



# KNOWLEDGE IN THE MAKING

**IN COMMUNITY DEVELOPMENT**, Southeast Arizona Area CD Specialist Douglas T. Dunn is coordinating a detailed economic analysis of retail trade in Safford. The project has identified the area from which Safford merchants attract buyers, and surveyed people in that trade area about where they shop for various goods. One aim is to identify types of businesses that should be practical in Safford but that the city now lacks. Another is to find out why some area residents shop elsewhere. The city plans to use the results to help decide whether to invest in renovation projects in the downtown business district. The data will also go into a program to encourage new and expanded businesses in town. In the two years following a similar market analysis in Willcox, retail sales in that city grew 18 percent, and 17 new businesses opened.

**IN PLANT PATHOLOGY**, Dr. Michael E. Stanghellini is testing uses for a temperature-sensing gun that takes advantage of the fact the thirsty plants get hot. Water stress, whether due to a lack of moisture in the soil or a disease hindering the plant's ability to use it, causes the plant's surface temperature to rise several degrees, compared to an unstressed plant. The difference can often be felt by hand, but the gun allows testing of many plants more quickly and accurately. When pointed at an object, the hand-held gun gives a digital readout of the object's surface temperature. UA affiliate Dr. Ray D. Jackson of the USDA Water Resources Laboratory in Phoenix pioneered use of the machine in agriculture. Stanghellini expects it to be useful in early, non-destructive detection of disease, and in screening for stress-resistant varieties in plant breeding projects.

**IN LANDSCAPE ARCHITECTURE**, fourth-year students of Walter E. Rogers and Gene S. Trobia are designing revitalization plans for the downtown area of Casa Grande. The City and the Central Business District Association are paying expenses. Rogers said, "Merchants there see the delicate balance they're in right now with the first shopping center on the fringe of the city starting to take away downtown business. If something is not done soon, Casa Grande's downtown could begin the same slow decay that Tucson and Phoenix have experienced." The students are surveying attitudes of merchants and shoppers, and collecting information about parking needs, traffic loads, pedestrian flow, visual qualities and other factors in the business district. They will produce several alternative design recommendations for revitalization. Closed-off pedestrian mall designs were rejected by the city twice in the 1970s. The students are aiming for more realistic proposals that will make the downtown more appealing to shoppers by enhancing the image and vitality of the central business district.

**IN ENTOMOLOGY**, Dr. Roger T. Huber is calculating time-tables for predicting insect emergence based on cumulative daily temperatures rather than calendar dates. He and graduate student Alan Nelson have developed such a system for the Egyptian alfalfa weevil, a widespread pest in the Southwest. The egg of the weevil needs 340 heat units between 45 and 86 degrees F before the larva emerges and starts eating leaves. A heat unit is the number of degrees over the 45-degree threshold for each day's average temperature. For example, if a day's average temperature is 61 degrees, that day has 16 heat units. An alfalfa grower can add up each day's heat units in the spring, and expect peak weevil emergence when the tally hits 340. A freeze before he counts 117 units kills the eggs and sets the count back to zero. Huber has calculated similar systems for the pink bollworm and the codling moth, a fruit-tree pest. He is working now on the Southwest corn borer and the tobacco budworm, which attacks cotton. The heat-unit method, called phenology, allows more accurate and localized predictions than use of calendar dates does. Better predictions of pest populations allow growers to make management decisions more efficiently, including decisions about pesticide use.

**IN ANIMAL SCIENCES**, Dr. Gerald H. Stott and Dr. Frank Wiersma are studying ways to reduce the environmental stress faced by newborn dairy calves in the southern Arizona summer. Calf loss in the state is highest in the summer. One reason is that the heat reduces the newborns' capacity to pick up disease-fighting chemicals called immunoglobulins from the cows' new milk. This leaves the calves susceptible to infection for their first month, until they start making their own immunoglobulins. Stott is determining factors that effect how well and how long newborn calves can absorb immunoglobulins. His results emphasize the value of starting the calves' feeding within 12 hours of birth, as well as reducing environmental stress.

**IN NUTRITION AND FOOD SCIENCE**, Dr. J. Warren Stull is using whey, a throwaway byproduct of cheese, to make ice cream. In taste tests, 800 blindfolded people could not tell the difference between the frozen dessert made from whey and regular ice cream. Stull substitutes whey for the 50 to 60 percent of ice cream that is usually whole milk. He uses whey from cottage cheese, known as acid whey. In cheese making, every 10 pounds of milk yields about nine pounds of whey, which contains milk sugar and high-quality protein. Most of the country's nine billion pounds of cottage cheese whey each year goes down the sewer, though. Stull chemically changes its acid and sugar content before using it in frozen dessert. He is also testing a combination of whey and another junk material, cotton gin trash, as a fermented livestock feed.

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## ARIZONANS YOU SHOULD KNOW

**Dr. Victor A. Christopherson**, a professor of child development and family relations in the UA School of Home Economics, has received two faculty awards. The Tucson Trade Bureau picked him for its 1980 Faculty Recognition Award. Then University of Arizona Foundation gave him the 1980 UA Creative Teaching Award. The latter included a \$1,500 prize. Christopherson will teach courses in human development theories and advanced child development next fall. He has been researching alcohol use patterns of Arizona's rural elderly (see spring 1979 Progressive Agriculture) and the development of social skills and behavior in rural youth.

**Marvin Morrison** of Higley was named "Arizona Extensionist of the Year" at the annual conference of the UA Cooperative Extension Service. The farmer and rancher has served on the Maricopa County Extension Board since it was organized in 1964. He and his brother Kenneth run an extensive crop and livestock operation that includes a dairy, a feeding operation, and a beef ranch in Yavapai and Coconino counties. Morrison has been active in agriculture since 1946, and is also a director of the Arizona Public Service Company. He was named Man of the Year in Arizona Agriculture in 1960. The Extensionist of the Year award goes to people who epitomize the Cooperative Extension Service philosophy of service to others.

**Bob Bowman** of Greaterville, through a quarter century of ranching, has earned the title of Arizona's 1980 Range Manager of the Year. The title comes from the Arizona Section of the Society for Range Management. Flagstaff-area rancher **Herb Metzger** is this year's runner-up. Bowman's 8,000-acre ranch, about 15 miles northwest of Sonoita, varies from level bottomland to the rocky slopes of the Santa Rita Mountains. About half of it lies in the Coronado National Forest. Use of a three-pasture rotation system of deferred grazing, control of burweed and mesquite, and adjustment of cattle numbers in dry years have helped him improve the quality both of the land and of his herd of Hereford-Red Angus crossbreeds.

**Dr. Wilford R. Gardner** became head of the Soils, Water and Engineering Department of the College of Agriculture on April 1. He came to the University of Arizona from the University of Wisconsin, where he taught soil physics. Before that, he worked with the USDA Salinity Laboratory in Riverside, California, Iowa State University, and the U.S. Army Corps of Engineers. The Utah native earned his B.S. at Utah State University and his master's and doctoral degrees in soil physics from Iowa State. In addition to administering the 30-faculty-member UA Department of Soils, Water and Engineering, Gardner will teach occasional soils classes and conduct research about relationships of plants and soil water, and the transport of water and salts in soil.

**Maria Paz Fernandez**, UA graduate student in foods science, was presented an academic medal by President of Mexico José Lopez Portillo in Mexico City in November. The ceremony was part of a three-day program for selected Mexican science students. Fernandez earned the award, and the trip to the national capital, for her undergraduate work in chemistry at the University of Sonora in Hermosillo, her home city. She is a research assistant to UA foods scientist Dr. J. Warren Stull.

**Malena Tellez** of Tucson won the 1979 National 4-H Dairy Award for her work with dairy goats. The 17-year-old started in 4-H seven years ago with one goat. Her project, and the involvement it sparked from the rest of her family, grew into a commercial goats' milk dairy, selling bottled milk to 13 health food stores. She has milked up to 56 does each morning, learned how to keep them healthy and how milk is tested, and planned breeding to improve the herd. A \$1,000 scholarship comes with the national award. Tellez, a senior at Sabino High School, plans to use it for studying agribusiness at the University of Arizona. This year, she switched her 4-H emphasis from dairy goats to Hereford cattle, tending three heifers, a bull, two market steers and calves. She belongs to Desert Amigos 4-H club.