

WEEDSOFT: EFFECT OF TOTAL COMPETITIVE LOAD ON CORN YIELD LOSS PREDICTIONS. William G. Johnson, and Andrew A. Schmidt, Assistant Professor and Graduate Research Assistant University of Missouri, Columbia, MO 65211.

A computer decision aid called WeedSOFT is available for growers in Nebraska to assist in their weed management decisions. WeedSOFT has the potential of being another tool for growers and consultants in other states to use in their weed management decisions if it provides accurate efficacy and yield loss predictions. A regional project was initiated in 1999 to adopt WeedSOFT to other mid-western states. Two years of field trials were conducted in an attempt to evaluate the performance of the program. The objective of this presentation is to evaluate the yield loss prediction in corn in participating states. The herbicide treatments resulting in yield loss predictions of 20% and less were evaluated in Missouri, Illinois, Wisconsin, and Indiana corn trials to evaluate the accuracy of yield loss predictions at or near economic threshold levels. Conventional-till cultural practices were followed to produce corn in these areas. The experimental design of each site was a randomized complete block design with three or four replications. Initial weed counts and corn growth stage was recorded when weeds were 2.5- to 20.3-cm tall. Weed species and densities were entered into WeedSOFT to retrieve a list of allowable treatments ranked by predicted percent maximum yield. Treatments evaluated included a weed-free check, the recommendation that predicted the highest maximum yield, a treatment that will result in a 10% predicted yield reduction, the same treatment followed by cultivation 14 days after treatment, a treatment that will result in a 20% predicted yield reduction, and a cultivation treatment. Visual weed control ratings and weed counts for surviving weed species were collected 14 to 28 days after treatment. Harvest weed counts and yields were recorded in the fall. To evaluate the accuracy of the percent yield predictions, linear regression analysis was conducted on predicted versus actual yield loss values. A slope parameter estimate and coefficient of determination was calculated for each site-year, state, and four corn grain yield categories. A slope value of 1 would indicate a good correlation between predicted and actual yield loss values. The slope parameters ranged from 0.40 to 10.48 when the data were analyzed by site year. Sites that had treatments with consistent control between replications and low variability among weed densities at harvest time had a slope value between 0.6 to 0.81. When the data were analyzed by grain yield categories, sites that had low (<1419-kg/ha) or high (>2145-kg/ha) yields resulted in a slope value of 0.78 and 1.04, while the intermediate categories had a slope value of 2.31 to 3.57 respectively. Actual yield losses were generally greater than predicted yield losses in this version of the software. This would indicate that further modification to the efficacy database, competitive index assigned to the weeds, and yield loss function is warranted.