

Genetically Modified Crops and IPM Adoption

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Abstract

In 1997 I issued a position statement from the Leopold Center for Sustainable Agriculture at Iowa State University that the Center would not sponsor research designed to “develop or expand the adoption of systems incorporating herbicide-tolerant crop varieties but will support research that includes evaluation of these technologies and their consequences as part of diverse cropping systems”.

This policy, which provoked considerable comment, was based on my belief that a broad-spectrum pest control such as glyphosate was not compatible with a sustainable agriculture. Further, it did not seem to be part of bio-intensive IPM. The policy came from views I developed beginning in 1989.

In this presentation, I review the attributes of currently approved genetically modified herbicide resistant soybean (HRSB) and corn (HRC), and genetically modified corn for control of European Corn Borer (BtECB) and Corn Root Worm (BtCRW).

I present a series of matrices evaluating these crops against attributes of bio-intensive IPM and sustainable agriculture. While the HRSB and glyphosate does an excellent job controlling most nuisance weeds and BtECB has been quite effective in control of European Corn Borer, neither of these pest control systems consistently increase producer profits. This is due to decline in yield in the case of soybean, and increased seed costs in the case of Bt corn. Developing pest resistance is a major concern with these crops. While it is claimed that HRSB and HRC aid in soil conservation by minimizing or eliminating tillage, their introduction appears to be coincidental with the increased popularity of conservation tillage. And conservation tillage has declined somewhat in recent years while land in HR crops has increased. Further, they have not lessened pesticide use, have minimized options for crop rotations beyond a two crop system, and have little or negative effect on beneficial insects. Glyphosate resistant weed species are on the increase.

The success of the herbicide tolerant crops lies in the simplified management they offer. This enables larger farm operations and fewer producers on the land. Hence they are little different from other technologies that have been part of the long-term trend of labor displacement and substitution of energy-intensive inputs for management.

Further, their widespread acceptance has greatly altered the economic, political and social landscape of the global food systems. Although agriculture will not likely revisit the issues surrounding approval of these crops, society must question the wisdom of further development of single gene GM crops for pest control.