

## Del. entomologist studies chemical warfare waged by plants

NEWARK, Del. — If it weren't for their own defense strategies, the plants we know today probably would have been gobbled up by hungry insects long before they reached their present state of evolution. Yet people usually think of plants that are preferred insect hosts as susceptible or poorly protected.

John C. Reese, entomologist at the University of Delaware Agricultural Experiment Station, disagrees with this assumption. Actually, he says, even the most susceptible plants are remarkably well protected against insect attack. Finding out how they wage war on insect enemies could help geneticists develop varieties of food crops which are more productive and cost less to grow.

One way plants protect themselves is by producing substances called allelochemicals. These are nonnutritive compounds, such as alkaloids, which are synthesized by one organism and have some effect on another — in this case, a negative effect on plant-chomping insects. Reese says he hopes to isolate and identify some of these compounds. If this can be done, it might be possible to chemically screen plant varieties for resistance to major crop pests — a much more efficient method than the time-consuming field trials now used.

With the help of a \$7000 University of Delaware Research Foundation grant, the entomologist has been testing his theory on the natural resistance of plants to insects, using black cutworm larvae, tissue from inbred field corn lines, and an artificial diet which favors larval growth. He reported on this work at the recent national meeting of the American Chemical Society in Las Vegas.

Results of his research show that even fairly susceptible corn lines are quite well defended against cutworm attack. In fact, larvae raised on the artificial diet grew more than six times as well as those reared on corn leaf tissue.

He has been able to extract some of the growth-inhibiting properties of corn seedlings. Incorporated in an artificial diet, these substances inhibit larval growth, proving that at least some of the plant's protective strategy is due to chemistry.

Reese found that cutworm larvae are most affected by this chemical defense during the first 48 hours after they hatch. He is using this knowledge to increase the sensitivity of his screening method.

He also found that the larvae are very susceptible to handling — a fact rarely taken into account when such experiments are designed. Because of this, he and his assistants now place eggs, rather than larvae, on the diet or plants when screening is done.

Using this method of testing for plant resistance to insect attack, the entomologist says he may eventually be able to chemically screen as many as 1,000 to 2,000

inbred corn lines during a single winter season. Those which show the greatest promise can then be studied more closely the following growing season for their interaction with cutworm larvae or other insects. This would greatly simplify the search for resistant plants.

The black cutworm is a major pest of field corn, as well as a number of vegetable crops. It has been known to destroy up to 95 percent of the corn seedlings in some fields and, according to University of Delaware Extension pest management specialist Mark Graustein, it causes at least 2.5 percent of this crop to be replanted

each year.

More than 71 million acres of field corn are grown annually in the U.S. at a value of approximately \$14.4 billion. Even if only one percent of the crop is lost to cutworms, this still represents a loss of about \$144 million.

Toxaphene is one of the most frequently used insecticides for controlling black cutworm larvae, but it may be withdrawn from commercial use because of the recent discovery of its mutagenic properties. Also, black cutworms are more prevalent in no-till than in conventionally grown corn.

As no-tillage practices continue to increase, cutworm problems may also increase substantially.

This puts more pressure on plant breeders to develop insect-resistant varieties.

The use of crop plants resistant to insect attack is basic to the integrated pest management programs now being advocated in agriculture. Such programs call for the use of resistant varieties, cultural and other biological methods, as well as chemicals in suppressing crop pests.

Resistant varieties don't cost more to grow, have few environmental side effects, and are very compatible with other control techniques. Thus, they're an extremely important part of this pest management package, concludes Reese.

## PSU announces 'Expo' aides

UNIVERSITY PARK — With Penn State's annual Dairy Expo just three weeks away, several students and faculty members are busy preparing for the day-long show and subsequent banquet, on May 1.

The overall exposition chairman is Logan Bower, senior in dairy production from Blain, assisted by Hooversville dairy production major David Naugle. Show manager is Brian Detwiler, senior in dairy production from New Enterprise, and his assistant is Don Snyder of Pitman, junior in agricultural economics and rural sociology.

Special events for the day are being planned by Martha Gregory, junior in nutrition from Litzitz. The assistant chairman is David Lash, sophomore in dairy production from Newton. Faculty advisors are Lawrence D. Muller, and Thomas F. Sweeney.

Judges for fitting and showing competition will be Guernsey breeders Peter Witmer of Willow Street, and Bernita Snider Gable of New Enterprise.

Also planned for "Show Day" are special events which include a celebrity milking contest, various milk "chugging" contests, and a calf dressing contest. The com-

plete exposition includes the annual Dairy Princess Contest April 12.

Holstein breed manager for the Exposition is Sylvia Cooper, senior in dairy production from Slippery Rock. She is assisted by David Stahl, senior in dairy production from Somerset; Robert McCarthy, senior in dairy production from Aaronsburg; and William Devore, senior in dairy production from Washington.

Show manager from Brown

Swiss, Guensey, Ayrshire, and Jersey breeds is Ken Kehr, junior in dairy production from Littlestown. The assistant show manager is Linda Kramer, junior in dairy production from Fenelon, along with Penny Smith, sophomore in dairy production and agricultural education, from Mansfield.

Editor of the Penn State "Dairyman," the official catalog and yearbook for the Dairy Science Club, is Cindy Barto, senior in

advertising from Pennsylvania Furnace. Laura England, junior in general agriculture of Williamsburg, is the assistant editor of the "Dairyman." Publicity chairman is Lisa Shirey, junior in agricultural education from Beavertown. Assistant publicity coordinator is Marcia Minor, freshman in agricultural business from Washington.

Presentation of awards will take place at the annual banquet May 1 at 7:00 p.m. in the Sheraton Inn, State College.

## U. of Del. Ag Day set for May 1

NEWARK, DEL. — Students at the University of Delaware's College of Agricultural Sciences are getting ready for their annual Ag Day festivities. This popular event takes place Saturday, May 1, starting at 10 a.m.

Students and professors will be on hand to answer gardening questions, conduct tours of the grounds and facilities, and let visitors pet the animals. They're preparing a fine country dinner — a mouth-watering chicken barbecue. From 1 to 4 p.m. visitors can buy half a chicken, potato

salad, roll and butter, homemade dessert and beverage — all for a modest price.

The day's events will include a sheep shearing and wool weaving contest; a petting zoo that features a variety of clean, well-groomed farm animals gentle enough for even young children to pet; a student beef show with halter-broken heifers and steers trained by the contestants; horse grooming and riding demonstrations; pony rides; and hayride

tours of the University farm's animal, plant and research areas.

There will also be a plant sale, a sick plant clinic, and flower arranging contest, plus guided tours of the college's ornamental gardens, and demonstrations on how to preserve flowers.

There will be crafts for children, an egg toss, a hay bale toss and a tug-of-war. There will be educational displays on everything from farm safety and solar energy to career opportunities in agriculture.

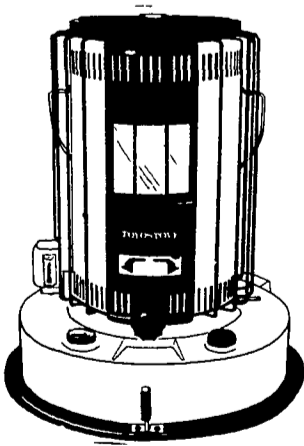
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