KNISS, ANDREW R., University of Wyoming, Department of Plant Sciences, 1000 East University Avenue, Laramie, WY 82071. **Volunteer glyphosate-resistant corn interference in glyphosate-resistant sugarbeet.**

ABSTRACT

Roundup Ready sugarbeet will often follow Roundup Ready corn in many growers' crop rotations. Many growers will rely exclusively on glyphosate for early season weed control in Roundup Ready sugarbeet. Since glyphosate will not control Roundup Ready volunteer corn, it is of interest to know how much volunteer corn is required to cause yield loss in Roundup Ready sugarbeet. The objective of this study was to determine the sugarbeet yield loss caused by season-long volunteer corn interference. A field study was conducted at the Sustainable Agriculture Research and Extension Center near Lingle, Wyoming in 2008. Sugarbeet ('Beta 66RR60') was planted into 30-inch rows at a density of 76,000 seeds per acre on May 14. Soil at the site was a Haverson and McCook loam (45% sand, 35% silt, 20% clay, 1.6% organic matter, pH 7.8). Roundup Ready corn was planted at densities of 1 corn plant per 33, 14, 8, 4, and 2 feet of row, as well as a check treatment with no corn. Plots were kept weed-free by applying glyphosate as needed. Plots were 4 rows wide by 30 feet long and arranged in a randomized complete block design with 3 replications. One of the middle rows from each plot was harvested on October 7, 2008. Root weights were determined in the field, and a sub-sample was then collected and sent to the Western Sugar tare lab for quality analysis. Non-linear regression analysis was used to estimate sugarbeet root yield loss due to volunteer corn density. Sugarbeet yields averaged approximately 25 tons per acre at volunteer corn densities of up to 1 plant per 14 feet of sugarbeet row. However, yield loss increased rapidly as volunteer corn density increased beyond this level. Volunteer corn density of one plant per 12 feet of row caused a 10% yield loss, and one corn plant per 10 feet of row caused a 20% yield loss. The small difference between 1 plant per 12 feet of row and 10 feet of row is rather difficult to assess visually on a field scale, but could have a potentially large effect on sugarbeet root yield. Based on these results, it is imperative that volunteer corn is controlled to prevent yield loss. However, it is unclear the length of time that corn can be left in the field, as this study only quantified the effect of season-long interference. Future research should be targeted at how time of volunteer corn removal affects yield in Roundup Ready sugarbeet.