

EFFECT OF TILLAGE AND CROP ROTATION ON THE SUGAR BEET CYST NEMATODE, *HETERODERA SCHACHTII* SCHMIDT, 1871

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ABSTRACT

Sugar beet cyst nematode, *Heterodera schachtii* Schmidt, 1871 has long been known to be a serious pest of sugar beet (*Beta vulgaris* L.). Fields infested with this pathogen exhibit chlorosis and a reduction in tap root size which can lead to decreased yield. The objective of this study was to evaluate the impact of tillage and crop rotation on the sugar beet cyst nematode for potential use as control mechanisms in the North Platte Valley of western Nebraska. A trial was conducted during the 2011 growing season at the University of Nebraska's Panhandle Research and Extension Center with corn, beans and sugar beet in rotation under two tillage conditions (plowed and reduced till). Seven different rotations were present and five rotations were sampled. Soil samples were collected at planting and before harvest. One subsample for each plot was taken to the lab to be analyzed. Cysts were extracted, stained and then counted under a Barska light microscope. A marginally significant tillage x rotation interaction ($F = 3.35$, $P = 0.03$) was observed at planting. At planting, there was a significant difference ($F = 18.8$, $P < .0001$) in the number of eggs counted between the five rotations, with rotations 2 and 5 containing significantly less eggs compared to rotations 4, 6 and 7. At harvest, no tillage x rotation interaction existed ($F = 1.19$, $P = 0.34$). Egg numbers did not differ significantly between the five rotations, or the two tillage regimes. With the exception of plowed plots in rotation 4 (at planting) none of the plots reached the economic threshold level for SBCN in Western Nebraska (2.8 eggs per 1 ml soil). In conclusion it can be said that crop rotation with non- host crops can be beneficial in suppressing sugar beet cyst nematode numbers.