

How Blitecast cuts sprays, costs by 50 percent

SAN FRANCISCO, Ca. - For years, most East Coast potato growers have successfully controlled the dreaded disease late blight, by using 10 weekly sprays of a controversial chemical. At \$3.65 and a pound-and-a-half per acre, it seemed a small cost to protect potatoes against the fungus that had caused the infamous Irish famine.

However, in Pennsylvania alone, potato farmers each summer apply 375,000 pounds of fungicide, at a cost of nearly \$1.4 million.

In the early 1970s, Penn State researchers developed a computerized pest forecasting system, that predicted peak damage periods. Called Blitecast, the system permitted potato growers to cut the number of sprays to five or six, and to reduce their spraying costs by almost half.

The technique worked "incredibly well" for several years. Participating farmers saved a lot of money, and hundreds of thousands of pounds of chemicals were not needlessly used.

Still, many potato farmers continued to "play it safe," routinely spraying at least 10 times each growing season.

Why didn't all Pennsylvania potato farmers choose to use Blitecast?

That's what Penn State plant pathologist David R. MacKenzie has been trying to determine.

"The answer," MacKenzie told the annual meeting of the American Association for the Advancement of Science, "seems to be that, although we scientists can develop such forecasting methods, we can't yet tell farmers what the risks are."

"Quite often," said MacKenzie, a noted potato researcher and pioneer in computerized plant pest forecasting, "we don't understand why particular forecasting techniques work, and thus can't promise they'll work every time."

"It's thus possible that an explosive pest problem, such

as potato late blight disease, could result from a forecasting failure—and thus could spell disaster for a particular grower."

Essentially, MacKenzie maintained, pest forecasting methods must be far better understood, if they are to be truly valuable to any crop production scheme.

In the 1970s, he explained, researchers devised tremendously successful complex formulate to forecast peak pest periods for several crops. But while, for example, it's thus possible to calculate that a certain combination of weather factors is likely to lead to large pest build-ups and hence to crop losses, scientists don't understand the underlying assumptions that make the system work.

"More importantly," MacKenzie adds, "we don't understand how best to deliver such forecasting information to farmers, in a system they'll accept. This is true for potatoes, for which the prediction system is most advanced, or for such other crops as apples and alfalfa."

Penn State researchers, including computer scien-

tists and electrical engineers, have developed several "delivery" systems. MacKenzie said they are ready to test these systems on farmers, to help determine how to best help farmers with pest management decisions.

To determine whether it pays to spray—whether a particular insect or disease is about to do more damage per acre than the cost of spraying—a grower can use a computer, a programmable pocket calculator, an economic injury level graph, or can call on a county agent for help.

All of these Blitecast systems represent different ways of interpreting the previous week's weather information. To make a forecast, a farmer monitors his field's temperature, humidity, rainfall and other factors.

Under the original Blitecast system, factors phoned their findings to the University, where a giant computer analyzed the probabilities, and predicted whether spraying was needed.

To reduce the growing cost

burden to Penn State, Dr. MacKenzie and five undergraduate students developed a mini-computer, called a "Blitecaster."

Available since 1977 for \$1100, the device automatically monitors field conditions. To determine whether to spray, a farmer only needs push a button.

"Though the Blitecaster has performed very well, and now can be used for both late blight and green peach aphid," MacKenzie said, "only a few Pennsylvania potato farmers have bought one. While a grower could recoup the machine's cost in one or two seasons and thereafter save a lot of time and money, most farmers seem unwilling to try."

Given pest forecasting systems' tremendous success and potential, he continued, it's important to learn more about both the systems and which ones growers will accept.

Seeking these answers, MacKenzie has begun analyzing vast computer stored weather records, and corresponding incidences of late blight. He's particularly interested in understanding the relationship between the past weeks' weather and the need to protect a crop the following week—a major assumption of Blitecast.

Ultimately, he hopes to learn not only how Blitecast works, but whether there's a better way of protecting crops—a way most farmers will accept.

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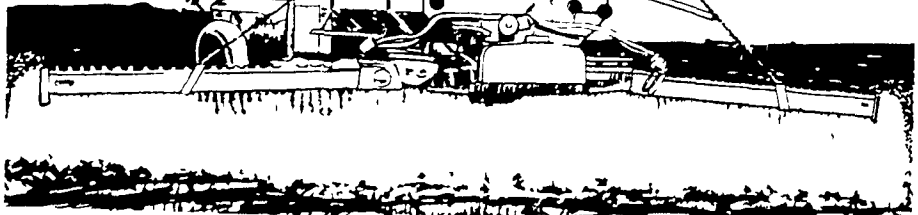


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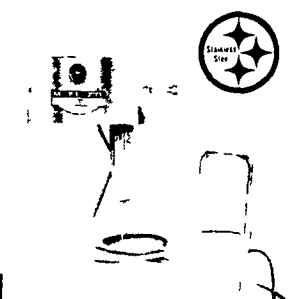
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