Fruit Growers Get Hands-On Look A[illegible]

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ate professor of entomology at Penn State. "It's a process."

That process involves the gathering of extensive amounts of information about weather, crop grown, the environment, the type of pests, knowing the lifecycle of pests, and using that information to form strategies that deal precisely with the problem, according to experts who spoke to 32 growers on Wednesday.

Dealing with the problem can prove time- and money-saving in the end through the use of pest monitoring and technology that is readily available to growers. That technology was explored at the one-day intensive workshop at the Ag Center.

The technology of IPM goes back to the 1930s, when an Arkansas entomologist used scouting for bugs in cotton to determine what to do, according to Rajotte. In fact, growers made use of IPM through the 1950s to apply economic decisions to pest handling. In the late 1960s-early 1970s, because of political activities, growers became aware of the importance of protecting the environment. That renewed interest in the environment, after the economic considerations of the 1980s, came about in the last decade and into the 1990s, according to Rajotte.

What IPM strategies do is require the fruit grower "to think why you are doing certain pesticide . . . activities and reason it out to a certain extent." Rajotte said that in the past, growers simply sprayed "every Thursday" regardless of whether the crop needed it. With IPM, growers must seriously examine the need for spraying and pinpoint when, in what way, and how.

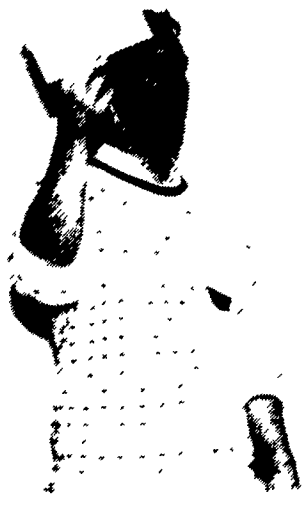
Another reason IPM tactics may be necessary is the potential for increased biological resistance to pesticides that insects can build up over time. This phenomena is growing and "we have to pay attention to it," said Rajotte.

IPM technology, making use of weather, monitoring through the use of traps, biological controls, and other methods, continues to improve. "IPM technology will become more prevalent, useful, economic, and environmentally friendly as time goes on," he said.

At the workshop, researches examined ways growers can utilize IPM effectively in orchards. Rajotte emphasized the importance of key IPM elements: gathering information, looking at thresholds, keeping mindful of multiple tactics, using pest and crop biology, scouting, and most important of all, crop record keeping.

Record keeping is "a big tool in pest programs," said Rajotte.

Tactics growers can use include "biotactics" or using the interaction of natural pests (a natural organism such as the stethorus beetle and larvae control in attacking overwintering European red mite eggs on Red Delicious apple trees). Another would be the use of wasps that can attack the coddling and tufted bud moth larvae, of which the adults are prime culprits in apple trees.



If growers "think ahead and have the management system in place," they can make use of pheromone controls to stop the coddling moth and tufted apple bud moth from creating major apple orchard damage, according to Glenn Koehler, associate scientist-IPM at the University of Maine Cooperative Extension Service.

Kelly Anon, research technologist, provides data for the growers at the workshop.

Rajotte examined using pest monitoring and calculations to determine whether the count showed "economic" threshold levels (where treating the problem equals the cost in terms of lost crop totals) or crop injury levels (where more money is lost from crop damage than it would cost to treat the pest).

Growers should understand that biological controls, such as using stethorus or other parasites on apple trees, "need time to build up," he said. "It may need some active management tactics by growers beforehand."

In diagnosing plant disorders, growers should take time to look closely at various possible causes of the problems before making a decision to use IPM. That includes extensive inspection of the parts above ground, cultural practices used, looking at the root systems, checking the "microclimate," and looking at soil and leaf tests.

The most important consideration, according to Mena Hautau, Berks County extension agent and coordinator of the workshop, is to "have an open mind toward diagnosis," she said. "Don't blame it on one thing and jump to conclusions."

There are no black and white answers, according to Hautau. "Diagnosis is a lifelong-type process, a skill you improve with time," she said.

Growers now can make use of a free plant disease mailing kit available from Extension. Growers need to complete a form about the specimen to obtain advice. Hautau told the growers that they shouldn't be afraid to say "I don't know" about the cause of a particular disease problem.

At the workshop, growers took part in pest scouting hands-on activities. A simulated orchard put red mites on an array of simulated trees, and growers were tasked to count the mites in the tree (marked on simulated leaves with a red pen) and the amount of stethorus beetles and larvae on the tree (marked on bags with Xs and squiggles). A worksheet allowed them to calculate threshold levels.

At the simulation, growers learned how to identify the mite eggs and were shown the damage it does to tree bark on the Red Delicious variety. The simulation of the apple orchard system tested their knowledge and understanding of how to measure the pest thresholds and what exactly to do about them — to spray or not spray.

Scouting forms the basis of many IPM programs, either using spraying or beneficial insects. Growers should carry a hand lens with them at all times and some kind of record keeping system, using a counter and sheets of paper, to properly record pest infestation. "You have to be in the orchard on a weekly basis to assess information about mite/stethorus populations," said Rajotte.

"The main task as a grower is to make the orchard hospitable to stethorus," he said.

The natural propagation of the stethorus species can aid growers in a big way. The adults can readily be introduced to an orchard and can play a big part in reducing mite population, if growers keep careful tabs on spraying and scouting.

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Koehler examined several studies undertaken at Penn State. They showed that making use of pheromone disruption costs less than pesticide applications and was more effective, in the long run, in keeping red mite populations low in orchards.

Koehler explained that pheromones are hormones that are secreted outside the body of the insect to attract mates for reproduction. By using synthetic pheromones, the pests are "confused" by the lures and cannot reproduce.

In Maine, Koehler said, growers raise about 4,000-5,000 acres of apples for a total of two million bushels per year. On a regional level, including six states in New England, growers manage about 12,000 acres of apples and have their share of pest problems. But each state has an IPM program.

Koehler told the growers to assume the perspective of the bug and what bugs have to do to survive. Knowing the lifecycle of the pest opens up ways to deal with it.

Growers who use IPM can track, capture, and scout bugs in the orchard. Using pheromones, traps can be set to lure pests in. Counts can help determine what the thresholds are and how an IPM strategy can be implemented. Also, using "kairomones," or natural plant attractions, pests can be captured for scouting and counting purposes.

In the past, many growers had a rough estimate of when a pest would emerge. But that rough estimate varied according to weather. Rather than relying on imprecise estimates of emergence, for control of the tufted apple beetle moth (TABM), growers can more effectively and precisely apply controls using the concept of "degree

Bill Serfass, Allentown, counts the spots representing mites at the hands-on workshop.

Growers now can take advantage of a free plant disease mailing kit available from Extension. Growers need to complete a form about the specimen and send in the specimen to obtain advice. Dr. Ed Rajotte, associate professor of entomology at Penn State, holds the kit.

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