

Greenhouse Screens Bar Whiteflies, Slash Insecticide Use

WOOSTER, Ohio — You put screens on your windows to keep out house flies. Why not do the same thing to your greenhouse for whiteflies?

That's the question a team of Israeli researchers asked, then answered, in defeating a devastating tomato disease.

The team, led by Menachem J. Berlinger of the Gilat Regional Experimental Station, found that greenhouse "insect exclusion screens" are an effective way to prevent tomato yellow leaf curl virus, or TYLCV. The screens, installed in vents and doors, keep out tobacco whiteflies, the tiny vectors of

the virus.

Furthermore, an Ohio State University scientist working with the team determined that the screens are cost-effective, too — they make economic sense for producers as well as consumers — and said there's high potential for their use in the United States.

Robin Taylor of Ohio State's Department of Entomology said the screens have led to an enormous reduction in pesticide expenditures by Israeli greenhouse tomato growers and to millions of dollars in savings by Israeli consumers.

"I've seen the economics. I've seen the biology. It's a technology that makes logical sense," said Taylor, whose economic evaluation of the screens, co-authored by Berlinger and three other Israeli researchers, appeared in the journal Crop Protection.

Until the screens were widely used (starting in the mid-1990s), tobacco whiteflies were the biggest pest problem of Israeli greenhouse tomatoes. Most of the spraying that was done on the crop was done to kill whiteflies to keep them from spreading TYLCV. Yet growers still lost tomatoes and profits.

Israeli consumers, meanwhile, spent an estimated \$16 million to \$32 million a year more on tomatoes from 1980 to 1990 — because of lower production and higher production costs — than they would have if screens had been used.

Now, although fungicides and spot insecticides are still needed — when, say, whiteflies breach a break in a screen, usually a rare event — overall pesticide use on Israeli greenhouse tomatoes has plummeted: from a high during infestations of one or two sprays a day to one or two a season. And TYLCV no longer controls profits or

prices.

"The study showed that the screening is beneficial to both the public and the producer, which is actually not very common," Taylor said. "Usually there's a winner and a loser. In this case there are two winners. The losers, if any, are the chemical companies."

The biggest winners were the early adopters: the first growers using the screens. They enjoyed about six years of better than average production, since other growers' yields were still being cut by TYLCV, and much better than average prices, since Israeli tomato demand is inelastic (it's not affected by the price) and overall production was down.

That's one of the study's main messages, Taylor said: that the early adopters of a new technology gain the most, since once the technology is widely adopted the advantage over other growers disappears.

"If you're an early adopter with the right technology, you make a killing," he said.

So will U.S. greenhouse growers — early, late or in between — adopt screening? Some already have, including in California and North Carolina.

For now, however, the tendency is to avoid the risk. Greenhouse screening isn't widely known, used or marketed here. It's also a capital cost (as opposed to pesticides, an operating cost), and for some growers, raising even the modest amount of capital needed — about \$10,000 per acre — may be difficult.

Growing interest in sustainability, not to mention integrated pest management and organic farming, may change this.

"A lot of people are concerned about making agriculture sustainable," Taylor said. "One of the ways to do that is to reduce inputs, and one of the big inputs is pesticides."

"Insect pests are serious business for greenhouse growers," he said. "Screening and other strategies could virtually eliminate greenhouse insect pests and the need to use pesticides to control them."

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