Complete Farming News in Lancaster Farming

Beetle Helps Reduce Spraying

To spray or not to spray? That is the constant question facing commercial apple growers who add insect predators to their arsenal of pest controls.

Now a new approach developed by a statistician at Penn State's Fruit Research Laboratory at Biglerville has all but eliminated that dilemma for one major pest, the European red mite.

Its perennail struggle with the ladybird beetle (Stethorous punctum), its natural predator has been simulated by computer and the results used to develop a simple chart.

All the grower has to do is compare the average number of mites and beetles observed on each of ten trees in his orchard with the numbers on the chart. If the observed count falls within the range indicated by the chart, the grower can be sure that the beetles are controlling the mite population and that there is no need to resort to spraying with a chemical miticide.

Paul Mowery, an alumnus of Penn State's Department of Statistics and a research assistant at the Laboratory, developed the chart and the computer simulation which can "grow" an average apple tree, complete with mite infestation and beetle predators, at the rate of a complete four month growing season every 20 seconds. The technique enables the researchers to see immediately the effects of a wide variety of possible conditions.

Mowery points out that it would have taken at least four years to generate the information needed for the charts from a field program. Using the computer, the entire project took only six months to complete.

The charts represent one of the finishing touches to the European red mite integrated control program which was originated and developed by Dean Asquith, professor of entomology, and his associates at the Fruit Research Laboratory. Mowery reports that the entomologists find that the use of the mite's predator is particulary effective because the pest goes through eight generations in an average season, rapidly enabling it to develop resistance to chemical pesticides.

The use of predators in the mite control program does not eliminate spraying against other pests, but the chemicals used do not inhibit the ladybird beetles and, therefore, cause less shock to orchard ecosystems. The recommended chemicals also have less residual effect making the technique, overall, a more environmentally sound system than programs relying entirely on spraying.

In addition, in early trials in Adams county, Pa., the program reduced the amounts of miticides growers needed by 50 to 70 percent even without the chart as a guide to spraying. That's a saving of about $25 per acre or $5,000 per year on the average 200 acre commercial orchard.

Mowery regularly commutes the 110 miles to the Fruit Laboratory for two days and then spends the rest of his work week on the University Park campus. He maintains an office in the Department of Statistics where he has easy access to the University's IBM 370-168 computer and where he can interact with students and faculty members in the department. He says that he finds the ability to talk to other statisticians stimulating and helpful and notes that this work has been helpful, in turn, to the department as a source of "real" data for use in classes.

Mowery's project is part of a larger pome and stone fruit research program at the Fruit Laboratory directed by Asquith. The program is part of a nationwide effort to discover new principles, strategies, and tactics for pest regulation and control in major crops and is supported by grants from the National Science Foundation and the Environmental Protection Agency.