

Corn flea beetle and Stewart's wilt predictions

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Stewart's wilt is an important disease of sweet corn in New York. The disease is caused by a bacterial pathogen that is vectored almost exclusively by the corn flea beetle. The bacteria overwinter in the gut of adult flea beetles. In the spring, beetles infest early plantings of corn and transmit the pathogen to the plant by feeding and defecating on leaves. Stewart's wilt is characterized by development of conspicuous streaks on the leaves and stalk due to plugging of vascular tissue. Early wilt infections cause reduction of yield in susceptible varieties by reducing stands due to death or stunting of infected seedlings. Seedlings, which survive early infections, remain stunted, tassel prematurely, and frequently produce no ears or nubbins. Disease severity is aggravated by high temperatures, which causes faster development and movement of the bacteria through the infected plants.

Corn flea beetles spend the winter as adults near the soil surface in grassy areas in and around cornfields. Severe winter temperatures can kill most of the population and result in a very low incidence of Stewart's wilt disease the following summer. Thus, a winter temperature index is used to predict the likelihood of Stewart's wilt problems. One forecast uses the number of months with mean temperatures above 24°F for December, January, and February. The Stewart's wilt index (likelihood of wilt problems) is as follows:

Iowa State method	
Number of months > 24° F	Predicted Risk
0	Negligible
1	Low to moderate
2	Moderate to high
3	High

Risk maps can be accessed at http://www.nrcc.cornell.edu/grass/stewart_maps.html. The model does not account for the number of beetles entering the winter, the insulating influence of continuous snow cover on beetle survival, the number of surviving beetles that actually carry the pathogen, the influence of natural enemies and disease on beetle mortality or the effect of varietal susceptibility to the bacterium. Despite these knowledge gaps the model has done well in predicting relative incidence of Stewart's wilt.

Management options for Stewart's wilt disease control include:

- 1) Planting SW- resistant varieties
- 2) Planting with treated seed for susceptible varieties
- 3) Applying a foliar insecticide spray, if needed, to protect seedling corn.