ECONOMIC EVALUATION OF REDUCING PREEMERGENCE HERBICIDES FOR SITE SPECIFIC WEED MANAGEMENT. Tyler W. Rider and J. Anita Dille, Undergraduate Research Assistant and Assistant Professor, Department of Agricultural Economics and Department of Agronomy, Kansas State University, Manhattan, KS 66506

   The objective of this study was to determine if it is economically feasible to reduce PRE herbicide application rates. Field tests were completed on Field 306 at the Kansas State University Agricultural Research Center, Hays, KS. A premix of 48% flufenacet and 10% isoxaflutole was PRE broadcast in strips at rates of 0, 0.133 kg/ha, 0.278 kg/ha, and 0.406 kg/ha. On 21-23 May 2002, weed species were mapped on a 7.6 x 7.6 m grid with species identified and counted in a 1 m2 quadrant at each grid point.
  The weed species identified lead to the POST broadcast application of a tank mix of 0.001 kg/ha prosulfuron and 0.32 kg/ha sodium salt of diflufenzopyr on 31 May 2002. Weed species were then mapped on the same grid on 12 July 2002 to evaluate the POST application. On 24 August 2002, the corn was harvested as silage. Dry silage weight/ha was recorded for the controls and each herbicide treatment.
   Weed populations observed on 12 July 2002 were used to calculate competitive load values for each 7.6 by 7.6m cell. These competitive load values were used to estimate grain yield. Quadratic production functions were estimated from both the silage yield and estimated grain yield data allowing calculation of the economic optimal herbicide rate and to capture the possible negative relationship of applying too much herbicide.
  Various production functions were estimated and the functions that explained the most variation in the data were optimized.
   The rate of PRE herbicide that maximizes yield using the silage yield model was 0.69 the label rate. The PRE herbicide application rate that maximizes profit was 0.67 of the label rate where price of silage was $0.005/kg and price of herbicide was $0.06/kg. The rate of PRE herbicide that maximizes yield from the grain yield model was 0.71. The rate of PRE herbicide that maximizes profit was 0.63 of the label rate where price of corn was $2.09/bu and price of herbicide was $0.05/kg.
   This study found that it was economically feasible to reduce PRE herbicide application rates and that the economic optimal application rate was near 0.67 of the label rate.