Gene Flow from Transgenic Crops to Wild and Weedy Relatives: When Is It a Problem? (C04-snow090352-Oral)

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Abstract:

Gene flow between crops and wild plants is often cited as a biosafety issue for transgenic crops. Gene flow occurs when pollen moves from a crop to a wild relative, or vice versa, and genes from their offspring continue to spread via the dispersal of pollen and seeds. Crops such as canola, rice, wheat, sorghum, sugar beet, sunflower, squash, lettuce, and radish have sexually compatible, weedy relatives in the USA. Crops and weeds often exchange genes, but transgenes are potentially more diverse and more effective than genes used in conventional breeding. Crop genes can persist in weed populations for many generations, even when first-generation crop-wild hybrids have lower fitness than their wild counterparts. Using sunflower as a case study, we found that a Bt transgene can be highly beneficial to wild sunflower populations. In the short term, the spread of transgenic herbicide resistance via gene flow may create logistical and/or economic problems for growers. Over the longer term, certain weeds are likely to benefit from transgenes that confer resistance to ecological factors such as herbivores, diseases, or harsh growing conditions.

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