

YIELD PENALTY DUE TO DELAYED WEED CONTROL IN CORN AND SOYBEAN. Stevan Z. Knezevic, Sean Evans, and Mike Mainz, Assistant Professor, Graduate Research Assistant, Research Technologist, Haskell Ag. Lab., University of Nebraska, Concord, NE, 68728-2828.

The two commonly asked questions by corn/soybean producers are: (1) how to time post emergence weed control and (2) how much is it going to cost if weed control is delayed. This is especially true for the cropping systems that utilize genetically modified crops.

The first question was addressed using a concept of critical period of weed controls (CPWC). CPWC is a period in the crop growth cycle during which weeds must be controlled to prevent yield losses. Research from University of Nebraska has determined that the length of such critical period was influenced by the cropping practices (eg. nitrogen (N) fertilizer and crop row spacing). Field studies conducted in eastern Nebraska determined the effects of three nitrogen rates on the CPWC in dry land corn and of three row spacings on the critical time for weed removal in dry land soybean. When data was averaged over years and locations, the study in corn concluded that CPWC ranged from V1-V11, V3-V10, V4-V9 and V6-V9 for N-rates of 0, 55, 110 and 210 kg/ha, respectively. Study in soybean suggested that critical time for weed removal coincided with V3, V2 and V1 for soybean row spacing of 7.5", 15" and 30", respectively.

In order to address the second question the yield loss data from the above studies were pooled over years-locations and related to the crop growth stage at the time of weed removal for both corn and soybean. The 5% yield loss was arbitrarily selected as a maximum acceptable loss. The two percent yield loss per every leaf stage of delay passed the critical time of weed removal was determined as the cost of delaying weed control in both corn and soybean. For example, the time (5% yield loss) to control weeds in 7.5 inch rows soybean was the V3 stage. If weed control was delayed to the V4 (fourth trifoliate) the yield loss was 7%, costing a producer about 2 percent in yield losses due to prolonged competition from weeds. The same is true if weed control is delayed past the recommended critical time in other row spacings in soybean and various nitrogen levels in corn. This recommendation is applicable up to canopy closure in corn (about 11 fully developed leaves) and the R3 stage in soybean (beginning pod). If the weed control is delayed further than these indicated stages the yield losses will be much higher than suggested.

In terms of actual economic losses: (a) in corn, it will be about \$4 per acre for every corn leaf stage of delay, assuming a price of \$2 per bushel and a yield goal of 100 bushels per acre, and (b) in soybean, it will be about \$5 per acre for every soybean leaf stage of delay, assuming a price of \$5 bushel and a yield goal of 40 bushels per acre [106].