

Arizonans Benefit from Accomplishments of our College

As time moves on we like to review a small part of the accomplishments of our people — the faculty and staff who make up the College of Agriculture. We like to see how well we have served you, the people of Arizona.

Because of space limitations in this editorial we highlighted only one or two accomplishments for each discipline.

In an Agricultural Biochemistry year-long course students from microbiology, pharmacy, biological sciences, agriculture and home economics are trained in basic nutritional biochemistry.

Cotton growers, poultrymen and pork producers all benefit from the work Agricultural Biochemists have

done with respect to making cottonseed meal available as another feed source. In cottonseed there is a substance called malvalic acid which is toxic to non-ruminants. Our researchers have found ways to inactivate the toxic factor in the cottonseed meal or cottonseed oil. Thus, this by-product of the cotton industry can now be safely used in poultry and pork industries.

In Soils our faculty has introduced the auto-tutorial method of laboratory teaching improvements.

Soil researchers have discovered the organic phosphate structure as it occurs in the soil and the means by which it remains available to plants contributing to the phosphate fertility in soils.

Our Engineers have found improvements while developing a new ground operated agricultural crop sprayer. This piece of new equipment is expected to compete in performance as well as in cost of operation with the efficiency of aerial application of agricultural chemicals. Also, a new design for a cooled dairy cattle shade is proving to be nearly two times as effective as older designs and may be shown to be substantially more economical to construct. Research in this area is continuing and new information will be available in the future.

We also are proud of the Hayden alfalfa variety which has been released to the growers by our Agronomists and Plant Geneticists. This outstanding alfalfa has two major contributions to make over older varieties: it provides higher forage production and is resistant to biotypes of the spotted alfalfa aphid which has been damaging to Arizona alfalfa crops.

The work in water use efficiency⁴⁴ developed by our Agronomists and Crop Physiologists is shedding new light on how better to use that water which is available in our state as well as developing crop plants which are more efficient in the use of this precious water resource.

Cobalt 60 irradiation of beef tapeworm embryos reduces the virulence for the bovine host. Evidence for a "vaccine effect" following the subcutaneous injection of irradiated embryonic tapeworms has been obtained by our animal pathologists. This evidence consists of a significantly lower number of "takes" in vaccinated cattle when they are challenged by fully virulent embryos after vaccination.

They also find through immunization and feeding experiments that when a rancher holds his cattle for 45 days prior to shipment it improves the health of his animals and improves the feeding efficiency of the cattle after arrival at the feedlot. By holding his animals 45 days it is found that he recovers his costs through the extra weight that has been gained by the

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College of Agriculture Accomplishments.

(From page 2)

animals. During shorter holding periods the weight gain is not sufficient to offset his costs.

Our Plant Pathologists isolated and discovered the disease causing organisms which are responsible for decline in sorghum during the hot summer months. Since this was reported, others in the U.S. have similarly reported the problem in many states. A means of controlling the identified fungus causing Blackleg in potatoes has been announced. Also root rot was identified in Arizona alfalfa fields for the first time setting into motion a joint effort to breed up a resistant variety.

In the Watershed Management Department a Computer Assisted Instruction Program has been set up where the student has dialogue with the computer, the computer questions the student and the student answers the question. If his question is answered incorrectly the computer helps the student obtain adequate information so he can properly understand the material.

Practical guidelines are being developed for increasing snowpack runoff from ponderosa pine lands in Arizona by means of vegetation management. In these studies, various kinds of thinnings and clear cuttings are being evaluated in terms of increased snow accumulation and snowmelt runoff. The effect of physiographic factors on snowmelt runoff are also assessed. The management options being considered are compatible with the production of other forest products such as timber, wildlife and forage. This research has the potential of materially increasing the water supply for agricultural users in valleys and lowlands of Arizona as well as for other water interests of the state.

Short-stemmed wheats with their higher yields per acre as now produced in Arizona are offering another choice of feed grains to cattle feeders for the mutual benefit of grain growers and cattle feeders. Our Animal Scientists conducted feeding efficiency studies with rations built around

the new wheat varieties for successful utilization.

Animal Scientists also found that cows and calves grazing irrigated pastures have shown a net return of \$116. per acre per year for the past two years in current University of Arizona studies. One acre of alfalfa-Coar-fescue pasture has produced 900 pounds of feeder calf weight in the Arizona system.

Western dairy cattle at certain times of the year are stressed by high temperatures as well as by poor nutrition resulting in low breeding efficiency and reduced milk secretion. Our Dairy Scientists have developed a method to measure plasma corticosteroids and progesterone which are vital in the reproductive process. Both of these hormones are found to be deficient in quantity during hot summer months causing the inability of animals to successfully breed. In cooperation with Agricultural Engineers, they have shown that by cooling the cattle reproduction can be improved nearly 100 per cent and that milk production increases 15 to 20 per cent.

Our Dairy Scientists have worked out an answer to just how much of the respective insecticides may be present in feeds and still meet government tolerances. Finding how to measure these extremely low levels has been a remarkable contribution to the consumer, to the farmer who produces forages and to the dairyman. As a result our Arizona dairy foods are among the most wholesome foods we can consume today.

There has been a great deal of interest in the additives put into fresh and preserved foods. Our Poultry researchers have been doing some important early research for the U.S. Food and Drug Administration in testing food additives for toxicity or for birth deforming properties. They too have been testing some of the new Mexican wheats for nutritional value with chickens. It appears to be a very good new source for commercial feedgrains which is high in protein. Rations have been fed to chickens

with as high as 75 percent of the ration containing the new wheat.

Our Horticulturists have teamed up with commercial growers such as Bud Antle, Inc., and Farmers Investment Corporation to field test a trickle irrigation program on pecans, lettuce and citrus in Pima, Pinal and Maricopa counties. The object of trickle irrigation as compared with flood or sprinkle irrigation is to reduce the water losses usually associated with the water loss of evaporation and percolation . . . but only the amount of water actually needed by the plant in the soil at the root zone is provided. Savings thus far have been significant.

In another area of Horticulture our Landscape Architecture program is growing in popularity among students. The professors of this group have a program in progress in which they are attempting to place a dollar value on the aesthetics of environmental preservation.

Entomologists tell us that the pest management programs on cotton have completed three years of operation in Graham county and one year in Pinal county. These programs are designed to improve efficiency in cotton pest control through field sampling of cotton pests and their damage. The information thus obtained permits insecticide treatment to be made based on actual need.

Accomplishments of other disciplines will be continued in the editorial of the next issue. Please refer to Volume XXIV, No. 1, January-February 1972.

Harold E. Myers

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School of Home Economics