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ANALYSIS

UCS says EPA Bts around the bush

Officials at the US Environmental Protection Agency (EPA, Washington, DC) expect to receive by mid-March a major new EPA-commissioned report from the EPA advisory panel—drawn from academia and the US Department of Agriculture—on insecticide-resistance management strategies for crop plants genetically engineered to produce *Bacillus thuringiensis* (Bt) insecticidal toxins. However, although activists say that “immediate action” is needed to preserve the long-term efficacy of Bt toxins, agency officials will not yet say what policy changes, if any, they are considering until they have assessed the new report.

This Bt report results from the EPA’s 2-day scientific review—the Scientific Advisory Panels Meeting on *Bacillus thuringiensis* Plant Pesticides and Resistance Management—that the agency sponsored in February. In prepara-

UCS: Immediate action is required because US agriculture is already 3 years into a multimillion acre experiment on resistance development and transgenic crops.

tion for the meeting, agency analysts compiled a review, “White Paper on Bt Plant-Pesticide Resistance Management.” Independently, a group of Bt experts, commissioned by the Union of Concerned Scientists (UCS, Washington, DC, and Cambridge, MA), issued a report with a more pointed analysis, “Now or Never: Serious New Plans to Save a Natural Pest Control.”

These reviews focus on concerns that the use of engineered Bt-producing crops will lead to target pest insects with resistance to Bt toxins, reducing the usefulness of these insecticides. To impede the emergence of resistance, many experts recommend that use of Bt-containing crops be “managed” first through the use of plants that produce high doses of insecticide, and second, by establishing Bt toxin-free “refuges” in which Bt-susceptible insects can flourish, diluting the Bt-resistant insect population.

“While the theory of high-dose expression coupled to effective structure refuge is relatively straightforward, its implementation has been controversial,” EPA analysts note in their white paper. “There is disagreement as to what is the necessary arrangement

and relative size of Bt and refuge field plots, [and] the nature and objective of performance-monitoring activities.”

Based on industry reports, EPA officials note that in 1997 as many as 2.4 million acres of genetically engineered Bt cotton were planted, about 4 million acres of Bt corn, and 25,000 acres of Bt potatoes. So far no elevated resistance to the insecticides, produced by these engineered crops, has been detected in field settings, according to officials.

In the UCS-commissioned report, six widely recognized, university-based Bt experts—David Andow from the University of Minnesota (St. Paul), David Ferro from the University of Massachusetts (Boston), and Bruce Tabashnik, from the University of Arizona (Tucson), plus EPA advisory panel members Fred Gould, from North Carolina State University (Raleigh), William Hutchison from the University of Minnesota, and Mark Whalon from Michigan State University (East Lansing)—recommend a series of steps to preserve the utility of the Bt insecticidal proteins. They recommend that all Bt resistance management plans be “enforceable” by the EPA. In addition, they recommend that Bt-engineered crops be grown with “relatively large” refuges of 20–50% of affected acreage, that the “spatial relationships” between a particular Bt-engineered crop and its refuge be “specified,” and that detailed Bt-monitoring and Bt resistance-response plans be put in place.

“Immediate action is required because US agriculture is already 3 years into what has become a multimillion acre experiment on resistance development and transgenic crops,” say Margaret Mellon and Jane Rissler of UCS. They are renewing demands presented to the agency early in 1997 (*Nature Biotechnology* 15:409, 1997) and questioning how many more times the issue has to be debated before a strategy is developed. “If EPA is to meet its responsibilities to save Bt...the scientific advisory panel meeting [in February 1998] should not become another excuse to delay action strengthening the plans until next year or even later.”

However, agency officials say they need to assess the latest white paper before making any new policy decisions about Bt crops, according to Janet Anderson of the EPA Office of Pesticide Programs. “We went to a lot of expense to bring [the panel] here,” she says. “We will look carefully at their report and then decide what to do.” Moreover, Anderson notes, “There is not a lot we can do because people have already bought seeds and are planting or getting ready to.”

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