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Learning from past experience

To the editor:

In the article "Bt resistance management" (*Nature Biotechnology* 16:144-146, February 1998), the authors summarize many of the ideas and actions suggested by participants in the US National Forum on Insect Resistance to *Bacillus thuringiensis*, held in Washington, DC. But these ideas try to reinvent the wheel by neglecting the vast knowledge and practical experience of resistance management strategies gained with sprayed insecticides, fungicides, and herbicides. The problem remains exactly the same—the difference is in handling pesticidal seeds and plants instead of pesticides. Accepting and using this parallel could be a



powerful and timesaving approach. The sustained use of a single pesticidal mechanism against insects, pathogens, or weeds throughout a crop's season and from year to year will inevitably lead to a buildup of resistance.

Cooperation is another key factor in managing resistance. In a book review titled "The Economics of Resistance Management," Smith writes: "To date, with pesticides, there have been many more resistance management failures than successes. The commonest failure is to act quickly enough. . . The key is communication and cooperation between growers, extension workers, scientists, government ministries, distributors, and agrochemical companies. No matter how well thought out, any strategy will not tackle the resistance unless all the growers in an area understand and apply it."¹ Learning from those failures and successes and taking into account the revised recommendations² from the Global Crop Protection Federation's (Brussels) Insecticide/Herbicide/Fungicide Resistance Action Committees (IRAC,

HRAC, FRAC) should be helpful in many ways.

One country, Australia, has started to regulate mandatory resistance management strategies for pesticide use—through industry cooperation, its mandatory herbicide labeling scheme was begun in 1996. Each herbicide is assigned 1 of 14 letters, depending on its mode of action. Users can now distinguish products with different modes of action so they can be rotated to help prevent resistance³, and similar insecticide and fungicide schemes are planned for the future.

Formidable problems can be expected if we have to implement, for example, resistance management strategies for crop varieties that are insecticide- and herbicide-resistant. We should instead look at the past successes and develop initiatives that build on knowledge already gained to attain an effective resistance management strategy.

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1. Smith, A. June 13, 1997. *AGROW* No. 282:17-18.
2. *Resistant Pest Management*, Summer 1996. 8:62-64; *AGROW Supplement*, Autumn 1996:31-35; *Pesticide Outlook*, October 1995:30-33; *FRAC Monograph No.1*, 1995:24-30.

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