Corn Rootworm Resistance

With the advent of triple-stack seed corn, many farmers feel that they don't have to worry about some of the pests that they used to. They perceive problems caused by corn borer and root worms to be issues of the past. The new genetics available in seed today are outstanding, but we as farmers and crop advisors need to take a pro-active stand to keep those genetics protected against Mother Nature. Controlling volunteer corn in soybeans and always planting 20% of your corn acres as refuge acres will help with this possible problem.

Western corn rootworm and Northern corn rootworm are leaf beetles that feed predominately on corn. Rootworms overwinter as eggs that were deposited in the soil the previous growing season. The eggs generally hatch from late May to mid-June, about the time that corn is in the four-leaf stage. The eggs hatch into larvae, which feed on the corn's root system for three to four weeks, during which time they pass through three growth stages, known as instars. At maturity, the third instar transforms into a pupa, and after a week or two of inactivity, emerges from the soil as an adult beetle. The beetles feed on corn foliage, pollen, and silks around mid-July. The adult beetles are active for 10-12 weeks, during which time they feed, mate, and deposit their eggs in the soil where they overwinter.

Corn rootworm feeding has commonly been found to be more of a problem in corn on corn situations since the beetles would only lay their eggs in corn fields. A new biotype of the Western corn rootworm has been found depositing its eggs in soybeans however, so the corn rootworm is now capable of causing injury in first year corn also. This is when the seed genetics are great!

So why all of the talk about resistance and how does it happen? Volunteer RR corn has become a very common weed in RR soybeans. Beetles feed on that volunteer corn and receive a sub-lethal dose of BT (Bacillus thuringiensis), which puts them in a prime position to breed a susceptible female. Just like weeds are becoming resistant to glyphosate, the insects could become resistant to the genetics bred into the corn. Controlling the volunteer corn when it is less than 12 inches tall is critical.

Planting at least 20% of your corn acres in refuge is another practice that will help preserve the modern genetics that we use. The refuge should be planted with a similar hybrid at the same time as the triple stack corn. The primary purpose of the corn refuge acres is to maintain a population of corn insect pests that are not exposed to the BT proteins found in YieldGard or Herculex corn. That lack of exposure to the BT proteins allows susceptible insects to mate with any rare resistant insects that may emerge from the BT corn. Susceptibility to the BT proteins will then be passed on to the offspring.

Modern technology is great, but we all have to do our part to combat resistance.