

Corn Talk News

RESEARCH UPDATE



CORN TALK NEWS

PENNSYLVANIA MASTER CORN GROWERS ASSOC., INC.

IPM RESEARCH ON FIELD CORN PROVIDES ANSWERS

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New York's field corn has been valued at \$350 million in recent years, so learning sound ways to protect this crop from pests is a high priority. Researchers at Cornell University are working with funding from the New York State Integrated Pest Management Program to fine-tune ways for farmers to keep production high and environmental risks low.

Predicting Western Corn Rootworm Injury. Many growers continue to be concerned about western and northern

corn rootworm. Corn rootworm larvae, which feed on the roots of field corn, can weaken the plants to such a degree that they topple over. Scouts currently gauge the risk of rootworm injury by counting the adult beetles on corn plants. If the action threshold is reached, the following year the field might be planted to a different crop, or an insecticide is applied. Recent studies suggest that the threshold is right on target for silage corn, but needs refining for use with grain corn. Because unnecessary soil insecticide use can cost producers \$14 to \$16 per acre and increase the risk of ground and surface water contamination, improvements to pest assessment methods are needed.

In 1994, IPM researchers evaluated the effectiveness of

three methods. They tied yellow sticky cards to corn stalks so they could check for adults, counted live adults on the plants, and made egg traps. These traps were plastic containers of clay "kitty litter" that were buried in the ground, camouflaged with a corn leaf, and later examined for any eggs that females would have laid in this "soil." Through this research, more accurate economic injury levels will be established. For example, similar research suggests that if 100 rootworm eggs per row foot are found in silage corn, or 300 eggs per row foot are found in grain corn, farmers might decide to treat or rotate the field out of corn the following year. In a related project on silage corn, researchers determined that manure applications of 20 to 40 tons per acre increased plant height and the crop's tolerance to rootworm.

Velvetleaf Threat Depends on Weather. Velvetleaf, a prolific weed with velvety, heart-shaped leaves, is not easily controlled by the preplant herbicides applied to fields. Farmers might ignore low populations of velvetleaf if they could be assured that their corn yields would remain high. For four years, crop scientists have been determining what economic threshold, if any, exists for this weed so that farmers can decide

about additional control measures. This painstaking research involves hand-weeding of plots to allow a specified number of velvetleaf plants to grow, then taking "canopy measurements" from a view of 4 feet above the ground to determine what portion of a square meter is covered by the weed leaves or by corn leaves. At the conclusion of the 1994 field season, researchers confirmed that when velvetleaf is in competition with corn (dry years), yields can be reduced by 48 percent because plants are moisture-deprived. In wet years, corn plants will be able to tolerate substantial competition from velvetleaf. Two obstacles to implementation of weed thresholds are the accuracy of long-term weather predictions and future implications for weed seed production.

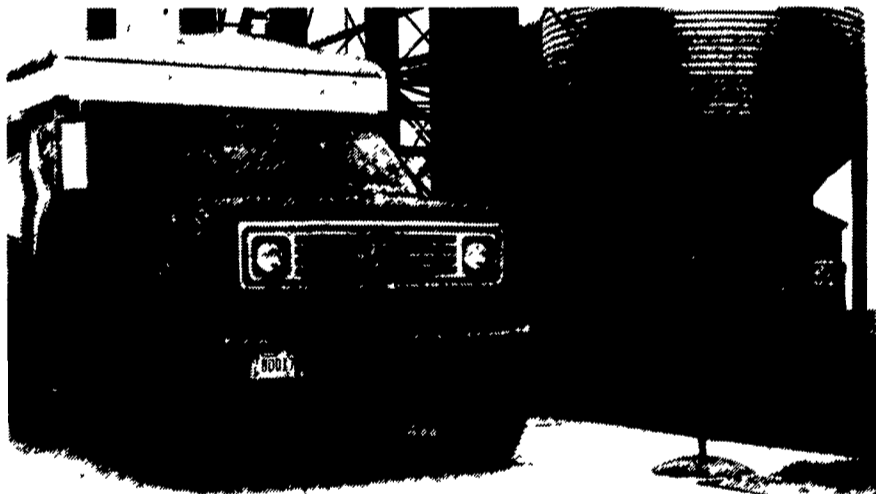
Rotating Corn with Soybeans Shows Benefits. This past year entomologists, pathologists, and soil and crop scientists began a second phase of a project to determine the best cultural practices for grain corn. They concluded that in rotated corn, chemical inputs can be greatly reduced or eliminated. In the past, the researchers demonstrated that planting a non-corn crop for one year can control corn rootworm and eyespot disease, and increase yields. They also showed that

corn and soybeans can be grown with less herbicide by applying the chemical in a band and cultivating once. In that demonstration, weed control was adequate, and yields were the same as crops managed traditionally. Two rotation plans were studied: continuous corn, and corn rotated with soybeans (which is useful as a cash crop and has had few pest problems in recent trials). These schemes were combined with two tillage systems, moldboard plow and conservation tillage. Conservation tillage systems keep topsoil and residues in place. For example, the chisel plow, which shatters the soil, turns over less soil than the traditional moldboard plow. Although the chisel plow is currently used on 30 percent of the state's corn acreage, use is likely to increase.

Research on production and pest management with this implement has just begun in New York. The final variable in the research was the pest management system. Researchers tested three approaches: cultural (rotary hoe plus cultivation), chemical (insecticide and broadcast herbicide), and reduced-chemical (banded herbicide) plus cultural. The 1994 data suggest that in nonrotated corn, reducing chemical inputs may be difficult.

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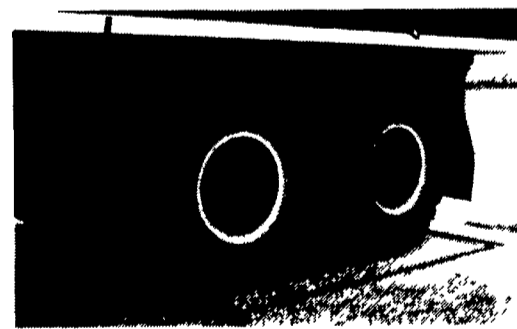
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