DETERMINING SOYBEAN ROW SPACING EFFECTS ON WEED COMPETITIVE ABILITIES FOR WEEDSOFT. Ryan D. Lins and Chris M. Boerboom, Graduate Research Assistant and Associate Professor, Department of Agronomy, University of Wisconsin, Madison WI 53706.

The effect of soybean row spacing on weed competitive ability should be incorporated into bioeconomic weed management models to improve the accuracy of their yield loss estimates. To determine the magnitude that soybean row spacing affects weed competitive abilities, data was analyzed from five field experiments that were used to validate WeedSOFT. The five experiments were established with one in East Lansing, MI, two in Columbia, MO, one in Arlington, WI, and one in Lancaster, WI during 2000 and 2001. Experiments were arranged in a randomized complete block, split plot design with four replications where the main plots were soybean row spacing. The experiments in Michigan and Wisconsin compared 19- and 76-cm row spacings, while the experiments in Missouri compared 38- and 76-cm row spacings. Herbicide treatments used in individual experiments were site specific and chosen from WeedSOFT yield loss predictions so that the treatments would provide a range of yield loss in each study. Weed free and nontreated controls were also included in each study. Pre-harvest weed biomass and soybean yield were measured in each study. A ratio of narrow row (19 or 38 cm) weed biomass to wide row (76 cm) weed biomass was used to determine the extent that row spacing affected weed competitive abilities for each study. To determine the direct effect of soybean row spacing on weed competitive abilities, the total pre-harvest weed biomass for treatments that were applied to both row spacings were compared. Comparing soybean yields as a percentage of the weed free yield tested the indirect effect of row spacing on weed competitive ability.

The Arlington, WI and both Columbia, MO studies had less weed biomass in the narrow row spacing than in the wide row spacing at $P = 0.1$. The ratio of mean weed biomass in narrow row soybean to wide row soybean was 0.78, 0.63, and 0.87 for Arlington, WI and Columbia, MO in 2000 and 2001, respectively. At Lancaster, WI, the weed biomass in 19-cm rows averaged 81% of the weed biomass in the 76-cm rows, but was not statistically significant. In four of the five studies, narrow row soybean had 2.2 to 8.6 % less yield loss than wide row soybean when expressed as a percent of the weed free yield, but only the Columbia, MO study in 2001 had a significant difference. This data analysis suggests that narrow row soybean can reduce the competitive ability of weeds when compared to wide row soybean. However, the variation in the data of these studies made it difficult to measure differences between row spacings. Further research is needed to more accurately quantify the magnitude of the row spacing effect.