and low on the plant, and continue fruiting throughout the season. These strains appear to have tolerance to high night temperatures, since they are capable of fruiting at the low altitudes during July and August, when minimum night temperatures are high.

On the other hand, strains that do not have tolerance to high night temperatures do not set fruit until late in the season, and are rank when grown at low altitudes. These strains, however, when grown at high altitude, set fruit fairly low and are not particularly late.

Low vs. High Altitudes

At the low altitudes, fruiting height and yield are closely associated—that is, the lower the fruiting on the plant, the higher the yield. At the high altitudes, fruiting height and yield are not generally associated. The difference in fruiting height between the highest and lowest yielding strains is strikingly different at low altitude. However, at high altitude, where night temperatures are moderate, all strains begin to set fruit relatively low on the plant. At high altitude, intermediate fruiting height is most desirable in terms of plant type, maturity and yield.

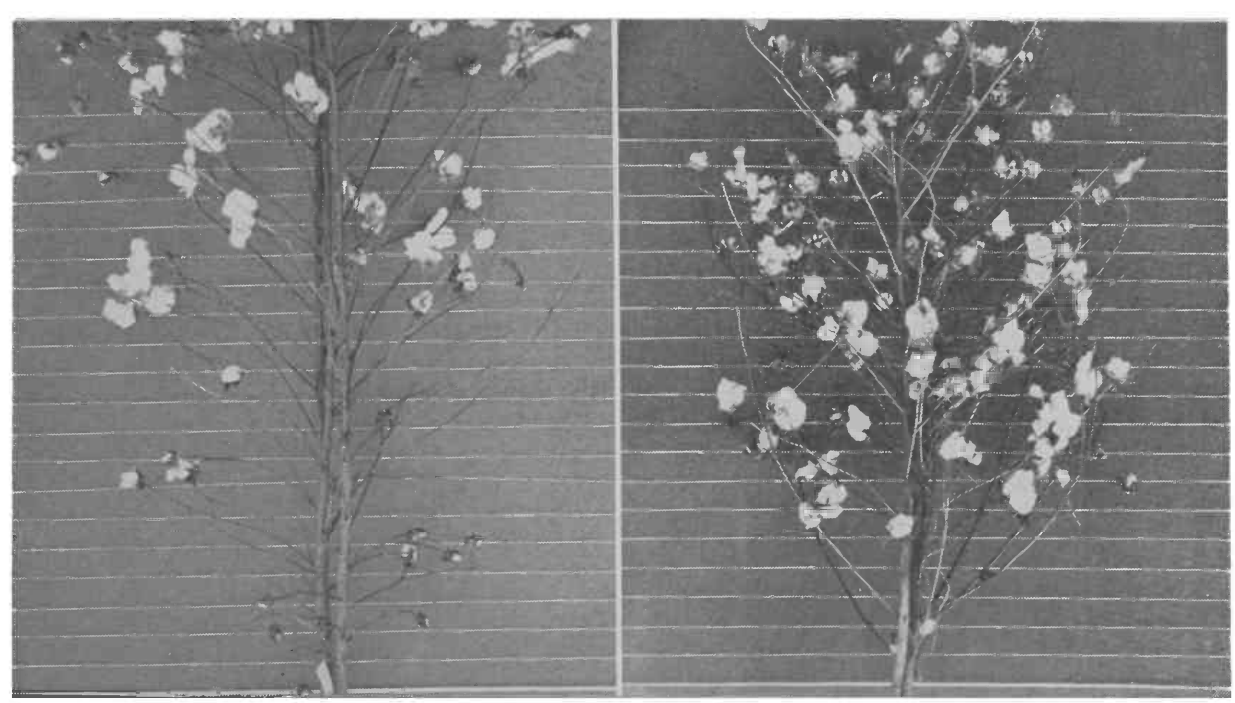
The strains that fruit highest on the plant may under certain conditions be desirable, but generally they are too late. They set a fair bottom crop and an excellent top crop if frost is late. If the normally very high fruiting strain is grown under adverse conditions (e.g., salt and/or Verticillium wilt) at high altitude, it is reasonably early and may yield relatively well. Under high fertility conditions at high altitude, the lower fruiting strains may be most desirable, since high fertility tends to offset the effect that high altitude has on fruiting height and yield response of a given strain.

At intermediate altitudes, small variations in the minimum night-temperature levels from year to year result in a variable fruiting height response. If the growing season is warmer than average, strains with tolerance to high night temperatures are most productive. If the growing season is cooler than average, the slightly higher fruiting types are most productive.

To date, only seven varieties of Pima have been grown commercially

(Continued on Next Page)

BELOW ARE SHOWN fruiting patterns of a high-altitude Pima cotton strain when grown at low altitude (left) and when grown at high altitude (right). At low altitude the fruiting does not begin until late in the season, the plant is rank and yield is low. At high altitude, fruiting begins at an intermediate level and the plant is desirable in terms of plant type, maturity and yield.



The authors are Research Agronomist and Research Geneticist, respectively, in the Crops Research Division, Agricultural Research Service, U. S. Department of Agriculture, University of Arizona Cotton Research Center, Tempe, Arizona.

Consumers Like New Milk-Egg Beverage

By J. W. Stull, R. R. Taylor, B. L. Reid and F. D. Rollins

During winter holiday seasons, milk beverages formulated with eggs have high consumer appeal. These beverages are known as eggnog and are characteristically flavored with spices, rum, etc. Current dietary interest in high protein foods suggests that a more universal acceptance of this distinctive beverage combination could be developed. Flavoring ingredients other than those used in the seasonal application would have wider acceptability.

From a nutritional standpoint, a beverage of this type would be an important item for persons of all ages. For example, many times the diet of young children, teen-agers and others is notably lacking in milk and egg products. Providing unique, appealing forms or combinations of these products would significantly improve their nutritional status.

The Departments of Dairy and Poultry Science have developed a beverage of this type which has some highly appealing characteristics. It is formulated by mixing together whole milk, cream, non-fat dry milk, eggs, sugar and flavoring. The beverage is pasteurized, homogenized, cooled and packaged using conventional processing methods. It has composition and nutritive characteristics as shown in Table 1.

J. W. Stull and R. R. Taylor are professor and research associate, respectively, in Dairy Science. B. L. Reid and F. D. Rollins are professor and extension specialist, respectively in Poultry Science.

The Public Likes It

At a recent University of Arizona Open House function, samples of a chocolate flavored beverage were provided for people who visited the Agriculture Building. Nearly 1,000 men, women and children sampled the product. They were invited to fill out a short preference questionnaire after testing the beverage. Of those who filled out the questionnaire, the results showed high acceptability (Table 2). An 8-ounce serving of this beverage could be used as a virtually complete breakfast, a nutritious snack or lunch or a wholesome refreshment beverage.

Table 1. Composition and nutritive characteristics:

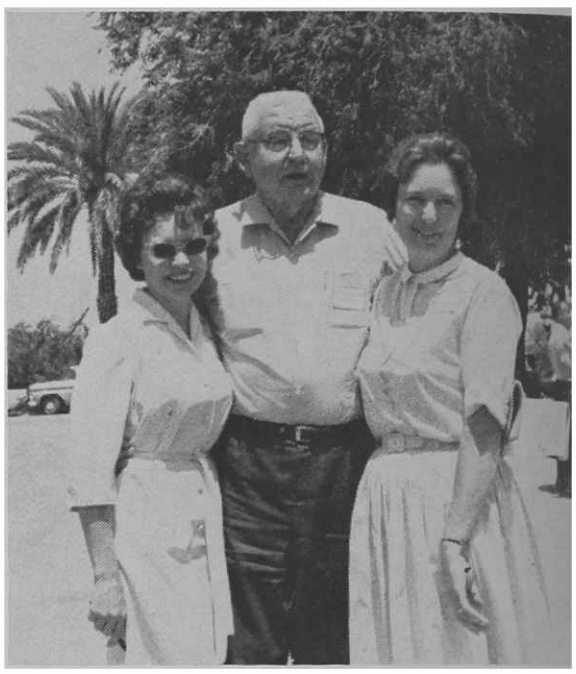
Fat (%)	6.0
Protein (%)	8.0
Carbohydrate (%)	11.4
8 oz. serving provides:	
300 calories	
18 gm. protein (25% recommended daily dietary allowance)	

Table 2. Results of preference questionnaire:

1. Would you buy this beverage if it were available regularly?
   Yes 93% No 7%
2. Do you consider this beverage to be:

Excellent	69%
Good	30%
Poor	1%

OUR MYSTERY PICTURE



This trio should be easy to identify, for those who attend field days at the Mesa Branch Experiment Station.

The man in the center was identified with the Mesa Station for years, from the time when he helped harness the mules and harrowed out an infestation of johnson grass.

The attractive young ladies, understandably of another generation, are identified with the Mesa Station today. You'll find identifications on Page 23.

(Continued from Previous Page)

in the southwestern United States. The first five varieties to be grown commercially — Yuma, Old Pima, SxP, Amsak and Pima 32 — were very similar in many respects. All were high fruiting at low altitudes, and the differences among the varieties in fruiting height, maturity and yield were small regardless of the location in which they were grown. They differed little, if any, in their reaction to night temperatures.

Varietal Adaptability

Pima S-1, however, sets fruit lower on the plant than the previous commercial Pima varieties; and Pima S-2 sets fruit lower than S-1. The lower fruit set of Pima S-2 is more pronounced at the lower than at the higher altitudes, thus the yield advantage of Pima S-2 over Pima S-1 is greater at the low altitudes.

The experimental strains being evaluated in the regional Pima Strain Tests show a continuation of this trend toward cottons with specific adaptability. At low altitude, certain strains with tolerance to high night temperatures begin to fruit early and continue to do so throughout the season, thus producing high yields. At high altitude, the very lowest fruiting strains are not usually the most productive, and the bottom crop is too low for efficient machine harvesting. Strains with intermediate fruiting heights are usually most desirable in terms of plant type, maturity and yield at the higher altitudes.

These results indicate the desirability of growing more than one commercial variety — one variety primarily for low altitude and another for high altitude. Either variety might be grown at the intermediate altitudes. The choice should depend upon growing conditions on the individual farm.

After Seeing Russia, I Feel That

OUR AGRICULTURE IS BEST

By George W. Campbell

The Soviet Union (Russia) uses almost twice as much land and more than seven times as many farm workers to produce a little more than one half (60%) as much agricultural products as the United States. One Russian farm worker produces enough food for himself and five others. One U. S. farm worker produces enough for himself and 30 others.

Almost half of Russia's total labor force is "tied up" in producing food and fiber, compared to about 10 percent of the U. S. total labor force. Consequently, due to our farmers' unmatched efficiency, even though our labor force is only about two-thirds as much as Russia's, we have about five million more workers than Russia who are free to work at jobs other than food and fiber production.

U. S. farmers by the efficient and extensive use of tractors, harvesting machines, fertilizers and other forms of capital and the constant application of results of scientific research, have become so productive that *our* agricultural problems are problems of *surpluses*. Russia's agricultural problems are problems of scarcity. Russian agricultural production has not increased as fast as has its population. U. S. agricultural production has consistently increased faster than our population.

The average factory worker in the USSR must work 10 percent longer to buy the same *kind* and *amount* of food as he did in 1928. In the U. S., he works half as long for higher quality and greater quantities of food.

The average factory worker in the USSR spends 60 to 65 percent of his take home pay for food; the U. S. worker spends 18 percent for food.

The average factory worker in Moscow must work twice as long as the New York worker to buy a pound of rye bread, 21 times as long for sugar, 9 times as long for butter, 8 times as long for eggs, 6 times as long for tea, 4 times as long for beef, 4 times as long for milk, 4 times as long for potatoes, 16 times as long for a man's cotton shirt, 11 times as long for a man's wool suit, 16 times as long for a woman's rayon street dress, 11 times as long for women's shoes, 15 times as long for men's shoes, 10 times as long for soap, 4 times as long for vodka, and 4 times as long for cigarettes.

Due in large measure to the inefficiency of Russia's farmers, and to the efficiency of our farmers, the real income of the average Russian is only a fourth to one-third of that of the average American. Indeed, insofar as it can be measured, the Russian's income today is very close to that of the American in 1890. This comparison includes the medical care, education, and related services provided by the government.

A family of four to six persons in Moscow, characteristically lives in a one room "apartment," shares a tiny kitchen with four other families, and a single toilet and shower with eight other families.

The Russians of today are not starving, and are in no danger of doing so. They probably consume more total calories than we do. Most of these calories, however, are in bread and potatoes. The Russian eats about twice as much bread and potatoes as the American — but less than half the meat, less than one-third of the eggs, and only about one-fourth of the milk.

The agricultural problems of the U. S. are complex, serious, and vexing. Attempts to solve them have been, are, and will be costly to us as tax payers. Nevertheless, I would not choose to swap *our* agricultural problems for those of the Russians.

I, for one, thank God that our agricultural problems are problems of *surplus* and not problems of scarcity.

Dr. Campbell is an agricultural economist in the Extension Service. He is reporting on his own observations as a recent visitor to the USSR.

U.S. Agriculture—1980

If the American farm of yesterday is hard to recognize today, think how it will be tomorrow.

Economists who trace trends foresee big changes down on the farm by 1980.

Many young people have already quit the family farm, leaving dad to man the tractors.

But dad is now beginning to think of trailer life in Florida. Who will replace him?

Many college-educated farmer's sons will return — but as ambitious businessmen rather than farmers. They will demand capital, new credit practices, modern equipment, and a big enough plant to harvest a good profit.

So farms will grow bigger. Assets per farm and farm worker are expected to double by 1980. Computers will be rolled in to help solve questions dad used to answer by hunch.

These trends, already shaping, will pick up still more momentum.

—Christian Science Monitor.

4 Tucson Girls Win County Dress Revue

Four Tucson girls who created their own wardrobes will represent Pima County in the dress revue and fashion show at the state 4-H Roundup on the U of A campus July 26-30.

They are:

— Amy Roberts, 17, daughter of Mr. and Mrs. J. Gordon Roberts. She is a member of the Nimble Fingers 4-H Club.

— Claudia Park, 15, daughter of Mr. and Mrs. William J. Park. She is a member of the Tanque Verde Community 4-H Club.

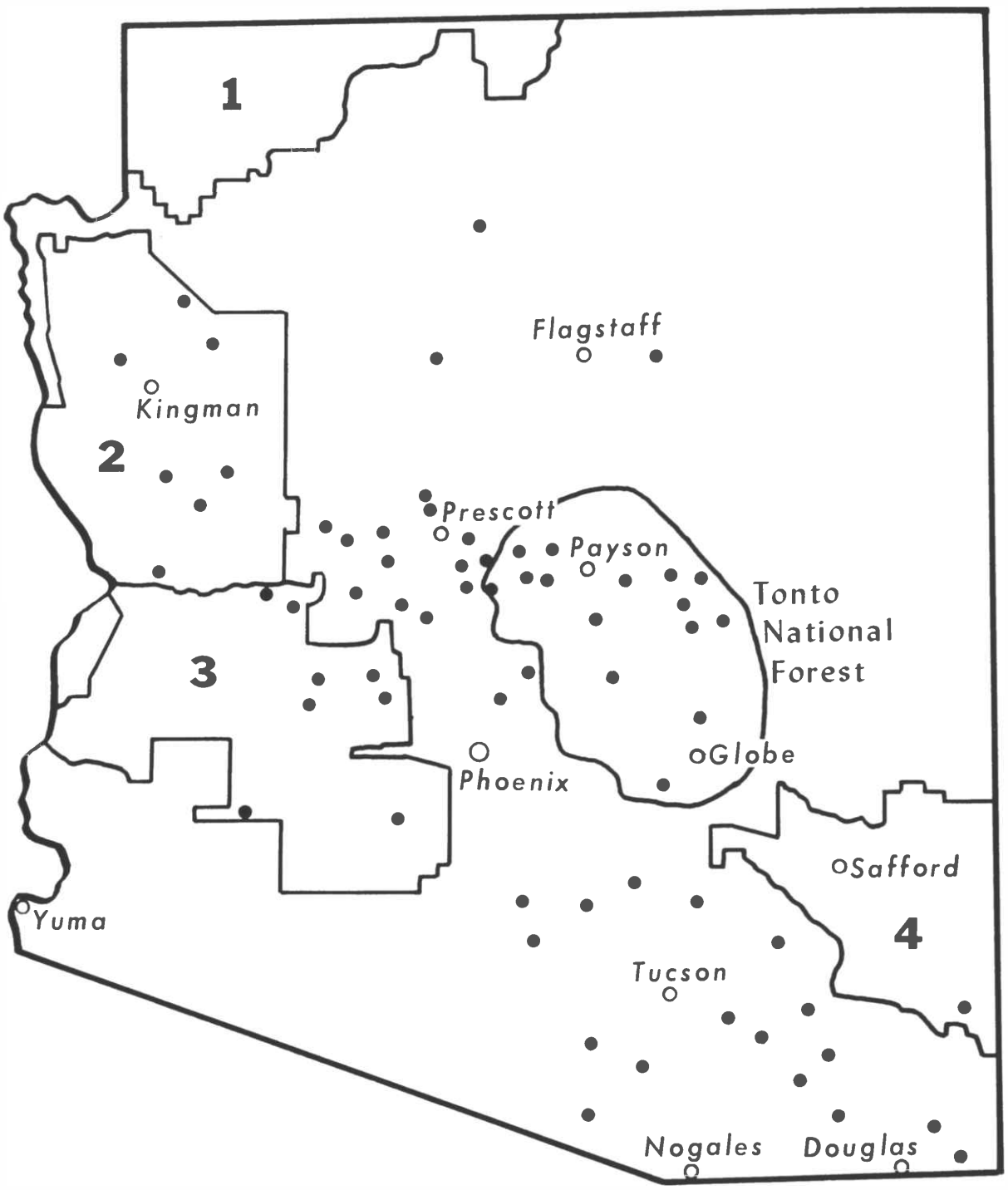
— Kathy Kegans, 14, daughter of Mr. and Mrs. Kirby Kegans, a member of the Nimble Fingers 4-H Club.

— Jeanette Roberts, 16, daughter of Mr. and Mrs. Garold Roberts, and a member of the Nimble Fingers 4-H Club.

The statewide winner, to be chosen here this July, will go on to the national 4-H Congress in Chicago next November.

O.K. TO BLOW UP BARN

Buildings that blow up like balloons now show potential for agricultural uses, according to South Dakota State University. The air-supported structures have been found useful as portable processing plants, temporary storage, temporary labor housing, livestock show houses or as crop storage structures that can be ventilated or collapsed on the product alternately, if necessary for conditioning.



Legend

Numbers are Bureau of Land Management Grazing Districts.

● Represents approximate location of sample ranches.

FIG. 1, at left, shows location of the sample ranches in Arizona.

ARIZONA RANCH PRICES CONSTANT

By William E. Martin and Gene L. Jefferies

Our study of Arizona ranch sale prices does not support the general belief that livestock ranches have been recently experiencing an upwards trend in sale value. While individual exceptions to the rule may surely be cited, statistical analysis failed to show any significant long-run trend in Arizona ranch sale prices since 1957.

From 1957 through 1963 a total of about 160 bona fide ranch sales occurred in Arizona BLM grazing districts two and three, the BLM section 15 areas, the intermingled state lands, and the Tonto National Forest.

Purchasers in 66 of these transfers were interviewed relative to variables affecting the sale price. Data gathered included such items as date of sale, total sale price, amount of deeded land, types and amounts of public lands, and cattle included in the sale. The accompanying state map, Figure 1, shows the location of the ranches sampled.

Multiple regression analysis was used to develop an equation that explained the sale price as a function of the above named variable. This statistical analysis enabled us to estimate the sale value of the individual components of land and leases involved in the sale as well as to check for a trend in sale value over time. The results on the valuation of land and leases were reported in the March-April issue of *Progressive Agriculture*. This current report concentrates on land value trends.

May Give Erroneous Impression

The general belief in rising ranch prices is given support by the USDA report, *Farm Real Estate Market Developments*. This report presents index numbers of average value per acre for grazing land in Arizona that have a significant and continuous upward trend over the past 22 years.

This trend is shown as especially marked during the past seven years that we studied. See Figure 2, for a graphic illustration of this alleged trend in sale value. The 10 years, 1950-1960, are shown as experiencing a 72 percent increase in value per acre. From 1960 to 1961 a three percent rise is shown, and from 1961 to 1962 there apparently was a seven percent increase in grazing values.

These USDA indices are based on replies to mail surveys sent to farm

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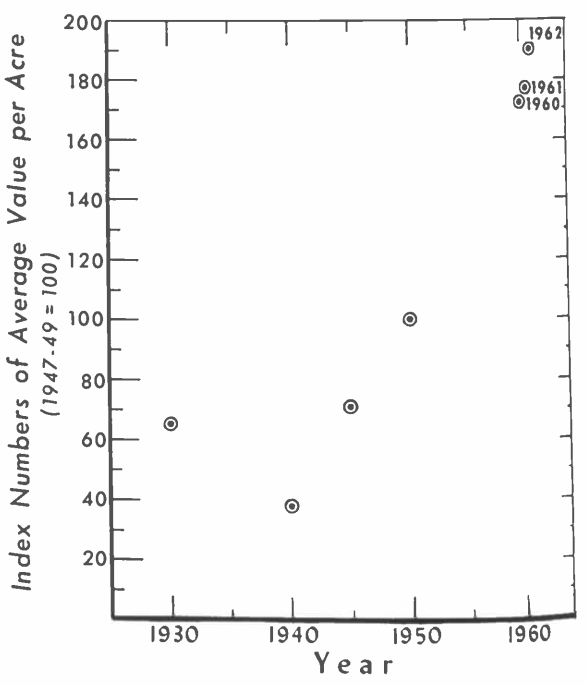
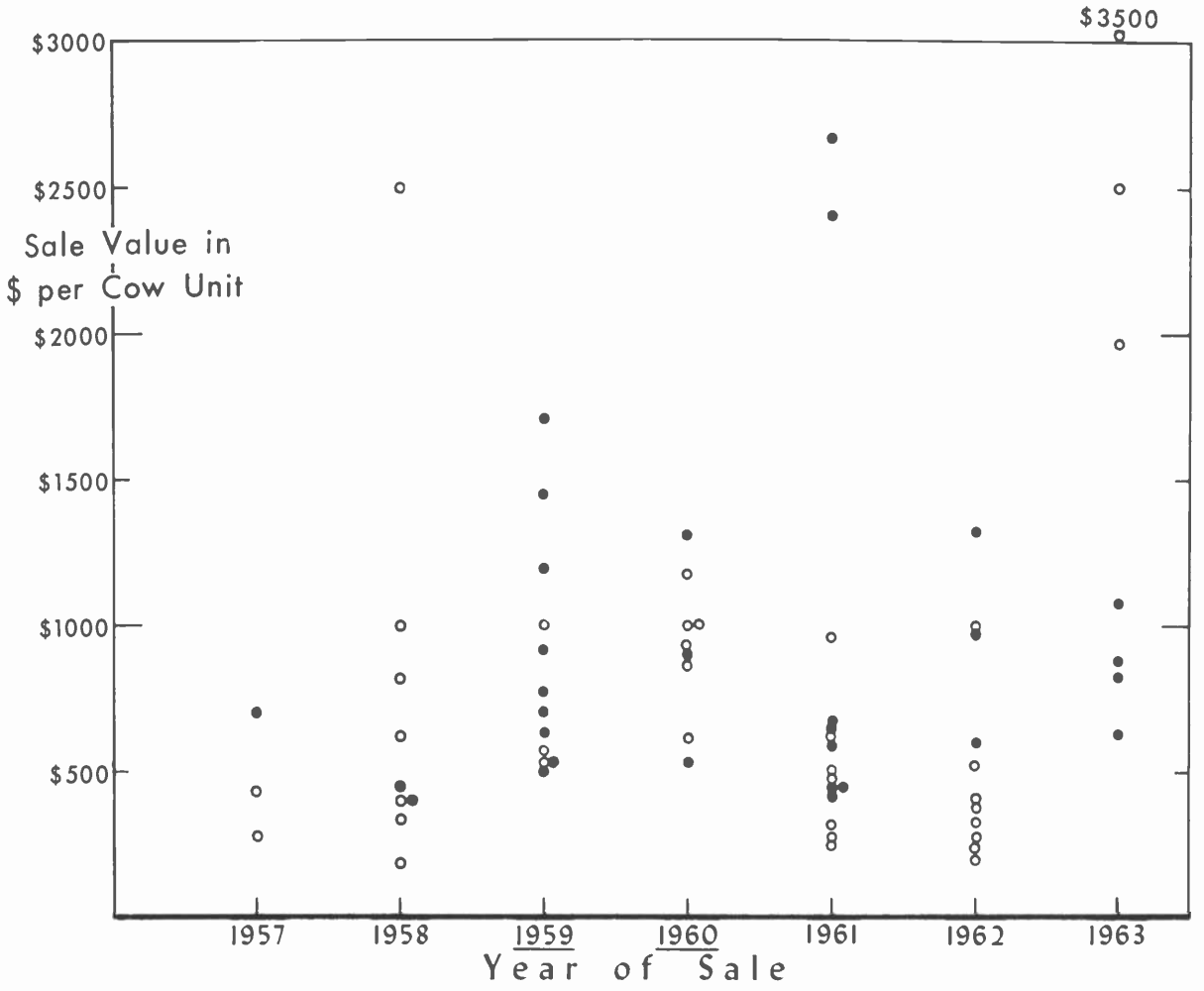
FIG. 2, below, gives the index numbers of average value per acre for Arizona grazing land, 1930 to 1962. Taken from the USDA "Farm Real Estate Market Developments," these indexes are not valid when compared to actual ranch sales, the authors point out.



Dr. Martin is an associate professor in the Department of Agricultural Economics. Mr. Jefferies was formerly a research assistant and is now a field administrator with the Peace Corps in Brazil.



Legend: Closed dots represent ranch sales that included breeding herd; Open dots represent unstocked ranch sales.

FIG. 3, above, shows year of sale related to sales value per cow unit.

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real estate reporters within the state. Separate questionnaires are sent to two groups of reporters: (1) farm real estate dealers, and (2) non-dealers, including local bankers, lawyers, abstractors, county officials, local representatives of lending agencies, and others familiar with the farm real estate market in their localities.

Most of these reporters participate in these surveys each year. Since they are in close contact with sellers and buyers and are presumably well informed as to current market trends, their opinions are likely to reflect those opinions generally held within their communities.

Rosy Hue of Memory

Our point is that these estimates are opinions and judgments only, not rigorous analyses of actual ranch sales. We suggest that these reporters may be letting their memories play tricks on them by remembering the individual sales that showed increases in value, and unintentionally forgetting to balance out these observations with ranch sales that have shown declines. Also, a general belief in rising prices tends to be infectious When your colleagues believe one way, you may begin to believe that way as well.

We acknowledge that there has been a large general increase in grazing land prices over the last 20 years. But we would argue that during at least the past seven years, the very period during which Figure 2 shows prices rising so rapidly, the average price level for ranch property has remained relatively constant, with only minor fluctuations and a few spectacular sales.

The data from which we arrived at this opinion are presented in Figure 3. Sale values in dollars per cow-unit from a sample of 66 actual ranch sales are plotted against the year of sale. Note that while the average price appears higher in 1959 and 1960 than in 1957 and 1958, prices in 1961 and 1962 declined to the level of the earlier years. The year 1963 shows some spectacular sales of unstocked ranches (surely for purposes other than simply raising beef) while the stocked ranch sales are about at the 1959 and 1960 levels. Statistical analysis failed to show a significant trend between the years 1957 and 1963. In other words, any apparent trend was probably due to chance in selecting the sample.

Not For Raising Beef

In conclusion, we suggest that where ranch values are presently still expanding, they are usually being influenced by the expanding speculative demand for desert home sites, subdivisions and other nonagricultural uses for desert lands. Livestock ranches in general have not been recently experiencing this same upward trend in value. Investors interested in purely ranch properties in expectation of rapidly increasing prices probably have been disappointed in recent years.

County Agent Grounds Has Farm Labor Plan

Into the breach stepped the county agent!

The discussions had gone on all spring, as result of the end of the bracero agreement. Labor Secretary Willard Wirtz said there was no point in importing Mexican workers to harvest Southwestern fruits and vegetables when the U. S. has an army of unemployed.

The growers insisted that most domestic labor wasn't too anxious to take the arduous field jobs, many couldn't do the "stoop" labor and many others would rather stay on the relief rolls.

Bob Grounds, Yuma County agricultural agent, hatched himself a scheme:

With start of the cantaloup harvest coinciding with school closing, at the end of May, why not recruit high school and college boys from Arizona's rural areas? And who could best screen those youths, as to their ability and desire to do a hard day's work in the field? The local county agent, of course.

So Grounds wrote to county agents in Arizona's other 13 counties, asking that these other counties help recruit labor for the Yuma County cantaloup harvest. After all, the county agents are good judges of "youth power" and can select the best workers and encourage them to apply.

Results, said Grounds, were most successful. News stories appeared in The Arizona Republic, at Phoenix, and in The Arizona Daily Star in Tucson. The Vegetable Growers Assn. at Yuma offered not only going wages, free housing and excellent meals at a remarkably low cost, but also incentive payments of 10 cents per box of melons and five cents additional for workers who stay the entire season.

As for the county agents, "We're swamped with inquiries," Blacky Blackwell of Pima County told his Yuma County colleague, after the plan was publicized.

PIMA COUNTY

Changed by Urban Growth

By M. Lee McGoogan

IN PIMA COUNTY the Extension efforts realize that with cotton and other products, families are consumers of goods as well as producers.

There's nothing so certain as change. Through the years American agriculture has adjusted to population increases, advances in science and technology, foreign trade opportunities and consumer demands. During war years or eras of peace, agriculture has adapted by producing or curtailing output.

County Agent G. E. Blackledge has watched the changing scene during his 20 year tenure in Pima County. He's seen numbers of farms sharply decrease and size increase. Fewer people live on farms. In 1950 there were 7,411 persons living on farms. This number decreased to 2,796 in 1960.

Changes in Number of Farms, Pima County

1949	1959	1960
1,950	481	421

Areas that were rural have become urban or suburban. Housing developments are polka dot areas on range landscapes. Farm lands 20 years ago are business and housing areas within Tucson city limits, according to Glenn Blackledge. There were 9.55 square miles of the city in 1950; 70.9 in 1963.

Change in Needs, Too

Increases in population have brought corresponding demands for services. He's adapted to change in program emphasis as people on the move seek help from the Pima County Extension Office in adjusting to the area's soil, vegetation and climatic conditions.

Changes in Population

	1944	1954	1963
Tucson	38,000	54,000	237,000
Pima Co.	90,000	190,000	322,000

Changed Cotton Production

Competition between fibers for consumer and industrial use has forced cotton producers to utilize every resource for economical and efficient production methods.

Mr. Blackledge has relayed to cot-

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The author, Miss McGoogan, is a Georgia native, who was a home demonstration agent in that state from 1934 to 1958, when she went to the University of Wisconsin for further training. After Wisconsin came experience in Maryland, as a 4-H and home economics information specialist. Miss McGoogan, who has a bachelor of science degree in home economics from the University of Georgia, and a master's degree in agricultural journalism from the University of Wisconsin, came to Arizona in the fall of 1961, as county home agent in Pima County.

A FAMILIAR SIGHT in Pima County is the county agent out in a cotton field, discussing problems of planting, irrigating, fertilizing, insect and disease control. Here Pima County Agent G. E. Blackledge (left), talks cotton with Art Pacheco.

(Continued from Previous Page)

ton producers research findings in fertilizing, varieties, irrigation, weed control, planting, cultivating and harvesting practices.

With increased costs of production, growers are meeting the cost-price squeeze by shifting from hand labor to almost complete mechanization. Playing important roles in economical and efficient production are use of chemicals to control insects, planting productive and disease resistant varieties, and increasing fertilizer.

Poultry Production High

Poultry production in Pima County represents almost half the laying birds in Arizona. Pima County is one of two counties in Arizona that produce more eggs than its population consumes.

Pima County produces 15 percent of the national copper supply. The county produced 185,000 tons in 1963, valued at $116,000,000, from five major mines. Mining and quarrying industries gave employment to 3,300 persons in Pima County during April, 1963. Taxable sales of mining output increased $28,694,000 from 1959 to 1962. This increase in production changes tax structures in rural areas.

Changes in Livestock

Emphasis on quality rather than quantity is producing more beef per cow unit in Pima County. There has been little change in the number of cattle on the range. The change is to better cattle and better ranges.

Pima County boasts some of the best desert grasslands in the country. There is marked improvement in this 20-year period in practices of herd improvement, range reseeding, brush control, parasite and insect control, related Mr. Blackledge.

Most of Pima County's water supply is from ground water produced by deep wells. Water levels drop at rates of one to two feet per year, in some areas to 10 feet where there is heavy irrigation and industrial use. Part of Tucson's supply is pumped through large pipelines for a distance of 20 miles. Land with water rights is sought by farm, industrial and urban interests.

Presently, commercial, municipal and domestic uses require 165 gallons per capita per day. Most light industry, school and recreation facilities have independent supplies. They use 40 gallons per person per day.

Tucson water engineers are aware of unprecedented present demands and are planning future needs. Their projections are based on anticipated population growth and development.

Population Estimates

	Tucson Urban Area	Pima County
1980	570,000	625,000
2000	1,400,000	1,500,000

The prediction is for 175 gallons per day per capita for domestic, municipal and commercial use; 40 gal. per capita per day for schools, recreation and light industry.

Climate Is Nearly Ideal

With marked changes in other areas, the climate of Pima County remains ideal. Sunshine is abundant with 85 percent possible sunshine in the Tucson area. There is an average rainfall of 10.9 inches. Relative humidity is low most of the year. This climatic factor makes conditions tolerable for persons with respiratory and arthritic conditions. Humidity ranges from an average low of 25 percent to an average high of 62 percent.

Winter weather conditions attract one of Pima County's treasured sources of income — tourists who boost the economic, cultural and social life of the area.

"What varieties do I plant?" "How often to water?" "When? Morning or night?" "What is this bug?" "What is this plant?" "Why is my tree dying?" These and many more questions are all in a day's work for Pima County Extension Agents.

Almost three-fourths of the county's population is confronted with unfamiliar conditions. (There are only 462,241 native born residents from a population of 1,545,000 persons in Arizona).

Pima County Agent in Charge, Garrett E. Blackwell, Jr., says, "Population explosion has more than tripled the population in the past 21 years. Over 60 percent of my phone calls and 50 percent of my time is spent in providing information to help urban and suburban people solve their home-plant-care problems. Adjustment to our Southwestern desert situation creates questions from newcomers.

"The fact that people ask for information in agriculturally related areas is proof positive that the Agricultural Extension Service can help people live happier and more rewarding lives in their changing world," says Blackwell.

Family Living Changes

Families are now consumers of

(Continued on Next Page)

MRS. JAMES LARSEN, a 4-H leader in Pima County, instructs her daughters, Cindy and Jody, (in photo below) that you must determine best buys by figuring cost per egg.

Maier Tapped For Executive Training

Dr. Robert H. Maier of The University of Arizona Department of Agricultural Chemistry and Soils, has been named as one of the first 25 participants in a new program to train college administrators.

He will spend the next academic year working in administrative offices at the University of North Carolina, Chapel Hill.

Selection of the professor of agricultural chemistry and soils was announced in Washington by the American Council on Education, which runs the program with Ford Foundation financing.

He had been nominated by UA President Richard A. Harvill. Maier, 37, joined the university here in 1956.

Earlier, he had earned a bachelor's degree in chemistry and botany from the University of Miami and master's and doctor's degrees at the University of Illinois.

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goods rather than producers. With a greater variety of goods to consume, there is constant demand from the Pima County Extension Office for consumer information. People want immediately the information they need to make decisions.

With families on the move, there is less stable volunteer leadership. Locating leadership potential and training are the challenges in Pima County.

There is little community interest or unity because neighbors are strangers. They come to Pima County from varying cultural backgrounds for permanent or short time residence.

Many schools run double shifts, complicating management of the home. Within a small family activities, interests and schedules vary widely. Family unity is sacrificed unless parents make a real effort to preserve it.

Accepting the Challenge

Fitting 4-H into urban and suburban situations means new projects, more area clubs that demand more and better trained leaders. With a steady increase in numbers of 4-H members in the Tucson area and a decrease of those with farm backgrounds, projects requiring limited space are in demand. This is reflected through the increase of 4-H members carrying horse and dog projects. Extension Agents working with the 4-H Club program in Pima County are Ellen Kightlinger and Howard Jones.

Homemaker club programs are directed mainly toward consumer education. While they continue to give opportunity for developing homemaking skills, they include "buymanship" for family needs. Decision making is an educational process and increasingly important.

The broad family living program includes beautification of community and state, study of Arizona laws concerning wills, child development and family relations. Other areas are clothing, housing, management and feeding the family with least possible financial stress. Leadership development is high on the priority list.

Dr. Massengale Chosen Professor of the Year

Dr. Martin A. Massengale, associate professor of agronomy, was selected as the "Outstanding Professor of the Year" by the Agricultural Student Council, of which Kenny Evans is president.

"Each club represented on the council is eligible to nominate one professor for the award. Nominations are based on classroom teaching, work with students, research projects and community activities," Evans explained.

Dr. Massengale's name will be inscribed on a permanent plaque in a trophy case in the lobby of the Agriculture Building.

Dr. Massengale received his Bachelor of Science degree from Western Kentucky State College in 1952, and his Ph.D. from the University of Wisconsin in 1956. He came to the University in 1958 as an assistant professor. In 1962 he was appointed associate professor of agronomy, and he has just been advanced to full professor.

Dr. Massengale is faculty advisor to several graduate and undergraduate students and student organizations in the College of Agriculture, including the Agriculture Student Council. He is also head resident of Hopi Lodge.

Dr. Massengale is a member of Phi Kappa Phi, Gamma Sigma Delta, Sigma Xi, Alpha Gamma Rho, Phi Sigma, Gamma Alpha, American Society of Agronomy, Western Society of Crop Science, American Grassland Council, American Society of Plant Physiology and the Arizona Academy of Science.

Schwalen, on UA Staff Nearly 50 Years, Retires

It is typical of Harold C. Schwalen that July 1, when he completes 48 years on this university's staff, he'll keep right on working in the Department of Agricultural Engineering. "It'll take me another month, after July 1, to complete the work I'm on now, a water study," he says. Prof. Schwalen, who reaches the compulsory retirement age of 70 this summer, has had a lifetime concern with water, it scarcity, its use and its quality.

He was just a little tike when his family moved here from St. Paul, Minn., in 1904, and at that time fields along the west bank of the Santa Cruz river, in Tucson, were irrigated by the almost constant flow of the river. Those fields are subdivisions today, and the river now runs only for a few hours or days a year after an occasional rain.

But the memory of a boy of nine has been the lifetime concern of the man now 69. Only the water table has lessened.

Prof. Schwalen went to work for The University of Arizona when he got out of the artillery, after serving in World War I. And Pres. Harvill notes that he has served this university "longer than any other person" save the late Dr. A. E. Douglass, famed astronomer and tree ring specialist.

Prof. Schwalen, for many years head of the Department of Agricultural Engineering, has a quick alertness of thought and action which belies his age. And after retirement he'll still be active in this community, handling his own business affairs and taking on occasional engineering assignments. In these activities his colleagues wish him well.

Another retirement July 1 from this sector of the U of A is that of Miss Ethel Thompson, professor of Home Economics since 1938, who has produced an important list of research accomplishments in the field of human health and physiology.

Turfgrass Management Under Saline Conditions

By Fred Turner, Jr.

Six varieties of bermudagrasses were planted by sprigging at the Safford Experiment Station in late 1962. One of these, common bermudagrass, produces pollen and seeds. Another, African, has a light seed set. The other varieties, Tifgreen, Tifine, Tifway and B-181, are all hybrids and produce neither seed nor viable pollen.

During most of 1963 and all of 1964, these grasses were flood-irrigated with highly saline water (3200-3500 p.p.m. total soluble salts). Adaptability of these turfgrasses for lawns, fairways, tees, and athletic fields is being investigated.

Although all varieties started recovery from dormancy two weeks later in 1964 than in 1963, the B-181 greened 7 to 10 days earlier than did the other varieties.

Tifway Thatch Heaviest

Early in April all plots were uniformly verticut (scalped) and the thatch was removed. The Tifway thatch was noticeably thicker than was that of the others. The African thatch was quite thin. The remainder were intermediate in this respect.

In mid-July and again in early September, part of the Tifgreen was again verticut. With supplemental nitrogen and water, an acceptable lawn was reestablished within three weeks. This area had none of the browning and uneveness that was evident in high-cut Tifgreen, which was verticut only in April.

Mowing heights of 3/8", 1" and 2" were compared. A reel-type mower was used. The lowest height was always easily mowed, and all varieties except African had good color and density. In mid-August, all of the African had large dormant areas. This browning was most pronounced in the lowest-cut plot. Most of the browning had disappeared by late October.

Varietal Differences

As would be expected, the higher the mowing height, the denser the turfgrass. However, there were some noticeable differences between varieties. Common, Tifine, B-181 and African never became so thick that they could not be clean-mowed. By mid-August, however, the 2"-height Tifgreen was showing some light-colored areas where the mower had not cut clean. This was also observed in the 1"-height Tifway. But the 2"-cut Tifway was so thick by this time that it stopped the mower reel many times. A clean, even cut could not be made, and it had a ragged appearance for the rest of the year.

Ammonium sulfate (AS) was applied to all plots at the rate of 10 pounds per 1000 square feet at about six week intervals through the growing season. But yellowing of foliage was observed in most varieties by mid-summer. On August 8 the following materials were broadcast, in separate strips within each variety, at the above rate: AS, Zinc MNS, and ferrous ammonium sulfate (FAS). Within 10 days the African and Tifgreen were noticeably greener, and the Tifine and Tifway slightly greener, where FAS had been applied. There was no noticeably greening response to other materials.

On August 28, several herbicides were tested on weedy areas of a Tifgreen lawn:

1. **DSMA at the rate of 1 lb./10 gal. of water.**
2. **MCPP at the rate of 2¼ oz./1000 sq. ft. (in 2 gallons of water).**
3. **DCPA at the rate of 15 lbs./acre + ½% spreader in 50 gallons of water.**

Enough of each material is spread on each plant to uniformly wet the grass and weeds.

Control of Weeds and Grass

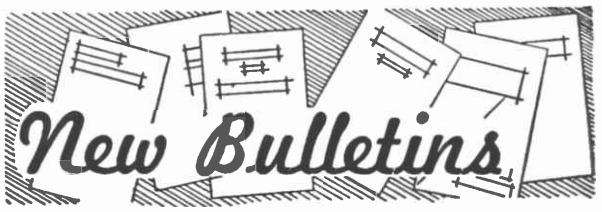
The principal weeds were spurge and annual grasses (commonly called "water grass"). DSMA killed the annual grasses but only wilted the spurge. MCPP effectively killed the spurge, but barely touched the grasses. DCPA had no apparent effect on any weeds or on the Tifgreen, but it was noted later that no new weeds appeared in plots treated with this material. A slight browning of the Tifgreen following applications of both DSMA and MCPP had nearly disappeared in two weeks.

Puncture vines growing in Tifgreen were sprayed with MCPP in late August. They were completely killed within 10 days.

Common Bermudagrass in non-lawn areas of the station and as intrusions into the Tifgreen lawn was severely damaged by the bermudagrass mites. The Tifgreen in the lawn and plots and the other bermudagrass varieties showed little, if any, mite damage, so no chemical control measures were taken.

Development of an instrument to measure turfgrass density is continuing. An expanded investigation of both turfgrass varieties and of management is underway. There will be further research with insecticides and herbicides.

Dr. Turner is superintendent of the Safford Branch Experiment Station.



Bulletins

- A-40 Soil Organic Matter
- A-26 (Revised) Protect the Cotton Plant from Insect Injury
- A-24 (Reprint) Sprinkler Irrigation
- A-14 (Revised) Arizona Insect Control Recommendations
- A-13 (Revised) Kill Livestock Pests
- A-4 (Revised) Field Crop Varieties for Arizona

Circulars

- 233 (Reprint) How to Process Your Home-Grown Ripe and Green Olives
- 142 (Reprint) Household Equipment — It's Care and Repair

Folders

- 80 (Revised) Arizona 4-H
- 68 (Revised) List of Available Publications

JULY

26-30—State 4-H Roundup — U of A Campus, Tucson

AUGUST

5-6 —Arizona Cattle Growers Assn. and Arizona Section, American Society of Range Management, joint meeting, Springerville

8-13—Annual FFA Leadership Conference — U of A Campus, Tucson

SEPTEMBER

28-30—Extension Agents - in - Charge Conference, U of A Campus, Tucson

Trifluralin's Effect On Secondary Roots of Cotton Seedlings

By L. R. Vannoorbeeck and K. C. Hamilton

The chemical trifluralin, trade name "Treflan," has proven an effective herbicide for controlling annual weeds in irrigated cotton. Applied to the soil and incorporated before the preplanting irrigation, it has given season-long control of grasses and certain broadleaved weeds. However, temporary stunting of cotton seedlings following preplanting applications of trifluralin has caused concern to many cotton growers.

During 1964 the effects of trifluralin on cotton seedlings were studied in a U of A greenhouse at Tucson. Trifluralin at the rate of one pound per acre was mixed into the surface 1, 2, 3, or 4 inches of a sandy loam soil. Cotton seeds were planted and the pots subirrigated. At intervals cotton plants were harvested to weigh the plants and determine the number and position of secondary roots. Some of the data from these experiments are summarized in the accompanying table.

Mr. Vannoorbeeck is a former graduate student in Agronomy; Dr. Hamilton is professor of Agronomy.

Affected Root Growth

Incorporation of trifluralin below the cottonseed affected the number and distribution of secondary roots on cotton. The primary root penetrated trifluralin-treated soil but produced no or few secondary roots until reaching soil free of herbicide. Cotton seedlings partially compensated for the lack of secondary roots on the upper portions of the roots by producing more roots than normal below the trifluralin layer. Later a few abnormally thick secondary roots developed in the trifluralin-treated soil.

Trifluralin also decreased the weight of cotton seedlings. The reduced root system was accompanied by a visible reduction in top growth. Incorporation of trifluralin in the top four inches had a greater effect than incorporation into the surface two inches. The response of cotton seedling roots to trifluralin incorporation to different depths is illustrated in the photograph on this page.

This response of cotton seedlings to trifluralin, observed in the greenhouse, also occurred in the field. Cotton seedlings were temporarily stunted when growing in trifluralin-treated soil. Their susceptibility to seedling disease was also increased. When the surface soil dried rapidly, the reduced root system of cotton seedlings necessitated earlier irrigation.

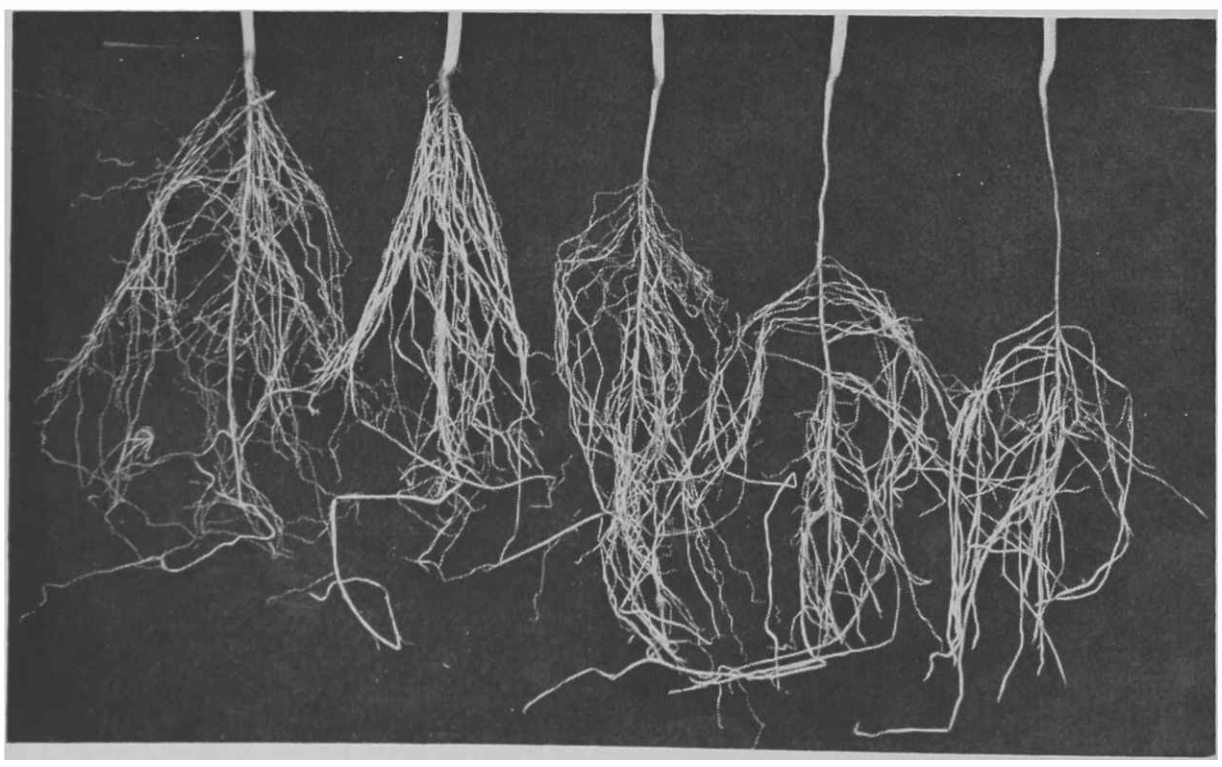
Keep It Near Surface

Effects of commercial applications of trifluralin on cotton seedlings can be minimized by restricting the depth of incorporation of preplant treatments. When trifluralin was incorporated by furrowing only, there was less effect on cotton than when trifluralin was incorporated by disking or harrowing in addition to furrowing. Trifluralin incorporated by furrowing only has given excellent weed control. Movement of the soil during furrowing and subsequent seedbed preparations has provided adequate incorporation to obtain weed control.

In summary, preplanting applications of trifluralin have given season-long control of many annual weeds. It is presently the best herbicide available for the selective control of annual grasses in cotton. Growers can expect temporary reduction of the secondary roots of cotton plants in the layer of soil treated with trifluralin. This effect of trifluralin can be minimized if the herbicide is incorporated no deeper than actually needed to control weeds.

Weight and Root Distribution of 12-day-old Cotton Seedlings in Soil Treated with Trifluralin.

Depth of incorporation of 1 lb/A of trifluralin	*Weight of seedlings in grams*	*Number of secondary roots Portion of primary root by inches*				*Total roots in top 5 inches*
		2nd	*3rd*	*4th*	*5th*	
Untreated	31	22	18	11	8	59
2 inches	29	0	19	16	11	46
4 inches	28	6	0	0	15	21



TRIFLURALIN EFFECT on roots of 10-day-old cotton seedlings grown in soil treated with the herbicide is shown at left. Left to right — untreated, trifluralin in the top inch, two inches, three inches and four inches. No secondary roots developed in the layer of soil containing trifluralin.

What Do You Mean by

HUMAN HORTICULTURE?

By Ava Dale Johnson

Someone answered the phone. "Seed potatoes? No. Yes, this is the nursery; but no plants, just children."

One is rarely surprised that The University of Arizona studies young potatoes, cotton bolls or even baby intestinal worms, but faces often go blank at the mention of a laboratory for fledgling homo sapiens. Nevertheless, The U. of A. has just that: a laboratory nursery school for humans, ages three and four.

Lab For Little Ones

The nursery school is, first, an observation ground for students in child development. There, preschool specimens — old enough to walk and talk but not old enough to mask typical human emotions, display unguardedly a wide range of pleasure, resentment and aggression.

Both men and women take the Home Economics School's courses in child development. Among the hundreds enrolled are Asians, Africans and South Americans—future nurses, teachers, sociologists, psychologists, extension agents and homemakers. Diverse peoples, they unite in their urgent quest for self-understanding and the know-how to get along better with others of the human race.

Books Not Enough

For these modern college students, books about human development are simply not enough, the same as texts on Egyptian cotton, navel oranges or Rhode Island Reds can't tell the whole tale. They ask questions and they want to see with their own eyes.

"Do humans ever really have a tail?"

"If the mother's and the baby's blood don't mix, how can some drugs taken by the mother, harm the baby?"

"In my country of Brazil, everybody has natural childbirth; how is it something so special here?"

"But why do you toilet-train so slowly? In Nepal, we finish this by seven or eight months."

Mrs. Johnson is an instructor in Child Development in the School of Home Economics.

"He should have been through with that months ago!"

Older Children Puzzle, Too

The same students who demand answers about birth, infancy and toddlerhood, seek explanations about the older child. Some inquiries are satisfied with viewing a preserved fetus, models and live demonstrations. Others, like "How come my three-year-old neighbor opens the door, smiling, and the four-year-old slams it in my face?", are resolved through visits to the nursery lab.

A second purpose of the laboratory nursery school is to gear young women for working with preschool children in their homes. Through study of what such youngsters require, and how their individual best can unfold through skillful guidance, students prepare for contact with boys and girls in the nursery school. There, under supervision of instructors, they get the feel of blending tender personalities with art, music, science, social studies and human relations.

They acquire some finesse in motivating, granting freedom, setting limits, protecting, redirecting the child not yet five. (And they grasp that working with children is nowhere as sure nor as tidy as following a cake recipe).

Use For Everything

Psychology? Yes, applied from prerequisite classes in both beginning psychology and child development. Technique? Indeed. The co-eds learn to recruit almost everything in the common kitchen, sewing basket, tool shed, back yard and trash can for pastes, paints, collages, rhythm instruments or props for dramatic play. They sniff out first hand the learning situations which a child of preceding generations often bumped into automatically. "Does milk come from the icebox or the grocery store?" Take a trip to the dairy. "What's butter?" Pass up the trinket and coloring book and buy a carton of cream for the child to churn. "What are those purple balls over there by the tomatoes?" Time to bring home raw turnips and other rare vegetables for junior to slice, nibble and cook. "How does it work?" Time for a peek under the hood with Daddy, or a turn at holding a hubcap full of nuts while Mama changes a tire.

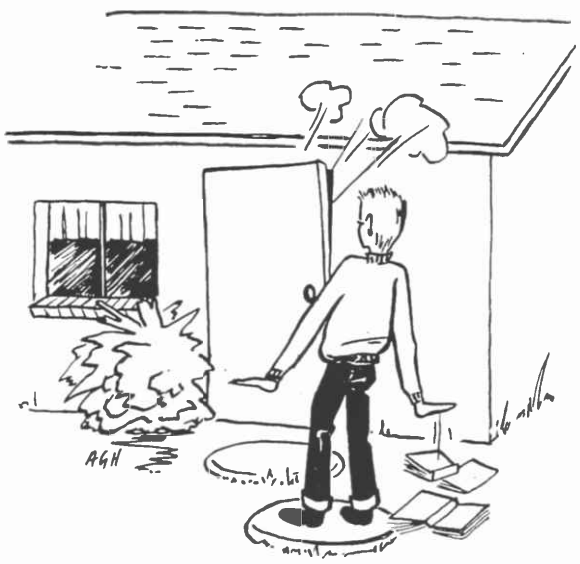
Still a third reason for the nursery school lab is providing a practice classroom for students learning to be nursery school teachers.

Comparative Judging

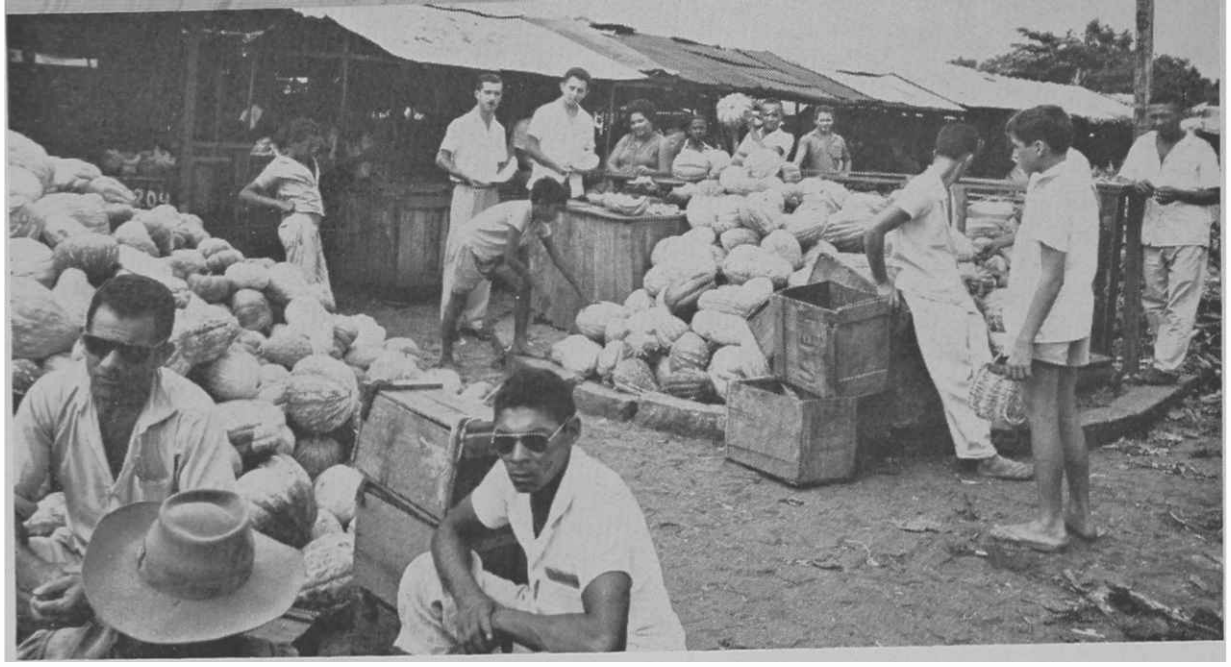
A fourth goal is supplying mothers and fathers of the nursery children a means of appraising their child in relation to others his same age. Often, they comment after a visit, "Billy's like his own self, but yet, it's surprising how much he's like the others. Maybe he's not as far off the beam as we thought!"

A fifth reason for the University laboratory school is the higher developmental achievement of the three and four-year-olds themselves. A rebellious boy, happier in a setting of wide freedom, firm limits. A whining girl, nagging less in a surrounding of affection, plenty of playmates, and endless intriguing activities.

Seedling potatoes? No, just children. The U. of A.'s nursery school "greenhouse" is where instructors, students, parents and preschoolers stumble onto some new insight every day.



" . . . and the four-year-old slams the door in your face."



AGRICULTURAL MARKETING in northeast Brazil leans heavily on the open air public market. In this photo by Dr. J. Richard Kuykendall of the U of A group, ← one can see the displays of squash brought to market for sale. Two men standing, in the background, are Prof. Diogenes Cabral and Tarquinio Prisco, both of the escola staff.

Menzie, Economist, Furnishes

BRAZIL REPORT

By Elmer L. Menzie

As a member of The University of Arizona team in Brazil, I would like to introduce you to some of my associates at the Escola de Agronomia, University of Ceará. Dr. Mario Rocha is a catedratic professor, my immediate counterpart in the Departamento de Economia Rural. He is the head of the department and specializes in the area of accounting and farm management.

Dr. Nilo Barroso is a half-time instructor who spends the other half of his working day at the Bank of the Northeast. He is the department's teacher in basic economic theory. Dr. Francisco de Oliveira Melo is another half-time assistant professor who teaches marketing. The other half of his time is spent teaching at a secondary school. Dr. Faustino de Albuquerque Sobrinho is a full-time professor in sociology and extension.

They Overcome Handicaps

The members of this department, as in others in the Escola, work under many handicaps, and are appreciative of any help that we are able to give. Some have the strain of more than one job, and all suffer from a lack of time and resources for both teaching and research. For example, library facilities are minimal, which makes an effective teaching program extremely difficult. (A good building is now available and books are on order for the new library.)

Trained personnel and other resources are in short supply for adequate research programs, yet research is of prime importance to development of the institution and the state. Information is badly needed to increase agricultural output and to improve teaching programs. All fields need and want more guidance and assistance.

Ceará, as one of the states of the area known as the dry Northeast, has many problems for its trained people to solve. In 1960 the population was estimated at 3.3 million approximately 24 percent more than in 1950. (About 15 percent were in the city of Fortaleza, where population nearly doubled in the 10 year period). It is estimated that about two-thirds of the population is rural and about the same proportion has been classified as economically inactive. That is, they really do not participate in normal commercial markets.

Per Capita Income Low

Gross per capita income in Ceará in 1960 of about 12,000 cruzieros was less than half the average for Brazil as a whole. (The cruziero at that time was about 200 to the U.S. dollar, making the above per capita income around $60). Distribution of income is also very poor, with the largest part of the population receiving bare subsistence. Early in 1965 minimum wages for salaried employees was raised to about 40,000 cruzieros per month. At the prevailing rate of exchange this amounts to approximately $21. (Inflation has reduced the value of the cruziero from the 200 per dollar in 1960 to 1940 per dollar in May of 1965). A large part of the population, of course, does not enjoy even the 40,000 cruziero-per-month minimum.

Inflation is a constant problem. While the present government is acting to relieve this situation, it continues to persist. Based on 1948 = 100 the index of general living costs in Fortaleza, Ceará, in the first part of 1964 was over 3500. Between 1961 and 1964, the index nearly quadrupled. The problems resulting from such a rate of inflation have been phenomenal, and a major part of the current government's program is directed toward bringing this aspect of the Brazilian economy under control. Indications are that in recent months the rate of inflation may have been reduced.

Nearly half of the income of the state of Ceará in 1960 was derived from agriculture. Output has been rising, but not nearly as fast as the inflated values might indicate. Recent year production estimates place the value of cotton at about 25 percent of the total, bananas, beans and "milho" each about 10 percent, with meat, hides, milk and eggs together making up over 20 percent.

Hacienda Plantation Farming

Agricultural production is largely primitive in nature. Much of the

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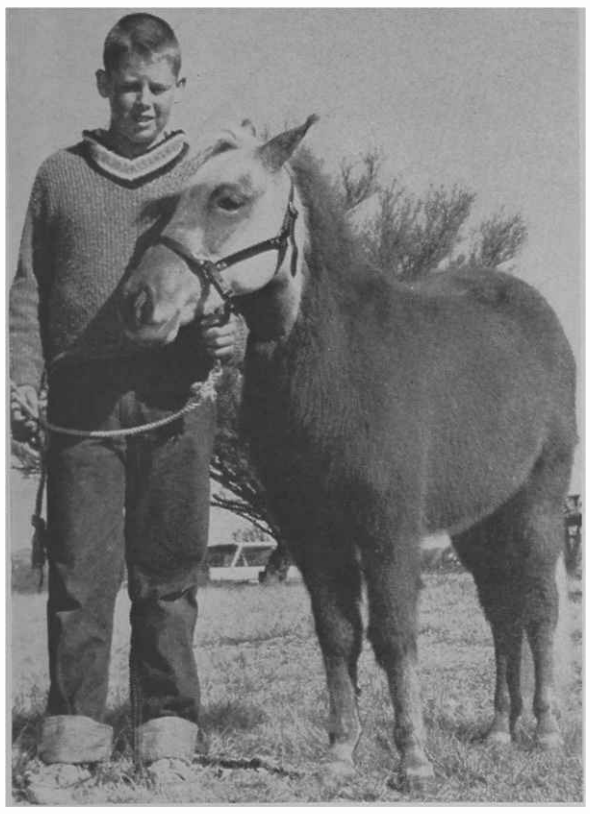
WORKING TOGETHER FOR Brazilian agriculture are, left to right, below, Francisco de Oliveira Melo, Elmer L. Menzie, Nilo Alberto Barroso, Mário Rocha and Faustino de Albuquerque Sobrinho.

This article is one of a series of reports by U of A agricultural scientists stationed in northeast Brazil. Dr. Menzie is the adviser in Agricultural Economics.



HAPPY IS A BOY and his pony, in this case David Linneen, 11, of Tucson, given a registered Shetland to care for as a 4-H project. The pony was given to David by the regional club of the American Shetland Pony Assn., at ceremonies at Hungry Horse Ranch, near Tucson. David is son of Mr. and Mrs. R. H. Linneen.

Foreign Visitors, Trainees Receive Warm Welcome Here

By James F. Armstrong

A year ago readers of this publication were introduced to the liaison officer, International Programs Personnel, who was filling a newly created position in the College of Agriculture. This position was created primarily to function as "contact officer" between the College of Agriculture and the Foreign Training Division, International Agricultural Development Service, United States Department of Agriculture, Washington, D. C.

The Foreign Training Division (FTD) is charged with the responsibility of arranging training programs in agriculture with land-grant colleges and universities, private colleges and universities, federal government agencies and private concerns and individuals. A particular program may combine coordinated training from any combination, or all, of these sources.

In general, FTD arranges programs for International participants sponsored by Agency for International Development (AID), Food and Agriculture Organization of the United Nations (FAO) and other similar sponsoring agencies. Assistance in arranging and coordinating training programs for privately financed participants is also provided by FTD.

It Is An Involved Job

Primary duty of the "contact" is to accept, reject or recommend changes in proposed training programs, as submitted by FTD to the College of Agriculture on behalf of sponsored international participants. This function is done with cooperation of department heads and their staff and/or with administration personnel in the area of interest. Once the primary duty is completed, and assuming pro-

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land is owned and operated by "Fazendeiros". In 1960, over 28 percent of the farm units had less than 10 hectares and retained less than 1.5 percent of the land area.

Establishments with 100 hectares or more had over 75 percent of the agricultural land area, but had less than 55 percent of the cultivated land. In 1960 only 316 tractors and 1305 plows were recorded in the whole state. These numbers are increasing and the state is starting to establish rental stations, but most producers still do not even have mule power.

Problems in agriculture are not only those of increasing productivity. The lack of storage programs for either animal or human food supplies increases the severity of the problems in dry periods. There are seasonal shortages yearly which create real problems, in addition to severe shortages during periods of drought.

The practice of harvesting and maintaining stocks of forage or other feeds is almost non-existent. As a result of this and other factors, it takes approximately four to six years for beef animals to be prepared for market. Thus, even though there are relatively large numbers of cattle in the Northeast, meat supplies are low. Furthermore, if dry periods are extended, the basic herd tends to be reduced because of the lack of feed to meet the needs.

Not Heavy Meat Animals

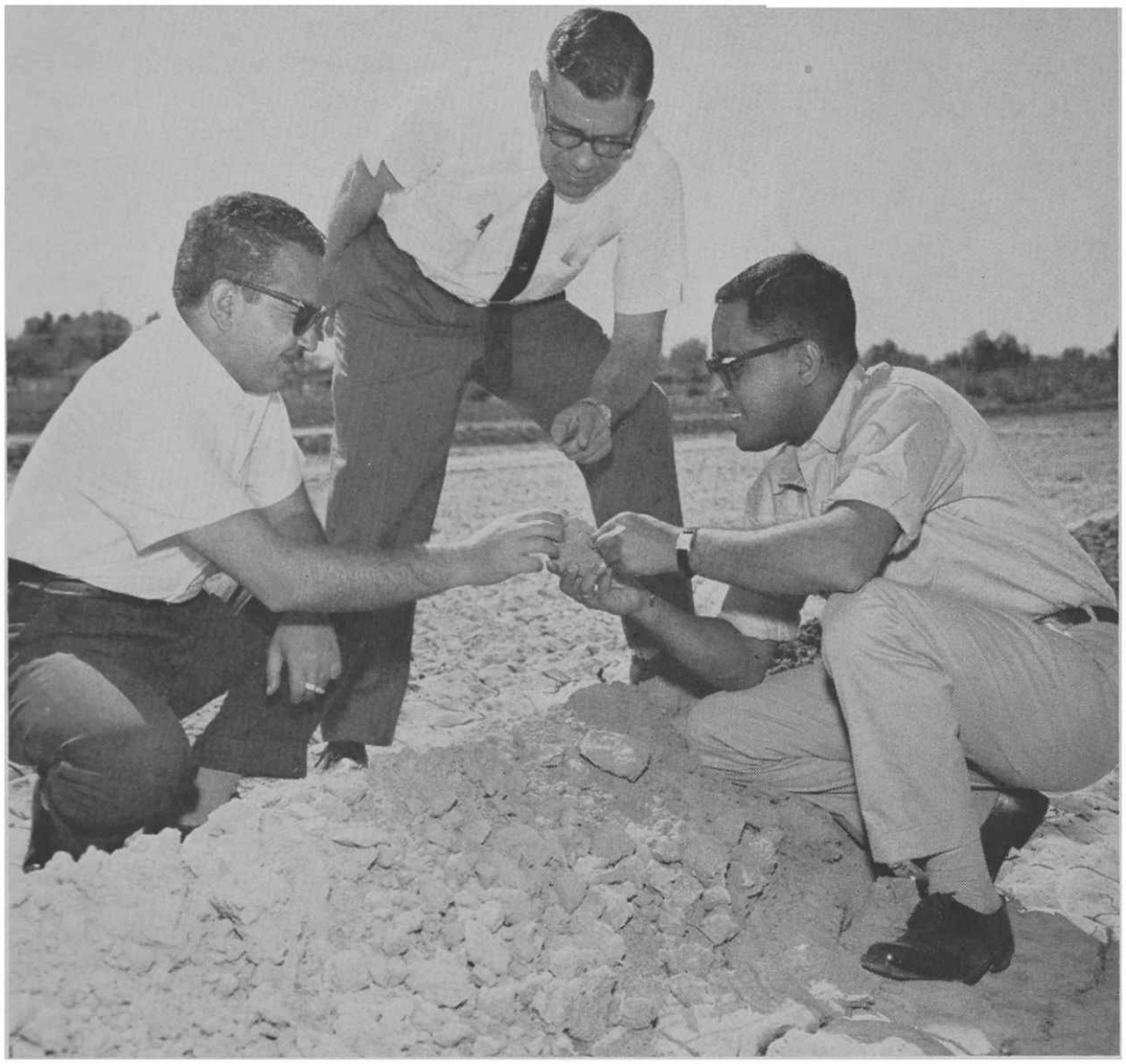
It is difficult to obtain comparable estimates of productivity especially on a state basis. However, estimates for 1962 indicate that 79 million head of cattle in Brazil produced less than 3 billion pounds of beef carcass, while a U. S. inventory of 99.8 million head produced over 15 billion pounds of beef. Estimated inventories of hogs in Brazil in 1962 were more than 90 percent as large as those for the U. S., yet production of pork in Brazil was shown to be less than 10 percent of U. S. production. Indications are that productivity in Ceará is somewhat lower than the Brazilian averages.

Lack of storage of human foods creates problems for both producers and consumers. Items on the food list become intermittently unavailable, and if droughts occur even basic foods must be imported. Producers lose since they are forced to accept going market prices for their products when they are harvested and are unable to take advantage of higher prices when supplies are short. Transportation is also a major problem. Some areas lack access to markets because roads, railroads and transportation equipment are inadequate.

Estimates have been made that from 25 to 50 percent of the product is lost between harvest and consumption. This is due to the lack of storage, refrigeration and other factors such as inadequate facilities for transportation and handling. For example, perishable products may stand for long periods exposed to the hot sun or rain and movement of fruits and vegetables is almost entirely a bulk operation with numerous handlings of the product.

Future Looks Bright

The problems seem endless but an effort is being made by the people of Ceará to cope with them. New power sources, highways, schools, and projects for improvements in both agriculture and industry are evidence of progress in the struggle for economic development. Like Brazilians elsewhere, the Cearense is optimistic about the future in spite of the problems, and believes that his country is the land of tomorrow.



LEARNING BY OBSERVING actual soil type at The U of A Campbell Ave. farm are Ahmed Naguib, left, and Atef Hafez, right. Man standing between the two is ← Jim Armstrong. The two visitors are UAR trainees, Naguib sponsored by AID and Hafez by FAO.

Stull, Brown Report Their Dairy Research

University of Arizona research was reported upon in June at the annual meeting of the American Dairy Science Assn. at Lexington, Ky.

Dr. J. Warren Stull and Dr. W. H. Brown are co-authors of two papers presented at those meetings.

One dealt with the variations in fatty acids of milk at various stages of lactation, while the other paper described an improved technique for blood lipid analysis.

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gram acceptance, many other functions become necessary. Coordination of the training program then becomes a major concern of the contact officer.

Training programs for foreign nationals are basically of two types, academic or visitor. Academic refers to programs in which the participant enrolls for one or more semesters of classroom study with definite training objectives. Typical training objectives are: (1) pursuit of B. S. degree in agriculture, majoring in a specific field, (2) special course work relating to a particular subject or area of study, or (3) pursuit of an advanced degree in some specific phase of agriculture.

Visitor programs have reference to in-service, on-the-job training and observation. Such programs vary in length from one day to three or four weeks — even longer in some instances. They may differ in number of trainees from one person to groups of 30 or more.

Each of the visitor programs is designed to fit the specific needs and desires of the individual or group. Representative examples of visitor programs are: (1) participate in Soils and Fertility short course for one week on this campus, (2) enroll in Western Regional Extension Winter School for a three-week period, (3) observe and study operation of an experiment station (3 days), or (4) discuss latest developments in irrigation practices with an irrigation specialist (1 day).

They're All Different

No two visitor programs are the same, although their training objective may be quite similar. Differences in length of training, program emphasis and personal interest tend to make similar programs dissimilar.

In most cases the trainee is an official representative of his own government and receives training through agreement between the U. S. government and the home country.

When academic participants have been accepted at the university, the liaison officer assumes the function that the title implies — that of serving as liaison between the student and the university, and between the student and his Washington program specialist in FTD. Responsibility of this position involves periodic grade reports, progress reports, arranging field trips, making travel arrangements, counseling, recommending program changes and securing program and visa extensions for worthy students.

For a Day or a Week

Service provided the visitor includes arranging and coordinating the desired specialized training. This may involve only a campus visit for one day or, at the other extreme, may involve visits and training throughout the state for a period of one week or more.

The liaison office receives and distributes official mail for all participants and is the official contact for all international agricultural trainees programmed and serviced by the Foreign Training Division, IADS, USDA.

Ultimate objective of these training programs is to provide academic and/or in-service training that will be useful in improving agricultural conditions in developing countries of the world. Basically, developing countries are highly dependent on an agricultural economy. Training supplied by The University of Arizona represents a significant contribution towards the improvement of living standards and common understanding throughout the world.

Jim Armstrong does a job somewhat outside the normal routine of this College of Agriculture, going about it in a quiet, unobtrusive manner. Because of that, the work he does and its importance to this University, this nation and the world is not as well recognized as it should be. We appreciate his telling us here something about that work.

Factors Affecting Bollworm Control

By George P. Wene and L. W. Sheets

During August and September the most serious insect problem of many Arizona cotton growers is the control of the bollworm, *Heliothis zea* (Hbn.). Before another bollworm season arrives it should be of interest to review the factors affecting the abundance and control of this pest, and to anticipate the steps which may be taken to lessen its injury.

Factors to be considered include rainfall, effects of July treatments for lygus bug control upon bollworm parasites, size of bollworm larvae when control treatments are begun, the interval between successive treatments, recommended pesticides, comparative effectiveness of spray and dust formulations, and the reduction of DDT drift contamination. The following statements are based on field research observations made in Arizona during the past eight seasons.

Worst In Wet August

Bollworms are most destructive to cotton in seasons when the rainfall and relative humidity are high during August. In years with low August rainfall, bollworm populations seldom reach or exceed a population level of 14 larvae per 100 plants. Such infestations are easily controlled by chemicals. The year 1959 was such a year. One inch of rain fell in Phoenix during nine days scattered throughout the month. The average rainfall was only 0.11 inch per rainy day, and the effects of this rainfall quickly disappeared due to high temperatures and wind.

Oviposition (egg laying) occurred throughout the month, but relatively few eggs hatched, due to the activity of beneficial insects (parasites and predators) and the desiccation caused by the hot dry winds. Furthermore, such predators as *Orius, Collops* and lacewing larvae were observed killing small bollworms, and in some instances actually eliminating recently hatched infestations. As a result, many infestations were kept below destructive levels.

The effect of abundant rainfall during August on bollworm population flare ups was evident in 1964, when 3.80 inches fell in Phoenix on seven days scattered throughout the month. An average of 0.54 inch of rain fell on each of the rainy days. As a result the humidity was very high (evidenced by the fact that evaporative coolers were ineffective).

Oviposition had begun by the beginning of the month and apparently increased as the season progressed. It was favored by cloudy, humid days with little or no wind. No desiccation of eggs was noticed, probably due to the high humidity. Very little activity of egg predators, such as of *Orius, Collops,* and lacewing larvae, was observed. As a result, bollworm populations increased and by the end of the month many untreated fields had all plants infested.

Insecticides Can Be Factor

The selection and use of insecticides during July for lygus bug control has an effect on potential bollworm infestations in August and September. Applications of Bidrin, dimethoate and phosphamidon, when applied during the early part of July, appear to adversely affect bollworm predators and cause early, explosive and damaging bollworm populations which are very difficult to control for the remainder of the season. Such insecticides are called "bollworm accentuators." *Limited tests have shown that these accentuators have little or no effect on the potential bollworm population when applied prior to June 20.*

Bollworm populations also increased slowly to destructive levels when malathion, diazinon, methyl parathion and trichlorfon (Dylox) were used for lygus bug control during the latter part of July. Such bollworm infestations were prevented when DDT was added to the insecticidal formulation.

Experiments in Arizona in 1959 and 1960 showed that the best bollworm control was obtained when insecticides were applied at 7-day intervals. Commercial control of bollworms was still obtained when the interval between applications was lengthened to 10 days. Bollworm populations were actually increased by stretching the interval to 14 days.

A number of experiments conducted during 1963 and 1964 showed that bollworm control could be obtained by applying insecticides at 7 to 8 day intervals. However, if infestations are as high as 35 or more bollworms per 100 plants, bollworms may be brought under control by applying two treatments at 4-day intervals, followed by further applications at 8-day intervals as needed during the remainder of the season.

Effectiveness of DDT Brief

Research has shown that 50 percent of the initial deposit of a pesticide such as DDT may disappear by the end of three days. The remaining deposit is actually inadequate to kill even small bollworms. Therefore three days after an application the cotton plant is again unprotected. If the interval between applications is 7 or 8 days, larvae will have a period of 4 to 5 days to develop without being seriously poisoned although, except in severe infestations, bollworms can be effectively controlled no later than this time. Small larvae are much easier to kill than large larvae.

The time interval between applications is also determined by the type of insecticide used. Azodrin, a new organic phosphate with a very short residual toxicity, gave excellent control of bollworms on an interval of four days between applications, but populations built up to highly destructive levels when the interval be-

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Dr. Wene is an associate entomologist and Mr. Sheets is an agricultural technician with the USDA Agricultural Research Service.

Dave Aepli Appears In Our Mystery Picture

Longtime superintendent at the Mesa Branch Experiment Station, Dave Aepli, was on hand when station field day was held last May. And, without the slightest sign of resistance, he posed with the two young ladies who man the visitors' registration desk at such affairs. That is the mystery picture trio pictured on Page 10.

The two with Dave are Mrs. Celia Roberts (on the left, with dark glasses) and Mrs. Mary Glenn Carlin, both regular secretaries at the Mesa Experiment Station.

Both have, in addition to secretarial competency, the highly desirable asset of always being smilingly gracious and helpful to visitors and to their colleagues at that research center.

Semi-retired, Mr. Aepli still takes an active interest in those acres which he supervised for so many years, and can link each new research finding to those of years and even decades ago.

Fertilizing Arizona's Rangelands

By J. L. Stroehlein, Bahe Billy, and L. R. Amburgey

Much of Arizona's range production is limited by a low moisture supply. In areas of adequate moisture, however, production is often limited by low soil fertility.

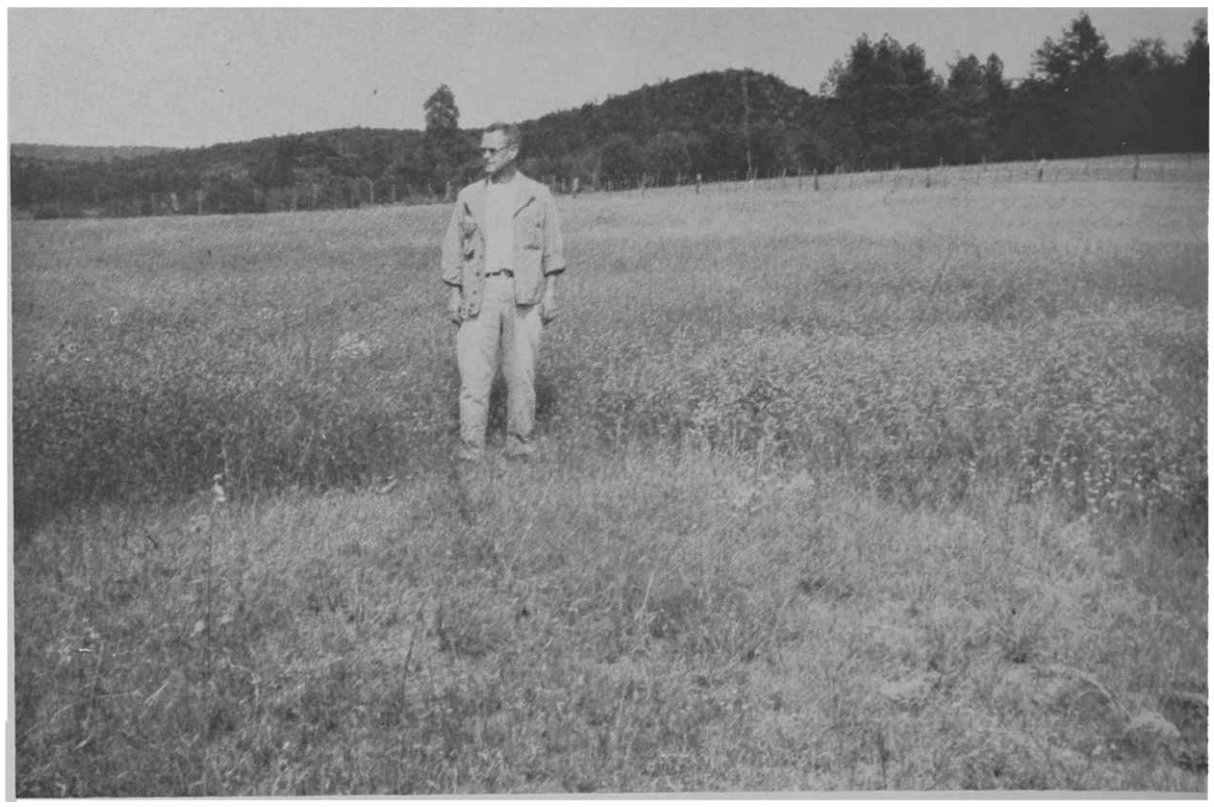
It is known as a result of numerous field experiments that fertilization can improve forage yields and quality, influence livestock distribution, and help conserve soil and soil moisture when conditions are favorable.

In many instances results have not been satisfactory, due to a lack of moisture or other factors. Several conditions must be present for range fertilization to pay dividends. The soil must be fairly low in fertility, soil moisture must be adequate, and there must be a good stand of grass on the site.

First Test the Soil

Evaluation of native fertility of range by soil testing should provide a basis for fertilizer recommendations. Thus experiments initiated in 1964 studied (a) the usefulness of soil tests in outlining areas of potential fertilizer response and (b) the proper time of application with respect to rainfall.

The authors are assistant professor, graduate assistant in research, and extension specialist, respectively, all in the Department of Agricultural Chemistry and Soils.



OBSERVING EFFECT OF fertilizers on a good stand of blue grama grass at Rodger's Q Ranch in Gila County is Dr. Lyman Amburgey, extension soils specialist. The plot on the right received 100 pounds of nitrogen, the plot on the left received 100 pounds of nitrogen plus 44 pounds of phosphorus per acre, and the plot in the foreground was unfertilized.

Several experiments were established during the summer of 1964. Nitrogen with and without phosphorus and potassium fertilizers was broadcast on field plots in June or July. Rainfall was sufficient at all sites for good growth. The plots were clipped for yield measurements in September and October. A partial list of treatments and yields is shown in the accompanying table. Response varied from no increase at Kitt Peak to more than eight times at Rodger's Ranch in Gila County.

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tween applications was lengthened to eight days.

Experiments in 1959 and 1960 showed that spray formulations of insecticides were as effective as dust formulations in controlling bollworms. Since that time most of our field experiments have been conducted with spray formulations. Sprays do not contain sulfur, which is commonly added to most dust formulations for spider mite control.

In recent years spider mites have been of minor importance on cotton in Arizona, and the few infestations that have been observed have come so late that no economic damage was evident. Many recent grower complaints against sprays for bollworm control appear to have resulted from late or poorly applied treatments.

Insecticide formulations recommended for bollworm control have commonly included DDT in combination with another insecticide, such as toxaphene, strobane, malathion, endrin, dieldrin, or BHC. DDT has also been used alone. A mixture of endrin and methyl parathion has also been recommended. Perhaps the most commonly used formulations are sprays or dusts containing DDT plus toxaphene or strobane.

Restrict DDT as a Dust

Because of hazards of drift contamination of forage crops, recent state restrictions have limited the use of DDT in dust formulations although, because of a lesser hazard, *there are no similar regulations against DDT in spray formulations.* All applications containing DDT, whether in spray or dust formulations, should be made only when there is no serious possibility of contaminating neighboring forage crops. Regardles of drift hazards, there remains the possibility that DDT may soon be less effective against bollworms, at least in some areas, because of a developing problem of insecticide resistance.

New Chemicals Being Tried

Insecticides which may be used in place of DDT are being tested each year in field experiments. Although carbaryl (Sevin) has not been effective, the following toxicants (although slightly less effective than DDT formulations) have given commercial control of bollworms when used in sprays at intervals of 7 to 8 days: toxaphene or strobane at 6 pounds per acre (also as 20% dusts), one pound methyl parathion plus 4 pounds toxaphene per acre, and one pound methyl parathion plus 0.5 pound endrin per acre. Azodrin, one pound per acre, applied at 4-day intervals, was as effective as toxaphene-DDT mixtures against bollworms.

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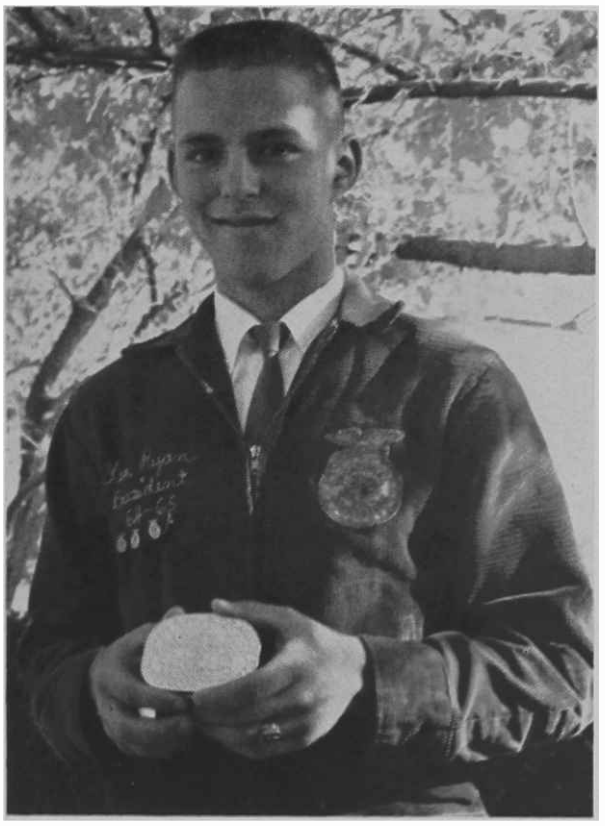
Clipping weights alone do not show the complete value of fertilization. For example, the nutrient content of the grass may be increased and cattle distribution may be improved. It is known that cattle often prefer fertilized grass. On the other hand, cattle may not harvest as much grass as shown by the clipping weights and, furthermore, it may not be desirable from the standpoint of the grass.

Still Some Questions

Range grasses will respond dramatically to fertilization under certain conditions. However, many questions are not answered about the value and economics of range fertilization. Among these questions are costs of fertilization and possible returns in yield. The use of extra forage produced depends on the feed supply and cattle numbers on hand. Soil tests may show areas of greatest response. Proper time of application may further insure returns.

These experiments, as well as a few others in the past, have indicated that best results will be obtained when fertilizers are applied after the start of the rainy season. Nitrogen fertilizer moves readily into moist soil and is not as likely to be lost as when broadcast on hot dry soil prior to summer rains. Summer rains produce about 90 percent of the perennial grass forage in southern Arizona, and maximum use of fertilizer will be made soon after the plants begin to grow. The nature of the rainy season is such that, once started, additional rains are likely, helping to insure adequate moisture. Selection of soil types with good infiltration rates and moisture storage capacity also insures maximum benefits of rainfall.

Fertilization probably will play an increasing role in ranching in certain areas of Arizona.



COW-CALF MATCHING champ at an Angus Field Day at the U of A was Ken Ryan, 16, son of Mr. and Mrs. Walter R. Ryan of Marana. Ken, member of the Marana FFA chapter, made highest score in matching calves with their dams.

Effect of Fertilizers on Yield of Range Grasses During 1964

Location	*Treatment N-P-K lbs./A*	*Yield, Dry Matter lbs./A*	*Vegetation*	*Rainfall measured in.*
Kitt Peak	0-0-0	1,260	Native Gramas, and Three/awns	8.05 July 13 to Sept. 2
	200-88-0	1,370		
Scott's, Gila Co.	0-0-0	520	Native Three/awns and Gramas	11.57 July 24 to Sept. 19
	50-0-0	1,560		
	100-0-0	2,650		
	50-44-0	1,950		
	100-44-0	2,730		
Rodger's, Gila Co.	0-0-0	300	Blue Grama and Three/awns	Estimated to be average (20-22" annually)
	50-0-0	1,250		
	100-0-0	2,300		
	50-44-0	1,460		
	100-44-0	2,510		
	0-44-0	230		
Bisbee	0-0-0	1,590	Lehmann Lovegrass	3.25* Aug. 1 to Sept. 3
	100-0-0	2,970		
	200-0-0	3,090		
	100-60-0	3,460		
	200-60-0	3,440		

* July rains fairly abundant but not recorded.

Do Imports Affect U.S. Cattle Prices?

By Robert A. Young
and
James Simpson

The monthly average price paid for steers of Choice grade at Chicago declined from $30.13 per hundredweight in November 1962 to a low of $20.52 per hundredweight in May 1964. Since beef cattle represent an important segment of the U.S. agricultural economy (accounting for an average of $7.7 billion per year in sales for the period 1958-63), serious concern over this situation has been expressed by domestic cattle feeders and range cattle producers. Their concern has been widely echoed by private and public organizations in those states and communities where the production and marketing of cattle is an important source of income and employment.

At least two major developments relating to the supply of beef have been associated with this falling price of fed cattle. First, total cattle numbers in the United States in 1964 reached an all-time high of over 107 million head, some 17 percent above the cattle population at the beginning of the cycle in 1958. Slaughter of cattle rose accordingly. Production of beef in 1963 was at an all-time high, and 1964 brought another new record. Second, shipments of live and dressed beef into the United States by exporting nations had jumped from an average of less than three percent of United States consumption in the period of 1952-57, reaching levels of nearly 10 percent of total U. S. supplies of beef in calendar 1963. Sharply conflicting opinions have been expressed as to the relative impact of changes in these supply factors upon the price of cattle in the United States.

This is first of two articles which will review and analyze the evidence as to the effect of these conditions

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Dr. Young is assistant professor of Agricultural Economics, Mr. Simpson is a senior student in the College of Agriculture. An early version of this article was submitted as a term paper by Mr. Simpson. This is first half of a two-part study.

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on the price of fed cattle. We shall consider first the factors leading to the increased imports of beef into the United States and the effect of these imports on domestic cattle prices.

Why Imports Increase

Most imported beef is frozen and boneless, of grades suitable for use only as hamburger or in the processed meat industry. Australia and New Zealand alone are responsible for some two-thirds of the beef shipped into the United States, accounting for 46 percent and 22 percent, respectively, of imports in 1962. The balance has come mostly from Ireland, Canada, Mexico and Central America.

Several factors have contributed to the increased supplies of beef from outside this country. First, under long term agreements made in early postwar years, the United Kingdom contracted to purchase much of the exports of meats from Australia and New Zealand at guaranteed prices. These agreements were relaxed, particularly in 1958, and the last was terminated in 1960. Exports to the United Kingdom from Australia and New Zealand declined sharply after 1958 (from about one-third of the United Kingdom's imports to about one-tenth by 1963) while exports by these nations to the United States during the same period increased rapidly.

Second, the governments of exporting nations, through assistance programs, tax benefits and price guarantees, have stimulated the production of beef to levels which could not be absorbed in their traditional markets.

DR. F. EUGENE NELSON, professor in the U of A Department of Dairy Science, was installed as president of the American Dairy Science Association at its 60th annual meeting June 20-23, at the University of Kentucky, Lexington. This Association has more than 2,500 members. Dr. Nelson was vice president of A.D.S.A. the past year, and previously was a director and also a member of numerous A.D.S.A. committees. He was editor of the Journal of Dairy Science for six years. In 1953 he received the Borden Award of A.D.S.A. for research on the microbiology of dairy products.

Less Cow Beef Available

A third general consideration relates to the supply and price of low grade beef in the United States. Cow and bull beef — which goes largely toward satisfying the demand for manufacturing meats and hamburger — prior to the current cycle accounted for about 20 percent of domestic beef consumption.

During the rising phase of the current beef cycle, supplies of cow beef declined as cattlemen reduced culling rates and built up their herds. Measured on a per capita basis, production of low grade beef (cow and bull beef) in the United States was down markedly in the period 1958-63. (See Table). In response to these lower supplies, prices for cull cows and the low grade beef derived from them have been favorable over the period, relative both to previous levels and to markets elsewhere in the world. (See Table).

Thus, a period of relatively short supplies and favorable prices for lower grade beef in the United States coincided with conditions of increased production and diminished markets for the traditional beef exporting countries of the world. Changes in the beef situation since 1947 are shown in the table. Column 3 shows the per capita production of cow and bull beef. Column 4 shows imports and Column 5 shows the total of low grade beef supplies. It is apparent that rising imports of beef have served to maintain the per capita supply of low grade beef.

Beef is beef — or is it? Would additional supplies of imported beef have the same effect on the price of fed cattle as would equivalent increases in supplies of fed cattle?

Little Effect on Fed Beef

The evidence indicates that supplies of low grade beef (including imports) have a relatively minor influence on prices of fed cattle.

Statistical analyses by USDA demonstrate that the characteristics of demand for different grades of beef are such that steer and heifer beef (largely fed beef) on the one hand, and cow and bull beef (low grade beef) on the other, can be regarded as separate and distinct commodities. Little of the low grade beef or imported beef substitutes directly for the higher quality product.

Statistical studies by the authors

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Per Capita Production of Beef and Veal by Major Classes, Imports of Beef and Veal, and Prices, United States, 1947-63[a]

(1) Year	(2) Production of steer and heifer beef, and veal	(3) Production of cow and bull beef	(4) Imports of beef and veal	(5) Cow and bull beef production plus imports	Prices (per cwt., Chicago) (6) Utility cows	(7) Choice steers
	(pounds per capita)				(dollars)	
1947	53.0	28.5	0.4	28.7	14.26	26.22
1948	44.7	24.8	2.4	27.2	19.49	30.96
1949	50.2	20.1	1.7	21.8	16.33	26.07
1950	48.2	21.0	3.4	24.3	19.36	29.68
1951	43.3	19.7	3.8	23.5	24.48	35.96
1952	48.8	19.1	3.1	22.2	19.53	33.18
1953	62.6	24.0	2.1	26.1	12.41	24.14
1954	63.0	25.9	1.7	28.0	11.46	24.66
1955	63.2	27.4	2.0	29.4	11.52	23.16
1956	68.1	26.4	1.5	28.0	11.37	22.30
1957	66.6	24.3	3.7	27.9	13.61	23.83
1958	63.6	18.6	7.3	25.9	18.41	27.42
1959	64.6	16.5	7.2	23.7	17.79	27.83
1960	69.8	17.0	5.3	22.3	15.68	26.24
1961	72.8	15.3	7.1	22.4	15.66	24.65
1962	70.8	16.0	9.4	25.6	15.50	27.67
1963	75.9	15.1	10.0	25.1	15.10	23.96
1964[b]	81.5	18.5	7.1	25.6	13.72	23.09

[a] Source: Economic Research Service, U. S. Department of Agriculture.
[b] Preliminary.

SPRINKLING COTTON WITH SALINE WATER

By C. D. Busch and Fred Turner, Jr.

When the water quality is low, then sprinkler irrigation management can influence cotton yields.

A sprinkler irrigation system was installed on three acres of the Safford Experiment Station late in the spring of 1964 to determine if cotton can be successfully sprinkler-irrigated with high salt-content water. The well, serving the sprinkler system, has an average salt content of over 3,000 parts per million. At this concentration the water carries four or five tons of salt in each acre foot.

Three comparisons were chosen to evaluate differences in the irrigation timing, type of cotton and ground preparation, and the effect they might have on cotton tolerance to sprinkler-applied saline water. They were:

Day vs. Night

1. Day vs Night Sprinkling. The day sprinkled plots were started between six and seven a.m. and irrigated for 12 hours. Night sprinkling began between 6 and 7 p.m. and ran for the same length of time. The daylight hours have higher evaporation rates and higher wind velocities. This combination can accumulate more salt on leaf surfaces as a higher percentage of the water evaporates from the foliage.

2. Flat vs Bed Planting. A flat field surface will have more uniform evaporation and water distribution. The salts in the soil, therefore, can be expected to move up and down in the profile equally throughout the plot. On a furrow and bed surface more evaporation can be expected from the protruding beds especially when the plants are small. Consequently the bed surface may concentrate soil salinity.

3. Long Staple (S-2) vs Short Staple (1517D) Cotton. Plant varieties can show marked differences in salt tolerance at various stages of growth.

Compared With Other Method

In addition to the above comparisons, adjacent field areas provide opportunity for comparison with furrow irrigation.

Irrigations for both the sprinkler plots and adjacent furrow irrigated areas were scheduled from soil moisture tension readings to insure that all plots received adequate, but not excessive, moisture.

Tensiometers were set at 12, 24, and 48 inch depths. The 12 inch depth, with a tensiometer scale reading of 50 or higher, was used to indicate the need for irrigation. Neutron moisture readings were taken immediately before and after each irrigation for an indication of moisture distribution.

First Year Results Reported

Three irrigations, each applying about three inches of water, were required during this season. An application rate of ¼ inch per hour was used throughout. Some salt burn, associated with spray drift, was noted when the plants were less than 12 inches tall. Water application including the 12 inch pre-irrigation totaled 22.8 and 21.0 inches for the night and day sprinkled plots respectively. An additional 6 inches of rainfall supplemented the irrigations.

An analysis of cotton leaves revealed noteworthy differences related to treatments this first year. The method of irrigation affected salt content in the cotton leaf. These differences are from within the leaf tissue, since the leaf samples were thoroughly washed in preparation for analysis. The differences appear to be only in the leaf, as a similar petiole analysis showed no pattern in salt concentration. Table 1 presents the leaf data averaged for two replications.

Table 1. Sodium Content of Washed Cotton Leaf Samples
(percent of oven dry weight)

Variety	*Irrigation Method*		
	Sprinkler		*Surface*
	Day	**Night**	**Furrow**
Short Staple (1517D)	.67	.32	.21
Long Staple (S-2)	.39	.13	.03

Irrigation and equipment problems

(Continued on Next Page)

Dr. Busch is Associate Professor of Agricultural Engineering. Dr. Turner is Agricultural Chemist and Superintendent of the Safford Branch Experiment Station. Special thanks are due to the Buckner Industries Inc. and the Shur-Rane Division, FMC Corp. for their equipment contributions to this research.

(Continued from Previous Page)

are consistent with these findings. These measurements indicate that the supplies of low grade beef (including imports) and of other meats (pork, poultry, lamb) have only minor effects on the price of high quality beef (represented by the price of Choice steers, Chicago).

Works the Other Way

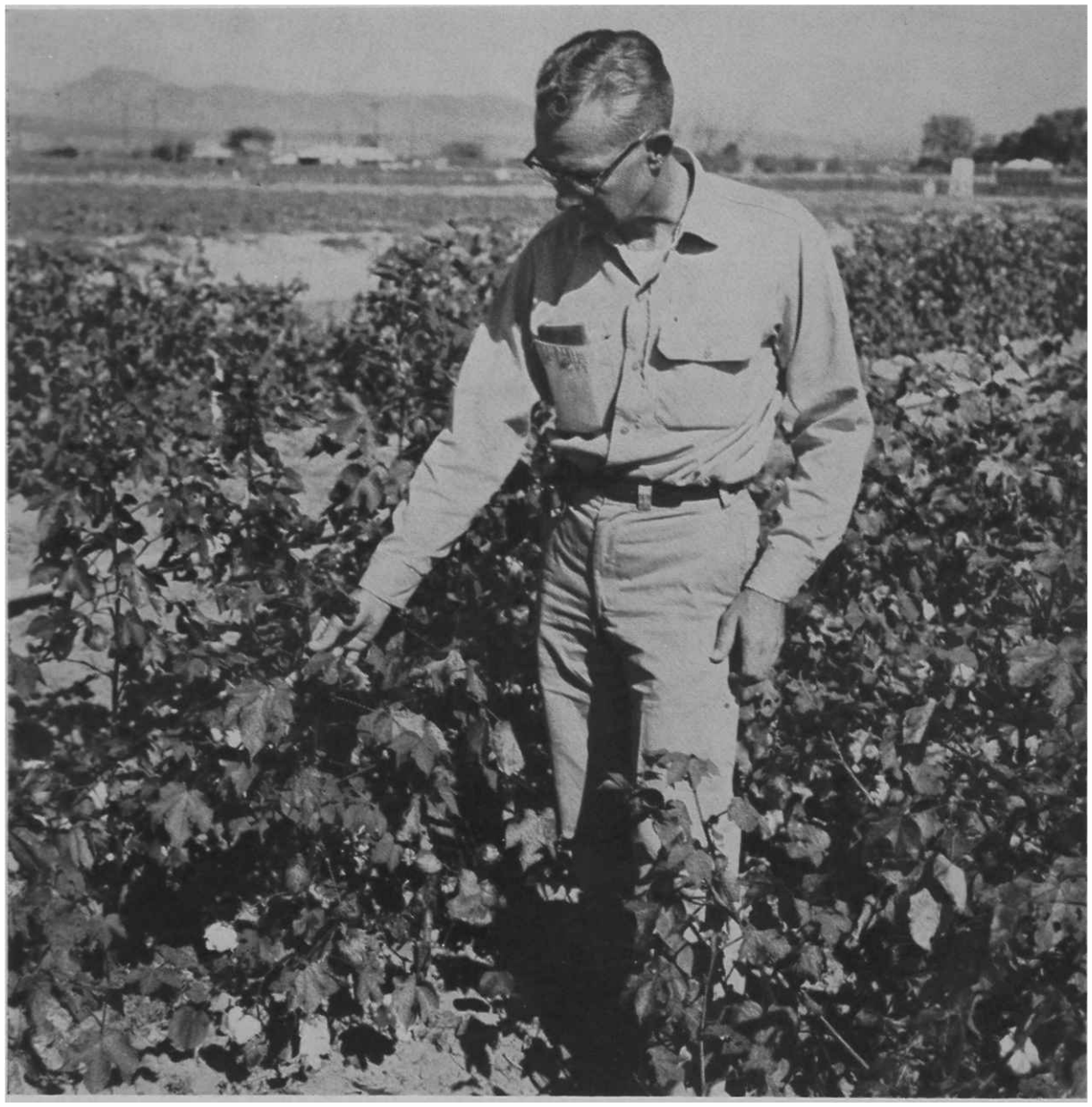
There is an influence in the other direction, however. It has been estimated that nearly one quarter of the meat from fed beef carcasses finds its way into hamburger and manufacturing uses. Hence, supplies of quality beef do have a substantial influence on prices of low grade beef.

Additional support for these conclusions can be found by examination of the effect of imports on the price of low grade beef (using the price of Utility grade cows at Chicago as a measure). As is shown in the table, imports per capita increased from 5.3 pounds in 1960 to 9.4 pounds in 1962, an increase of some 80 percent, while the average price per hundredweight of Utility cows decreased hardly at all.

Since the sharply increased levels of imported beef have not had a significant downward influence on prices in the markets of low grade beef, it does not appear likely that any major influence would be felt from imports on the fed beef markets.

In the next issue of *Progressive Agriculture* we shall continue the analysis with an examination of the effect of increased domestic supplies of beef on fed cattle prices.

IN PHOTO BELOW, Dr. Fred Turner, Jr. examines the day-sprinkled cotton for leaf burn. Some salt burn, associated with spray drift, was noted when the plants were less than a foot tall.



delayed planting until May 26 and were responsible for spotty stands. Yield data are reported for portions of the plots where the stands were judged normal and comparable among the treatments.

The following table presents the data, averaged for two replications.

Table 2. Plot Yields

Lbs. of seed cotton for 50 ft. of row.

Surface Treatment and Cotton Variety	*Irrigation Method*		
	Sprinkler		*Surface*
	Day	*Night*	*(Furrow)*
BEDDED			
Short Staple (1517D)	8.8	13.2	13.0
Long Staple (S-2)	1.7	4.9	4.0
FLAT			
Short Staple (1517D)	8.3	11.8	—
Long Staple (S-2)	1.2	2.5	—

Night sprinkled and furrow irrigated cotton produced comparable amounts. The day sprinkled, however, produced only 68 percent as much as the furrow irrigated short staple cotton and only 43 percent as much as the furrow irrigated long staple cotton.

Clearly the pattern of plot yields relates to the method of applying the salt laden water. The smaller but consistent effects of surface treatment are not fully understood at this time. However, the coming years' data should add to the understanding of cotton's salt tolerance.

Sedona Woman Heads Homemakers Council

Mrs. Charles "Sylvia" Nemec of Sedona, Oak Creek Canyon area of Coconino County, is the new president of the Arizona State Homemakers Council.

She succeeds Mrs. Bert Wood of Camp Verde, Yavapai County, who served as first president of the organization.

Other new officers, elected during Town and Country Life Conference on The U of A campus in June, are:

Vice President — Mrs. Forrest "Jeanne" Smith, 8235 East Koralee Place, Tucson.

Secretary — Mrs. Lonnie "Mae Olden" Davison, 4234 East Lee Street, Tucson.

Treasurer — Mrs. Joe "Irene" Mahan of Morenci, Greenlee County.

Richard Keller Freyert
Director of the Agricultural
Experiment Station
Campus