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IN THIS ISSUE -- *Feedlot Diseases, Winter Lawn Care, New Fabrics, Computer Cattle Records, New Federal Bee Laboratory, Sorghum Combining, Lygus Bugs, Hopi 4-H*

DON'T PENALIZE FARMERS

All of us have read — and most of us from time to time have gladly quoted — statistics showing that the American consumer eats better food for a smaller portion of his income than does anyone else on earth today, or than earlier generations of Americans were able to do. Food today — the best quality of food, the highest protein diet in world history — takes an amazingly small portion of the consumer's pay check.

We're proud of that, we're proud of a highly efficient technical agriculture which is the envy of the world, and we're proud of the land-grant colleges' contributions in teaching, research and extension which have had so much to do with this efficiency.

Low food prices to the consumer, however, should not be provided at the expense of agriculture. *The Washington Post,* in an editorial, points to that danger. We quote:

"The tendency to make agriculture the goat for rises in living costs has been deplorable, and the consuming public must not be allowed to have the notion that it can justly count on the depression of agriculture to keep urban living prices low.

"The American people are spending a smaller percentage of income on foodstuffs than ever before. And, in future, they probably are going to have to spend more for food if rural America is not to be discriminated against and deprived of a fair share of the rising prosperity and affluence claimed by the rest of our society.

"The economic rewards of those engaged in management and labor in rural America, and the social and cultural advantages available to both, must be made commensurate with the rewards of urban workers and managers.

"If we do not have in the future more success in equalizing these rewards than we have had in the past, the population distribution is going to become even more unbalanced, and the problems of the great cities even more unmanageable.

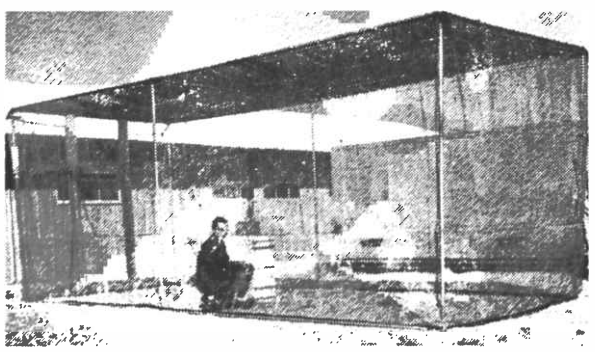
"And, if this is to be prevented, those who grow the food and fiber of this country, and those who live in the small rural communities that serve them, are going to have to be better paid.

"If that pay does not come through the market place, it is going to have to come through public revenue. We cannot safely put the burden of holding down urban living costs on underpaid rural workers."

Harold E. Myers

Dean
College of Agriculture
and
School of Home Economics

OUR COVER PICTURE

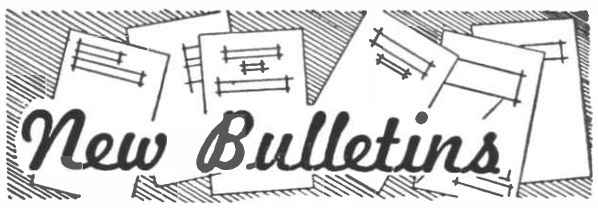


An agency cooperating with this College of Agriculture for many years is moving into a new $500,000 home, so the federal Honey Bee Research Laboratory becomes news for PROGRESSIVE AGRICULTURE IN ARIZONA.

The photo on our cover, reproduced here, shows one of the scientists seated in a plastic cage near an artificial feeder. He is observing the collecting behavior of the bees in this controlled environment.

Although mankind has benefited for centuries from its association with the honey bee, there still is much in their behavior which is a mystery to man.

More pictures and story on Page 6.



Circular 291—Home Business Centers.

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Folder 123—To Know Textiles, Know Fiber Names.

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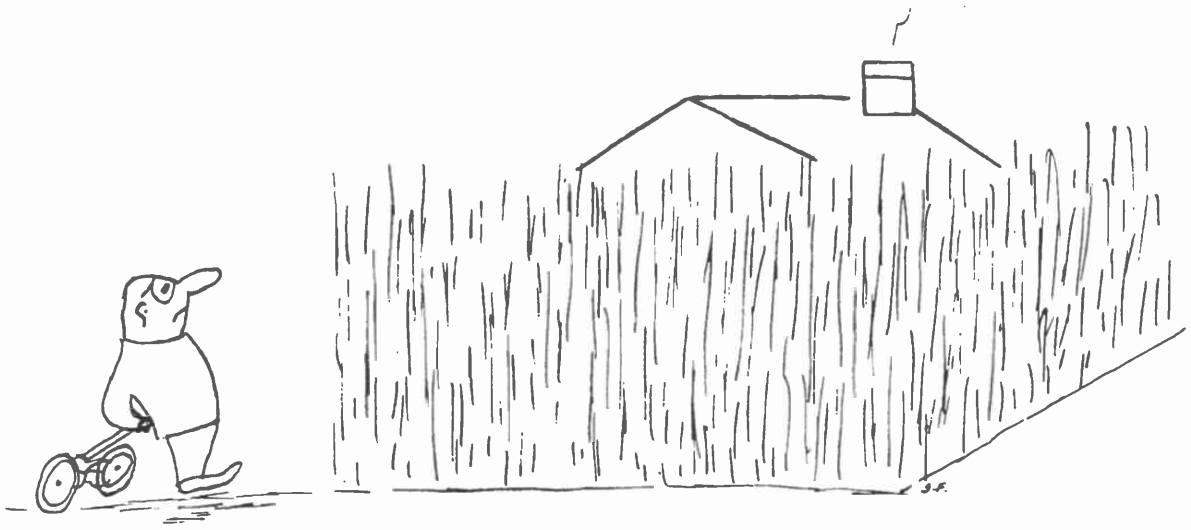

Sleeping Bermuda Lawns Need Some Winter Care

By Steve Fazio

Lawns will be emerging from their long winter dormancy within the next few months and now is the time to make preparations for their care throughout the summer months.

Proper care of lawns — from dormancy through the active growing season — is dependent upon MANagement. Yes — man's effort will determine whether the lawn will be a vigorous, weed-free, luxuriant green carpet or an infested weed patch. A knowledge of the basic principles of lawn management will enable a gardener to cope with the many facets of growing a beautiful lawn regardless of the variety used in the home grounds.

Retain Some Moisture

During the dormant winter period one should never allow the soil in the lawn area to become too dry. Winter rains are normally sufficient to satisfy the moisture requirements of lawns in most areas of the state, but if rains are sparse and soil examination reveals dryness, an irrigation should be applied to prevent drying injury to the roots or rhizomes.

Shallow frequent watering during the active growing season may cause a buildup of salts in the upper surface of the soil. Yellowing of the foliage and poor vigor are results of this type of irrigation on heavy soils. Light sprinklings are permissable if an occasional heavy watering is applied to leach the salts to a lower depth, thus creating a more favorable condition for the roots.

Fertilization of the lawn area prior to the onset of the dormant season is often overlooked and "starved" lawns make poor recovery the following spring. The gardener should be aware of the approximate date of the average first frost in his particular area and then time the fertilizer application four to six weeks ahead of the first frost. The lawn will absorb the nutrients during this late period of the season and when it emerges in the spring it will be in a vigorous condition to start growing.

Spring Fertilization

If heavy rains were prevalent during the winter months, another fertilizer application is suggested in early spring as soon as new growth is visible. On light, sandy soils, leaching caused by winter rains may deplete the supply of fertilizer which was applied during the late fall.

Additional fertilizer may be needed if the lawn tends to go "off color" (light green) during the growing season. A summer application is often necessary when growth is rapid and the lawn is making a heavy demand on the available soil nutrients.

Mowing is an extremely important management practice which can cause serious damage to the lawn when done improperly. First, the mower blades should be sharpened to make clean cuts. Dull blades crush rather than cut, and the ends of the leaves die back, giving the lawn a brownish appearance for several days.

Too High to Too Low

Permitting the lawn to grow to a height of several inches before mowing results in dense shading of the lower portion of the plants. This results in a tender, succulent growth which is subject to sunburning when exposed to sunlight after mowing. Recovery will be slow, especially during mid-summer, and weed seeds will be given an opportunity to sprout and gain a foothold in this type of environment.

Some lawn varieties produce leaf blades near the top portion of stems when allowed to grow too tall. The lower portion of these plants will be devoid of foliage, due to heavy shading. When the tops are mowed off, the remaining stems are without any protective leaves near the base.

Recovery from this type of mowing is dependent upon new stems and leaves developing to replace those which were clipped. Frequent mowings at a given height encourage leaf development near the base of the stems and sunburning will not be a factor. If the lawn is permitted to grow approximately ½ to ¾ inches between mowings, recovery afterward will be rapid; germination of weed seeds will be discouraged, and the vigor of the lawn will not be interrupted.

Lawns Must Breathe

Bare spots in lawn play areas caused by heavy usage require special care to encourage growth of the grass. Lack of growth may be due to a compacted soil condition. (Reduced air spaces and cemented soil particles). Prior to the emergence of the lawn, these bare spots should be aerified (machine which removes small plugs of soil) or renovated several inches deep to break up the crusted soil surface. Organic matter is incorporated to create a more friable condition. The area is then seeded or sprigged in the same manner as a newly planted lawn.

Yes, management — throughout the year — is the factor which can decide whether you'll have a beautiful lawn or a weed patch!

Prof. Fazio is head ot the Department of Horticulture.

FEEDLOT DISEASES CAN BE COSTLY

By Ned W. Rokey

Ravages of feedlot diseases will cost Arizona's cattle feeding industry a whopping 4¼ million dollars in direct costs during the next calendar year. These costs will be represented by dead animals and cost of treating disease.

It is impossible to estimate the magnitude of indirect costs resulting from loss of weight during disease episodes, lowered feed consumption, poor feed conversion, condemnations at slaughter, etc. However, this cost is believed to be substantially greater than the direct costs.

Virus Diseases

Many of the parasitic, nutritional and, to some extent, infectious diseases of cattle have been known for years and are readily handled by proper use of antibiotics and addition of minerals and vitamins to the ration.

Recent studies indicate that 65 percent of the feedlots sampled in one state were infected with para influenza 3 virus (the virus involved in shipping fever). Another study indicated that almost 70 percent of the animals tested had been exposed to bovine virus diarrhea, a recently emerging feedlot disease. Moreover, there are increasing numbers of reports of salmonellosis in cattle.

In recent years a new and complex disease syndrome, characterized by high temperature, diarrhea, and respiratory distress, has appeared in feedlot cattle. High morbidity and mortality may be associated with the disease. Response to treatment is poor. The causative agents are not clearly defined but are believed to be due to a concurrent virus-bacteria infection. The disease has been named Bovine Enteric - Pneumonic Disease Syndrome (BEPDS).

Outbreaks Are Seasonal

Although serious outbreaks of disease may occur at any time during the year, the feedlot disease problem generally starts increasing during the late summer and early fall months, building to a peak in late November and December. There is an apparent decline during the late winter and spring months, with relative freedom from infectious diseases during late spring and summer months. During peak periods, morbidity in some shipments of cattle may be as high as 65 to 70 percent with a mortality from 10 to 20 percent in some lots of cattle.

The high rates of morbidity and mortality can be directly related to the nature of the infectious disease agents and to the rapid acceptance of sophisticated management techniques by the livestock feeding industry during the past decade. The feeding industry now deals with relatively young cattle in contrast to the 600 to 700 pound animals common a few years ago. These animals are transported en masse, are of a diverse origin, and are held in close confinement in large concentrations.

Susceptibility to diseases on the part of young cattle is similar to susceptibility of children to common childhood diseases. One case of chicken pox, mumps or measles in a highly concentrated population, such as found in public schools, will generally result in an epidemic that subsides only when all susceptible children have contracted the disease.

Stress and Concentration

Serious outbreaks of disease occur when young cattle of diverse origin, relatively susceptible and unexposed to disease, are assembled in large concentrations for shipment and subsequent high concentration in feedlots. Under these conditions, disease rarely occurs from a single causative agent, but more generally is complicated by two, three or more.

The resulting disease syndrome results in a high mortality, high morbidity, and extremely poor response to treatment. A serious consequence of intestinal diseases, although animals may appear clinically normal, is possible permanent damage to the digestive tract, in turn resulting in poor feed conversion and failure to gain economically.

Exposure to diseases may occur at the point of assembly or at the point of destination. The disease usually manifests itself after cattle have arrived, and is further complicated by change in ration and physical stress of long distance traveling, branding and handling procedures. Many feedlot operators have encountered serious outbreaks of infectious bovine rhinotracheitis (IBR) or bovine virus diarrhea (BVD) 7 to 10 days following injection of these vaccines.

Whether these are true vaccination

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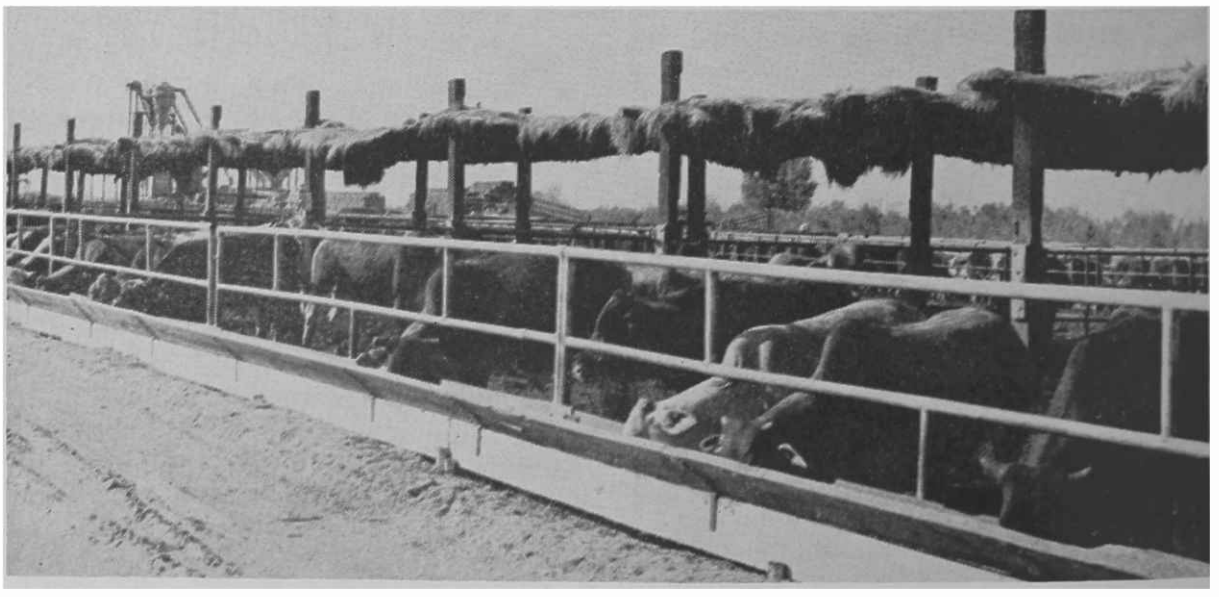
IN A FEEDLOT animals of diverse origin are concentrated, increasing possibility for spread of disease.



This College of Agriculture maintains an Animal Pathology laboratory at our Mesa Branch Experiment Station, near Phoenix, as a portion of the Animal Pathology Department activity. Dr. Rokey, Animal Pathologist and Doctor of Veterinary Science, is in charge of that laboratory.

(Continued from Previous Page)
breaks or complicated secondary infections is not clear. However, it is well known that injection of a live virus vaccine such as IBR, BVD, or para influenza 3, results in a transient and marked drop in white cell count. Animals so affected are believed to become quite susceptible to secondary bacterial infections that further complicate the response to treatment.

Treatment Is Complicated

Treatment of feedlot diseases is met with varying degrees of success and, in many instances, is quite unsatisfactory. There is a logical explanation for this apparently poor response. Many feedlot diseases, BEPDS for example, are believed to be the result of multiple viral-bacterial infections. It is known that viral agents are not affected by most antibiotics and, as a matter of fact, virologists use these same antibiotics to insure pure culture growth of viruses. In those diseases where the primary agent is a virus, the value of antibiotic therapy is limited to control of secondary bacterial infections. In treating a secondary infection of animals debilitated by a virus disease, response at best is poor, even though the drug of choice would prove entirely effective if the secondary infection existed separately.

It is important to obtain a diagnosis before an effective and economical medication program is undertaken. Medications are often administered in hope of a favorable response. If not successful, an attempt is then made to obtain an accurate diagnosis. In many instances, when diagnosis is finally obtained and proper medication administered, mortality and morbidity have already declined and the disease has run its course, leaving a percentage of unthrifty animals that fail to respond to any type of therapy.

Is Costly Procedure

These are expensive situations, not only from the standpoint of high mortality, but also from the standpoint of high-priced medications that are essentially useless in treating the disease that existed. Massive treatment of feedlot cattle — for that matter, all livestock and poultry — presents other important considerations quite aside from the use for which they were intended.

There are an increasing number of antibiotic-resistant bacteria emerging as a direct result of constant exposure of bacteria to antibiotics through the medium of medication of sick animals and low level feeding for economical gain. For example, research conducted at the University of Arizona Animal Pathology Laboratory at Mesa revealed approximately 50 percent of 117 *Salmonella typhimurium* isolations resistant to terramycin; 35 percent of 114 *Salmonella newport* isolations were resistant to the same drug. Tests revealed that streptomycin and dihydrostreptomycin, once drugs of choice, were almost completely ineffective. Results obtained on tests involving sulfonamides were even less effective. However, the above named drugs are administered to newly arrived cattle on a routine basis.

Prevention Is Cheapest

Prevention of disease is far more important and generally is less expensive than subsequent treatment. For example, blackleg and malignant edema are quite readily and economically controlled by proper administration of vaccines. Similarly, infectious bovine rhinotracheitis (red nose), leptospirosis and, to some extent, bovine virus diarrhea, are controlled in the same manner.

Excellent treatments are available for both external and internal parasites. Nutritional diseases, such as Vitamin A deficiency, can be controlled inexpensively.

At the University of Arizona, research work on feedlot diseases is being carried out by the Department of Animal Pathology. This research was initiated in 1965 at the Mesa Laboratory. Research is devoted to investigating the causative agents, incidence, reservoirs of infection, and methods of treatment of feedlot diseases, with special emphasis on BEPDS. This disease syndrome is held responsible for a substantial portion of the total loss suffered by the feeding industry. Studies designed to determine accurately the carrier status (latently infected) animals are also included.

The BEPDS Syndrome

Preliminary results indicate that salmonellae may be an important contributing factor in the disease syndrome. Approximately 33 percent of the feedlot animals tested have been positive for *Salmonella*. Research studies indicate that bovine virus diarrhea (BVD) and infectious bovine rhinotracheitis (red nose) (IBR) may also be involved in the BEPDS syndrome. The exact role of viral agents and salmonellae has not yet been determined and will be placed in proper perspective as research progresses.

Before the problem can be fully resolved it will be necessary to determine the health status of the cattle populations. Most researchers agree that many herds may have subclinical infections where disease is not manifested until physical stress occurs (weaning, abrupt change in rations, temperature variations, transporting, etc.). Inability to determine accurately the health status of animals under transport presents a serious problem to the regulatory officials and the feedlot operator.

For lack of technology to learn the carrier status, infected animals may be transported freely. For example, salmonellae-infected cattle, accompanied by valid health certificates verifying that they are free of contagious or infectious diseases, move freely in interstate commerce. In a shipment so involved, animals will be exhibiting clinical signs at the point of destination and it is not unusual that some death loss may occur in transit.

Some Loss Not Insured

Although insurance carried by the transport agency covers the burden of the immediate death loss, the subsequent cost of treatment of sick animals, additional death loss, and resulting poor performance of recovered animals occur at the expense of the purchaser. Perhaps more serious is the fact that these animals may serve as a source of exposure to other cattle in the lots, and also to any subsequent shipments of susceptible animals.

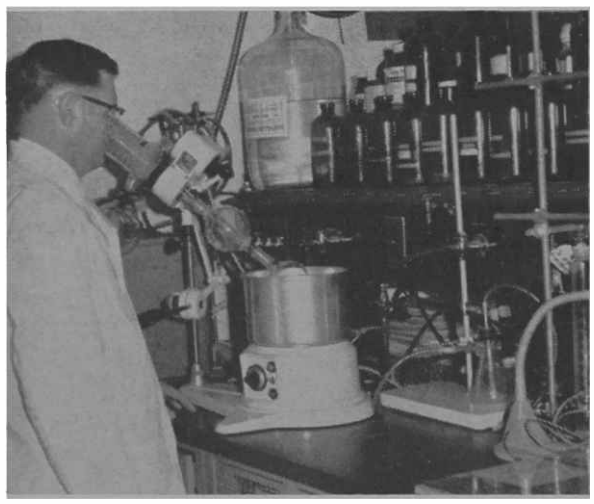
Research aimed toward development of technology for determining the health status, and accurate and reliable methods of treatment and control, is extremely time-consuming and expensive. Its continuance, and support for such continued study, would seem to be well justified.

An author, writing in the Journal of Animal Science about the relation of fatness to tenderness in beef, comes up with the classic sentence: "It is disconcerting that something which has appeared so obvious to so many for so long should be so extraordinarily difficult to prove in the laboratory."

LOS EXPERTOS del Departamento de Agricultura estadunidense después de ocho años de investigaciones han comprobado que las ovejas de razas cruzadas producen hasta veintisiete corderos más por cada cien animales madres que las de raza pura. Los corderos de cruce tiene un peso medio de 4.5 kilos más por cabeza al ser destetados.

NEW FEDERAL HONEY BEE LABORATORY OPENED IN TUCSON

PARTIAL VIEW of the front of the new Honey Bee Laboratory.



A ROTO-EVAPORATOR to remove solvent is used when preparing pollen for analysis.

A bright new chapter in a very happy relationship recently took place when the federal Bee Research Laboratory moved into its new half million dollar home on East Allen Rd., near the UA Dairy Research Center.

The mutually helpful cooperation between this ARS agency of the U. S. Department of Agriculture and the UA College of Agriculture began 17 years ago. In 1949 Frank E. Todd and Samuel E. McGregor were transferred to Tucson, to set up a federal apiculture laboratory on The University of Arizona campus.

This first "bee lab" was in a white stucco building on the site where the new Science Library now stands. The building had once housed Home Economics, and before that was a university president's residence.

Out to Allen Road

When that building was moved in a university building program, the federal bee laboratory was moved to three ARS-owned buildings near the Dairy Center, land deeded to the U. S. Department of Agriculture by the university.

Over the years the Bee Research Laboratory has been concerned primarily with the use of honey bees in the pollination of crops, and with the effects on bees of pesticides used on agricultural crops.

In its new home both the staff and its field of interest will be greatly increased. Since establishment here in 1949, the staff has varied from two to five professional scientists. The staff proposed to conduct the expanded program in the new facilities will total 16, including the present four.

Eventually there will be four professional workers in physiology-nutrition; three in pollination-insecticides, three in behavior, two in microbiology-cytology, two agricultural engineers, a plant physiologist and a plant breeder.

Onward and Upward

Over the years the staff has changed gradually. Frank Todd went to Washington to head honey bee research in the Agricultural Research Service. Later he retired, and Sam McGregor has replaced him at Washington.

Present head of the soon-to-expand staff is Dr. Marshall Levin, whose own scientific interest in apiculture was, this past year, overburdened with concerns over architects, builders, contractors, plumbers, laboratory supplies, landscaping — and the intricate bookkeeping which all of that implies.

Dr. Levin obtained his bachelor's degree at the University of Connecticut, his master's and doctor's degrees at the University of Minnesota. He started his work in apiculture with the U. S. Department of Agriculture in June of 1954, and came to the Tucson bee research laboratories in April of 1962.

Activities Unified

The new laboratory, planning and construction of which he has largely directed, has 16,000 square feet of usable office, laboratory and storage space on one floor. Best of all, it unifies under one roof the activities formerly carried on in three buildings and other outbuildings. It includes offices, laboratories, and convenient access to shops and greenhouses. Dr. Levin already feels that the federal facility is making for a more efficient operation.

Research on bees in the United States has been conducted in the past by ARS scientists at five or six field stations in different parts of the country, and by about 20 universities and experiment stations.

Here in the Southwest, California has an extensive bee research program. Nevada, New Mexico and Texas have no such facilities. While work at Tucson and similar facilities is oriented to regional problems, such

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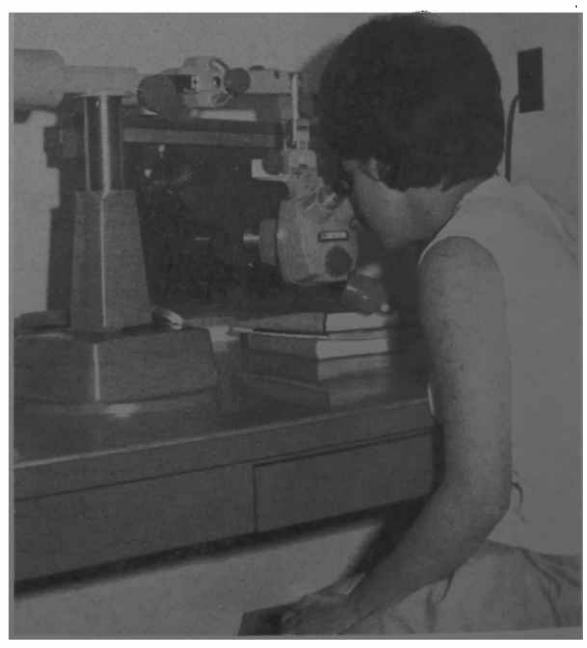
RESEARCH ON NEW hive equipment shows that bees do well in this abnormally large brood chamber, being examined here.



AN ESPECIALLY-DESIGNED microscope makes it possible to observe behavior of nurse bees, and to follow larval growth in the cell.

SEEDLING PLANTS are grown under intense light in the greenhouse to bring out genetic markers by means of which the extent of cross-pollination can be determined.

THE BUILDING'S name is prominently displayed near the front entrance.

HAND POLLINATION of alfalfa is carried out in the bee laboratory's greenhouses to determine crossability of alfalfa clones being tested.

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research also has wide applicability, useful to the entire nation.

Local Work Widely Useful

Studies on effects of insecticides on honey bees, conducted here in Arizona, have wide usefulness. The same is true of pollination studies, studies on pollen chemistry, bee attractants and repellents, bee biology and behavior.

"The relationship between the federal Bee Research Laboratory and The University of Arizona has been a happy one, and helpful to both," says Dr. Levin. It has been a solid basis for the graduate student program in entomology, which will be expanded as the new laboratory's staff expands. A member of the staff has taught UA courses on the honey bee, from the time Frank Todd first began the course in 1950. (In a recent issue of PROGRESSIVE AGRICULTURE IN ARIZONA a Graham County Extension Agent, who has fostered and encouraged a honey production industry in that county, credits his own interest to "courses Frank Todd taught when I was a student at the University").

In the new laboratory the federal scientists expect to conduct, in cooperation with the University of Arizona and other institutions, investigation in five general areas: physiology-nutrition, pollination, pesticides, individual and group behavior, and microbiology-cytology.

Long Known — Little Known

Why are bees attracted to some plants and repelled by others? What does odor or color have to do with bee behavior? How do sound, light, temperature and humidity affect bees? Although bees are the only insects managed and controlled as economically desirable helpers by man, much about them is a mystery to the apiculturist. This is more remarkable because bees and mankind have been associated to their mutual benefit for centuries. Biblical references to bees and honey are frequent.

Thanks to a Congressional appropriation — strongly urged by Sen. Carl Hayden — Dr. Levin and his associates hopefully expect to find answers important to the entire nation.

While the consumer with a jar of honey thinks of the bee principally as source of that healthful sweetening, the agriculturist knows that pol-

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BEES ARE HELD in small cages in the incubator for many purposes; test diets are fed, bees are held until proper age for some research use, or they are returned to the cages after experimental treatments of various kinds.

New Fabric Developments on the Market

WHAT'S IN A LABEL?

By Pauline Hall

Some of the newer fabrics having widespread fashion appeal are now on local markets. In some, care labels are lacking while in others the information may be incomplete, misleading, and even confusing.

In Tucson, a few of the recent purchases of yard goods included a vinyl coated fabric and a fabric-to-fabric laminate. The vinyl coating is on 50 percent rayon and 50 percent cotton plain woven fabric and is available in colorful paisley patterns, solid colors and large polka-dots. The laminate has a face fabric of an Orlon acrylic filling knit in a houndstooth pattern backed with acetate tricot.

Similar fabrics are found in many ready-to-wear apparels and will appear in the array of fashions for spring. The vinyl coated fabrics are used for coats, jackets and young girls' dresses. The end use of the laminates is limitless, and should depend on the fabrics making up the layers. These fabrics do not require linings and usually have better "hand" and body. Hand is a term to describe how a fabric feels, and is a subjective evaluation.

How Adequate Are Care Labels?

The vinyl coated fabric was labeled with the care information: "Do not wash or dry clean — wipe off with damp cloth." The cost of the fabric was high enough to expect to wear a garment made from it for quite awhile, in which normally more than a wiping would be needed to keep the garment clean. The laminated fabric carried the terse information of "Washable."

Both care labels appeared somewhat misleading and inadequate. Other research has indicated that vinyl coatings can usually be laundered satisfactorily, while the dry cleaning solvents attack the plasticizers. The plasticizers are one of the components of the vinyl and give the soft pliable hand to the coating. The plasticizers are soluble in the dry cleaning solvent and, once these are removed, the vinyl coating becomes stiff and boardy and may cause some shrinkage.

The care of laminates not only depends on the fibers present in the layers of fabric, but also whether the adhesive usually used to laminate the layers is water-soluble or dry cleaning solvent-soluble. The fabric manufacturers of the laminates should consider the compatability of the fibers in the layers of the fabric and the adhesive in terms of the expected end use of the textile.

Test for Care

In view of the information given on the labels for care of the two fabrics and reports of care for similar fabrics, some laboratory tests were made for launderability and dry-cleanability to determine the reliability of the labels. The tests were done in the Launder-Ometer which accelerates the conditions of cleaning normally done to fabrics.

Three different tests were made, including one dry cleaning and two washing conditions. Each of the accelerated dry cleanings equals five normal dry cleanings. One of the

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Dr. Hall is an associate professor of clothing, textiles and related arts in the School of Home Economics.

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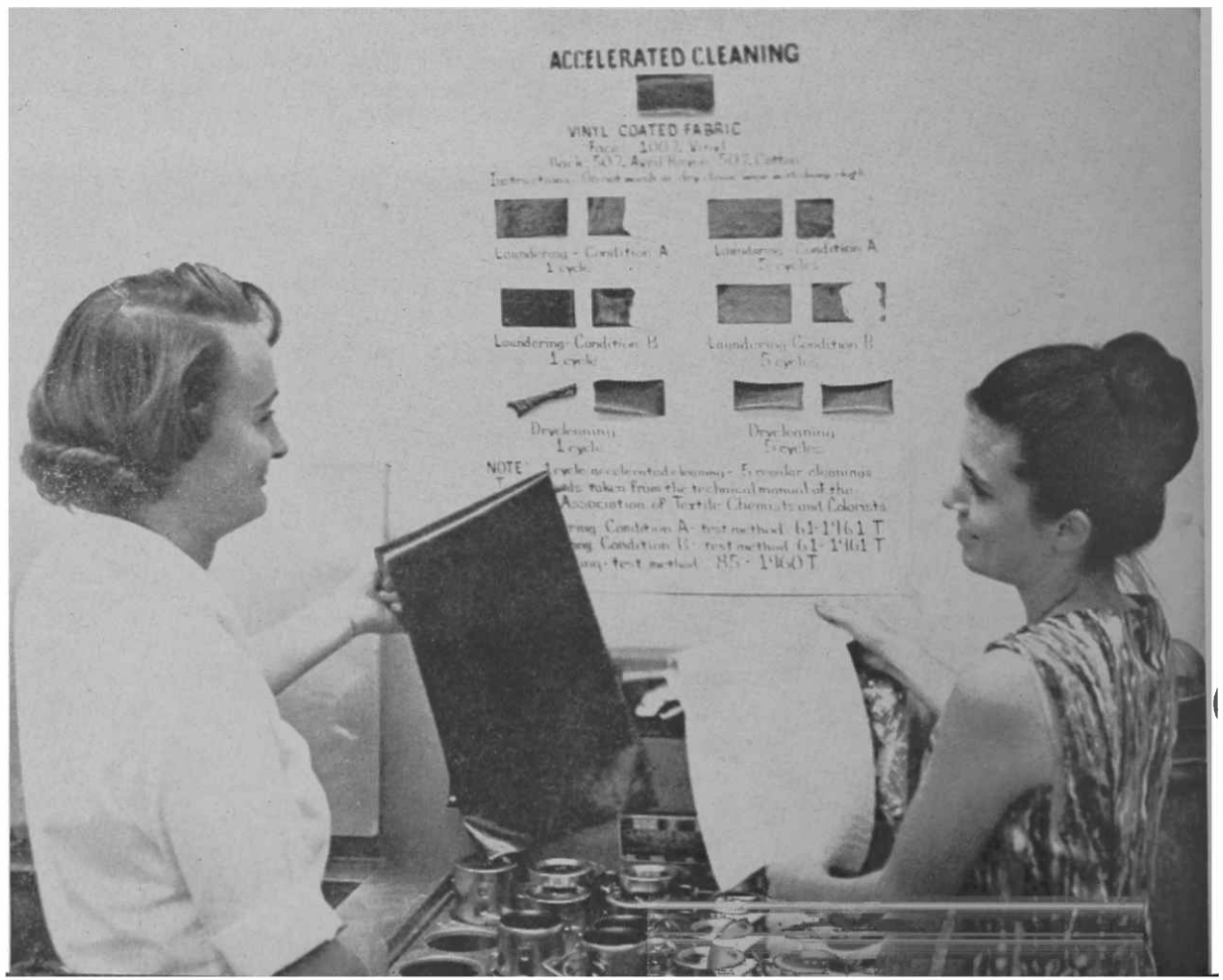
lination is the most important chore of the bee. The pollinating activity of the honey bee is an important part of a national production of two to three billion dollars worth of over 50 different crops in this country. Cotton, cantaloups and alfalfa, the citrus industry, the flowers which grace our gardens and homes, these and many more depend upon insect pollination.

No Surpluses in Future

The world itself is realizing that the day of food surpluses — surpluses only in a few commodities and in a few nations in a perennially hungry world — has ended. Growing populations face hunger and actual starvation.

The faithful little friend which pollinates our food and fiber crops — the honey bee — is more crucially important to man today than ever before. The new $500,000 laboratory, dedicated to learning more about bees, dedicated also to increasing cooperation with this University and its College of Agriculture, is an asset to the community and the nation.

LABORATORY TESTS of various new fabrics are made by Dr. Hall, left, and a student, Connie Mitchell of Phoenix. Each of the round containers (between the two women) holds a fabric sample for testing. Above, on the chart, can be seen the small samples of fabrics which have undergone the accelerated cleaning test. Note how some curl up, some shrink, others change color, denoting probable results in actual usage.



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washing conditions simulates average hand washing, while the other washing is comparable to low temperature machine washing. Both of these accelerated laundering conditions equal five of the respective types of normal launderings. Each of these accelerated cleanings was done one time and five times on replicate pieces of fabric to give results comparable to five and 25 cleanings of the three cleaning conditions.

Not to be Dry Cleaned

Results of these laboratory tests showed as was expected that dry cleaning was totally unsuitable for the vinyl coated fabric. The fabric became stiff and boardy and excessive shrinkage and loss of color was noted. Machine washing conditions result in a more limp hand and a greater color loss than hand washing conditions. The comparable five hand washings showed no noticeable change in color, shrinkage or hand, while the comparable 25 hand washings produced some color loss and a limp hand. It was concluded that garments made from the vinyl-coated fabric probably would not require frequent laundering, and up to five hand washings would not produce excessive changes in the fabric.

The laminated fabric showed no visible changes in hand and appearance after the dry cleaning tests. Slight shrinkage was noted but not a sufficient amount to be objectionable. Both laundering conditions produced excessive shrinkage in the fabric. The simulated hand washing conditions produced little change in color of the laminate; however, the acetate tricot became rougher, which might be attributed to degeneration of the fabric.

The acetate fiber is noted for its chemical breakdown in laundering with a detergent or soap. The machine washing conditions proved most unsatisfactory, since the layers of fabric became completely separated, in addition to the excessive shrinkage and degeneration of the backing fabric. In conclusion, the label carrying the information that this fabric is "washable" was considered most erroneous. Not even the mildest condition produced acceptable results, since the shrinkage was excessive and the acetate backing was damaged. Only the dry cleaning tests proved satisfactory for this fabric.

Instructions May Mislead

From these isolated yet typical cases, consumers may be misled or confused by the care instructions given to fabrics. With the vinyl coated fabric, mild hand launderings would be appropriate for cleaning even though the label had stated that neither dry cleaning nor laundering should be done. The laminate fabric was labeled as being "washable" but not even the mildest laundering conditions were satisfactory. Only dry cleaning of this fabric was acceptable.

In view of these tests, the consumer of textile products has two choices in care of these new fabrics. First is to actually test a fabric for care. With yard goods, the home sewer can purchase a small amount of fabric and test it by laundering under various conditions and noting any changes. Dry cleaning conditions may be somewhat duplicated by placing a small piece of fabric in a jar with some spot removing agent and some small items such as marbles, screws, etc. By shaking the jar, the agitation and abrasion usually found in dry cleaning will be simulated.

The second choice would take more time to accomplish. This is to promote more explicit and permanent labeling from the textile industry. The Industry Advisory Committee of Textile Information, a private voluntary group, has devised a new labeling system. The members of the textile industry who agree to conform to this system will, starting this spring, provide sewn-in labels in items requiring special care. This is a step in the right direction. However, fabrics which can be cleaned by obvious or traditional means will not carry labels. This new system still leaves the consumer with many questions such as:

Still Many Questions

Does this item require special care even though a label is not sewn in?

What are the best obvious or traditional means of cleaning an item?

What provisions are made to adequately label yard goods used by the home sewer?

Such care labels should utilize words and phrases in common use to describe conventional washing and cleaning methods. The term "washable" does not give any indication of the conditions — such as hand or machine washable and temperature of the water. Permanent labeling of ready-to-wear apparel is easily provided by sewn-in fabric labels. Yard goods could also carry this information.

It's foolish to worry about confused, miserable teenagers. In a few years they'll be confused, miserable adults.

Cochise County
- KAWT, Douglas — 6:15 a.m. Mon. through Fri.
- 12:20 p.m. Monday through Friday
- KHIL, Willcox — Mon. thru Fri., 6:05 a.m.

Coconino County
- KCLS, Flagstaff — Tues. and Thurs., 8:45 a.m.
- KCLS, Flagstaff (Home Agent) — Wed., 10:15 a.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.

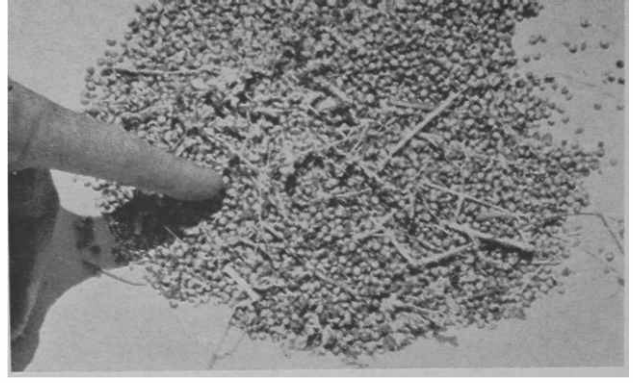
Mohave County
- KAAA, Kingman — Mon., 9:06 a.m. (Extension Home Economist)

Navajo County
- KDJI, Holbrook — Tues., 1:00 p.m.-1:15 p.m.
- KINO, Winslow — Sat., 12:15-12:30 p.m.

Pinal County
- KPIN, Case Grande—Mon. thru Sat., 6:55 a.m.; Mon and Fri., 9:30 a.m.; Tues., Thurs. 11:30 a.m. on Monday and Wednesday and Sat., 12:20 p.m.

Yavapai County
- KYCA, Prescott — Mon., Wed., Thurs. and Fri., 3:45 p.m.
- KNOT, Prescott — Mon., Wed. and Fri., 6:25 a.m.
- KVIO, Cottonwood—Mon. and Fri., 8:15 a.m.

Yuma County
- KVOY, Yuma — Mon. thru Fri., 5:45 a.m.
- KYUM, Yuma — Tues., Thurs. and Sat., 6:25 a.m.
- KYUM, Yuma — Saturday, 4-H Program, 10:05 a.m.



THE EXTENSION SPECIALIST points to a sample of clean sorghum grain (left) ← and to a sample of trashy seed, resulting from maladjustment of the combine.

Combining Sorghum For Maximum Seed And Minimum Trash

By Marshall M. Machado

The purpose of any harvesting and threshing operation is to recover the maximum amount of seed, free from foreign material, with a minimum of seed loss and seed damage. Proper combine adjustments affect both the quantity and quality of harvested grain.

Adjustments affecting sorghum seed loss and trash content are (1) cutter bar and reel settings, (2) cylinder speed, (3) cylinder-concave clearances, and (4) sieve adjustments.

Checking Seed Losses

Seed losses can occur at the cutter bar, cylinder, straw walkers and sieves. Losses at the cutter bar result from heads of grain falling to the ground after being cut by the knife and from grain being knocked to the ground by an improperly adjusted reel. Unthreshed heads of sorghum carried over the rear of the straw walkers are considered cylinder losses. Overloading the straw walkers may also cause loose grain to be discharged with the straw.

Overthreshing or overloading creates a heavy mat of leaves, stalks and grain over the chaffer and sieve, causing grain to be carried out the rear of the combine. Excessive trash reaches the grain bin when the combine operator attempts to retrieve all of the grain by opening the chaffer and sieves too wide.

The operator should check each of the potential seed loss areas frequently and observe the amount of trash reaching the grain bin. By making adjustments of the combine and controlling the feeding rate, the operator can harvest the maximum amount of grain with a minimum of trash.

Adjusting the Combine

Cutter bar height is usually determined by the density of stand. The cutter bar should be set low for thin stands of sorghum and relatively high in dense stands. Setting the cutter bar too low in dense stands overloads the machine. More trash will be found in the grain bin and losses of grain over the chaffer and sieve may result from excess straw.

Peripheral speed of the reel should be 1.0 to 1.2 times the forward speed of the machine to prevent shattering of the grain. Raise the reel and/or fill the area between the center of the reel and the reel slat with canvas or a similar material when the reel is throwing cut grain.

Rasp bar, angle bar, or spike tooth cylinders may be used. Cylinder peripheral speed should be 4000 to 5000 feet per minute. This will be about 700 to 875 rpm when using a 22-inch diameter cylinder. Check the operator's manual since the rpm required for the given peripheral speed will vary with cylinder diameter. Use the faster speeds if many unthreshed heads of grain are found. Excessive cylinder speed causes over threshing and increases damage to seed.

Cylinder-concave clearances should be approximately ½ inch in front and ¼ inch at the rear. Decreasing the clearances may be necessary if many unthreshed heads are found. However, decreasing the clearance has the same effect as overloading the machine since the sorghum straw is badly broken and can plug the chaffer and sieves. Increasing the cylinder

(Continued on Next Page)

The author is an Extension Service agricultural engineer.

By Robert E. Dennis

Arizona growers have a reputation for producing sorghum grain of high quality. Kernels are plump and full, and foreign material is usually at a minimum. Arizona sorghum grain takes roller crushing treatment well and, when free from foreign material, is excellent for use in the new cooked rations for livestock.

The yield per acre of sorghum grain in the state has more than doubled in the last 20 years. The acreage used for sorghum grain tripled during the same priod.

Arizona growers should be congratulated for the quality product they have been producing, but in recent years 10 to 15 percent of the total harvested sorghum grain has contained excessive stalks and leaves. This trash is creating a marketing problem for Arizona-grown sorghum.

Sorghum grain with excessive stalks and leaves does not store well, and is unsatisfactory for use in cooked rations. Trash accumulates in the storage pile or bin, forming barriers to the free movement of air. Moisture collects around the trash, causing grain to mold. Cooked grain with excessive amounts of trash sours after processing.

Dr. Dennis is an agronomist in the Extension Service.

GROWERS SHOULD CAUTION operators against excessive speed of the combine which, in many cases, is cause of overloading and a poor threshing operation.

Visitors at High School Senior Day

HIGH SCHOOL SENIOR day on the U of A campus each fall brings visitors from a multitude of Arizona high schools. Agriculture, it was interesting to note, attracted as many girls as boys. Here Dean Myers looks on approvingly as some of the distaff visitors register.

(Continued from Previous Page)

speed has less tendency to break straw than decreasing cylinder-concave clearances.

Fan speeds should be sufficient to keep chaff "floating" over the sieves to facilitate separation of the seed from the trash. Excessive fan speeds will blow seed out the rear of the machine or into the tailings auger where damage to the seed may occur. The blast of air should be directed toward the front of the sieves.

Check for Overloading

The chaffer (upper sieve) should be set ½ to ⅔ open and lower sieve ⅓ to ½ open. Both sieves should be set level or tilted slightly forward. *If excessive amounts of straw and chaff are reaching the grain bin it may be necessary to close the sieve setting. Before adjusting the sieves check for overloading and/or overthreshing. Overloading results from too much material being taken into the machine, and overthreshing from cylinder-concave clearances being set too close and excessive cylinder speeds.*

Both overloading and overthreshing increase the amount of trash entering the grain bin. Increasing the cylinder-concave clearance and decreasing forward motion of the combine will reduce overthreshing and overloading problems. Grain can be more easily separated and cleaned by increasing the cylinder concave-clearance and decreasing the forward motion of the harvester when weeds and/or green stalks are a problem.

Constant observation of the condition of harvested grain is necessary to determine the proper combine adjustments. Adjustments will vary depending on the condition of the grain and the area of maximum grain loss within the machine. Operators should make adjustments to meet individual crop conditions. Arizona growers may preserve their reputation for high quality sorghum grain by reducing overloading and overthreshing problems at harvest.

62 YOUNG SIRES IN GAIN TESTS AT UA STATION

While pudgy people worry about gaining too much weight, 62 young beef bulls are going to school at The University of Arizona, trying to prove how fast they can gain weight.

The 62 are enrolled in the sixth annual gain-test trials at the U of A River Road Farm in Tucson. The current test started Oct. 21, 1966 and will terminate Feb. 28, 1967. (Five of the animals actually began the test last Oct. 10, to meet the 140-day period required by Performance Registry International).

Three breeds are represented in the tests this year — 7 Angus, 7 Brangus and 48 Hereford, the latter group including 9 polled Herefords. Animals come from four states.

Breeds, and the number of animals entered by each breeder, include:

Angus — A. F. Flint & Sons, Bard, N.Mex. — 4; University of Arizona, Tucson — 3.

Brangus — Las Delicias Ranch, Tucumcacori — 4; Floyd Robbs, Willcox — 3.

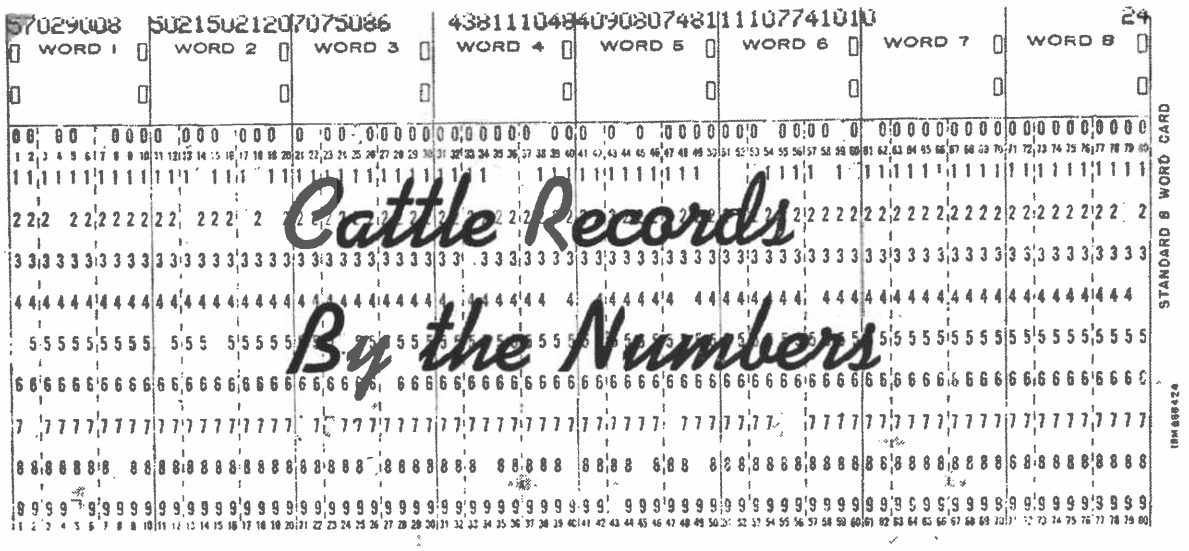
Polled Hereford — R. F. Burnett & Sons, Elfrida — 3; Jack Oleson, Avon, Colo. — 6.

Hereford — Stephen L. Bixby, Globe — 1; Theo. L. Cairns, Lindsay, Calif. — 3; Cowden Herefords, Phoenix — 3; Elgin Hereford Ranch, Elgin — 3; E Z Ranch, Tucson — 2; Heady Ashburn Ranch, Patagonia — 4; I V Bar Ranch, Bisbee — 4; Norman Hodgkin, Tucson — 1; Hooper Hereford Ranch, Springerville — 2; Jay Six Ranch, Benson — 3; Las Vegas Ranch, Prescott — 2; C. C. Mathews, Willcox — 3; Walter W. Meyer, Florence — 1; Thurber Hereford Ranch, Sonoita — 3; University of Arizona, Tucson — 2; Wayne G. Wallace, Sanders — 2.

Animals consist of two groups, seniors being those born between Sept. 1 and Dec. 15, 1965, and juniors born between Dec. 16, 1965, and March 1, 1966.

Specific requirements, with all animals fed the same growing ration and housed and handled under like conditions, require that to pass the test an animal must gain an average of 2.3 pounds per day, yearling weight of 825 pounds or more, and a minimum grade or conformation score of Low Choice.

The annual grade-gain tests are directed by Dr. Bruce R. Taylor, head of the Animal Science Department.



Cattle Records By the Numbers

By C. B. Roubicek

In the July issue of PROGRESSIVE AGRICULTURE IN ARIZONA, Henry Tucker described the potential value of automated records in cattle feedlot operations. Automation also has a place on the range for either purebred or commercial cattle operations.

Accurate records and prompt data summaries are of ever increasing importance in ranching. This is not a question of using the data for some new economic theory, or to show the neat rows of figures as an advertising gimmick. It is simply a matter of putting the ranch operation on a sound business basis in order to survive.

It Produces Information

Automation will not provide complete and accurate data for the rancher. This he must do himself. Automation can process the data and place them in the hands of the producer in a minimum of time. He can then use the information to make sound decisions for increasing herd productivity and efficiency.

The initial encounter with automated records doesn't have to be a 15 round championship bout; a three-round preliminary is still worthwhile. That is, a simple concise listing of the progeny of each female in the breeding herd can provide very helpful information.

The first thing that must be done is to prepare a data card for each animal. This includes animal identification and pertinent performance data that are available for this animal. An example of this is shown on the illustrated IBM card in our heading. The numbers punched in the card are

(Continued on Next Page)

Dr. Roubicek is a professor in the Department of Animal Science.

BELOW IS REPLICATED actual page from San Carlos Apache Indian herd records, set up by UA personnel. This Apache-University of Arizona co-operative study is the largest "large animal" research project in the world.

SAN CARLOS DATA -- PROJECT NUMBER 1053 -- CALVES BY DAM

DMNR	CFNR	SR	SRL	MGS	SX	AG	DOB	BW	IBCF	WW	WC	WD	LW	LC	LD	TW	TC	TD	XW	XC	XD	R1	R2
57029																							
	00001	008		021	2	07	075	086		438	11	10	484	09	08	0748	11	11	0774	10	10		
	60221	011		008	2	03	082	090		454	11	11	368	09	07	0692	11	11	0704	10	08		
	61256	005		008	1	04	088	088		500	11	11	440	11	07	0838	10	10	0722	09	08		
	62250	005		008	2	05	078	110		440	09	10	424	10	07	0768	10	10	0804	10	09		
	63242	061		008	2	06	060	090		466	12	11	404	10	06	0692	12	11	0710	11	10		
5																							
57156																							
	00001	008		021	2	03	124	080		348	10	10	392	10	08	0706	12	12	0730	10	10		
	60046	011		003	2	03	052	072		532	11	12	470	09	08	0792	11	11	0790	11	09		
	61014	017		003	2	04	042	068		480	13	11	404	11	07	0810	12	11	0840	11	10		
	62169	017		003	2	05	061	076		462	11	11	440	10	08	0806	12	11	0748	10	08		
	63154	051		003	2	06	055	078		450	12	11	416	10	06	0674	10	10	0722	11	09		
	64000	060		003																			
6																							
57164																							
	00001	003		035	2	03	127	086		352	10	10	404	09	09	0678	11	11	0706	10	09		
	60226	013		003	1	03	082	070		540	11	12	494	09	08	0710	11	11	0590	10	07		
	61052	012		003	2	04	049	078		426	13	12	370	10	08	0700	12	11	0650	10	10		
	62000	054		003																			
	63201	054		003	2	06	056	086		498	13	11	390	10	06	0632	10	10	0642	11	10		
	64040	073		003	2	07	045	066															
6																							
57119																							
	00001	007		040	2	06	109	086		406	12	12	434	11	10	0720	11	11	0712	10	10		
	60272	011		007	2	03	113	080		374	11	11	352	09	07	0676	11	12	0658	11	08		
	61290	002		007	2	04	127	090		362	10	10	334	11	07	0790	11	12	0762	11	11		
	62000	059		007																			
	63236	059		007	2	06	060	070		414	11	11	370	10	06	0626	12	10	0620	12	10		
	64000	059		007																			
6																							
57019																							
	00001	006		033	2	06	071	084		446	11	10	470	10	09	0734	11	11	0640	09	08		
	60276	011		006	1	03	056	072		502	11	11	456	09	07	0694	10	10	0608	10	07		
	61000	015		006																			
	62000	058		006																			
	63000	062		006																			

03

(Continued from Previous Page)
also printed along the top edge. The information we have on this card uses the first 19 digits for animal identification and pedigree. The first 5 numbers, 57029, are the animal's tattoo, or permanent identification. By our system, the 57 designates the year of birth, the 029 shows that it was the 29th calf born that year.

Brevity Via Digits

The next 3 numbers, 008, are the code numbers for the sire of calf 57029. Instead of using the name or registration number of the bull, we assign each bull a code number and use it for our data cards. This makes the sire designation much shorter and easier to read.

The next numbers, 50215, are the dam of 57029. The sire of the dam is next and coded as 021. The following digit, 2, is for the sex of the calf (1 is male, 2 is a female). The 07 shows the age of the dam when the calf was born.

The remainder of the card is used for performance data. The numbers 075 are date of birth, the 75th day of the year (March 16). Her birth weight was 86 pounds. The next array of figures show weight and grade at various ages. As we read the card we see that her weaning weight was 438 pounds, conformation score 11, and condition score at weaning was 10. Weights and grades for 12, 18, and 24 months of age are also shown. The last 2 columns of the card (24) are the deck identification number.

Obviously the individual performance data will vary a great deal among ranches. This, however, is no problem and merely requires that certain fields in the card be assigned to the specific data that are available.

It is Her Diary

Once the individual record cards have been punched they can be used in a variety of ways. One example is shown at the left as a progeny listing by dam. Animal 57029 is now of interest to us as one of the cows in the breeding herd.

The first row of data (see again Page 12) is numbered 00001 and is the record of her own performance as we saw on the IBM card. The subsequent rows show the calves she has produced in the herd and lists their individual performance record.

Other cows are shown with their progeny records. A year number followed by 000 indicates that the cow was dry that year.

Even a brief study of these records would help a rancher in deciding which cows should be culled or saved, and where to look for replacement heifers.

Similar listings have been made for individual sires and for grandsires. In fact, any type of listing or summary that the owner wants can be quickly made available.

Genetic Correlations

The format presented here is the one we use in our cooperative cattle breeding project working with the Apache Indian Tribe at San Carlos. In addition to sire and dam summary listings we have used these data to determine heritability estimates and to compute genetic correlations among the various traits.

We are now undertaking a detailed study of these data to determine how accurately we can predict the potential lifetime production of a heifer from the records of her own growth performance and the production of direct and collateral relatives. The punch card then, can become a ticket that permits us to enter a whole new world of animal production.

BIG-EYED BUGS AS PREDATORS OF LYGUS BUGS

By G. D. Butler, Jr.

Laboratory studies to evaluate the potential effectiveness of some of the common predators of Arizona cotton fields in the destruction of bollworm eggs were discussed in Progressive Agriculture for July-August 1966. Similar studies were carried out during June 1966 on the relative effectiveness of different stages of a big-eyed bug, *Geocoris punctipes*, on lygus bug nymphs. Some 9000 lygus bug nymphs were fed to various predators and 400 daily feeding records determined.

Adult lygus bugs were collected from alfalfa and placed in gallon jars with green beans. Eggs, laid in the beans, hatched in approximately six days and the small nymphs were collected daily for the feeding tests. Small petri dishes were used as arenas and each was provided with a small piece of green bean to serve as food for the lygus bugs. After 24 hours, the number of missing lygus bugs was determined and each predator was transferred to another dish with a fresh supply of lygus bug nymphs.

Dr. Butler is an associate professor of Entomology.

Females Consumed More

The number of lygus bugs consumed by male and female big-eyed bugs is given in Table 1. Females consumed about twice as many first instar lygus bug nymphs as males. The number of lygus bugs consumed decreased as their size increased. This is due to the fact that a third instar lygus bug is approximately the same size as an adult big-eyed bug; therefore the larger lygus bug nymphs may decide not to hold still and may even "bite back."

Table 1. Number of Different-Sized Lygus Bug Nymphs Consumed per Individual Geocoris punctipes Adult in 24 Hours.

Sex of Geocoris	*Lygus bug instar*	*Number of feeding days*	*Mean No. consumed*
Male	first instar	63	12.1
	second instar	20	4.0
	third instar	10	2.4
Female	first instar	45	25.6
	second instar	5	6.2
	third instar	7	2.6

Newly hatched big-eyed bugs ate a few small lygus bug nymphs, as shown in Table 2, and, as might be expected, the number of lygus nymphs eaten increased as the size of the big-eyed bugs increased.

Table 2. Number of First Instar Lygus Bugs Consumed by Individual Geocoris punctipes Nymphs of Different Ages in 24 Hours.

Stage of Geocoris development	*Number of feeding days*	*Mean No. lygus bug nymphs consumed*
first instar	26	1.5
second instar	50	2.6
third instar	48	7.4

Intricate Interactions

(Unfortunately these studies were terminated when Dr. Butler transferred to the USDA Cotton Insects Branch to work full-time on lygus bugs.) These studies point up how sex and the age of the predator, as well as the age of the prey, affect the complex interaction of insect predators and their prey in Arizona crop areas.

THE BIG CAT walks right up and over the largest mesquite trees.

READY FOR SEEDING, after the root knife has gone by. Most success in reseeding comes when seeding is done just before anticipated rains, and a variety of grass species are used. Also, there may be a benefit from leaving the bladed trash for fertilizer, protection from winds and from grazing, rather than burning this material.

Papago Pasture Development

GOOD RANGE MANAGEMENT, TEACHING LABORATORY

By James Simpson and Phil R. Ogden

The Papago people of Vamori village about 10 miles south of Sells operate a cow-calf operation on a range where annual plants provide much of the forage. The Papago Indians, one of the agrarian Pima tribes who have lived in the arid Southwest for many centuries, today live on a reservation adjacent to, and west of, the city of Tucson, Arizona. The Papago were in that area when Europeans first arrived here in 1690, apparently were there centuries before that time, and it is their home today.

The reservation is in three units totalling nearly 3,000,000 acres — second largest Indian reservation in the nation. These units are the San Xavier with 71,090 acres, the 10,297 acre Gila Bend unit, and lying between them the main reservation of 2,774,536 acres.

Living on this reservation are 5,000 to 6,000 Papagos, governed by one tribal council and served by one Indian Bureau agency, at Sells, some 60 miles west of Tucson.

There Used to be Grass

Much of the reservation is mountainous, but there are plains and valleys which once had rich stands of perennial grasses but, through overgrazing, have deteriorated. Average rainfall is between 10 and 11 inches. There is little forage growth during the dry months of May, June, October and November when feed is scarce.

In an attempt to alleviate the periodic near-starvation conditions for their cattle, the people of Vamori village, in 1960, requested a brush control program to improve range forage production on an area south of their village, located in the south central part of the reservation.

After a series of meetings with Bureau of Indian Affairs personnel from the Sells branch of the Land Operations Office, a plan to develop a permanent pasture utilizing flood water was proposed. The Indians have irrigated "Bolsa" type farms for centuries, so the idea of using floodwater for agriculture is not new, but is an old practice that has been remodeled.

Spreading Flood Waters

The Vamori pasture is located on one of the many rich alluvial fans on the Papago Reservation. These sites are inundated to a depth of up to

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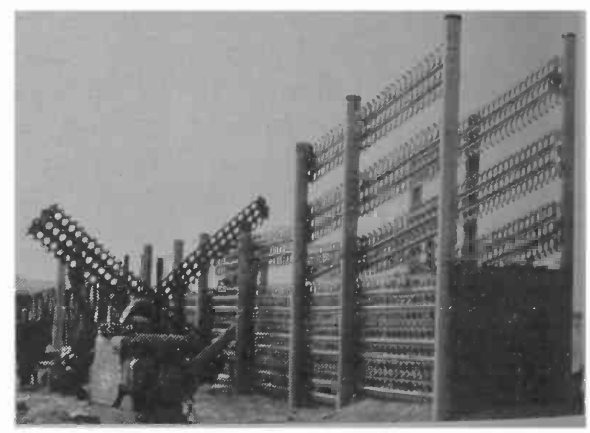

USING MILITARY surplus runway matting, the Papago tribesmen are building new, strong corrals and loading chutes.

AT A FIELD DAY Papagos from many villages see the big cat work, learn how they, too, can improve their ranges.

LUSH PASTURE for the "hungry months" in the Papago grazing cycle. Such pastures, like this one at Vamori, can be cross-fenced, grazed thoroughly when the usual range feed is sparse.

WATER, AS WELL as nutritious grass, is needed in Arizona pastures. Here is a new charco on Vamori pasture.

(Continued from Previous Page)

eight inches of water several times a year by the flash floods produced by torrential rainstorms which often occur many miles away.

In 1961, project work began when 1,200 acres of generally dense mesquite stands were cleared by blading with a crawler-type tractor. After clearing, the land was turned with a "fleco" root knife, developed by the Empire Machinery Co., the brush piled and burned, and the area seeded by aircraft prior to summer rains. Species seeded and rates were: blue panic, 5 pounds per acre; buffel, 3 pounds per acre; Wilman lovegrass, one pound per acre, and Lehman lovegrass at one pound per acre. The residents of the village fenced the pasture and agreed to manage it on a sustained conservative basis for the most beneficial use.

Cost of clearing, knifing once, piling and burning brush, and reseeding was $20,400. Dikes and "charcos" (stock tanks) cost $5,000 for a total initial cost of $25,400 or $20 per acre.

Planning for Maintenance

Plans call for division of the pasture for deferred rotation grazing, as well as spraying the new woody regrowth as needed. Annual maintenance costs for spraying woody plants, fence maintenance, and occasional reseeding on flood-damaged areas, are estimated at $350 per year. With the proper management being demonstrated, the improvements should last indefinitely.

Prior to treatment, 16 acres were required to carry one cow for one month in the Vamori area. Now less than two acres is presently needed to support one cow for one month. The 1,200 acres has a present carrying capacity of 633 animal unit months.

Is a UA Laboratory

The pasture may have greater potential than this. The possibility of increasing the forage yield and nutrient content of the pasture grasses is being investigated by personnel of The University of Arizona Departments of

(Continued on Next Page)

Mr. Simpson is a graduate student in Agricultural Economics at The U. of A. His thesis work is concerned with a cost and benefit evaluation of proposed forage development projects on the Papago Reservation. Dr. Ogden is Associate Professor of Range Management at The University of Arizona.

CHUCK WHITFIELD, UA graduate and Range Conservationist at the Papago Agency, stops a field day tour of Papagos on the bank of a charco to tell about the range reclamation work, why and how it was done, and how the lush new pastures can fill the gaps in the Papago grazing pattern.

(Continued from Previous Page)

Agricultural Chemistry and Soils and the Department of Watershed Management, with a cooperative range fertilization trial on the pasture. The Papago people have been very cooperative, reports Charles R. Whitfield, Land Operations Officer, and additional requests for this type of program are being made by Papago livestock users.

In addition to the dollar and cents gain, there is a definite educational benefit for the Indians on the Reservation. Stimulated by actually observing the results of proper management and cooperation by their neighbors, Papagos from other villages have subsequently worked toward developing three other pastures with a remaining estimated potential of 50,000 acres.

Many Observe, Learn

The educational benefits are not limited to residents of the reservation, however, but are shared by touring Range Management classes from The University of Arizona, as well as foreign visitors seeking ways to develop grazing resources within their own countries. Also, non-reservation cattlemen from throughout southern Arizona are being encouraged to visit this practical example of good range management.

UN TRATAMIENTO para tratar de combatir el canibalismo en los aves es el de añadir una cucharada de sal común por cada cuatro litros de agua de beber durante dos días. Este remedio se emplea después de que se ha iniciado el vicio en la parvada, y ni la cantidad de sal ni el tiempo deben aumentarse.

That which happens to the soil when it ceases to be cultivated, happens to man himself when he foolishly forsakes society for solitude; the brambles grow up in his desert heart — Rivarol.

Recent Journal Articles Listed

EDITOR'S NOTE: In addition to the various "popular" publications of this College of Agriculture — Extension folders, Extension bulletins, 4-H materials, the popular bulletin series, technical bulletins and others — staff members submit a prodigious output of material to the scientific journals in a score or more of fields of scientific inquiry. A listing of recent journal papers is given in each issue of PROGRESSIVE AGRICULTURE IN ARIZONA. Readers who wish copies of certain papers should write directly to the authors. The listing below includes Journal Number, title of the paper, authors, and journal to which the article was submitted.

1076 "Influence of Shade, Soil and Water on Saguaro Seedling Establishment"
by Raymond M. Turner, Stanley M. Alcorn, George Olin and John A. Booth
Botanical Gazette

1077 "Calcium-45 and Strontium-89 Movement in Soils, and Uptake by Barley Plants as Affected by $Ca(Ac)_2$ and $Sr(Ac)_2$ Treatment of the Soil"
by W. H. Fuller, J. E. Hardcastle, R. J. Hannapel, and Shirley Bosma
Soil Science

1078 "Secretion of DDT in Milk by Fresh Cows"
by W. H. Brown, J. M. Witt, F. M. Whiting, and J. W. Stull
Bulletin of Environmental Contamination and Toxicology

1079 "Cotton Harvest Schedule Evaluation"
by H. N. Stapleton, M. D. Cannon, W. A. LePori
Proceedings Cotton Defoliation-Physiology Conference

1080 "Histomorphological Changes in Reproductive Organs of Rats Fed Cyclopropenoid Fatty Acids"
by A. M. Rascop, E. T. Sheehan and M. G. Vavich
Proceedings of Society for Experimental Biology & Medicine

1081 "Variability of Secretion of DDT in Milk"
by J .W. Stull, W. H. Brown, F. M. Whiting, J. M. Witt
Journal of Dairy Science

1082 "Effect of Frequency of Nitrogen Application on the Yield Components of Barley"
by H. Tucker and H. A. Schreiber
Agronomy Journal

1083 "Control of the Arborvitae Aphid on Arborvitae"
by George D. Butler, Jr. and Paul D. Gerhardt
PCO News

1084 "A Liquid Scintillation Technique for the Radio Assay of Calcium-45"
by J. E. Hardcastle, R. J. Hannapel, W. H. Fuller
Analytical Chemistry

1085 "Sewage Effluent Recharge in an Epemeral Channel"
by W. G. Matlock
Water & Sewage Works

1086 "Relating Ranch Prices and Grazing Permit Values to Ranch Productivity"
by William E. Martin and Gene L. Jefferies
Journal of Farm Economics

1087 "A Malaise Insect Trap for Crop Areas"
by G. D. Butler, Jr.
Journal of Economic Entomology

1088 "Respiratory Exposure of Dairy Animals to Pesticides"
by J. M. Witt, F. M. Whiting, and W. H. Brown
Advances in Chemistry Series (monograph of American Chemical Society)

1089 "Effects of One Fall Broadcast Application of Nitrogen and Phosphorus Fertilizers on Mature Intermediate Wheatgrass in the Southwestern Ponderosa Pine Zone"
by Fred Lavin
Range Management

1090 "Effect of Iron Sulfate on Egg Discoloration Caused by Gossypol"
by A. R. Kemmerer, B. W. Heywang, M. G. Vavich and E. T. Sheehan
Journal of Poultry Science

1091 "Micromorphological Study of Soil Crusts"
by D. D. Evans and S. W. Buol
Soil Science Society of America Proceedings

1092 "The Anthicidae Collected by Gy. Topal in Patagonia"
by Floyd G. Werner
Annals of the Hungarian National Museum

1093 "F_1 Hybrid Muskmelons, III: Field Production of Hybrid Seed"
by Dr. Robert E. Foster
Proceedings for the American Society of Horticulture Science

1094 "Acceptability and Nutritional Response Comparisons Between Calf Starters"
by R. W. Gardner
Journal of Dairy Science

1095 "Alfalfa Mosaic Virus of Head Lettuce in Arizona"
by William J. H. Stone and Merrit R. Nelson
Phytopathology (note)

1096 "Effect of Dalapon on Glucose Utilization"
by M. L. Jain, E. B. Kurtz, Jr., and K. C. Hamilton
Weeds

1097 "Volume Weight Soil Sampler"
by Malcolm J. Zwolinski and (the late) P. B. Rowe
Journal of Forestry

1098 "Defective TMV Strains: Identification of the Protein of Strain PM_1 in Leaf Homegenates"
by C. L. Parish and Milton Zaitlin
Virology

1099 "Meiotic Irregularities in *Cucurbita* Species Hybrids"
by David Groff and W. P. Bemis
Journal of Heredity

1100 "A Highly Virulent Erwinia Isolate From Arizona Vegetables"
by William J. H. Stone
Plant Disease Reporter

1101 "A Revision of Acanthinus (Coleoptera: Anthicidae); III — The Spinicollis-Group"
by Floyd G. Werner
Annals of the Entomological Society of America

1102 "Grain Sorghums in Laying Hen Diets"
by R. Chavez, P. J. deMatheu, and B. L. Reid
Poultry Science

1103 "Variation of Pesticide Residues in Arizona Milk"
by J. M. Witt, F. M. Whiting, R. C. Angus, J. W. Stull and W. H. Brown
Journal of Dairy Science

1104 "Identification of Some Trace Lipids in Honey"
by Mr. R. Smith and W. F. McCaughey
Journal of Food Science

1105 "Chemical Control of Three Chihuahuan Desert Shrubs"
by Ervin M. Schmutz
Weeds

1106 "Use of Monosomes in Mapping Three Chromosomes in Cotton"
by J. E. Endrizzi and R. J. Kohel
Genetics

1107 "Antibiotic Production by Streptomyces Species from the Rhizosphere of Desert Plants"
by Julian W. Whaley and Alice M. Boyle
Phytopathology

1108 "A Preliminary Report on the Terrestrial Insects of the Rita Blanca Deposit, Near Channing, Texas"
by F. G. Werner
Memoirs of the Geological Society of America

1109 "A Review of the Mutillid Genus *Chyphotes* Blake (Hymenoptera, Mutillidae, Apterogyninae)"
by Clarence E. Mickel
Transactions of the American Entomological Society (Philadelphia)

1110 "Ecology of Boysag Point on the North Rim of the Grand Canyon in Arizona"
by Schmutz, Ervin M., Charles C. Michaels and B. Ira Judd
Ecology

1111 "Effect of Increasing Dietary Levels of Acetyl-Salicylic Acid on Performance and Cecal Microbial Counts of White Leghorn Pullets"
by J. M. Thomas, H. S. Nakaue and B. L. Reid
Poultry Science

1112 "Colonizing Flights and Associated Activities of Termites I. The Desert Dampwood Termite"
by W. L. Nutting
Psyche

1113 "Energy Requirements for Tillage Systems in Desert Soils"
by W. A. LePori and H. N. Stapleton
For Presentation at the 59th Annual Meeting A.S.A.E.

1114 "The Development of *Spodoptera Exigua* and Its Parasite *Chelonus Texanus* in Relation to Temperature"
by George D. Butler, Jr.
Journal of Economic Entomology

1115 "Comparative Susceptibility of Long and Short Staple Cotton to Bollworm Injury in Arizona"
by George P. Wene and L. W. Sheets
Journal of Economic Entomology

1116 "Computer Analysis of Synthesized Field Machinery Systems"
by H. N. Stapleton
American Society of Agricultural Engineers

1117 "The Development of Several Predaceous Hemiptera in Relation to Temperature"
by George D. Butler, Jr.
Scientific Note — Journal of Economic Entomology

1118 "Inexpensive Temperature Control for Research"
by R. E. Foster
Hort. Science

1119 "Non-Evaporative Convective Heat Transfer From the Surface of a Bovine"
by Frank Wiersma and Gordon L. Nelson
American Society of Agricultural Engineers

1120 "F_1 Hybrid Muskmelons, II. Bee Activity in Seed Fields"
by R. E. Foster and M. D. Levin
Proceedings American Society for Horticultural Science

1121 "Relating Ranch Prices and Grazing Permit Values to Ranch Productivity."
by William E. Martin
Journal of Range Management

1122 "Role of Seed Production on Predisposition of Sorghum to Charcoal Rot"
by L. K. Edmunds and R. L. Voigt
Published as an abstract in proceedings of the Annual Meetings of the American Phytopathological Society

1123 "Abrachiate, an Adroecious Mutant Muskmelon"
by R. E. Foster and W. T. Bond
Journal of Heredity

1124 "Nitrogen Availability on Fall Burned Oak-Mountain-Mahogany Chaparral"
by H. F. Mayland
Journal of Range Management

1125 "The Development of Trialeurodes Abutilonea at Different Temperatures"
by Dr. George D. Butler, Jr.
Journal of Economic Entomology

JANUARY

7—Citrus Field Day, UA Citrus Experiment Station near Phoenix

19-20—Irrigation Operators' Workshop, Stardust, Yuma.

25-27—A. I. Workshop, Dairy Research Center, Tucson

30—Annual Meeting, Ariz. Crop Improvement Assn., UA Campus, Tucson

30-31—Extension Winter School, U of A Campus

31—U of A Agric. Chemicals Conference, U of A Campus

FEBRUARY

1-17—Extension Winter School

1—U of A Agric. Chemicals Conference, U of A Campus

21—Annual Meeting, Ariz. Cotton Growers, Casa Grande

MARCH

2—Bull Sale, U of A Beef Cattle Improvement Station, Tucson

18—FFA Field Day — U of A Campus

Economic, Historic Maps Published by UA Workers

Two University of Arizona professors, Dr. Simon Baker and Dr. Thomas J. McCleneghan, have just published "An Arizona Economic and Historic Atlas" which everyone concerned with agriculture in Arizona should have.

The atlas includes a number of state maps pertaining to agriculture — general relief map, soil groups, vegetation, climatic regions, annual and monthly precipitation, January and July temperatures, frost-free days, river discharge, ground water levels, drainage areas, major dams and irrigated areas and public lands.

There also are maps showing place names, prehistoric Indian sites, early exploration routes, frontier army posts, ghost towns, early railroads, present airline routes, manufacturing and mineral area maps, television and radio stations, fishing and hunting areas by species, school and population maps, etc.

The atlas was published by the Division of Economic and Business Research in the College of Business and Public Administration, in cooperation with the Valley National Bank.

The Newest and the Best

ROSES FOR 1967

By R. B. Streets and Harvey F. Tate

One of the principal fascinations of rose culture is the growing of new and improved varieties which are introduced at the rate of about 150 per year. Not all of the new roses find a permanent place in the lists of best roses, but each year several outstanding new varieties are introduced.

As the average rose grower has neither the space nor the time to test even a fraction of the new roses, the following lists should be of value in selecting the few new varieties that can be planted in the home garden.

The selection is based on experience in growing and observing new varieties (made available for testing by some of the major breeders of roses in advance of sale to the public) and by observation in the growing fields, rose shows and gardens. Estimates of the value of new varieties are tentative and subject to change until five years' experience has made an accurate evaluation possible. This is the American Rose Society standard of rating.

Dr. Streets is Plant Pathologist of the Experiment Station. He is a rose judge and Consulting Rosarian of the Southwest District, American Rose Society. Mr. Tate is Extension Horticulturist.

Miss Faye Jones, Pres. of Rose Society of Tucson for 1964-65 contributed valuable test data.

For those interested in roses, this College of Agriculture has just published Bulletin A-30, "Roses in Arizona," and Folder 103, "Rose Varieties for Arizona, 1967." Copies are available from your local county agricultural agent.

All-America Winners for 1967

The rose industry maintains 16 test gardens representing all climates in the United States where new varieties are tested before being sold to the public. From one to four outstanding new varieties are chosen each year by impartial experts. This year's choices are :

LUCKY LADY, Gr. A light, pastel pink with strong stems. Buds and flowers of good form, borne freely on a good vigorous bush.

ROMAN HOLIDAY Fl. A brilliant orange-red floribunda which is actually a bicolor with base of petals a rich yellow. The 2½ inch flowers are fully double. The bush is compact with dark green leathery foliage. Good for group plantings and borders for a mass of color.

Two others are being tested.

Best 1966 Varieties

SIMON BOLIVAR HT. Large Chinese red blooms produced freely all season on a vigorous bush with large, glossy, deep green foliage. Mildew resistant.

PALM SPRINGS Fl. A large-flowered floribunda blooming freely all season. Blooms many-petaled opening flat, oriental-red to light bronze, center yellowish-pink. Bush vigorous, upright, foliage bronzy.

GAYTIME Fl. Another large flowered floribunda with almost hybrid tea blooms. Flowers open a cardinal-red and golden yellow, aging to raspberry pink. Continuous bloom all season. Lightly fragrant. Bush medium height.

Best 1965 Varieties

JAMAICA, HT. Buds ovoid, flowers large, a glowing rose red. Keeps well. Foliage dark, glossy, leathery. Bush very vigorous; abundant bloom.

POLYNESIAN SUNSET, HT. Buds long, flowers large, high-centered, with a fruity fragrance; coral-orange. Free blooming. Foliage leathery. Bush vigorous, but less so than Tropicana.

APRICOT NECTAR, Fl. An all America ('66) floribunda with large, cupped blooms; pink-apricot on a golden base, best in cool weather. Foliage glossy. Plant bushy. Free blooming.

CAMELOT, 1965, Fl. Medium to large deep coral blooms produced in abundance on a sturdy, upright bush. Bloom has many wavy petals and is colorful when fully open.

WOBURN ABBEY, 1965, Fl. A new color combination, a glowing orange with cherry red shadings deepening as bloom opens fully. A free bloomer on a compact, spreading bush. Makes a good color accent.

MR. LINCOLN, 1965, HT. A very good red rose with a high center and good stems. A good bush with average vigor. Good foliage.

A Vibrant Color — Orange Red

OLE, 1964, Gr. A distinctive rose with fluorescent vermilion flowers with many wavy petals. Attractive when fully open. Blooms resist rain, heat and wind and last well when cut. Foliage glossy. Bush vigorous and free blooming.

TROPICANA, 1963, HT. A brilliant rose. Fluorescent orange-red non-fading blooms on long cutting stems lasting well as cut flowers. Bush very vigorous and is free-blooming. Growth tall — give it room.

HAWAII, 1960, HT. Glowing orange-coral blend. High centered blooms that fade very little, on long sturdy stems. The foliage is glossy and the bush very vigorous, growing to five or six feet. Blooms freely.

SARABANDE, 1960, Flor. Brilliant orange-scarlet single or semi-double blooms in clusters on low spreading bush. Continuous bloom. An excellent color accent. Taller (2 to 3 feet) as it gets older.

MALIBU, 1960, Flor. The large blooms open coral-orange red, finishing several shades lighter. Size and form of blooms more like a hybrid-tea than a floribunda. Very colorful. Bush vigorous, of moderate size.

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AZTEC, 1957, HT. Bright orange-red blooms of good form on a rather spreading bush. Moderate bloom.

SPARTAN, 1955, Flor. The first of the bright, relatively non-fading orange-red floribundas. Heavy and continuous bloom of medium sized flowers. Foliage is almost evergreen. Bush is tall and upright. A fine color accent.

FLORIADE, 1964, Gr. Has the form and bush of Montezuma, from which it is a sport, but the color is a deeper orange-scarlet, and it appears to fade less. Slight fragrance.

New Red Hybrid Teas

WORLD'S FAIR SALUTE, 1964, HT. Large, high centered deep crimson, fading to scarlet, blooms on good stems. Foliage leathery. Bush vigorous and upright.

HELEN SCHOEN, 1963, HT. Bud pointed; flower very large, many-petaled, high-centered, slightly fragrant, deep rose red, on long stems. A show rose. Bush vigorous and upright. Moderate bloom.

RED AMERICAN BEAUTY, 1964, HT. Dark, velvety red blooms of good form and fragrance. Good stems produced on a vigorous upright growing bush. Free blooming. A most promising variety.

AVON, 1961, HT. A large medium red rose of exceptional form and fragrance borne on long sturdy stems. Bush vigorous and foliage very good. Free blooming.

AMERICANA, 1961, HT. Large medium red blooms of very good form and texture and good fragrance. Very vigorous bush and excellent foliage. Free blooming and non-fading.

CHRISTIAN DIOR, 1962, HT. Large crimson-red blooms with scarlet shadings, hold color well. Some fragrance. Good bush and foliage of average size.

JOHN S. ARMSTRONG, 1962, Gr. Medium sized dark red flowers of satiny texture and mild fragrance. Keep well as cut flowers. Vigorous bush with good foliage.

Good Pink Hybrid Teas

GRANADA, 1964, HT. This 1964 All-America winner has urn-shaped buds and blooms of varying shades of scarlet, nasturtium red and deep yellow, and a spicy fragrance. The vigorous upright plant blooms throughout the season.

ROYAL HIGHNESS, 1962, HT. Another show rose which was All America in 1963. Bud large and pointed; flower large, many-petaled, opening slowly, soft pale pink (fades almost white in heat). Very fragrant. Stems strong and straight. Foliage glossy, leathery, dark. Bush vigorous and upright. Free bloom. Quick regrowth.

COLUMBUS QUEEN, 1962, HT. Soft orchid-pink blooms of "show rose" form borne singly on long stems; excellent for cutting. Darker pink in cool weather. Bush very vigorous and free blooming, up to 4 to 6 feet. Foliage very good.

SOUTH SEAS, 1963, HT. Deep pink buds which open to a luminescent coral-pink exceptionally large bloom with wavy petals. Blooms finish with some darker overtones. Bush very vigorous to five to six feet.

DUET, 1960, HT. A very free blooming two-tone pink (light pink with deep pink reverse). Produces an abundance of well formed flowers, very good for cutting. The vigorous bush has handsome foliage. Blooms are good even in heat.

A Good New White

SINCERA, 1963, HT. Good white roses are hard to find as they are very susceptible to damage by thrips and weather. Sincera is a medium-sized, pure white show rose with a vase-shaped bud that opens slowly. Stems are long and foliage is good. Moderate bloom.

Yellow Hybrid Teas

KING'S RANSOM, 1962, HT. Brilliant golden yellow, showing a minimum of fading. Flower of good form and substance on good stems. Bush vigorous.

SUMMER SUNSHINE, 1962, HT. Another brilliant golden yellow of good size on a vigorous bush with good foliage. Form and substance good.

The "Peace" Family

There have been many sports and hybrids of the very popular Peace rose. The following have performed best in this climate

CHICAGO PEACE, 1963, HT. A deep phlox-pink with base of petals yellow (in cool weather). Otherwise both flower and bush very much like Peace.

LUCKY PIECE, 1962, HT. Deep pink and orange blended in petals (in cool weather). Otherwise both flower and bush very much like Peace.

PERSONALITY, 1960, HT. Deep yellow with strong pink suffusion (in cool weather). High centered bud and opening bloom very attractive. Open bloom not as good as Peace. Glossy Peace foliage on a stronger bush.

Good New Floribundas

CIRCUS PARADE, 1964, Fl. Similar to Circus but with considerably more cherry red shading of petals. Free blooming. Bush compact like Circus.

SARATOGA, 1963, Fl. Pure white gardenia-like flowers, long lasting on plant and when cut. Old rose fragrance. Compact grower of medium height with glossy green leaves. Free-bloomer.

LILLI MARLEEN, 1961, Fl. A brilliant dark cherry-red floribunda with long lasting flowers and unchanging color. Bushy plant well covered with semi-glossy foliage. Free blooming. A bright spot of color. Mildewed this fall.

HEAT WAVE, 1958, Fl. Fiery Chinese red blooms produced in great profusion on a vigorous bush. Bud short and pointed, flower form good. One of the brightest. Growth upright, compact and well foliaged.

RUBY LIPS, 1958, Fl. Free blooming semi-doubled bright red which holds its color. Bush compact and moderately vigorous. Good foliage.

Some Excellent Climbers

SIERRA SUNSET, 1961, L.Cl. Bud pointed; flowers large, high-centered, very fragrant, blend of yellow, peach, orange and red, borne in clusters. Very vigorous; only moderate bloom.

DON JUAN, 1957, Cl. Dark velvety red flowers produced freely on a pillar (short climber, 6 to 8 feet). Fragrant. Repeats well for a climber.

SHOWERS, 1957, Cl. Clear medium yellow flowers with wavy petals produced all season (rare in a climber grown in our climate). Vigorous growth to 8 to 10 feet.

CL. CHRYSLER IMPERIAL, 1956, Cl. HT. Crimson-red blooms like the bush produced on a vigorous climber.

CL. SUTTER'S GOLD, 1950, Cl. HT. Slender buds shaded and veined with red open to high centered blooms on good stems. Very fragrant. Good repeat bloom. Vigorous bush to 8 to 10 feet.

CL. PEACE, 1950, Cl. HT. Flowers just like the bush, produced freely on a very vigorous climber, growth 12 to 18 feet. Some repeat in summer; considerable in fall. This one needs room!

A Good "Fence Rose"

RED GLORY (HYBRID 311), 1963, Fl. Grows rapidly from small plants to 4 to 6 feet. Everblooming 2-inch single bright red flowers. Handsome glossy foliage. Plant 24 inches apart for a dense hedge. By far the most attractive of the "fence roses."

HOPI 4-H GIRLS learn the latest techniques in clothing making. These bright youngsters take quickly to the electric sewing machines, and have a keen sense of color and style.

LEARNING LEATHERCRAFTS — Even very young Hopi boys show amazing skill in cutting, shaping and embossing leather articles, as taught through 4-H clubs.

Gentle People of the Mesas Endorse 4-H Clubs

By Clay Napier

Tribal Councilman Logan Koope gazed solemnly into the purple sunset as the inquisitive visitor asked questions about his people's "snake dances," 4-H work and Hopi traditions.

"What you call dances are not dances," Koope explained. "They are the sacred religious rites of the Hopis."

The gentle host was too polite to say so, but it was apparent that visitors to the Hopi Nation in Navajo County, Arizona, are expected to be quiet and respectful on such occasions, just as you expect people to behave in your church.

Visitors sometimes fail to realize fully that the rain-making ceremonies, commonly called "snake dances," are among the Hopis' most sacred religious ceremonies. Although the "dancers" handle rattlesnakes, racers and bull snakes, this is NOT entertainment. They put their hearts and souls into the ceremonies.

Parents Endorse 4-H Activity

It is the same with 4-H Club activity in the Hopi Nation.

While many parents let their children participate in 4-H work but play only passive roles themselves, the Hopi parents reflect intense interest in everything their offspring do.

"Many of the Hopi are progressive. They accept new ideas that help them. They like 4-H because they see that 4-H helps their children," explained Dwain Gale, former Extension agricultural agent in Navajo County and now working for a master's degree at The University of Arizona College of Agriculture.

The UA Cooperative Extension Service and the Bureau of Indian Affairs cooperate with the Hopi 4-H program.

Amos H. Underwood, county agent at Holbrook, noted that the Hopis love their ceremonials, including the Butterfly Dance, the Hoop Dance, the Antelope Dance and the Buffalo Dance.

Hopi Team a Winner

Unlike many other Indians, the Hopi are not shy or reticent about appearing in public. Underwood pointed out that the Hopi talent team outdid all others in Arizona's 14 counties to win the State 4-H talent show two years in a row — once with their "Original Hoop Dance" and again with their "Impersonation of the Beatles."

The county agent said the Hopis are very proud of their annual "4-H Achievement Day" held each spring at Polacca. They dismiss school for the day and the young folks bring in clothing, foods, home management record books, poultry, rabbits, beef, horses, sheep, leatherworks and electricity for judging. Sometimes they exhibit as high as 700 entries in competition for 4-H ribbons.

"We are proud of these Hopi 4-H boys and girls," said Underwood. "They exemplify in their work and play the highest ideals of the 4-H program."

There are 30 4-H Clubs on the Hopi Reservation with 396 members — 157 boys and 239 girls. Most popular projects among the boys are leathercrafts, beef animals and horses. The girls like clothing, basic sewing, foods and nutrition.

Have Artistic Talent

Hopi 4-H boys and girls alike go strong for art (painting), tooling copper, electricity, making electric lamps, woodworking and carving. Their natural abilities often push them out to outdo their white counterparts.

(Continued on Next Page)

The author is Extension Information Specialist. Photos are by the author.

(Continued from Previous Page)

Typical of the adult Hopis who participate in the 4-H program are Mrs. Martha Sieweyunptew, a 4-H leader for the past 14 years, and Miss Mary Lou Loloma, a 4-H leader 13 years.

"I like to work because I know it helps our young people adapt to the new ways," said Mrs. Sieweyunptew, who lives on the Second Mesa.

Miss Loloma, of Polacca, called 4-H "one of the best educational tools I've found." She is a teacher at the Polacco Day School.

Another 4-H leader, Miss Evelyn Mack of Polacca, was too busy to talk much. "I'm on my way to a 4-H meeting now," she explained.

AN ANCIENT ART — Mrs. Martha Sieweyunptew, a Hopi 4-H leader, weaves a basket as her people have done for centuries. The Hopis are a progressive people, but they still strive to keep alive many tribal arts.

A male 4-H leader who helps the 4-H'ers develop their natural leathermaking abilities is Henry Talayumptewa. "I enjoy watching the creativity in the young people the way some people enjoy the sunrise," said Talayumptewa.

Proof that 4-H experiences stay with the Indians after the club years are gone was evident in a young man named Webb Polacca, 22, stepson of Olie Tolashie, a Hopi rancher. "In my beef 4-H project I learned much about the breeding and care of beef animals. I learned how to select good cows and bulls and how to care for them. I'm making a career of raising livestock," Tolashie said confidently.

A Skilled Silversmith

Another 4-H'er, Delbert Honani of Oraibi, won quite a reputation as a 4-H silversmith. He went on to continue his education at Phoenix Indian School in Phoenix. Oraibi, incidentally, is the oldest continuously inhabited village in the United States.

The Hopi women are receptive to homemaker clubs, too, under the leadership of the BIA. The women learn such skills as modern cooking and sewing. Their favorite project is making clothes for their children.

Although the Hopis treasure their ancient traditions and fully respect their ancestors, they have a knack for accepting modern ways at the same time.

They use trucks, tractors, station wagons and other modern vehicles. Television antennas project on the rooftops of many of their native stone and adobe homes. There is a 24-unit motel at Keams Canyon. A public cafe is located nearby.

But within a few minutes you can go from a modern way of life to villages where people have lived the same way for a thousand years. The most picturesque living areas are atop the mesas.

An Agrarian Society

Seventy-five percent of the people derive their living from agriculture — cattle, sheep, fruits, vegetables, including squash, watermelons, beans and cantaloup. Koope himself is a typical Hopi farmer. He cultivates 3 acres, and some have as many as 5 acres. "That's all a man needs," the tribal councilman explained.

An interesting agricultural twist is the way the Hopis raise peaches. They plant the trees in low areas where they get the maximum moisture, which may be far from the owner's dwelling place. "But a Hopi never bothers another Hopi's fruit trees," said Koope.

Because cattle constitute a major product for the Hopis, William "Bill" Beck, BIA range conservationist, works with both the 4-H Clubs and the adult agricultural program. The Hopis are quick to accept new range management practices, said Beck.

Best of Old and New

"We want the things the white man can give us that are good," said Koope. "But we do not want to lose the good things we have had for centuries."

That seems to sum up the Hopi philosophy.

Miss Stewart Honored For Work With BPW

More than 300 persons have learned to read and write in Tucson and the surrounding area as the result of efforts by a small band of women who cared.

One of these is Miss Jean M. Stewart, state leader of Home Economics in the Extension Service.

The work was begun by a University of Arizona Business and Professional Women's Club committee co-chaired by Miss Stewart and Mrs. Roger Schroeder of the UA Science Library. This is one reason why Miss Stewart is the BPW's "Woman of the Year," given the award at one of the club's noon luncheon meetings.

Making the presentation was another distinguished Tucson woman, Superior Court Judge Mary Anne Richey.

Mrs. Blanche A. Seferlis, president of the UA BPW, said Miss Stewart did "A distinguished job of helping illiterate people better themselves" in her work on the organization's Adult Literacy Group Committee.

During Miss Stewart's first year with the literacy group, the UA BPW Club received the trophy for the best community project from the Arizona State Federation of BPW. This year the club won second place in the same category.

For Miss Stewart, this honor was something of a switch. As prime mover in the annual Town and Country Life Conference, also called "University Week for Women," she often makes arrangements for others to be honored.

She has played the top leadership role in 19 of the conferences since the annual event was started in 1940. Thousands of women from all parts of Arizona have taken part.

Miss Stewart has been state leader of home economics for the UA Cooperative Extension Service since 1942. Before that, she chalked up two "firsts" in her career. She was the first clinic dietician at Stanford University Hospital in San Francisco from 1930 to 1936.

Later, from 1939 until she was promoted to her present post, she was the first extension nutritionist with the UA.

Distaff Side of Extension Finds, Meets New Challenges

By Jean M. Stewart

Extension programs have changed and must continue to do so to be of use in a changing world. We recognize that you must design a program to fit the needs and interests of Arizona families. There is no one program that would be effective for all the general public.

For instance, the number of young married girls as a group is growing in size. Many will complete high school, some won't. Their problems and needs differ from those of established families.

Tailoring programs to the groups which need help is a job specific to each county. In any given county a study of the population helps planners to identify groups. Such studies assist the Extension home economist to decide the groups which need the kind of help Extension can give, how the most people may be reached with the staff available, and suggest the best ways of reaching each group.

Miss Stewart is state leader of Home Economics Extension.

Ways to Reach People

Once the selection is made, programs and methods are selected by the home economist. This means providing programs these groups want, as well as including information that experience and research show they need. The home economist may set up workshops for the public to attend, give radio talks, television shows, hold a series of special interest meetings, and/or set up exhibits to reach people where they are.

Helen Wissner, Extension home economist at Yuma has completed three TV short courses: "Fabrics in Apparel," "Home Furnishings" and "Market-O-Rama". Four hundred homemakers enrolled for the first. Each course had six lessons given at weekly intervals. This is learning in the new convenient way.

Then there is Audrey Davies of Kingman who conducted workshops on best ways to store foods in the home freezers.

In Tucson, June Gibbs, Extension nutritionist, conducted cooking schools which are increasing interest in proper family nutrition. These are but a few examples.

DURING YAVAPAI county's Beef Festival an attractive 4-H member demonstrates, in a local supermarket, preparation of a "Sloppy Joe."

Groups Choose Programs

In the case of organized groups such as 4-H or homemaker clubs, members choose their own programs, selecting from the total county home economics Extension program.

A group of specialists serves on the state level. They develop programs complete with teaching outlines for use by the non-professional. These volunteer leaders then return to their own club or organization and present the information to the rest of the group.

The specialists, besides knowing their fields and developing programs, must keep current on what is happening to people. As people's lives and activities change, so do their needs and so should Extension programs change.

Another change in Extension programs places more emphasis on helping families with money problems. Many families are getting into deeper financial straits. They are going into debt too much, and business people are concerned.

Families receiving government aid

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HOW TO PATCH Levis is taught bi-lingually in an exhibit set up in a self service laundry at Amado, in Santa Cruz county.

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receive many kinds of help. Recipes are provided. Volunteer leaders prepare dishes made from donated foods, to show recipients how to use them in appetizing ways.

Audiences In New Areas

In recent years Extension home economics work is done in cities.

We also have an obligation to reach limited income families who are living in rural areas. Programs must be devised to reach them, even though they are scattered.

An expanding field for Extension workers has been the training of professional people.

More stress is being put on women, especially in later years of life, when they are likely to work outside the home, or at least have more leisure once children are gone. Older persons can find stimulating volunteer opportunities through Extension's educational work. They need more education of one form or another to lead a meaningful life in those 30 or 40 years remaining. Programs have to be very dynamic to keep up with people who have, need and want more education.

To Be a Better Shopper

Today one of the very important areas is consumer competence. More and more emphasis is being placed on programs which teach consumers to do better at the job of buying and using goods and services. They need to know more about merchandising, selection, use, care of goods, costs, budgeting and their own needs. All subject matter areas are part of it. For instance, homemakers in Pima, Maricopa and Cochise Counties through their homemaker club programs are studying merchandising under the title "So You Bought It on Sale".

Another area of home economics has seen increased emphasis. There has been much expansion in housing because of the mobility of families and the problems they are getting into. Problems include the major one of selecting a home to fit one's income and financing. It is the first time in history that families spend more on housing than on anything else. It is only in the last few years that people have been spending more on housing than they do on food.

Housing in this sense means more than the house. Building, remodeling, home furnishings and equipment, home financing — all are included in this category. As a subject matter field in home economics, it also includes housing in relation to the community, such as housing for the aged. In this case the home economist might help work out what special needs the aged have, what details in their homes would ease their living conditions.

PATIO COOKERY interests audience at a Beef Festival, as Miss June Gibbs, Extension Nutritionist, demonstrates how to spit a five found chuck roast in its natural juices on an outdoor grill.

Congressional Record Reprints P.A. Article

An article by Dr. Roger Fox, Department of Agricultural Economics, regarding the National Commission on Food Marketing, which appeared in this magazine last November, has been reprinted in The Congressional Record, at the the request of Senator Gale W. McGee of Wyoming.

Senator McGee called the work of Dr. Fox "An excellent paper on the commission's work."

An article from a previous issue of PROGRESSIVE AGRICULTURE IN ARIZONA, the editorial by Dean Harold E. Myers, also was reprinted in The Congressional Record. This was done, with favorable comments, at request of Rep. Morris K. Udall.

Another area receiving more attention is family life education. We are concerned about family stability, and mental health is one of these areas. The home economist's role is preventive rather than remedial. She helps people deal with tensions, establish good relations with others, and work out other problems which could cause mental illness.

The final change in Extension service programs is the expanding role personnel play in community development. Sometimes home economists serve on citizen committees studying needs of the community.

At other times they act as resource persons to give assistance, provide information and offer ideas in solving community problems. In certain cases they also do part of the job beyond the planning stage, taking it on as part of the Extension program and co-ordinating with other agencies for greater impact.

What Comes First!

Expansion of services brings more problems. With limited personnel you can't do everything. You must establish priorities. You must decide which groups need the most help of the kind you can give, how the most people can be reached with the staff you have, and what is the best way to reach each group.

NEW DITCH SEALING technique is most efficient with a three-man crew. One ← man jets the cracks, one sprays on the sealer and third drives the truck.

Improved Ditch Sealing Saves Irrigation Water

A way to save billions of gallons of valuable — and scarce — irrigation water has been developed by ARS water conservation scientists for use in western States.

It consists of an improved sealer and an efficient method of applying it to weather-cracked concrete irrigation canals. Using the new technique, three men can treat 800 feet of cracks, requiring about 10 gallons of sealer, in an hour's time.

Huge Water Loss

The need for a quick and effective sealer is illustrated in Arizona, where about 7,000 miles of concrete-lined canals lose an estimated 20 million acre-feet of water each year. Before a canal in Arizona's Salt River Project was repaired, it lost 2,800 acre-feet of water per mile each year, at a cost of about $8,400 per mile of canal.

In 1963, soil scientist R. J. Reginato and director L. E. Myers of the U.S. Water Conservation Laboratory at Phoenix began developing and testing improved materials and methods for sealing cracks in concrete canals. At that time, commonly used repair methods were laborious and expensive, frequently requiring hand cleaning of cracks and troweling on mastic-type sealers.

Working in cooperation with The University of Arizona's Agricultural Experiment Station and the Salt River Project of Arizona, the researchers developed a sealer that can be sprayed on the cracks with high-pressure pumps and nozzles. The sealer is a mixture of asphalt, butyl latex, and asbestos fiber.

Old Way Didn't Hold

Previous asphalt-base sealers could be easily peeled from concrete, the scientists explain, because the bonds were mechanical. Concrete has a negative-charged surface, so the researchers added positive-charged agents to their formulation, forcing the sealer and concrete to form an electrochemical bond.

The ARS-developed sealer, and one that became available commercially during the test period, were compared with conventional mastic sealers on various concrete-lined canals. Also tested were several methods of pretreating cracks before applying sealer. These pretreatments included wire brushing, sweeping with bristle brooms, or jetting with water. Some cracks were given a coat of cutback asphalt or kerosene; others were not.

Cleaning with the high-pressure water jet (400 to 500 pounds per square inch), without the tack coat, was the most satisfactory method of preparing the cracks for sealing. It blasted the soil out of the cracks and removed all silt and algae around their edges. Fine silt-covered cracks that might otherwise have been missed were quickly and easily traced with the water jet, the scientists say.

Holds Up Very Well

Sealer sprayed directly on the clean, wet concrete at 1,500 pounds per square inch pressure produced a superior bond. After one year, there were no bonding failures and the sealer could not be scraped from the concrete with a knife.

For efficiency, the scientists say, three men are required for the new method of crack treating. One man jets the cracks, one sprays on the sealer, and one drives a truck laden with pumps, sealer, and water supply along the canal.

$500 Scholarship In Range Management Announced by ASRM

The Arizona Section of the American Society of Range Management has recently announced its participation in a national two-year scholarship program sponsored by the parent organization.

The ASRM's purpose in providing this scholarship is to encourage and assist an outstanding student in the pursuit of a professional recognized bachelor of science degree at a college or university of his choice.

Raymond Houseley, president of the Arizona Section, recently announced to high school principals throughout Arizona availability of the new $500 per year scholarship. High school seniors who will graduate by June, 1967, from an accredited high school and who are interested in pursuing a professional education in range management or forestry, with a major in range management, are eligible to make application for the award.

GRADUATE TRAINING IN AGRICULTURE IN MEXICO

By Henry Tucker

Mexico, with almost half of its 45 million people engaged in Agriculture, faces a problem of providing enough food for a nation with the highest population growth in the Western Hemisphere.

With only a limited amount of available land, the key to success in the immediate future rests in intensified use of its present resources. One resource which can be expanded considerably is trained agriculturists, capable of working with farmers in developing improved practices and carrying on the research needed to meet the changing demands and conditions.

The 2500 students attending seven institutions with undergraduate programs in agriculture form a nucleus for the technical corps that is needed.[1] The only national source of specialists with advanced training is the Graduate College of the National School of Agriculture at Chapingo, Mexico.[2]

Initiated in 1959

The graduate program at Chapingo was initiated in 1959 and the degrees of M.S. in Agricultural Science and M.S. in Science are offered in Botany, Phytopathology, Entomology, Agricultural Economics, Genetics, Soils and Statistics. Applicants to this program must have a professional degree, or have completed the course work and subsequently received the professional degree.

The professional degree, generally Ingeniero Agrónomo, is awarded after four years of course work plus a fifth year of research with the formal presentation of a thesis, and generally represents a higher degree of training than is obtained by the U. S. student with a B.S. in Agriculture. While there are some differences in the quality of presentation and preparation of teachers, graduate students in agriculture at Chapingo generally are at an academic level which is comparable with U. S. graduate students.

About 75 students presently are enrolled in graduate work at E.N.A.,

almost half being non-Mexicans. Even when the numbers of Mexican students doing graduate work elsewhere is added to the 50 at Chapingo, this represents a relatively small number of potential master's degree candidates for the openings available.

In many cases, students are invited to take jobs as soon as they have completed their course work. Thus many fail to complete the degree requirements. Employers generally contend that they need a larger number of persons with lesser degrees, and only a few leaders with higher degrees to do the work that is needed in Mexico today. Salary differentials for additional degrees are relatively small, and offer little incentive for a person with the title "Ingeníero."

More Personal Attention

With small enrollments, students receive more direct attention in classes than in the U.S. Textbooks are mostly English or translations of American texts and are currently comparable with those in U.S. land grant colleges. Course contents are also similar. Course requirements are approximately three courses per semester for three semesters, followed by a research thesis and final oral examination before a three-man faculty committee. The major differences between the Mexican and U. S. graduate programs rest in the training of the faculty and the relationship between faculty and students.

With less than 10 percent of the total faculty in agriculture in Mexico with Ph.D. degrees and less than a dozen such degrees at Chapingo, it is doubtful if the overall training received by graduate students there is comparable to that received in the U.S. While graduate students have a closer relationship with their professors at Chapingo than at most Latin American schools, the shortage of qualified people in so many activities in Mexico places heavy demands on the faculty. Often their work takes them away from the campus and students more than is desirable in a good graduate program.

Future Plans Aim High

Plan Chapingo, a program aimed at developing the school's academic and research facilities to a center of excellence for Mexico and Latin America, should strengthen the graduate program in many ways.

A combined effort of the Mexican government, private U. S. foundations, banks and other organizations, is aimed at establishment of a completely new campus, and bringing to that campus the research work and the offices of the Ministry of Agriculture. Then research facilities in all areas can be enlarged, and the financial structure for supporting students at all levels likewise will be strengthened.

The plan includes proposals to increase faculty salaries, create opportunities for faculty members to take advanced degree work at leading U.S. institutions, and to bring visiting professors to the campus. This should greatly strengthen the graduate program.

Enrollment to Increase

Enrollment is expected to grow considerably and thus provide a broader base for the graduate program.

Within a few years, Mexico will be able to produce Ph.D.'s in all the agricultural sciences to help meet the ever-present shortage of trained teachers and research workers.

Dr. Tucker is a professor in the Numerical Analysis Laboratory, now on a year's sabbatical, teaching at Chapingo, just outside Mexico City.

[1] Undergraduate programs, with year of founding in parentheses are: Escuela Nacional de Agricultura, Chapingo (1854), Hermanos Escobar de la Universidad de Chihuahua (1906) Instituto Tecnológico de Monterrey (1948), Universidad de Coahuila (1953), Universidad de Nuevo León (1956), Universidad de Sonora (1953), Universidad de Sinaloa (1960).

[2] A graduate program in parasitology is offered at Instituto Technológico de Monterrey and professional work in Veterinary Medicine is offered at the Universidad Nacional Autónoma de México.

Green Manure Crops Worth Considering

By W. D. Pew

The need for maintaining good soil fertility and proper soil structure is a critical and ever-present problem with Arizona soils. One of the important reasons for this is their characteristically low level of organic matter. As is typical of soils where adequate soil moisture and temperature, proper amounts of calcium, and appropriate pH exist, the organic matter is rapidly burned up.

Under such ideal conditions, the decomposition of organic materials in these semi-arid area soils is very rapid, and they quickly revert to the low levels considered typical of them, especially since bacterial activity is high and chemical changes are favorable.

Much has been written and many tests have been conducted in the study of soil organic matter, what is required, how long it lasts, where it goes, and its importance in maintaining proper soil conditions for crop production.

Has Many Purposes

It should be pointed out that organic matter in soils is not only important for the obvious reasons in production, but also for less apparent ones. It has been said and repeated often that a function of organic matter "is to serve as a cushion against the shock of tillage."

Seemingly most farmers and growers do not think of it in this subtle way, but even this is a factor of serious concern because poor soil structure often results from tillage methods. This is becoming a more and more difficult problem. Yet, as far as the farmer is concerned, most of these tests and evaluations point to one very obvious conclusion.

Namely, it is nearly always considered prohibitive costwise — compared to benefits received — to develop and/or restore organic matter in the quantity required to improve its level in Arizona soils regardless of the method used. Therefore, only soils used for high income crops, such as vegetables, commonly receive such treatment.

Two Ways to Supply It

Several ways are available to improve, temporarily at least, the organic matter level, but the two most common are application of animal manures and the growing of green manure crops. One basic difference exists between these two methods, along with several indirect and lesser differences. Basically, the use of animal manures brings about salt accumulation, but they do contain and supply rather easily used plant nutrients. These materials are in larger quantities than for green manure crops.

Conversely, green manure crops tend to reduce the salt concentration of the soil, largely through the leaching action of the irrigation water. Likewise, the crop residues returned to the soil from such crops release nutrients, as they decompose, at a much slower rate and in smaller amounts than for animal manures.

As we turn our attention to green manure crops, the grower — if he selects to grow such a crop — has a large number from which to choose. However, in reality only a few, because of their relative effectiveness, are ever employed in the lower elevation areas of Arizona. These are guar, papago peas, sesbania, and, as a secondary purpose, alfalfa. Those that are sometimes used include barley, sudan, and sorghum crops that are plowed under while yet in the young, succulent stage. At elevations between 3000 and 4000 feet, cowpeas is the usual crop.

Owner Often Reluctant

With Arizona agriculture being a year-round activity, and since labor costs are high and water, land, and similar production items are expensive, the average farmer generally feels he is not interested in growing green manure crops. It would appear, however, that in some instances such a decision is hasty and is not in the best interest of the farmer, since he may not be aware of all the facts.

He may be missing an excellent opportunity effectively and economically to improve his soil and its productivity. Hence, he should more carefully study his soil problems, requirements and possible benefits before making a decision. Perhaps he should design a cropping program that would provide for growing such crops rather than considering them independently, and thus use them only on an infrequent basis. Certainly it is his decision, but to acquaint himself with some of the basic knowledge of such a program would seem of prime importance in achieving success in crop farming. Some of the considerations he should make and questions to ask are:

Answer Four Questions

1. Do I have a problem with harmful salt, and would growing green manure crops provide an opportunity to correct it?

2. Would the growth of these crops improve my soil by selecting one with a different type of root system than my usual crops, and thus more effectively utilize the natural fertility of my soil?

3. Will a cover crop help in "opening" my soil and provide for better water movement and subsequent crop root development?

4. Will it provide a means by which my soil may be replenished with organic matter for a temporary period, at least, by plowing these crops back into the soil to maintain structure and improve tilth?

Careful consideration of each of these should be made, as well as for any special consideration the farmer may have. He could thus determine the benefits that could be derived and to what extent. Unfortunately most growers approach a cover crop program with a tongue-in-cheek skepticism and permit only a very superficial, often biased, evaluation before making a decision.

It is common reasoning that if its use cannot be justified on the income from the first crop following the cover crop, it is branded an impractical and undesirable practice. Yet, a deeper study would likely reveal longer-lasting benefits that could make it a highly desirable program. In this manner its values could and should be extended over a longer period of time and be measured by the increases from several crops and seasons rather than for only one.

Specifically, what might be expected from a green

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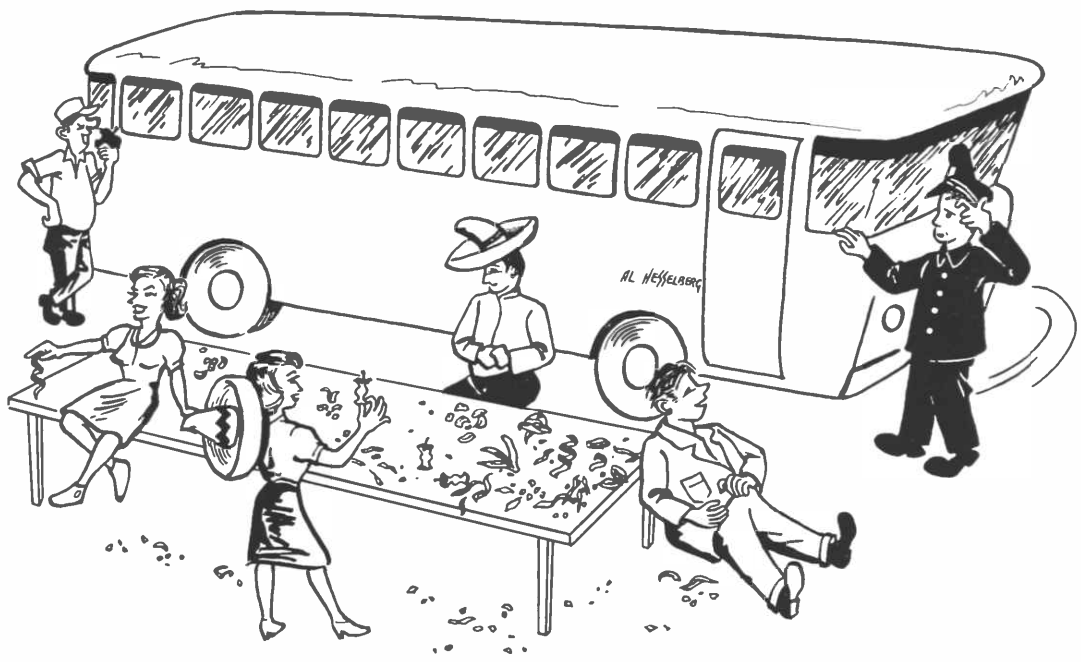
The author is Horticulturist and Superintendent at the Mesa Branch Experiment Station.

Border Bug Battle

Few Land-Grant colleges of agriculture are as near the border of a foreign country as is this college, at The University of Arizona. Likewise, probably all readers of PROGRESSIVE AGRICULTURE IN ARIZONA have been stopped at the Nogales border and asked "Bringing any fruits or vegetables?"

But of the thousands who are stopped daily, few realize the importance of that question, or the hazard to our agriculture, our livelihood and food supply, in the possible invasion of insects and diseases from which our crops, trees, soil, and ornamental plants and flowers are now protected. The USDA Plant Quarantine inspectors are doing an important job and deserve the good will and support of all of us.



At a California port of entry there were 80 persons on the bus which had come all the way from El Salvador. Plant quarantine inspectors confiscated fruit from persons, bus seats and handbags, putting it all outside on one side of the bus, while they searched the other side.

"When we returned," said an inspector, "all the fruit had been eaten, and we found only scattered peelings, cores, etc. So, in the interest of international good will, and since the disposal job would seem to have eliminated any chance of pest dispersal, we accepted it all in good graces and bid the travelers to be on their way."

California Leader In Tuber Production

What state receives the largest income in the nation from potato production? Maybe you'll be surprised, as we were, to learn it is California. In California the 1965 income from those edible tubers was $126,964,000. Only other state anywhere in that range was Idaho with $102,737,000.

From there the descending scale includes, in third place, that old standby, Maine, with $49 million, and another old timer, New York state, with $46 million. Wisconsin follows with $30½ million, and then a winter potato state, Florida, comes along with $28½ million.

In the $20 million area is a group of important "potato" states, including Colorado, Pennsylvania, Minnesota, Michigan, North Dakota, Washington and Oregon. In the group which counts on potatoes for approximately $14 million each per year are some of the winter producing areas — Virginia, North Carolina, Alabama and Texas.

Arizona, which in 1965 realized $9,656,000 from potatoes, is considered an important producing area, ahead of 29 other states in the continental United States.

These figures, and many more dealing with area, season of production, markets, variety, total yields, cultural practices, yield per acre, portion of the crop used in various ways, research information available, legislation and grading, and many other topics, are found in the "American Potato Yearbook," published annually at Westfield, N.J.

Los coccidiostatos quimicos han hecho posible el uso de mantecas animales y grasas en las raciones. Las mantecas son ricas en energía y, cuando se usan correctamente, mejoran la eficacia del alimento. Los antioxidantes tienden a estabilizar ciertas vitaminas, particularmente las vitaminas A y E.

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manure crop when compared with a heavy application of feedlot manure or the continued use of organic fertilizer is shown in this table. Cost conscious growers might reduce these figures to dollar and cents values and thus be able to compare costs with benefits. This would represent the usual terms of evaluation in determining the value of such crops.

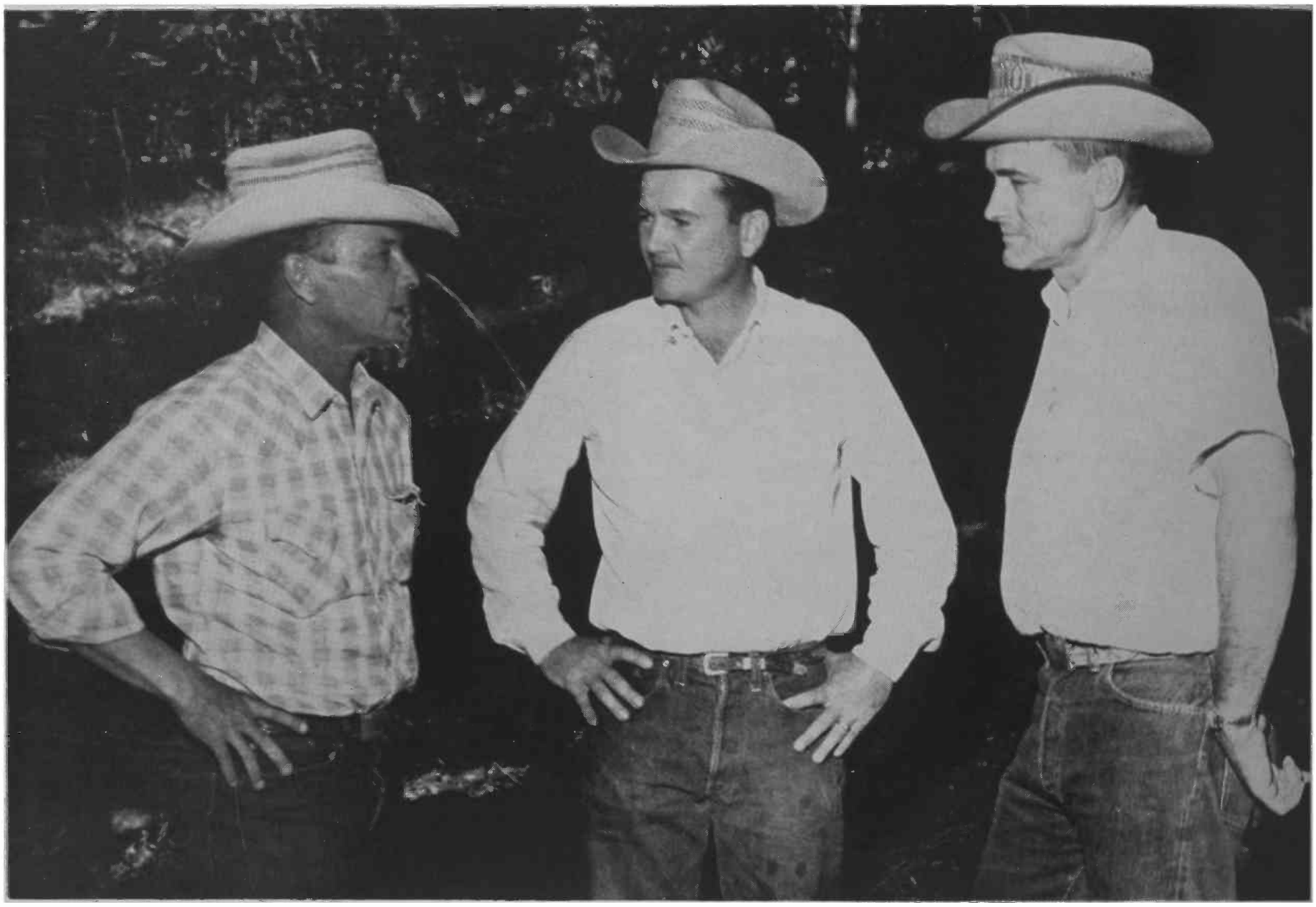
Yet, this is not all of the benefits received. To these should be added improvement in soil tilth, influence on water efficiency, ease in tillage, disease and insect control, and similar changes associated with this kind of program, if the total value is to be determined, understood, and applied.

Table 1. Effects of Guar and Steer Manure on Production of Head Lettuce.

Treatment	*Harvests* 1st 2-dozen	2nd size—	Total *cartons/acre*
Guar*	83.0	364.0	447.0
Steer manure (20 tons/acre)	192.0	348.0	540.0
Check	32.0	212.0	244.0

*Equivalent to approximately 20 tons material on a fresh weight basis.

Gila Cattle Growers Plan For 67'



Steve Bixby, Jr. (center) of Globe, president of the Gila Cattle Growers' Association, discusses cattle marketing problems with Robert G. (Bob) Boice (left), also a Globe cattleman and immediate past president of the organization, and Robert (Pat) Gray, Gila County Agent for The University of Arizona Extension Service. At Gray's suggestion, the association sponsored a highly successful cattle auction and are considering two more next year. Elected to serve with Bixby at the organization's autumn meeting were Lon Winters of Globe, vice president; Mrs. Miriam H. Boice (re-elected) secretary; and Roy Hicks, treasurer; all of Globe.

— Photo by Bob Halvorson.

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