RUSH, C. M.*, K. M. VAUGHN, and J. E. WARNER. TAES, 6500 Amarillo Blvd. W, Amarillo, TX 79106. - Reduction in Aphanomyces seedling disease of sugar beet by management of soil moisture.

Aphanomyces is the most common seedling pathogen of sugar beets grown in the Texas Panhandle. Since the infective unit of this pathogen is the zoospore, we hypothesized that disease control could be achieved by planting seed into a soil wet enough for seed germination but too dry for zoospore movement. In a laboratory study, sugar beet seed, cv. Tx-9, were untreated, solid matrix primed (SMP) or SMP and mixed with a fluid for fluid seeding. Seed were then planted into soils with matric water potentials adjusted to -1 through -9 bars, all of which are too dry for zoospore movement. Neither seed treatment nor soil matrix potential affected overall seed germination, but SMP treated seed and SMP+fluid both germinated faster and had better radicle growth at all matric potentials than the control. Seed with the same treatments were also planted in the greenhouse in boxes containing soil artificially infested with oospores of Aphanomyces cochlioides. Ten boxes were pre-irrigated and allowed to dry down to approximately -1.5 bar before planting. After planting, five of the boxes received a second irrigation. Seed treated with SMP or SMP+fluid emerged faster than non-treated seed in all boxes, but after six days no significant differences existed. After six days, seedling emergence in boxes irrigated post-plant was only slightly better than in pre-irrigated boxes, 100 vs. 97% respectively, but the difference was significant. However, the average disease in boxes irrigated post-plant was 56% and only 5% in pre-irrigated boxes.

WINDELS, CAROL E.*, and DONNA J. NABBEN-SCHINDLER. Northwest Experiment Station, University of Minnesota, Crookston, MN 56716. - Indexing sugar beet fields for root rot potential of Aphanomyces cochlioides.

The purpose of this investigation was to determine if indexing soils for root rot potential in the greenhouse could predict Aphanomyces root rot in the field. In October-November of 1985-89, 100 field sites (that were to be planted to sugar beet the following season) were sampled and indexed for root rot caused by A. cochlioides. Each soil was screened, mixed, planted with fungicide-treated sugar beet seed (25 seeds/each of 4-5 pots), incubated at 17 $\pm$ 2 C until emergence, and then the temperature was increased to 25 C to favor damping-off. As seedlings died they were assayed for A. cochlioides and 3 wk after emergence, remaining seedlings were rated for root rot using a 0-3 visual scale. Based on these values, a disease index was calculated on a 0-100 scale (0 = all plants healthy and 100 = all plants dead). Of the 100 sites indexed, Aphanomyces was detected in 64 sites and the root rot index values for these soils ranged from 6 to 100. The following field season, 56 sites were planted to sugar beet (Aphanomyces had been detected in 42 of these fields); root rot index, yield and quality also were determined. Root rot index values and final seedling stands in the greenhouse assay correlated with yield in 1 of 5 yr ($P = 0.05$). Generally, weather conditions during the other 4 yr did not favor severe Aphanomyces root rot. Although the seedling assay detects A. cochlioides in soil, application of the root rot index to the field is confounded by environmental conditions unfavorable for disease development on sugar beet.