WEEDSOFT®: A WEED MANAGEMENT DECISION SUPPORT SYSTEM AND TEACHING TOOL. Alex R. Martin*, Professor, Department of Agronomy and Horticulture, University of Nebraska, P.O. Box 830915, Lincoln, NE, 68583-0915.

WeedSOFT® is a Windows based weed management decision support system developed for use in seven North Central states. This effort resulted in each cooperating state having a version of WeedSOFT®, that addresses its unique soil and climatic conditions, weed species and crop production practices. This regional project involves Illinois, Indiana, Kansas, Michigan, Missouri, Nebraska and Wisconsin. WeedSOFT® consists of three modules, Advisor, EnviroFX, and WeedVIEW. Advisor supports preemergence, postemergence and pre + postemergence weed management decisions in four crops: corn, sorghum, soybean, and wheat. EnvironFX supports site and herbicide specific assessment of groundwater contamination potential. WeedVIEW provides visual images as an aid in weed identification.

Advisor computes a crop yield loss and dollar loss based on weed density, weed free yield goal, and expected crop price. Weed management strategies evaluated include cultivation, band herbicide application, broadcast herbicide application, and combinations of these tactics. The user may specify herbicide price, seed cost associated with herbicide resistant crop, application cost, cultivation cost, row spacing, and herbicide band width. Advisor then ranks the available strategies, including cultivation and various herbicide treatments and application methods in order of net return or in order of crop yield depending on the user's preference. Additional herbicide treatment selection criteria based on user input include soil properties, rotational crop, ground and surface water based restrictions, and crop and weed growth stage. Output includes an ordered ranking of weed management strategies based on net return or crop yield and a detailed economic and efficacy analysis of individual treatments. In addition an estimate of each treatments effect on the weed seedbank is provided. New features of Advisor include a seed calculator, tank mix calculator, and field record keeper.

WeedSOFT® is useful in a teaching environment. Learning modules addressing Postemergence Application Timing, Weed Seedbanks, and Environmental Factors have been included in the 2004 version of WeedSOFT®. Among the biological principles that can be illustrated using WeedSOFT® are: differences in competitiveness of different crop species and weed species, the influence of weed and crop growth stage on crop-weed interference, and the influence of production practices including crop row spacing on crop competitiveness. The influence of environmental factors including soil properties and precipitation pattern on herbicide efficacy and risk to rotational crops can be systematically illustrated with WeedSOFT®.

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