

The Desert Vegetable Crop Production Program

Assistance for Arizona's growers

By Joanne Littlefield

Agriculture in Arizona is a \$6.3 billion dollar industry. In response to growers' needs, the University of Arizona College of Agriculture and Life Sciences created its Desert Vegetable Crop Production Program (DVPP). Faculty associated with the program include weed scientists, plant pathologists and entomologists in Cooperative Extension who are at the forefront of desert vegetable research. Arizona vegetable growers and shippers are the main clientele. Additional clientele who are kept abreast of current research include crop production consultants, seed, fertilizer and agrichemical industry representatives, pesticide applicators, equipment manufacturers, storage operators and truckers. According to the Arizona Department of Agriculture, Arizona's agriculture industry ranks third in the nation for the production of fresh market vegetables.

In 1995 the College of Agriculture conducted an extensive review process of Cooperative Extension outreach efforts, and determined that a program was needed to communicate the latest College of Agriculture and university research findings to the agricultural community. The DVPP was created to meet the following goals:

Yuma is considered the leading supplier of winter lettuce in the country.

- Assisting Arizona vegetable industry in remaining competitive and profitable in a global economy;
- Introducing, evaluating and assisting in the development of new opportunities and new crops to expand the industry;
- Evaluating, developing and introducing economical and environmentally responsible methods for efficient water use and crop protection practices;
- Assisting the Arizona vegetable industry in providing the U.S. and international consumer with safe and nutritious quality foods at affordable prices.

RESEARCH HIGHLIGHTS

Entomology

The Department of Entomology has conducted extensive research to learn more about how to combat whitefly in cotton, melons and vegetable crops. Historically, whitefly migrates to other crops when cotton is defoliated in the fall. This has led to significant damage on vegetable crops, especially fall lettuce, leafy vegetables and cole crops. Because the introduction of insect growth regulators (IGR's) has decreased whitefly populations on cotton, the DVPP has worked to extend its use on other crops.

During 1998 and 1999, members of the DVPP, working with growers, crop consultants and the Arizona Department of Agriculture, generated recommendations on the use of a new IGR to manage whiteflies in cross-commodities (melon-cotton-lettuce). These resulted in an EPA emergency exemption for its use before official registration was completed. (Based on insect hormones, growth regulators disrupt the growth and development of insects, but are safe to humans and the environment.)

The vegetable team held training workshops to outline the uses and restrictions for growers and crop consultants on this new chemistry. Additionally, the publication *Cross Commodity Guidelines for Managing Whiteflies and Sustaining Chemical Efficacy in Arizona* was distributed at the 5th Annual Melon Field Day, Maricopa Agricultural Center in June of 1999.

In the spring of 1999 a new insect pest arrived in Yuma, Arizona: the lettuce aphid. "While we don't know if it will return this next year, a significant amount of research is being conducted to combat this pest," says David Kerns, an entomologist at the UA's Yuma Agriculture Center. Yuma is considered the leading supplier of winter lettuce in the country.

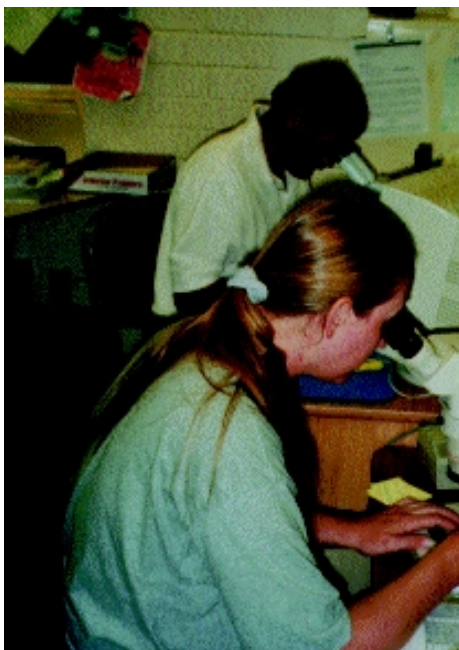
Plant Diseases

UA plant pathologist Mary Olsen is investigating diseases on peppers and melons, two major vegetable crops in Arizona. About six years ago peppers began showing signs of powdery mildew in Cochise County. Olsen wants to find out where the disease is coming from—possibly from a weed host—and determine which varieties of peppers are most susceptible.

In the past, the only registered fungicide that worked was sulfur, which had to be applied as a preventive measure. "This year we received a Section 18 emergency exemption from the EPA for another fungicide, myclobutanil, to try to combat this pathogen," Olsen says. "Trials have been conducted in central and south-east Arizona."

Melon diseases are currently under study in the laboratory and in field trials. Charcoal rot of melons, which causes a crown rot on the fruit, has been found on drip-irrigated melons in central Arizona. "We are trying to find out how and when it enters the plant and why all of the sudden it's getting worse, Olsen says. "We need to know what its sensitivity is to different fungicides, and why it's more prevalent in drip irrigated melon fields. We are also looking into the basic biology of the fungus itself."

"We really want to work on resistance management—trying to keep



Technicians examining whitefly on melons.

J. Littlefield

fungicides from developing resistance—by rotating different kinds of chemicals using fungicides that have a different mode of action each time,” Olsen says.

Weed Control

After many years of use, Dacthal herbicide has been taken off the market and will no longer be available for vegetable growers in Arizona. According to Kai Umeda, area extension agent in vegetable crops, this creates a significant hole in weed control programs. “Growers have lost a major tool in controlling weeds in cole crops and onions,” he says.

“Cole crops now only have two herbicides to be used at planting time in order to establish a crop stand. We are investigating what the two in combination might do to give broader control.” Without Dacthal, herbicides for onions are limited. “We are investigating the use of Prefar combined with Prowl herbicide at lower than label rates. We are finding that combining these two herbicides offers exceptional weed control,” Umeda says. He is also investigating using lower than labeled rates of postemergence herbicides applied to younger, smaller-sized onion plants.

Umeda has recently obtained grants from the Arizona Iceberg Lettuce Research Council and USDA IR-4 program to evaluate new herbicides for potential use on lettuce and other vegetables. “These are products recently registered for use in corn, soybeans and cereal crops. We will be conducting evaluations on cantaloupes, watermelon, broccoli and lettuce for these pre-and post-emergence herbicides.”

Umeda, Yuma County agriculture extension agent Barry Tickes and extension weed specialist Bill McCloskey are evaluating the ‘plant-back’ of vegetables into fields that previously have been treated with cotton or alfalfa herbicides to determine residual activity on vegetable crops.

Getting the Word Out

The DVPP maintains regular contact with agricultural producers to assess current commercial production needs. They meet at least once a year for a day and a half to hear suggestions from the advisory committee for the Vegetable IPM program. “We also offer the advisory group the opportunity to see research activities in labs on campus in Tucson,” Umeda says. “That exchange contributes to the direction of research

efforts for DVPP members, especially in entomology and plant pathology.”

After conducting extensive research in the field and gathering information from all available sources, faculty develop and execute an educational program through frequent and timely demonstrations, workshops, short courses, field days, and meetings. They also write and distribute bulletins, and reports. “We generate a lot of data and information that we need to disseminate,” Umeda says. “One of the basic mechanisms we chose was the World Wide Web. There is a statewide site, as well as two regional sites: one for Yuma County, and one on Maricopa County vegetable crops.”

Vegetable Crop Web Sites

- *Statewide:* ag.arizona.edu/extension/programs/vegetables/program.html.
- *Maricopa County:* ag.arizona.edu/maricopa/veginfo. Includes updates on meetings, field days and workshops as well as the monthly *Vegetables Newsletter*, which contains information on new methods, products, projects and activities.
- *Yuma County:* ag.arizona.edu/aes/yac/veginfo. Includes a pest update that describes appearance, biology, damage, management, and action thresholds for various insect pests of leafy vegetables, cole crops, and melons.

Linking Food Production to Food Safety

As a way of getting more information to a wider variety of people, Safe Food 2000 was developed as a multi-year initiative by Cooperative Extension and 21 other organizations to improve food safety information and training in Arizona. Partners include state and county health departments, school food services, local restaurants and food businesses, educators, food banks, agriculture and food service professionals plus faculty from the Maricopa County Cooperative Extension agriculture and family and consumer science departments. It includes training for civic and religious groups for safe quantity-food preparation.

Certification Programs for Arizona-grown Vegetable Crops

The Desert Vegetable Production Program has generated several sub-groups mentioned previously, including weed control and plant pathology. Another is the Integrated Pest Management (IPM) team. “For the past year we have been developing and promoting the IPM certification program,” says David Kerns, Yuma County Agriculture Center entomologist. “In this program producers grow their crop using IPM techniques and then document it. Through this certification process growers may get a premium value if the crop is marketed as such.” Kerns says certification is still in its infancy. “It will be at least a year before it is fully in place. We are working with a growers committee to establish the guidelines.” ❖



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