Soybean and Corn Diseases in No-Till Systems

Control of corn and soybean diseases in no-till is based largely on our knowledge of them in conventional tillage systems. One cannot assume that pathogens will behave similarly in conventional and no-till systems because some are known to be reduced by no-till whereas others are increased.

It is important to recognize that reduced tillage changes many aspects about a field that may affect pathogens. It does require us to consider that the control options have changed, particularly for soilborne pathogens. In cases where resistant varieties are available and where rotation can be used, there probably will be little change; where chemical control is required, the disease may have a major impact upon the way the crop is grown.

Good crop husbandry is still basic in crop production. Vigorous growing varieties with disease resistance should be selected when needed. Crops should be rotated as frequently as possible. Adequate fertility helps maintain nutrient balance in the plant and makes it more tolerant to the damage caused by certain pathogens.

Soybeans

Seedling Diseases. Fungicide seed treatments protect seeds and seedlings from several damping-off diseases caused by *Pythium, Phytophthora, Rhizoctonia, Fusarium,* and *Sclerotium*. *Phytophthora* resistant varieties are effective where this fungus is present.

Foliar Pathogens. Many foliar pathogens survive in crop residue. When crops are rotated, foliar pathogens are not any more severe in no-till than in conventional tillage. Several foliar fungicides are labeled for use on soybeans, but the yield increases in North Carolina have not been sufficient to justify their widespread use.

Soilborne Diseases. Phytophthora root and stem rot: Phytophthora in more mature soybeans is minimized by planting resistant varieties.

Southern blight: This disease is caused by *Sclerotium rolfsii.* The fungus survives on plant residue in the soil.

Red crown rot: The causal fungus is *Cylindrocladium crotalariae.* The diseases was reported to be less severe in Virginia in no-till than in conventional plantings.

Nematodes: Populations are likely to remain higher in fields that are not tilled and decrease as more tillage is done. Soybean cyst *(Heterodera glycines),* sting nematode *(Belonolaimus longicaudatus),* lesion *(Pratylenchus brachyurus),* and root-knot *(Meloidogyne incognita, M. halpa, M. arenaria,* and *M. javanica)* nematodes are the principle ones to consider. Crop rotation and resistant varieties are effective but are species specific. Nematicides are difficult to apply in no-till. County agents and specialists should be consulted for the most current practical and legal information on nematicides.

Corn

The disease incidence and severity in no-till corn in North Carolina, as well as in many other states, are similar to conventional planted corn.

Stalk rot: Stalk rot might be decreased in no-till corn.

Aflatoxin: Aflatoxin severity might be less in no-till because there is less moisture stress than in conventional tillage.

Gray leaf spot: This disease is becoming worse in Virginia and Tennessee in reduced tillage systems but not in Kentucky. It is likely where corn is grown continuously in reduced tillage systems in North Carolina that gray leaf spot will increase, if the corn is produced in areas where the environment is favorable for the causal fungus *(Cercospora zeamaydis).*

Nematodes: The effect of nematodes in reduced tillage systems has not been noted to be any worse than they are in conventional tillage. The problem may be enhanced over time in reduced tillage because control of corn parasitic nematodes is largely dependent upon nematicides. There is not a good method of applying nonfumigant nematicides in no-tillage systems.