

PROGRESSIVE AGRICULTURE IN ARIZONA

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Barley That Grows With Just One Irrigation

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High Salt, Low Water Barleys

One recently developed type of barley can produce half a ton of grain per acre using seawater as its sole irrigation. Another type, even newer, can yield two tons per acre without any watering after it is planted. It grows to maturity using a single 6-to-8-inch irrigation given before planting, plus two to six inches of rain.

University of Arizona plant breeder Dr. R. Thomas Ramage and his co-workers developed both of these barleys.

The latter type has two roles cut out for it: as a January-to-April crop in rotation with cotton on irrigated Southwestern farmland, and as a quick, after-rainstorm crop in unirrigated deserts like North Africa's. Genetically uniform lines of barley suited to specific growing conditions are now being selected from the variable population developed for single-irrigation use.

For the type of barley that grows with just seawater, the half-ton yield is too low to be economically practical now, compared with the 3- to 4-ton yields of conventionally grown barleys. However, it offers some security for a time when fresh water becomes too scarce or expensive. Also, another line from Ramage's salt-tolerant population yields up to two tons of grain using water about half as salty as the sea. Water of this high salinity (1.5 to 2% salt, compared with 3% for seawater) is available but unused in several areas of the West.

By Guy Webster
Agricultural Communications

Photograph: Barley from a one-irrigation test plot in Tucson.

Genetic Plasticity

Besides allowing specific benefits from either the one-irrigation or the salt-tolerant barley populations, the breeding work behind them has demonstrated that a crop grown by farmers for thousands of years can still be rapidly adapted to new growing requirements.

One key growing requirement for crop plants in Arizona from now on will be efficient use of water. The state uses up about 2.2 million acre-feet more groundwater each year than is replenished naturally, and nine-tenths of the state's total water depletion is by irrigated agriculture. Other dry regions in the Southwest and worldwide also need crop plants that use water at peak efficiency.

"Domestic crops have enough genetic plasticity for us to make them much more efficient users of what water we have available," Ramage said recently. ". . . We have been pleasantly surprised at how quickly we have moved barley to this situation" (single-irrigation growth with good yields).

This barley research is one example of work to improve traditional crops' ability to use low levels or low quality of water. Such efforts are a promising counterpart to more widely known work in adapting wild desert or seaside plants into marketable crops.

Ramage started breeding barley for salt tolerance in 1959. He was testing a breeding method for pushing a selected plant characteristic to an extreme while maintaining a genetically diversified population. From that population, individual plants can be isolated and inbred to give genetically uniform lines adapted to specific growing requirements. Many varieties that share the same desired trait (salt tolerance, for example), but differ in other characteristics, can all be developed this way from the same population.

Salt Tolerance

For refining this breeding method, Ramage chose salt tolerance in barley as the trait to push. Barley is more salt-tolerant than other cereal grains, but varieties available when he started this work could not give economic yields with water saltier than 0.75%. Ramage developed his original salt-tolerant barley population at Safford on salty soil using salty irrigation water.

By 1970, selected lines from this population had been grown with seawater in California by Dr. Emanuel Epstein. The half-ton yields are not enough to satisfy Ramage.

He said, "You could grow thousands of acres of barley on sand dunes with seawater and lose money on every acre of it. . . . Still, it's good to know that if we did have to depend on seawater sometime in the future, we could take these domesticated crops and have a usable production from them."

Salt-tolerant barley has some potential uses that look more immediately practical than seawater farming. Arizona has large supplies of water that is too salty for many uses, but not as salty as the sea. Dr. Edward P. Glenn and Barney P. Popkin described these supplies at the 1981 meeting of the Arizona-Nevada Academy of Science. Salty groundwater is easily accessible near the heavy soils of the Safford area, near the loams of the Gila River Indian Reservation and near the sandy soils of the Wellton-Mohawk Irrigation District. There is more in northeast Arizona, near Buckeye and south of Tucson. Also, water that has been used for some industrial or urban purposes is available but salty.

In recent years, Ramage has tested varieties from his salt-tolerant population that yield up to two tons when irrigated with 2% salt water in a greenhouse. Standard varieties in the same conditions yield almost nothing. Another test line yields 2.5 tons per acre with 3% salt water if it has first been sprouted with 1% salt water. Such varieties may allow productive use of the low-quality water available in this state and elsewhere.

Single-Irrigation Barley

Uses for Ramage's single-irrigation population may be even more widespread. He started developing this population about eight years ago in cooperation with a U.S. Agency for International Development project in North Africa. Some areas there with less than a foot of rainfall a year get most of that rain in a few sporadic storms. A grain that could be grown to maturity on one initial watering would allow desert dwellers there to plant their fields after a heavy storm and expect some harvest whether or not other rain came.

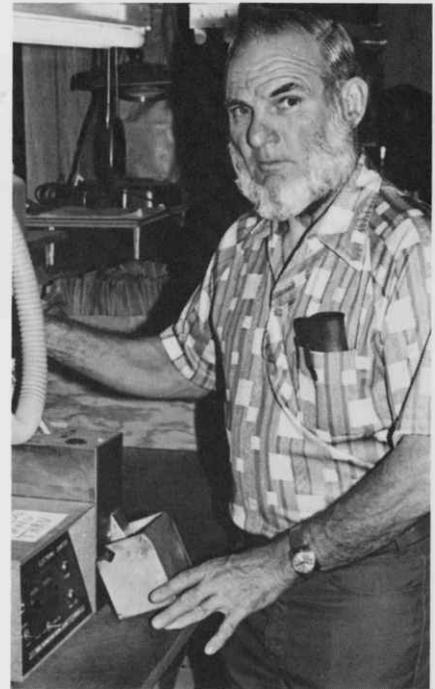
"This happens to be the exact type of barley that our cotton farmers need here," said Ramage. They can schedule their irrigation, instead of waiting for the rain. By irrigating, then planting barley after harvesting cotton, they can make full-season use of their farmland with minimal extra use of water. The barley can be harvested in time for May 1 cotton planting.

Ramage and his co-workers have produced a population of barley that suits these needs. In tests this year at Tucson and Mesa, selected lines from that population yielded 1.5 to 2 tons of grain per acre with a single pre-planting irrigation of six to eight inches and negligible subsequent rainfall.

Ramage and Rex Thompson, who conducted the Mesa test, officially released the single-irrigation population this summer on behalf of the UA Agricultural Experiment Station and the U.S. Department of Agriculture. The population is called Composite Cross XXXIX. The release makes it available to other public or private plant breeders. They can select from the population specific lines that perform well in various local conditions. Some lines are now being tested in North Africa. Ramage expects commercial seed companies to find lines they will inbreed for uniformity, then market for U.S. growers.

The best-yielding test lines from Composite Cross XXXIX reach maturity about a week earlier than standard barley varieties in some tests. That is probably one factor in their ability to get by on less watering. Another may be a deep root system; the initial irrigation moistens the soil to a depth of five to six feet. Ramage pointed out that further research to pinpoint the ways in which some varieties use soil moisture more efficiently than others could make the plant breeder's job easier.

He said, "There is no reason to expect that water efficiency of other traditional crops can't be improved the way we have improved barley's."



Dr. R. Thomas Ramage with grain-counting machine for analyzing barley harvest. (Photo by Ted Bundy.)



4-H'ers and Guide Dogs: Preparing for Adulthood

Richard St. Andre, a blind, bearded retiree in Cottonwood, says he's lucky to have a trained guide dog. His is a black Labrador named Bob.

St. Andre became Bob's keeper in 1978 after they finished training separately and together at the Guide Dogs for the Blind headquarters in San Rafael, California. St. Andre had begun losing his sight just a few years earlier.

Bob was bred and born at the Guide Dogs for the Blind kennel, but he lived most of his first two years with the family of a California 4-H member. Guide Dogs for the Blind places its puppies with 4-H'ers for 12 to 18 months to accustom the animals to family life and teach them basic obedience.

Now, St. Andre works with two Cottonwood 4-H members who are raising guide dogs. He helps them understand how important the dogs' behavior and skills will be to the blind people who will get the dogs later.

Though hundreds of 4-H'ers in other states have raised guide dog pups, Stacy Keesler and Kim Kallsen of Cottonwood are among the first 15 Arizona 4-H'ers to try it. Youngsters in six Phoenix families recently said difficult goodbyes to dogs they had lived with since June 1980. Earlier this summer, Chris Rivers of Yuma returned to San

Photograph: Four-H member Kim Debolt (right) and friends greet her guide dog puppy on arrival day at the Tucson airport. (Photos by Ted Bundy.)



Rafael a prospective guide dog that she had brought with her when her family moved from California to Yuma last year. This April, eight three-month-old pups arrived in Arizona from Guide Dogs for the Blind. Five Pima County 4-H'ers left the county fair just long enough to meet their charges at the Tucson airport. Keesler and Kallsen went to Phoenix to pick up their pups. The eighth went to Ronda Robles of Yuma.

"People in several other counties have expressed an interest in the guide dog program, too," says Al Meier, the Extension 4-H specialist who has started and coordinated the program in Arizona. "I expect we'll have close to 20 pups in the state by next summer."

Meier says raising a guide dog is a rewarding project for 4-H members: "They are doing something specifically for another person. What they have spent a year and a half on, if the dog passes its professional training, will benefit someone for about eight years or more."

Changing Masters

The dogs return to the San Rafael center when they are about 18 months old. They then receive five months of professional training in the specific skills needed by guide dogs. The 50 to 60 percent who pass the training are paired with selected blind recipients. The two train together for four weeks before leaving the school. The 4-H'er who raised the puppy is invited to the graduation ceremony, where he or she symbolically hands the dog's leash to the animal's blind new master. Guide Dogs for the Blind does not charge any fees to the people who receive the dogs. It is a non-profit corporation supported by donations.

St. Andre was handed Bob's leash by 4-H'er Anita Zick of Ramona, California. He and she have exchanged several tape-recorded letters since then. Many guide dog users form long-lasting friendships with the 4-H'ers who raised their dogs.



Top left: Stacy Keesler's 5-month-old trainee Allison (right) lends an ear to role model Bob, Richard St. Andre's working guide dog. Top right: Becky Meyer of Phoenix accustoms her pup Prism to aisles of food at Neb's Market. Lower right: Brad Roachell of Tucson meets his new pupil.

Right: Julie Wharton of Tucson encourages her guide dog pup to use stairs forbidden to other family dogs.
 Left: Phoenix 4-H'er Lindy Anderson gets good behavior from Quebec, her guide dog trainee, at Grande's Villa Restaurant.



"Working with 4-H has really benefited our organization," says Paul Keesberry of Guide Dogs for the Blind. The 4-H pattern of one-year projects, the 4-H tradition of learning responsibility by caring for an animal, and the organized 4-H leadership all suit the needs for raising guide dogs.

"It's absolutely essential that the puppies are raised in a family atmosphere at this young age. . . .Socialization is the number one concern," says Keesberry.

The Arizona 4-H'ers in the guide dog project range from 11 to 18 years old, and vary in their amount of prior 4-H experience with dogs. Some, such as Julie Wharton of Tucson and Dianne Lasher of Phoenix, had raised and trained dogs as 4-H projects for several years before receiving their guide dog pups. Others, including Jeni and Tami Wofford, have had dogs only as family pets, not 4-H projects.

Keesberry or another representative from San Rafael delivers the puppies personally. They are three-month-old German shepherds, Labrador retrievers and golden retrievers.

Training by 4-H'ers

The 4-H families teach the puppies good behavior, starting with housebreaking and learning not to jump on people or furniture. The pups get used to the home environment and to other animals.

In 4-H families, the other animals may be numerous. When Kim Kallsen had had her guide dog pup, Abba, for two months, she said, "Abba has learned to get along with the sheep, but the sheep don't get along too well with her." Stacy Keesler's pup Allison liked to chase kittens, but just looked at the calf from a distance. Both Abba and Allison seemed to get along with St. Andre's tolerant Bob.

Julie Wharton had two problems with teaching her pup Aesop to climb stairs: It was scared to come back down, and seeing this newcomer on the staircase upset her family's other dogs because they are not allowed upstairs themselves.

The 4-H'ers are expected to introduce their pups to situations that might be distracting or frightening. As a guide dog, the animal will need to accompany its master anywhere without fear or hesitation.

The Woffords and their neighbor Becky Meyer took their guide dog pups often to Tower Plaza shopping center in Phoenix. Lindy and Mike Anderson, also of Phoenix, took their pup Quebec for a ride on Molly the Trolley around Scottsdale Center.

Kim Kallsen says, "The first time I took Abba to a store, she freaked out when the automatic door opened. She wouldn't go in. I had to carry her in."

Learning to contact business proprietors beforehand and explain the guide dog training program has taught the 4-H'ers some lessons in community relations and cooperation.

Field Day Surprises

Group activities have supplemented the 4-H'ers' individual work with their dogs. Donna Anderson, the adult leader for the guide dog project in Phoenix, organized a field day at Roadrunner Park last winter. The local guide dog raisers took their pups through an obstacle course that included nearby ducks and cats, a chainsaw noise, a metal grating to be walked over, a person abruptly opening an umbrella, another stepping suddenly out of a mock telephone booth as the dog passed, and other surprises.

Local leaders Jane Dalton in Cottonwood and Pat Wharton in Tucson are planning similar field days. Wharton also plans activities to tie the guide dog training closer to the rest of the 4-H dog project. She hopes to establish a guide dog class for county 4-H dog shows. A separate class is needed because the obedience commands and standards that guide dogs must learn are different from those used for dog shows.

After training and loving her pup Patrina for more than a year, Jeni Wofford was not looking forward this summer to returning the dog to San Rafael. "I'll feel sad when we have to send her back," she said. "That will be the hardest part."

The family that raises a dog can choose to keep it if the dog fails its guide dog training. But for most of the 4-H'ers who raise the pups, their lasting satisfaction is in knowing that their job well done has helped make life easier for a blind person.

"Getting around with a cane is very slow compared to traveling with a guide dog," says St. Andre, who has tried both. "And I don't know of any cane that can lead you right to a door."



St. Andre and his guide dog Bob.



Lessons With a Healthy Turnout

"After 45 years of abusing my body with too much to eat, too much to drink, too much tobacco and not enough exercise, it was catching up with me," said Robert Hayes of Safford.

He signed up for a series of 10 preventive health-care classes that his physician, Dr. Tom Griffin, helped teach last year. Now, Hayes has quit his alcohol and tobacco habits, eats better and walks several miles with his wife Priscilla almost every day.

"I feel better," Hayes said recently. "I feel healthier. I am healthier."

The Hayeses took the health classes together. Priscilla Hayes said that, from doing the things suggested in the course and in other talks with Griffin, "We have a more open, more loving family. . . . We're really getting to know each other again and we're doing more things together."

The health classes were started by Margie Valentine, home economist for the Graham County Cooperative Extension Service. The free lessons emphasized proper exercise, nutrition, relaxation and self-counseling for keeping healthy. More than 200 Safford-area residents attended the classes last autumn.

"We had aimed for 35 to 50 participants," said Valentine. "But at the first session, 230 people showed up." She and others who organized

Photograph: Extension Home Economist
Margie Valentine and Dr. Tom Griffin.

the course decided to offer each week's class twice in order to have smaller groups. About half of the original turnout completed the 10-week course.

The Hayeses' benefits from the classes may have been greater than average because of their other contacts with Griffin, but an evaluation of the course showed that positive results were common. Out of 43 participants who voluntarily completed before-and-after-questionnaires, 12 fewer felt depression at the end of the course than at its beginning. Eleven fewer were bothered by headaches or muscular tension. Thirteen fewer had trouble getting a good night's sleep. Fourteen fewer felt fatigued more often than they thought they should. Six fewer were ignoring a treatable medical problem they knew they had, such as high blood pressure. Four fewer had thoughts of suicide. Also, 26 of these 43 were getting as much exercise as they thought they should by the end of the course, compared with just 15 of them at the start.

Course Repeated

Because of its popularity and success, the course was repeated once in the spring and again in the summer. Enrollment was limited to 35, and classes were moved from the Extension Service auditorium to Griffin's fitness center, but they were still free. The course will be offered again this autumn, if demand warrants it, said Valentine.

Before starting plans for this course, Valentine had been including some health information in her public lessons about nutrition, exercise and other topics.

"I saw that people were hungry for more information about how to keep themselves healthy, and I always feel that when people are hungry, feed them," she said. So last summer she decided to check with other local organizations offering health care or information to see what type of health education was needed most. She designed a survey asking about the health problems and needs of the community, then personally interviewed the staffs or representatives of 17 agencies.

"By the time I got through the list, I had heard the same things over and over, maybe with different terminology, but basically the same problems," Valentine recalled recently. Those problems included a need for training in preventive health care to avoid unnecessary medical costs, and the problem of coping with stress in everyday living.

She said, "The biggest headache in doing the interviews was that people kept saying, 'Somebody's always doing surveys like this, then usually that's the last we hear of it. What are you going to do about what you find out?' I promised them they'd see some action within a month."

Valentine quickly recruited help to design a course fitting the health needs identified in the survey. She worked with Dr. Griffin; Nancy Neavitt, an occupational therapist for Graham Behavioral Health Services; and Goeff Bury, adult education specialist for Eastern Arizona College. Griffin had been writing a book about how to keep healthy.

"Fitness Connection"

They titled the course, "The Fitness Connection: a Plan for Total Wellness." The autumn 1980 series was co-sponsored by the UA Cooperative Extension Service of Graham County, Graham Behavioral Health Services and Eastern Arizona College. EAC offered college credit in personal health for successful completion of the course. Three coun-

selors from Graham Behavioral Health Service helped Griffin and Valentine teach the course. Other speakers last fall included public health nutritionist Rochelle Ryder and outdoorsman Bob Hirsch.

Griffin's lessons for the course advocate a four-part plan for keeping healthy: regular exercise that is vigorous enough to stimulate the heart and lungs, a balanced diet that avoids unhealthful foods, periods of relaxation to relieve stress, and cultivation of a sense of self-worth. The classes teach how to follow each of these steps and why each is important. Griffin describes the results as feeling totally well, meaning energetic and enthusiastic, not just free from illness.

A half hour of aerobic exercise five to seven days a week helps improve the supply of oxygen to cells in the body by building up the efficiency of the heart, lungs and blood vessels. It also aids dramatically in weight control. Aerobic exercise is exercise that uses muscles in a repetitive way that allows them to be continuously replenished with oxygen, such as jogging or brisk walking. It differs from more strenuous exercise, like sprinting, that uses up oxygen more quickly than fresh oxygen can reach the muscles, thus leading to exhaustion. Swimming, dancing, bicycling and most sports can be part of a good aerobic exercise program. People who are not getting enough exercise should consult a physician before beginning.



Robert and Priscilla Hayes take a daily stroll through Safford.

Rest and Eat Well

Good health does not require avoiding stressful situations, just having the capacity to cope with them. Daily periods of relaxation help the mind and body counteract the harmful effects of stress. The "Fitness Connection" course materials describe several techniques for effective relaxation. All involve being in a comfortable, quiet setting and having a way to shift thoughts away from cares and woes. Concentration on breathing, or on a phrase repeated over and over, is among the methods Griffin suggests for clearing the mind of worries. He recommends a half-hour of such relaxation daily, either all at once or in spells of five minutes or more.

It is no secret that regular exercise and the ability to relax are healthy. The nutritional recommendations in the course also include few surprises: eat servings from each of the four basic food groups every day (grains, fruits and vegetables, dairy products, and high protein sources). Eat breakfasts. Drink plenty of water. Skimp on sugar, salt, and cholesterol sources.

However, even knowing all these things that contribute to health, many people have trouble finding the will power and time to do them. The "Fitness Connection" lessons attack this problem in two ways. They explain some of the basic biochemistry of health to convince people in the class that they **can** make themselves feel better. Griffin especially emphasizes the new-found importance of brain hormones that affect feelings of well-being. Second, the lessons teach people that they **should** spend the necessary time to protect their own health without feeling they are being wrongly selfish. One lesson even includes tips for managing time to fit health-maintenance into a daily schedule.

At the final session of the course this spring, a woman with several children asked Griffin how she could take time from her children during the day to relax for 30 minutes.

"One of the most unselfish things you can do for your children is to take care of yourself in front of them," he responded. "That teaches them the habit of taking care of themselves, too."

"We're Worth It"

Another woman in the class, Diana Larson, then gave an example illustrating Griffin's point. Prompted by discussions in earlier sessions of the course, she had begun fastening her seatbelt when she drove. Her eight-year-old son noticed the new habit and asked the reason for it. She explained to him that she thought she was worth protecting. Larson told the class that her son then buckled up too, and that he later commented, "Mom and I use our seatbelts because we're worth it."

Participants in the "Fitness Connection" courses have represented a cross-section of the Safford-area community of 20,000 people. In the initial series of classes last fall, they ranged in age from 18 to 65. More than half were married couples.

Andrew and Inez Burrell, both in their 60s, took the course together.

"We're both more aware now of how to take care of our own bodies through proper foods and exercise, rather than waiting to be sick and then paying the doctor to cure us," said Mrs. Burrell six months after completing the course. They exercise regularly on a mini-trampoline and by walking and bike-riding. They have cut down on salt and sugar in their diets, and she has tried some soybean recipes she learned

in the class. They have read books from the course's recommended reading list.

The Burrells learned about the course through the newspaper and from friends planning to enroll. Since they took it, they have recommended the course to several other friends.

Some of the other participants learned about the health classes during exercise or cooking classes they were taking from Valentine.

Robert and Priscilla Hayes took the course at the suggestion of Griffin, their family doctor.

Mr. Hayes said, "The large turnout made it easier to accept some of the advice he was giving us. It's easier when you see that a lot of other people are fighting the same problems—that you're not alone."

Enjoyable Exercise

Now, they are more careful what they eat, and include a salad night in their diet at least once a week. They go for a brisk, three-to-five-mile walk together most evenings after supper. "At first, I looked at the walking as a chore I had to do," he said. "But now, I look forward to it almost every day. . . . I walk almost everywhere I go in town."

She added, "Walking everywhere, you also get to see your community and know it better. I like that."

Giving up some unhealthy habits, including overdrinking, has helped Mr. Hayes feel better about himself. It has also led to more open relationships with his wife and two teenage sons. Mrs. Hayes' improved self-image has helped her feel good about returning to artwork she had given up years ago. She noted, "When you don't like yourself, you don't like the things you do." Now, she likes her paintings and takes art classes at Eastern Arizona College.

The health lessons have helped them learn how to handle some situations that don't go smoothly, too. Mrs. Hayes said, "When I get, as the kids call it, 'uptight,' I know it's time to put on my shoes and go for a walk. When I come back, I really feel better."

Other people have noticed the changes in the Hayeses' lives. "People say, 'Hey, you really must be doing something good. How can we get started on it, too?'" said Mrs. Hayes. She tells them to go to the "Fitness Connection" classes.

Homemaker Clubs Help Communities

By Dr. Norma Redeker
State Director, Extension
Home Economics Program

Many Extension Homemaker clubs tackle community betterment projects in addition to their monthly educational programs.

The Punkin Center Homemakers' Club of Tonto Basin successfully organized a project to build a 12,500-square-foot school and community center. The Pleasant Valley Homemakers started the isolated community of Young on its way to having professional medical care available in a new, four-room health building.

Homemaker clubs are one way the Cooperative Extension Service helps people stay involved in group activities that help them manage their own lives and homes. Through regular lesson programs, Extension home economists offer club members a means of learning useful household skills, economical management practices and ideas for strengthening family relationships. Club members also find many ways to make living better for their families by helping their communities.

The Punkin Center and Pleasant Valley stories told in accompanying articles illustrate how Homemakers can get a major project rolling, then hand over controls to other groups when the time is right.

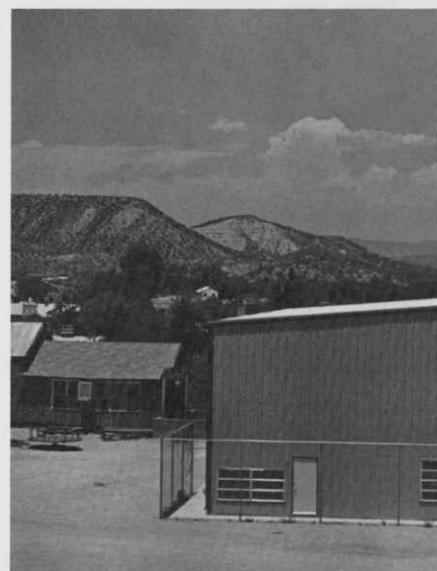
Homemaker clubs elsewhere in Arizona have succeeded at many other types of community projects.

In Tucson, several clubs organized a preschool children's fair last winter. About 400 youngsters, mostly from low-income neighborhoods, played games, heard stories, sang songs, saw animals and ate a nutritious snack. Nearly 100 adults, not counting Homemaker members, saw exhibits from 19 organizations and agencies offering child-related services in Tucson.

The Desert Daisies Homemaker Club of Bullhead City last year raised \$670 to support the local school for trainable retarded children. The club purchased playground and instructional equipment for the school and individual Christmas gifts for the students.

The Cactus Wrens Homemakers of Sunsites sponsor a free cancer-screening clinic in cooperation with the Sunsites Family Health Center each year. Fifty-one women came for examinations at the 1980 clinic.

Almost every town and neighborhood in Arizona has a Homemaker Club of people discovering ways to help themselves and their community. If you are interested, the home economist at your county's Cooperative Extension Service can help you find or start a club. Call 337-2267 in St. Johns, 384-3594 in Willcox, 774-5011 in Flagstaff, 425-7179 in Globe, 428-2611 in Safford, 359-2261 in Duncan, 255-3355 in Phoenix, 753-3788 in Kingman, 524-6271 in Holbrook, 628-5161 in Tucson, 836-5221 in Casa Grande, 287-4689 in Nogales, 445-6597 in Prescott, or 783-8338 in Yuma.





Club Helps Town Get Medical Care

By Guy Webster
Agricultural Communications

YOUNG—Whichever way you drive here, you travel more than 20 miles on a dirt road. The closest outside medical help is more than an hour's drive away, in Payson. Globe is more than two hours the other way. Winter storms sometimes close the roads.

Living in a remote valley is alluring, as the number of homes under construction around Young testifies. But the with population growing rapidly past 300 in the past decade, then past 400, the Pleasant Valley Homemakers thought that better medical care should be available locally.

The club had established a community first-aid station in 1945 and kept it stocked with supplies for more than 30 years. By 1976, the area's growth, plus the need to move the first-aid station anyway, prompted the Homemakers to start a new project: getting a professionally staffed health center for the community.

For the eventual success of their project, the Pleasant Valley Homemakers recieved a first-place award this year in a national contest of Extension Homemaker clubs' activity records in health, food and nutrition projects.

Now Young has the new, four-room Pleasant Valley Community Medical Center, where William Peck, M.D. (called "Dr. Bill" locally) sees patients every Monday and Thursday. He's also available for emergency care on other days. The Homemakers Club did not accomplish

Photograph: The Pleasant Valley Homemakers started this thrift shop in Young to raise funds for a community medical building. (Photo by Ted Bundy.)

this by itself; many groups and individuals played key roles, and Peck happened to move to Young at an opportune time. But the Homemakers did start the project, and several members are still active on the medical center's board of directors and in its fundraising Thrift Shop.

In 1976, Brenda Straw took the job of chairing the Homemakers' Health Committee. She was running one of Young's two restaurants at the time, but had worked in the past as a licensed practical nurse in Phoenix. "I listened a lot to the people in Young," Straw recalled this summer from her new home in Payson. "A lot of older people were saying, 'I wish there were a way of getting a doctor here.'"

Knowing the community was much too small to support a full-time physician, Straw checked other possibilities. In 1977 she helped arrange for Dr. Richard Meyers of Payson to begin visiting Young once a week. He saw patients in a housetrailer.

The same year, a Homemakers committee headed by Nita Heckman started the Pleasant Valley Thrift Shop to raise money for a health building. The shop sells used clothes and household goods that are donated, and does custom quilting. Last year, the shop earned more than \$4,700 toward supporting the medical center.

Also in 1977, Clifford and Pearl Martin donated an acre of land as the site for a medical building. To accept the gift on behalf of the community, the Pleasant Valley Community Medical Center was formed and incorporated, with Straw as first president of its board of directors.

In 1979, the Homemakers turned over the Thrift Shop to the Medical Center. The club also donated \$5,000 from its own funds to purchase equipment and furnishings for the center. The funds had been raised through bazaars, quilt sales, suppers, bake sales and community calendar sales.



Participants in the new medical center's dedication day celebration. (Photo by Mark Culbertson, Samaritan Health Service.)



Meanwhile the Medical Center site was being developed by donations of labor, money and materials. A baseball team of Forest Service employees dug the foundation. Brown Drilling Co. donated the well. Andy Coscia of Mesa donated the 22-by-32-foot metal building. Bill Goettel of Phoenix donated the heating and cooling system. Local plumbers, carpenters and electricians contributed their labor.

Meyers stopped seeing patients in Young when he moved away from Payson in 1979. That year, Peck moved to Young. He had been a highly-paid radiologist in Florida, then a horse wrangler for a Tucson dude ranch, then director of a primary-care medical clinic in Apache Junction. At first, he commuted from Young to Apache Junction and Payson.

Peck helped the Pleasant Valley Community Medical Center work out an agreement with Samaritan Health Service of Phoenix to provide medical care in Young. Samaritan is a non-profit corporation that runs several Arizona hospitals and health clinics. The community provides the building, utilities and equipment. Samaritan provides Peck's salary and insurance, expendable supplies, administrative backup, and the availability of air ambulance service. Peck's wife, Cynthia, also works at the center as accountant and receptionist.

With the medical center in operation, the Pleasant Valley Homemakers have moved on to other projects. They have already raised more than \$8,000 to use eventually on a community activities building.

As current club president Pat Wright commented, "Most people, when they want something done in town, they usually talk with one of our members first to get things started."

Gila County Extension Home Economist Betty Jean Faris of Globe works closely with Homemakers in Young and the rest of the county. She said, "In a small town like Young, the Homemakers are a nucleus for the whole community."

Top center and right: Children with balloons and medical center board president Sam Wright with a cake join in dedication day festivities at the Pleasant Valley Community Medical Center. (Photos by Mark Culbertson, Samaritan Health Service.)
Top and bottom left: Nita Heckman at the thrift shop and Dr. William Peck at the medical center. (Photos by Ted Bundy.)

Besides several bake sales, raffles and bazaars, some special projects helped the school fund grow. For the U.S. Bicentennial, the Homemakers prepared and published a 95-page history of the area. They have sold 4,000 copies, with proceeds helping to build the school. A one-day benefit celebration raised \$5,000. A fishing derby and fish fry raised \$900. James Peart of Winslow read a newspaper story about Punkin Center's school project and donated \$4,000 to it before he died. The school district also had a building fund that had been accumulating for several years.

In 1980, nine community residents, including Homemakers' Club president Frances Conway, formed a non-profit corporation to borrow the rest of the money needed for building the school. Funds from the school district's regular levy will pay off the loan.

Construction began in May 1980. A "Spring Fling" celebration with an admission fee of one sack of cement supplied much of the foundation material. Volunteer labor made the building affordable. Construction contractor Eddie Myers, husband of a Homemaker, donated his time as foreman for the dozens of volunteers from 14 to 75 years old. The 12,500-square-foot steel building was erected by the company that sold it, but the interior was finished by skilled workmen who donated their time. Homemaker Club members helped with some construction and also provided meals for the workers.

The building now houses four classrooms, a teachers' lounge and a large, bare gymnasium. Fundraising continues for finishing off the gym and kitchen, and for adding an office, a meeting room and upstairs classrooms.

"Even in the summer, the building is being used almost every day," said Annie Heck, a Homemaker and wife of school board president Bob Heck. Bingo games every Thursday raise money for the school. Tues-



Volunteers prepare the foundation for the new school. (Photo by John Dryer.)

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days are square dance nights. School teacher Jeff Shepherd led week-day recreation programs for youngsters this summer. Last spring, Gila Pueblo College held Monday night classes at the school. Private groups use the building for meetings and festivities; they pay a fee to cover utilities.

The first- to eighth-graders of the Punkin Center area are the school's most important users. Some outsiders have asked Homemaker Carolyn Dryer why the community has worked so hard on its new school. She said, "I tell them, 'Can you think of anything better to spend your time working on? These kids are our future.'"



Above left: Punkin Center Homemakers' Club president Frances Conway hands over a check for the completed exterior of the new school to building foreman Don Burden. (Photo by John Dryer.)

Above right: Punkin Center's new school dwarfs the old schoolhouse beside it. (Photo by Ted Bundy.)

Below left: Students help move furniture from the old school to the new one. (Photo by Betty Sue Conway.)



Ag Students Learn on the Job

About two-thirds of the students of agriculture at The University of Arizona had no agricultural background before coming to college. The College of Agriculture's student internship program gives these students, as well as the other third, a chance for hands-on application of some of their classroom learning.

The interns spend a semester or summer working in agriculturally related jobs with private enterprises or public agencies.

Some have tended calves for a 1,000-cow dairy or measured soil moisture in 5,000 acres of cotton. Others have bred sows in Kansas or queen bees in Tucson, or put birth-control implants in lions at the zoo. Interns have planted urban landscapes, pine forests or green house flowers. They have helped legislators study bills or helped future farmers get federal loans.

In fact, each of the 40 to 60 interns a year gets a unique set of experiences, says Dr. Frank M. Whiting, the professor of animal sciences who coordinates the agricultural internship program. He should know; he has visited hundreds of them on the job to see what they are doing and to meet with their supervisors.

Students earn up to eight hours of college credit for full-time work in an approved internship. Most are also paid by their employers. Afterward, interns write reports about what they did and learned.

"For me, the internship was the best college experience I had," Jan Halworth said recently. As a college senior from Tucson, she had no agricultural working experience before her 1976 internship in Tonopah with Conrel Co. (now part of Albany International). She worked on

Photograph: Horticulture student Tracy Johnston, an intern with AAA Landscape and Lawn Service, places stakes to mark where trees will be planted on IBM property in Tucson. (Photos by Ted Bundy.)



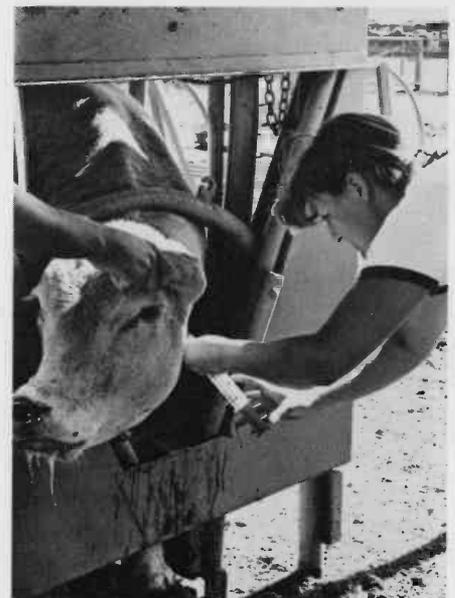
the company's tests of pheromone chemicals for controlling pink bollworms in cotton fields. Pheromones are insects' sex-attractant scents. Halworth placed pheromone traps in the fields and later assessed damage done to the cotton by pink bollworms.

Now Halworth has another perspective. After her graduation, she returned as a company employee, worked with the pheromone product through its registration with the Environmental Protection Agency, and reached an administrative position with Albany International in Buckeye. Now she supervises UA interns who come to work there.

Agriculture senior Nancy Sego from Coolidge interned for Halworth's company this summer. She plans to work in insect-control research after graduation, and the internship has helped convince her that she likes field work better than laboratory work. Besides learning about insects, "I've learned a lot about how cotton is grown," said Sego.

Halworth said, "We try to have an intern every year. From the company's standpoint, we get good employees on the job who are eager to learn as much as they can. We have a chance to look at people we might want to offer a job, or at least we have more people who understand what we're doing. One problem we are having with pheromones is lack of experienced people to use them, so that helps us."

Whiting hears similar enthusiasm for the internship program from many sources. He said, "The students think they're the big winners in this program. The employers, many of them, think they are the big



Top left: Setting a pheromone trap for pink bollworm moths: Nancy Sego, interning with Albany International of Buckeye. Right: On the doctoring crew at Red River Feedlot near Stanfield: interns Leslie Horn (above) and Dianna Amado (below).

winners. But I think the university is the big winner. We can read the students' reports and see how they change their curriculum. Virtually all of them make some changes in curriculum after they come back. On the job, they find there are subjects they need to know more about, and some that they don't need, so they add some courses they hadn't planned to take, and maybe drop some others. When advisers pay attention to what these students are doing, that's one of our best barometers of what potential employers are looking for."

Some interns and their jobs have been:

—**Peggy Briggs**, an animal sciences senior from Mesa, worked at Shamrock Dairy's 1,000-cow Emerald Farm in Chandler for the summer of 1980. She fed and tended calves from their day of birth until they reached about 300 pounds. Births averaged three to four daily during the summer. Briggs doctored calves for pneumonia, overheating and pinkeye and kept records of individual calves and of feed and milk. She sorted out calves ready for weaning, then kept them in weaner pens. Later, she said, "Most of the people at the farm were very helpful and showed great patience with all of my questions."

—In a summer 1979 internship, **Patrick White** used a neutron moisture probe to help plan more efficient irrigation scheduling for the 15,000-acre Phoenix Agro-Invests farm at Aguila. He was a soils, water and engineering senior. He and the farm's irrigation manager, Armando Gill, attended a training session in California and obtained licenses for using a neutron probe, which includes a radioactive element. They selected more than 100 test sites in 5,000 acres of cotton, installed access tubes at them, and periodically checked moisture levels at each point. During the internship, White also tested the fuel efficiency of irrigation pumps, calculated total irrigation applied to wheat, safflower and sugarbeet fields and measured tailwater runoff from cotton fields.

—**Kathi Knox**, a senior this year in the UA race track management program, worked for the 1981 spring semester as a legislative intern for the Arizona House of Representatives. She researched potential effects of bills before the House Environmental Affairs and Agriculture committees. She also wrote summaries of committee meetings for distributing to representatives on other committees. One bill she researched would have banned the use of animal drugs phenylbutazone ("bute") and Lasix at Arizona race tracks. Another would have required that an increasing percentage of the state government's paper purchases be recycled paper. Knox worked closest with committee chairmen Juanita Harelson of Tempe and John Hays of Yarnell.

—**Leslie Horn** and **Dianna Amado** interned together at the Red River Land Co. feedlot near Stanfield the first part of this summer. Horn, a pre-veterinary junior from Pennsylvania, had had little previous experience with livestock. Amado grew up on a southern Arizona ranch. They worked on the doctoring crew at Red River, treating the sick cattle among the feedlot's up-to-40,000 head during their internship. The students were also introduced to other tasks: processing new arrivals, working in the feed mill, keeping office records and riding horseback to check the cattle. Horn said of her co-workers, "These guys have taught us so much. I came in here and didn't even know how to work a chute or find a jugular."

—**Lawson Spicer**, now close to a Ph.D. degree in agricultural biochemistry and nutrition, did two internships as an undergraduate stu-



Lawson Spicer.

dent in 1974 and '75. First, he helped test feed rations in a nutrition laboratory at Arizona Feeds in Tucson. Six months later, he began work for the U.S. Farmers Home Administration office in Douglas. For FmHA, he helped applicants, especially teenagers, with paperwork and arrangements for loans. He visited many borrowers at their homes to see the enterprises being financed.

Spicer's two intern jobs illustrate some types of benefits interns gain. Even before the first job, he was aiming for a career in animal nutrition. "That internship gave me on-the-job training," he said. "I was really able to get a feel for what I hoped I would be doing in the future." The FmHA work "gave me a chance to broaden my horizons by getting to know people in many different areas." It also gave him a specific job offer. He worked for the same office for six months between finishing his bachelor's degree and starting graduate school.

Job offers to interns are frequent, but they are not a primary goal of the program. One-fourth of the fall 1980 employers asked their interns to apply for full-time work after graduation. "The program gives employers a good look at a potential employee for a specified period with no strings attached," Whiting pointed out.

More importantly for many interns, the program lets them check how their chosen field's appeal holds up on a day-to-day working basis. "I'd hate to figure out after a couple of years of vet school that it really wasn't what I wanted to do," said pre-veterinary senior Lisa Dorr of Tucson. She did internships last year tending horses at the University of Vermont's Morgan Horse Farm, then managed the breeding and gestation department at DeKalb Swine Breeders in Plains, Kansas. Both jobs included giving medical care.

"When I started I wasn't sure I wanted to go into veterinary medicine; now I'm sure I do," said Dorr.

Whiting noted, "We've had a few students find from this program that the work in their major field wasn't what they thought it would be. When they find that out, they have a chance to salvage some credits and switch to something else. It's better than finding out they don't like the work after they graduate."

At the beginning of each agricultural internship, the student, his or her academic adviser, the employer and Whiting all sign an agreement about the terms of the arrangement. It specifies the student's responsibilities, the types of operations the student will encounter, the pay rate and the academic credits to be earned.

Whiting recruits most of the employers who hire interns, but some students find their own positions, then apply in advance to get internship credit for the work. Except in those cases, students seeking internships are required to prepare formal resumes. Whiting tries to see that each employer has a selection of three or more applicants and that students apply to at least three employers.

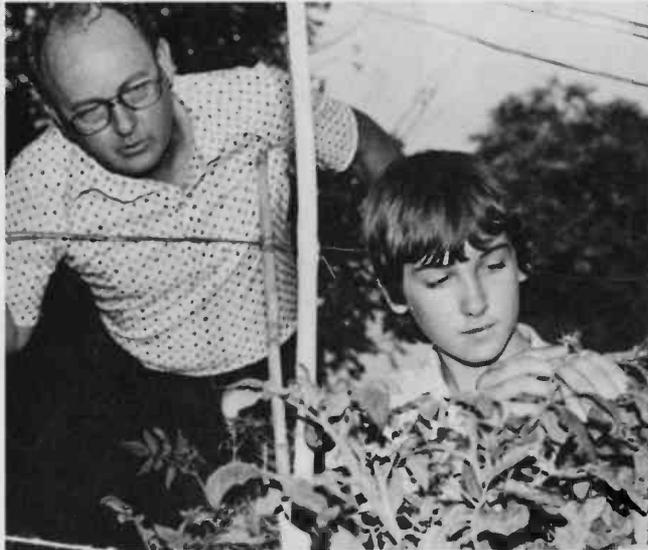
"Unfortunately, we usually have more interested students than openings," said Whiting.

He figures that, in getting to know each student and employer, visiting them on the job and reading their reports, he has learned as much from the program as anyone: "I thought I had a pretty good agricultural background when I came into this job, but I didn't even suspect a lot of what I've learned. . . . I think I've got the best job in the college."



During her internship at Reid Park Zoo in Tucson, Charlotte Fox steadies a sun bear for medical treatment. (Photo by Frank Whiting.)

Knowledge in the Making



Dr. Paul Bessey and son Andy check home garden tomato plants.

Top Garden Tomatoes Resist Curly Top Disease

Forty-eight home gardeners throughout Arizona helped UA horticulturists **Dr. Paul M. Bessey** and **Carl R. Wilson** compare six varieties garden tomatoes last summer. Two varieties resistant to curly top disease gave the best yields even though 1980 was a mild year for the disease. Those two were Saladmaster, which is a small, egg-shaped tomato, and Columbia, with a medium-sized, round fruit. Varieties GS-393 and Pacesetter 511 had yields in the same range as the top two, while Improved Pearson and Walter Villemaire, both lacking curly top resistance, produced considerably less. Separate variety demonstrations conducted at the Tucson Garden Center identified Saladmaster, Pacesetter 511 and Columbia as significantly better yielding than the other three varieties in Tucson's hot climate. The Pacesetter is a sauce tomato. The cooperating gardeners in the statewide comparison judged the fruit quality of Saladmaster and Columbia as good.

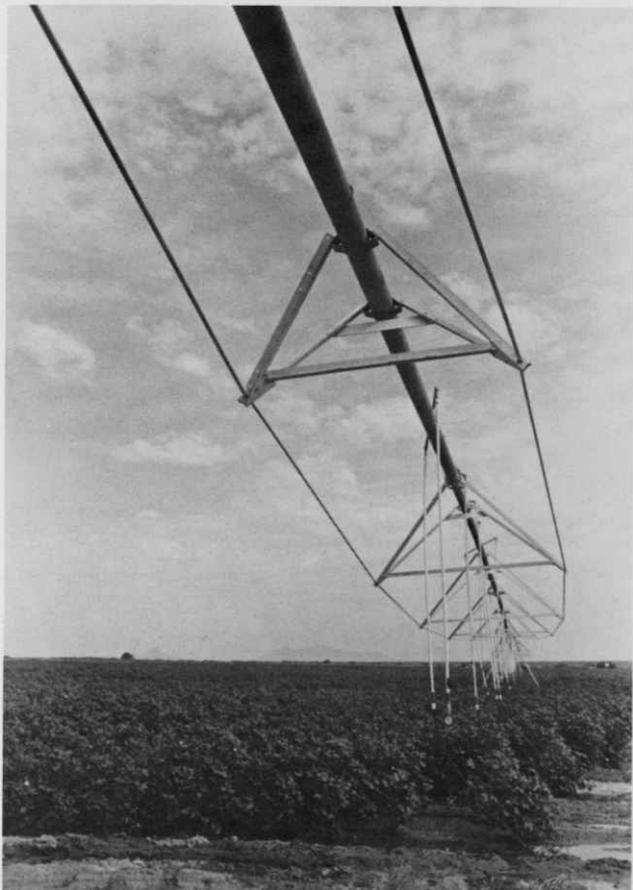
Bessey and Wilson are continuing the project this year, with three added varieties from Idaho that have curly top resistance: Super Star, Red Lode and Ida Red. The resistance is most valuable in years, such as 1981, when curly top is a problem. The disease causes serious tomato losses in home gardens throughout the West in about three out of five years. Saladmaster and Columbia seeds are available from a few Arizona nurseries and through the Washington State Crop Improvement Association, 513 N. Front St., Yakima, Washington 98901. County offices of the UA Cooperative Extension Service have much additional information helpful to home gardeners.

Public Services: Should They Be Private?

Basic public services such as fire protection and garbage removal often are financed by local taxes. Local governments can provide such services themselves or can contract with a private company to provide them, or let residents subscribe individually to private services. Consumerist **Dr. Julia Marlowe** of the UA School of Home Economics is studying consumer satisfaction with fire and garbage services in Pima County. Satisfaction with these services provided publicly will be compared with satisfaction in other parts of the county where the services are provided by private companies. The households surveyed are in neighborhoods that vary in personal income and housing density. Marlowe expects to have results analyzed by early autumn. They should be helpful in deciding whether public or private delivery of services is more satisfactory in areas of given density and income. Knowledge from research such as this can help local governments use tax money efficiently.



City of Tucson sanitation service: consumer satisfaction studied.



Droplines deliver irrigation directly to partitioned furrows.

Putting Irrigation Right Where it Belongs

UA agricultural engineer **Dr. Delmar D. Fangmeier** is testing a moving, overhead irrigation system that saves water compared with conventional siphon systems and saves energy compared with high-pressure moving sprinkler systems. He has attached drop lines from a wheeled overhead irrigation pipe that can travel the length of the field. The 12-foot-high pipe reaches across the field perpendicular to the furrows. Drop lines extend down at every other furrow. Some end in a spray head five feet above the ground. Others use plastic pipes to place water directly in the bottom of the furrows. The system works at about one-fourth the pressure of most moving, high-pressure sprinkler systems. That saves pumping energy. The water savings come primarily from uniformity of application. Each furrow is partitioned along its length by soil checks or small dikes that are formed mechanically at even intervals. By causing the water to pond instead of flowing away, these

checks equalize the amount of water that soaks into the soil throughout the field. Such checks are not possible when water is applied as a surface flow rather than from above. On cotton this year at the UA research farm in Marana, Fangmeier's test system is using about half the irrigation water used by conventional siphon systems on cotton in the area. He is comparing this system, and variations on it, with costs and performance of other high-efficiency irrigation methods being tried in the state. One variation Fangmeier is trying at Marana is a center-pivot overhead pipe instead of one that moves along the field's length.

Caution Flags for Jojoba: Fungi and Feed Tests

Two separate lines of research at the University of Arizona have handed setbacks recently to jojoba's prospects for becoming a commercial crop. Plant pathologist **Dr. Stanley M. Alcorn** and his co-workers have found that, under greenhouse conditions approximating those of an irrigated field, jojoba is susceptible both to Texas root rot and to verticillium wilt. Both are fungal diseases that can kill a variety of plants. In the wild, jojoba bushes apparently have little if any disease trouble. Supporting Alcorn's test results, findings of verticillium wilt have been made in commercial jojoba plantings near Kingman and near Bakersfield, California. Texas root rot has turned up in jojoba plantings in Sonora, Mexico.

Also this year, animal nutritionist **Dr. R. Spencer Swingle** has found some problems connected with using jojoba meal as a protein source in livestock feed. Jojoba's main commercial value is in the fine liquid wax that can be pressed from its seeds. However, the crushed meal that remains as a byproduct after extraction of the wax has been considered as a possible feed supplement because it is one-fourth protein. Swingle found that feeder steers ate significantly less feed when it was supplemented with 10 percent untreated jojoba meal than when the feed was supplemented with the same amount of cottonseed meal, a common protein source. Treatment of the jojoba meal with a fermentation process increased its palatability for the steers, but the test steers' ability to digest feed and to gain weight were lower with jojoba-supplemented feed than with cottonseed-supplemented feed. Despite these problems, Swingle feels that future work still may be able to make jojoba meal a practical feed ingredient.

**PROGRESSIVE
AGRICULTURE
IN ARIZONA**

College of Agriculture
The University of Arizona
Tucson, Arizona 85721

Arizonans You Should Know



Dr. Roy S. Rauschkolb, 51, has been appointed director of the University of Arizona's statewide Cooperative Extension Service. The appointment, announced by UA Agriculture Dean Dr. B. P. Cardon and subject to approval by the Arizona Board of Regents, is effective October 1. Rauschkolb is returning to Arizona after 12 years

with the University of California, where he has been regional director of the Cooperative Extension Service since 1977. He served on the UA agriculture faculty from 1965 to 1969 as an Extension cotton specialist, then superintendent of the UA Experimental Farm in Safford, then Extension soils specialist. His doctorate in agricultural chemistry and soils was awarded at the University of Arizona in 1968. Following graduation from Glendale Union High School in 1950, Rauschkolb put in a four-year enlistment with the U.S. Air Force as an airborne radio operator. He received a bachelor's degree in chemistry from Arizona State University in 1961 and a master's in agricultural chemistry and soils from the University of Arizona two years later. In his most recent post in California, Rauschkolb supervised 15 county Extension offices and statewide programs in field crops and row crops. As director of the UA Cooperative Extension Service, he will coordinate the efforts of 147 professional and staff employees in county offices throughout the state and 121 more on campus in Tucson. He succeeds Dr. Craig Oliver, who resigned earlier this year to direct the University of Maryland Cooperative Extension Service.

Throughout history, rust fungi have taken a big bite out of the food supply people have tried to grow for themselves. In the past generation or so, advances in plant breeding and crop protection have almost eliminated rust epidemics in major crops in developed countries, though the threat of disastrous losses still exists. Much of the success in controlling crop rusts has been based on work by **Dr. George B. Cummins**. His half century of studying the biology and worldwide distribution of these disease-causing fungi has made him the pre-eminent authority on rusts. Cummins has been a visiting professor in the UA Department of Plant Pathology since 1971, when he retired after 41 years at Purdue University. This May, Purdue gave him an honorary Doctor of Agriculture degree. His research laid the basis for developing Green Revolution varieties of grains and other crops resistant to rust damage. Few individuals have made as big a contribution to increasing and protecting world food supplies as Cummins has. Now he is working with Dr. Hector Leon Gallegos of Culiacan on a book about rust fungi of Mexico.

Dr. Paul B. Pearson, visiting professor of nutrition and food sciences, was elected a Fellow of the American Institute of Nutrition at the institute's recent annual meeting. Pearson, 75, has chaired nutrition departments at Texas A&M and Drexel universities, been president of the Nutrition Foundation, and directed the biology division of the U.S. Atomic Energy Commission. Concurrent with his present UA post, he is Chief of the Department of Nutrition at the School of Medicine of the Autonomous University of Guadalajara in Mexico. His research has helped advance the understanding of amino acid metabolism, malnutrition effects and the nutrition of embryos.