

RISKS OF WEED SPECTRUM SHIFTS AND HERBICIDE RESISTANCE IN GLYPHOSATE TOLERANT CROPPING SYSTEMS. Robert G. Wilson, Professor, Department of Agronomy and Horticulture, University of Nebraska, Scottsbluff, NE 69361.

Experiments were conducted in the field from 1998 through 2002 to determine if glyphosate use patterns in glyphosate tolerant cropping systems influenced weed control by placing selection pressure on weed species, altered weed population dynamics, or lead to the development of glyphosate-resistant weeds. Experiments were designed as a two factorial split plot set in a randomized complete block design with four replications. Main plots were either continuous glyphosate tolerant corn or a rotation of glyphosate tolerant corn, sugarbeet, corn, sugarbeet, and wheat. Sub-plots were glyphosate at 0.4 kg ha<sup>-1</sup> applied twice, glyphosate at 0.8 kg ha<sup>-1</sup> applied twice, a rotation of glyphosate at 0.8 kg ha<sup>-1</sup> applied twice followed the next year by a non-glyphosate treatment, or a non-glyphosate treatment each year. The seed bank was examined each year before crop planting. Weed density was measured before herbicide treatment, 2 wk after the last herbicide treatment, and at crop harvest. During the course of the experiment no weeds were observed to develop resistance to glyphosate. Over the five year period the weed population shifted from a kochia and wild proso millet dominated population to a predominately narrowleaf lambsquarters population. Narrowleaf lambsquarters seed and plant populations increased in areas treated with the low rate of glyphosate but decreased in areas treated with the high rate of glyphosate. Green foxtail and longspine sandbur increased in non-glyphosate treated areas. Narrowleaf lambsquarters increased to a greater extent in the corn-sugarbeet rotation compared to continuous corn. Kochia and hairy nightshade were more prevalent in continuous corn than in the corn-sugarbeet rotation.