

RNA-interference pesticides will need special safety testing

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Standard toxicity testing is inadequate to assess the safety of a new technology with potential for creating pesticides and genetically modifying crops, according to a Forum article published in the August issue of *BioScience*. The authors of the article, Jonathan G. Lundgren and Jian J. Duan of the USDA Agricultural Research Service, argue that pesticides and insect-resistant crops based on RNA interference, now in exploratory development, may have to be tested under elaborate procedures that assess effects on animals' whole life cycles, rather than by methods that look for short-term toxicity.

RNA interference is a natural process that affects the level of activity of genes in animals and plants. Agricultural scientists have, however, successfully devised artificial "interfering RNAs" that [target genes](#) in [insect pests](#), slowing their growth or killing them. The hope is that interfering RNAs might be applied to crops, or that crops might be genetically engineered to make interfering RNAs harmful to their pests, thus increasing crop yields.

The safety concern, as with other types of genetic modification and with pesticides generally, is that the artificial interfering RNAs will also harm desirable insects or other animals. And the way interfering RNA works means that simply testing for lethality might not detect important damaging effects. For example, an interfering RNA might have the unintended effect of suppressing the action of a gene needed for reproduction in a beneficial species. Standard laboratory testing would detect no harm, but there could be [ecological disruption](#) in fields because

of the effects on reproduction.

Lundgren and Duan suggest that researchers investigating the potential of interference RNA pesticides create types that are designed to be unlikely to affect non-target species. They also suggest a research program to evaluate how the chemicals move in real-life situations. If such steps are taken, Lundgren and Duan are optimistic that the "flexibility, adaptability, and demonstrated effectiveness" of RNA interference technology mean it will have "an important place in the future of pest management."

More information: RNAi-based Insecticidal Crops: Potential Effects on Nontarget Species. Jonathan G. Lundgren and Jian J. Duan, *BioScience*, 2013.

Provided by American Institute of Biological Sciences

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