

INSECT PEST CONCERNS IN REDUCED-TILLAGE CROPS

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INTERPRETIVE SUMMARY

Conservation tillage can impact pest management in crops such as corn, soybeans, wheat, and pumpkins. Crop residue can provide an ideal habitat for certain pest insects as well as some beneficial organisms. This presentation will summarize how reduced tillage might affect different insects of agricultural importance.

Reduced tillage in corn could have the following effects:

1. Increased pest pressure from cutworms. Black cutworm moths prefer to lay eggs in weedy fields and in fields with unincorporated crop residue.
2. Increased slug infestations. Slug densities are higher in fields with unincorporated crop residues and cooler, wetter conditions can lead to outbreaks.
3. Increased pest pressure from armyworms and stalk borers. Moths of these species prefer to lay eggs in fields with more grass weeds.
4. Increased pest pressure from seedcorn maggot. Although no-till corn stubble is less attractive to egg-laying seedcorn maggot flies than where crop residue has been partially incorporated into the soil, a cooler, wetter soil, and an increase in decaying organic matter can lead to problems with this pest, particularly when germination is delayed.
5. Increased pest pressure from wireworms and white grubs. Less soil disturbance and grassy weeds favor survival of white grubs and wireworms in soils.
6. Increased abundance of ground predators such as carabid and staphylinid beetles, which feed on many of the aforementioned pests.

Reduced tillage in soybeans could have the following effects:

1. Increased slug infestations.
2. Increased pest pressure from grasshoppers. Reducing tillage favors the survival of grasshopper species that lay eggs within fields.
3. Possibly less problems with spider mites. Where crop residues slow moisture loss, plants may be less drought-stressed than in conventional tillage. Reducing drought stress reduces mite outbreaks. Also, a reduction in windblown sand onto leaves, provides a less favorable habitat for spider mites to hide from predators.

Reduced tillage in wheat could have the following effects:

1. Increased Hessian fly pest problems. Populations of this pest carry over where wheat stubble is not tilled and volunteer wheat is not controlled. No-till seeding of wheat into other (non-wheat) crop residues poses no problem.
2. Increased infestations of winter grain mite. This mite species spends the summer in the soil at the base of plants in grass residue. Planting directly into residue can lead to mites invading new seedling wheat.

3. Decreased aphid pest pressure. Crop residues may decrease the attractiveness of new wheat stands to airborne aphids in the fall. By spring, it is unlikely that crop residues will affect aphid invasions. In addition, a number of arthropod natural enemies of aphids may overwinter in crop residue and be more prevalent the following spring to eliminate aphid populations.

Reduced tillage in pumpkins could have the following effects:

1. Increased squash bug problems. Squash bug adults prefer to hide in fields with increased crop residue, which provides cover. Densities of this pest are generally higher in no-till pumpkin fields.
2. Decreased aphid pest pressure. Crop residues may decrease the attractiveness of pumpkin fields to airborne aphids. A number of arthropod predators of aphids prefer crop residue as opposed to bare ground, and will be more prevalent to help eliminate aphid populations.