

Insect diets are studied

Knowledge of how an insect's diet affects its resistance to insecticides may lead to more sophisticated control of insects that damage a variety of crops, according to a team of Oregon State University entomologists.

Such knowledge could help farmers pick insecticides and use them more effectively as well as contributing to the development of more insect resistant plants, said Oregon Agricultural Experiment Station researchers Leon Terriere, Ralph Berry and Alison Moldenke.

The scientists have been varying the diet of cutworms and alfalfa and cabbage loopers to determine the effect on resistance to insecticides. The bugs damage crops such as peppermint, snap beans and table beets, explained Berry.

"Cutworms are a severe pest on peppermint," he said. "Approximately 50,000 acres of peppermint are grown in Oregon, about half in central Oregon and half in the Willamette Valley. Some peppermint is also grown in Ontario."

Diet is a relatively new dimension to the study of insect control, said Terriere. He and his fellow workers are trying to compile a profile of cutworm and looper defense mechanisms that stifle man's pest control attempts.

All animals and insects have internal defenses—detoxication mechanisms—they use to survive in a toxic environment. This detoxication process varies depending on the organism's age, sex and diet, Terriere said.

"If you are going to improve pest control strategies, you need to establish a profile of how detoxication fluctuates with respect to age, sex and diet in specific insects," he said.

Detoxication occurs through the production of defense enzymes within the insect, and only recently diet has been found to influence the production of these enzymes, Terriere said. Entomologists first discovered the impact of insect diet studying the housefly.

"The idea that one can feed a fly narcotics and see its detoxication mechanisms increase 50-fold raises the question: Is this going on in the real world?" he said.

To answer the question, Terriere, Barry and Moldenke designed a series of experiments to see if host crops stimulate detoxication mechanisms in insects.

Peppermint was one of the first crops tested. The researchers found peppermint oil stimulated detoxication mechanisms in cutworms and loopers.

"We were impressed that the peppermint plant has these inducing chemicals, and we sought to see how widespread such chemical induction is," Terriere said.

He and his colleagues found diets of broccoli, alfalfa, snap beans and cabbage did not stimulate the production of significant amounts of detoxication enzymes. Consequently, the researchers are focusing their attention on peppermint, attempting to identify the chemicals that stimulate the production of detoxicants.

"If we can identify one chemical, it might be feasible to start a plant breeding program to produce a peppermint plant that doesn't stimulate insect resistance," speculated Terriere.

Although he warned that finding only one chemical that causes increased production of insect detoxicants is doubtful, Terriere said research findings can improve pest control in three other ways.

First, results can alert pest controllers that chemical control of loopers and cutworms may be more difficult on certain plants such as peppermint.

Second, results can allow farmers to fine-tune insecticide application rates to specific crops, eliminate excess spraying of insecticides and reduce environmental contamination.

Third, timing of applications can be planned when the plant's ability to stimulate detoxication in insects is low and also when insects' natural defenses are at their lowest level.



Representing Clackamas County in the 4-H fashion revue was this group of 4-H members enrolled in clothing, knitting or crocheting projects. In front, from left to right: Lynel Hochstein, Milwaukie, Lauri Linton, Oregon City, Cynthia Davis, Milwaukie, and Cheryl Keller, Beavercreek. Standing, from left to right: Teresa Casciato, Milwaukie, Denise Lubbers, Oregon City, Kimberly Pritchard, Redlands, Angie Conibear, Sandy, Julie Swan, Oregon City, and Ronda Beckner, Wilsonville.

Digging bulbs does help

In the flower garden

Digging and dividing spring flowering bulbs such as daffodils, tulips, crocus and hyacinth, may seem like a bothersome, unnecessary chore but in the long run it will make the flower garden healthier and more attractive.

"Spring flowering bulbs should be dug, sorted and divided in the late summer," says Ray McNeilan, Oregon State University Extension home gardening agent. "Afterwards, the bulbs can be replanted, or stored until late September and planted when the weather is cooler."

Digging and dividing these flowers gives them more room to grow properly and prevents plant diseases, should they occur, from spreading rapidly from plant to plant.

When removing the plants from the soil, dig around the edge of the plant-clump and lift it carefully from the ground. Rather than washing the bulbs in water, simply knock the dirt off them.

Diseased, soft or rotten

bulbs should be discarded. Bulbs that are to be stored should be dried for a day or so. They can be spread on a wire tray which will allow air to circulate around the bulbs freely. Be careful not to crowd them together on the tray.

Store the bulbs in a dark, dry area like a cellar or in the back of a garage. Where possible, storage area temperatures should not exceed 65 degrees F.

If the bulbs are to be replanted immediately, plant them in clusters with individual bulbs four to five inches apart. Well-drained, sandy soil with maximum exposure to sunlight is best.

Work the soil to a depth of 12 inches. Plant tulips six inches deep; crocus, two inches; daffodils, seven inches; grape hyacinths, three inches; and irises, three inches.

Set the bulbs firmly in the ground and press out any air pockets that form around them as the soil is filled in.

A commercial fertilizer, such as a 5-10-5 combination,

should be worked into the soil around the bulbs. Use one handful per cluster of three to five bulbs, or two pounds for each five by ten foot plot of planted area.

Bone meal is also a good fertilizer for bulbs. Put two tablespoons of bone meal around each bulb to be fertilized and soak the planted area to water in the fertilizer and settle the bulbs.

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GOOD NEWS for PGE's residential and farm customers



lower rates averaging 27½%

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Passage of the Northwest Regional Power Act makes big reduction possible

That's right, even in these times of continued inflation PGE is submitting a rate proposal for regulatory approval by the Public Utility Commissioner that will give our residential and farm customers an average 27½% rate reduction! If approved on schedule it will be effective October 1, 1981.

For years, PGE and other utilities, government and elected officials in the Northwest have worked to develop a plan that would assure fair distribution of the lower-cost power from the Bonneville Power Administration's tax-payer financed system. The Regional Power Act which was passed by the U.S. Congress does that.

In addition, the Act provides for conserva-

tion assistance and reward as well as regional planning for future power needs and lower cost construction financing.

The end result is lower power costs for our PGE residential and farm customers. A mighty nice result.

Low cost conservation rates

PGE's submitted conservation rate proposals include a rate inversion which attempts to price marginal use at the highest price.

PGE proposes to have multiple-family dwellings' winter and summer rates set at 2.5 cents per kwh for the first 300 kwh and 3.0 cents per kwh for the next 300.

Single-family dwellings would pay 2.5 cents per kwh for usage between 0 and 300 kwh and 3.0 cents per kwh for usage from 301 to 700 kwh in both summer and winter.

Subsequent energy would be higher in cost and will vary seasonally as well as between single family and multiple family dwellings in the higher use blocks. However, none of the proposed rates would exceed the present yearly average residential rate of 4.52 cents

per kilowatt hour for all kilowatt hours used. The basic customer charge of \$3 per month remains.

So you can see it pays to conserve. If PGE's proposed rates are approved, some customers who use a small amount of electricity will find that their savings are far more than 27½%, large users will find the percentage is less—but everybody will enjoy lower costs and the average savings will be 27½%.

Full information will accompany your October bill.

If approved as scheduled, a more complete explanation of the new rate schedule will accompany your October bill. In the meantime, our local PGE offices will be supplied with updated information for your convenience.

We wanted you to know the good news in advance. Keeping your power costs down and your service reliable is our continuing effort. And telling you about a 27½% rate reduction makes us as happy as it does you.

PGE

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