Effective rootworm control safeguards yields

BLOOMINGTON, Ill. – "In terms of economic damage over a wide geographic area, corn rootworm is probably the number one insect problem in corn," according to Dr. Mike Turner, manager of entomology and pathology research for Funk Seeds International. Studies have repeatedly shown that one rootworm per corn plant can cost a grower eight-tenths of a bushel in yield loss per acre.

Dr. Turner says rootworms are a perennial pest throughout the Corn Belt. There are three species: the western, northern and sourthern. Although one species usually predominates in a field, Dr. Turner notes that two and sometimes all three species may be present, depending on the geographic location.

The adult beetles of the western rootworm are yellowish with a dark stripe on each wing cover. Northern rootworm adults are pale yellow as they emerge from the ground in midsummer, later turning a uniform green. Adults of the southern species are yellowish green with 12 black dots.

The western rootworm interbreeds with the other two species, and the larvae and adults of the mating closely resemble the western rootworm parent. The western rootworm has been expanding its range in recent years, moving in a northeasterly direction across the Corn Belt.

Rootworms can reduce corn yields in several ways, Dr. Turner says. Larvae of the northern and western species eat on the surface of the soil. They gouge out holes and tunnel lengthwise into the roots. Southern rootworm larvae also feed on the roots, but do not tunnel lengthwise. They feed on the growing points of young corn plants while they are near the soil line, and may cause seedlings to wilt and die. Such root pruning weakens the plant's root system and reduces yields, Dr. Turner explains, adding that lodging may also result.

In addition to reducing anchorage and the plant's ability to take the nutrients and water required for good yields from the soil, the Funk scientist says the adults of all three rootworm species feed on corn silks. When this occurs before pollination, this too can reduce yields, Dr. Turner says. The western rootworm is especially damaging in this respect.

Several factors determine the capacity of corn to tolerate rootworm damage. Dr. Turner says these include the strength of the root system, the number of roots the plant produces and its ability to regenerate roots, the stage of growth when attacked and how favorable growing conditions are after the rootworm larvae have attacked.

According to Dr. Turner, Funk Seeds evaluates its inbred lines, present hybrids and those under development for their ability to tolerate rootworm damage at all Funk research stations where corn rootworms are a problem.

"We continue to test hybrids that have already attained the G-Hybrid rating to evaluate how tolerant they are to rootworm damage," he says. "We're taking materials that are new to develop tolerance as we develop the hybrids. We'll throw things out very early in the program that are not tolerant, and this will allow us to carry greater tolerance right along with our high yielding capacity.

"When we talk about tolerance, we're talking about two things One is the number of roots that a plant produces and the second is that plant's ability to regenerate roots if some of its roots are destroyed by the corn rootworm. The better adapted a plant is at regenerating roots or the more roots it may have to begin with, the less damage is apt to occur from rootworm larvae damage."

Dr. Turner says a root-pulling technique developed by Funk is being used to evaluate each hybrid's tolerance to rootworm damage under heavy infestion. The physical resistance to being uprotted by the special mechanical device that is employed is a function of the number and size of healthy roots each plant has near the end of the growing season, he explains. Visual observations are also made, such as whether or not the feeding of the rootworm larvae has caused lodging.

Ray Sullivan, a Funk agronomist, says some growers think there's little danger of rootworm damage in first-year corn following soybeans because the beans are not a good host crop for a build-up of rootworm populations.

While this is true, he points out that a soybean field can be a good place for rootworms to multiply to economically damaging levels if it is weedy.

"If there's a weedy soybean field, whether it's grasses, broadleaf weeds or volunteer corn, the weeds will furnish the rootworm beetles with a food supply while they are mobile and depositing eggs for the next generation, from mid Summer on," he says. "When flowering, these weeds serve as hosts for the beetles, which feed on the pollen.

"In a clean soybean field, the problem is less likely to occur, but rootworm beetles will migrate to a soybean field, particularly if it is close to a corn field or if it is dry and the soybeans are lusher than the surrounding vegetation."

Sullivan encourages growers to apply a soil insecticide when planting corn is a field that had been in soybeans the previous year especially if the field was weedy or had volunteer corn.

Several soil insecticides, including Amaze, Counter, Dyfonate, Furadan, Lorsban, Mocap and Thimet, give good rootworm control, the agronomist says.

He continues: "I've seen situations where there's been a 25- to 30-bushel yield loss in first-year corn from corn rootworm because the grower didn't treat for the insect."

While some attempts have been made recently to control rootworms by aerially spraying fields with a Sevin oil formulation while the adult beetles are mobile, Sullivan says this would work only if large areas of corn were sprayed as needed throughout the egg-laying period, which lasts until frost. Field scouting by a past management consultant is a must in such an approach to rootworm control, he adds.

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