Insect Problems in No-Till Soybeans and Corn

No-till culture represents a major ecological change to many insects and mites. Tillage is extremely disruptive of soil insect habitat and produces high mortality of many pests. Thus, generally no-till insures greater survival of many pest and beneficial insects that may remain within the no-till field or move to other fields and/or crops. The full consequences of a widely practiced no-till culture are difficult to predict but some short-range consequences are apparent.

No-till soybeans planted into small grain stubble do not appear to suffer more overall insect damage than conventionally tilled soybeans of similar variety, planting date, and row width. Although more seedling loss is probably encountered in no-till, soybeans are not a population sensitive crop and therefore this increased plant loss is compensated for by increased plant size. No-till soybeans following small grain are usually seriously infested with corn earworm but this is due to lateness of planting, not no-till culture. Insect management for no-till and conventional till soybeans is identical. The unanswered question with no-till soybeans regards the survival of pest species which can infest other crops as well as soybeans. Armyworm, brown stinkbug and other pest insects build up in wheat and move to other areas.

Corn Problems

No-till corn presents a different situation since it is plagued by several kinds of soil insects and it is a plant population sensitive crop. Tillage destroys or disrupts soil insects and reduces populations by killing or forcing these pests to move. This effect is lost in no-till. Also, in no-till the killing of winter annual weeds or cover crops with herbicides presents the plant feeding insects three basic options: (1) move out of the field, (2) feed on those young, tender corn seedlings, or (3) die.

Another factor that fits into the picture of more insect damage is the increased probability of cool, wet conditions. Such conditions lead to slow growth and, because small seedlings are more readily damaged, slow growth decreases the crop's tolerance to insects. These conditions make insects a more serious threat in no-till corn, as compared to conventional culture.

Management of seedling corn insects in no-till follows a systemic approach and is focused on producing a vigorous, fast growing crop and on reducing populations of seedling insects.

One of the most important aspects in producing a vigorous no-till corn crop is advanced planning and site selection. Poor drainage, pH, fertility, and weed management can greatly affect plant vigor and insect damage. By giving up tillage, the options to correct drainage, pH and many fertility problems (i.e. phosphorus and some micronutrients) are lost. Heavy weed growth in the previous crop can foster the buildup of overwintering insects, such as cutworms, which may attack the no-till corn crop.

Because of these factors, advanced planning is needed so that fields to be planted into no-till are left in good condition. Also, site selection is crucial during the year of no-tilling so that a no-till crop will not be placed into a field with critical, yield reducing problems. Insects generally affect a poor crop more seriously than a healthy crop and attention to these factors helps insure a vigorous, tolerant crop.

Management Skills

Variety selection, plant population, and planting accuracy may greatly influence insect damage. Some hybrids grow off better in cool, wet conditions than others. Since no-till conditions favor low soil temperatures and fast grow-off is related to less insect damage, hybrid choice aimed at selecting vigorous germination and grow-off is important. Stalk strength is another important characteristic since plant residues and insect damage tend to foster stalk rots.

Initial stand and planting accuracy must be closely watched. Corn is a population sensitive crop and affordable plant loss is directly influenced by seeding rate. A farmer who plants less than the recommended plant population cannot tolerate additional loss to insects. On the other hand, seeding at 10 percent to 15 percent over the recommended population for each hybrid allows for some loss without affecting yields. Placement of seed either too deep or shallow can reduce vigor or increase exposure to pests, particularly insects and birds. Planter regulation is more difficult and more critical in a no-till situation and added attention is usually needed.

Growth promotion through the use of pop-up, starter, or banded fertilizers is frequently a good insurance policy on cool, wet-natured soils. No-till favors slow warm-up and phosphorus is tied up under these conditions; purple, phosphorus-deficient plants are much more susceptible to insect damage. Pop-up or starter treatments utilize a high analysis, low salt, fertilizer containing nitrogen and phosphorus (ratio 1 to 3 or 4, i.e. 10-34-0, 6-18-0, 18-46-O). Pop-up is placed into the seed furrow and utilizes liquid fertilizer (i.e. 10-34-o) at no more than 50 lbs/A; do not use on sandy soils. Starter treatment is placed to the side (about one inch) of the seed furrow and can include liquid or dry fertilizer (i.e. 10-34-0 or 18-46-0) up to 100 lbs/A or more; starters may be used on light soils. These treatments will produce vigorous, early growth

and work well with soil insecticides in protecting plants.

Rotation and Insecticides

Reducing the numbers of potential corn seedling pests involves rotation and soil insecticides. In no-till, rotation is even more important than in a conventional system since the tillage effect is lost. Soil insecticides also are recommended for no-till corn. Furadan 10G (10-20 lbs/A-furrow), Counter 15G (6.5-13 lbs/A-furrow), or Lorsban 15G (6.5-13 lbs/A-banded) are suggested. Higher rates should be used if more than a light infestation is expected (i.e. 50% to 100% above the lowest rate). Lorsban 15G is unique in that it is active on cutworms, a common problem on no-till corn.

Postemergence treatments for armyworms, cutworms, or billbugs may also be necessary in no-till corn. However, treatment should only be done if needed and this implies scouting. The threat of cutworms and other insects is serious enough to warrant checking no-till corn on a weekly basis from about 2 inches until 16 inches tall. Thresholds are influenced by plant population, and 5 percent or more damaged plants can be tolerated in full population stands, but 2 percent damage may be economic in fields with marginal or deficient stands.

Lorsban, Dylox or Proxol, or Sevin may be used postemergence on cutworms. Billbug treatments should be with Lorsban, Furadan, or Counter. Treatments should be directed to the plant base (directed or over-top spray). Lorsban and Sevin may be tied up on soil with high organic matter content.