

ROW SPACING AND POPULATION EFFECT ON YIELD AND WEED CONTROL IN HERBICIDE TOLERANT CORN. Craig M. Alford* and Stephen D. Miller, Graduate Research Associate and Professor, Department of Plant Sciences, University of Wyoming, Laramie, WY 82071.

Producers in the North Platte Valley of Wyoming and Nebraska have grown corn in 76 cm rows at populations of 28 to 32,000 plants per acre for the past several years. An alternative to this system would be to produce corn and other crops in rows narrower than 76 cm. In a narrow row production system plants are more equidistantly spaced thus allowing for more efficient use of resources such as nutrients, water, and light. Several studies have reported the following advantages of a narrow row corn production system: higher yields, reduced herbicide inputs, improved weed control, decreased soil erosion, as well as more efficient use of light, water, and nutrients. There have been a significant number of studies conducted in other regions of the country relating to the production of corn in narrow rows (< 76 cm) but none in the northern Great Plains.

Studies were conducted over a two-year period to investigate the effects of row spacing, plant population and herbicide treatment on the production of glyphosate and glufosinate tolerant corn under irrigated conditions. In 2001 corn was planted in at three populations, 39,500 79,000 and 118,500 seed per hectare, and at 79,000 seed per hectare in 2002 with all in 38, 56, and 76 cm rows. Each of these combinations was then treated with five herbicide treatments. In the glyphosate system: a pre-emergence application of metolachlor/atrazine followed by an application of glyphosate, a single application of glyphosate, two applications of glyphosate, a hand weeded, and a weedy check, in 2002 two applications of a 0.5 X rate of glyphosate was substituted for the single application, and a treatment containing conventional herbicides was substituted for the hand weeded check. In the glufosinate system: a pre-emergence application of metolachlor/atrazine followed by an application of glufosinate, a single application of glufosinate, two applications of glufosinate, a hand weeded, and a weedy check, in 2002 an application of a glufosinate/atrazine was substituted for the single application of glufosinate, and a treatment containing conventional herbicides was substituted for the hand weeded check. The study was setup as a split plot factorial arrangement in 2001 and a split plot in 2002 with four and three replications respectively. Planting population significantly impacted corn yields in 2001, while row spacing was not significant in either year. All of the herbicide treatments yielded significantly higher than the weedy check in both years of the study. Weed biomass was significantly higher in the low population treatments. Row spacing significantly impacted weed biomass in the glufosinate system in 2001, however, there was a trend towards less weed biomass with reduced row width with glufosinate in 2002 and glyphosate in 2001 and 2002. Most herbicide treatments provided greater than 90% control of broadleaf and grass weeds, both years, the only exceptions were the single application of glyphosate, single application of glufosinate, two applications of glufosinate in 2001 and two applications of a 0.5 X rate of glyphosate in 2002.