Organic Research Projects on Field Corn Breeding and Testing
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We have been involved with several research projects aimed at identifying and developing field corn varieties that are especially appropriate for organic growers in New York. Objectives include the following:

1. Evaluate public corn hybrids and varieties in replicated, small plot trials on two organic farms in each of multiple years, to identify those that are best adapted and most productive in New York.
2. Evaluate the same hybrids at two conventionally managed sites to gain an understanding of how similarly or differently hybrids rank in organic and conventional management systems.
3. Evaluate ten or more public inbreds that comprise these hybrids in organic fields in each of multiple years to determine the potential of these parents for organic hybrid seed production in New York.
4. Backcross the gametophytic sterility, white cap, and brown midrib traits into several public inbreds for later use in producing organically grown corn hybrids, as this combination of traits will minimize the potential for fertilization by other dent corn pollen (including pollen from genetically engineered varieties) and allow visual identification of outcrossed plants.

These projects have been on-going for a number of years. Our variety evaluations on organic farms have led to identification of two Cornell-developed field corn hybrids that are good options for organic growers in New York and for which organic hybrid seed production can be done here. Pilot productions of both hybrids were carried out on one or two organic farms in 2008 and some seed was sold for 2009 planting. Larger scale organic seed production of one of these hybrids is underway this year. More promising hybrids for New York’s organic growers are in the pipeline awaiting sufficient years of testing data to identify those that are truly the best.

We are breeding parents of our most promising hybrids to incorporate into them three traits: gametophytic sterility, which reduces the competitive ability of any pollen not carrying the same form of the gene (i.e., any pollen from standard commercial U.S. dent hybrids), and white cap and brown midrib, which are visible marker genes that would identify any seeds (for white cap) or plants (for brown midrib) that result from pollen contamination. These tools will allow organic seed producers and organic grain producers to minimize chances of pollen contamination and to visibly identify (and rogue out if they choose to) those seeds or plants that have come from pollen contamination. Since this is a gradual process, we have several more generation of breeding to be done before we have hybrid with all three of these traits ready for field testing.

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