

ENGELKES, CHERYL ANN\*, and CAROL E. WINDELS, N.W. Experiment Station, Univ. of Minnesota, Crookston, MN 56716. - Suppression of *Aphanomyces* damping-off of sugarbeet affected by soil moisture and rotation precrops.

Soil-incorporation of 4-wk-old oat into soil infested with *Aphanomyces cochlioides* reduces damping-off of sugarbeet in the greenhouse. Our objectives were to evaluate 1) effects of soil moisture during oat decomposition (3 wk) and sugarbeet growth (4 wk) on disease and 2) direct effects of volatiles and extracts from several crops on hyphae, zoospores, and oogonia of *A. cochlioides*. When two sandy loam soils were watered to field carrying capacity (FCC, 25% water by weight), root rot indices (RRI, 0=healthy, 100=plants dead) of beets were the same in soils precropped to oat or that were fallow (RRI $\geq$ 95). Reduction of soil moisture to 10% of FCC lowered RRI of beets to 21 when oat was a precrop compared to 80 when soil was previously fallow. When soil-incorporated precrops and controls (sugarbeet, fallow soil) had decomposed for 5 days in desiccators, *A. cochlioides* was exposed to resulting volatiles. After 48 hr, hyphae grew 0.8 cm with barley and sweet corn, 1.1 cm with oat and wheat, 1.4 cm with sugarbeet, and 1.5 cm with fallow soil. Exposure of *A. cochlioides* for 48 hr to root extracts of sugarbeet resulted in germination of zoospores and production of abundant oogonia, which all had antheridia. In comparison, oat root extracts resulted in lysis of zoospores and oogonia had few or no antheridia; wheat root extracts and water controls resulted in motile zoospores and reduced numbers of oogonia with antheridia. In conclusion, effectiveness of a green oat precrop is affected by soil moisture; some precrops directly reduce growth of *A. cochlioides*.