

Genetics gives hope of species-specific pesticides, minimal collateral damage

Imagine a future in which we no longer use pesticides. Instead, we use weevilicides or rootwormicides, targeted with exquisite precision at the genes that make these species unique.

This is the promise of RNAi techniques, as outlined in [this recent *New York Times* article by Andrew Pollack](#).

Scientists are working on ways to use RNA — a type of genetic messenger molecule — to trick the genomes of pests into shutting off vital genes. Better still, if scientists only target genes specific to the organism they're fighting, "civilian" casualties can be avoided. (Though, as Pollack points out, this isn't as easy as it sounds; one study found that RNA meant to kill rootworms also killed ladybugs.) It's hard to imagine a more fundamental level of attack, and the appeal of a pesticide with less ecological "splash damage" is undeniable.

Pesticides are a huge problem. It's one of the few things both sides of the GMO debate can agree on. The less we can get away with using, and the more narrow and controlled their effects, the better.

In our never-ending war against pests, be they plant or animal, we started with an approach akin to carpet-bombing and have slowly been refining our techniques. The abuse of pesticides essentially kick-started the environmental movement as we know it when Rachel Carson wrote *Silent Spring* chronicling the devastating effect overuse of DDT was having on our bird species.

Since then, we've adopted a variety of alternative techniques, from more carefully designed and deployed pesticides to ecological controls similar such insuring a healthy population of predatory ladybugs to keep the aphids in check.

Genetic engineering has offered us perhaps the biggest milestone in pesticide refinement, allowing us to create crops that produce their own insecticides (Bt crops) or crops which are immune to herbicides (Roundup-ready). In the former case, only insects which eat the plant are exposed to the toxin. In the latter, farmers are able to wipe out many varieties of weed in one well swoop without fearing for their crop of choice.

None of these approaches is perfect, but it's hard to argue that a more precise pesticide would not be a good thing. If we have to wage war, let's do so with minimal collateral damage.

Additional Resources:

- "[Crops that can genetically modify their pests](#)," Motherboard
- "[Monsanto wants to help honeybees fight mites with biotech](#)," MIT Technology Review
- "Video animation: RNA interference," Nature