

EFFECT OF GLYPHOSATE DRIFT DROPLET CONCENTRATION TO IRRIGATED POTATOES. Harlene M. Hatterman-Valenti and Collin P. Auwarter, Professor and Research Specialist, Department of Plant Sciences, North Dakota State University, Fargo, ND 58105

Field research was conducted at the Northern Plains Potato Grower's Association Irrigation Research site near Inkster, ND to determine if increasing the glyphosate droplet concentration by reducing the water volume would increase injury to potato and whether this increase in injury be similar at all growth stages. This was accomplished by comparing plant and tuber injury from glyphosate applied at 20, 5, or 1 GPA to 'Russet Burbank' plants at the tuber initiation (TI), early bulking (EB), and late bulking stages (LB).

The potato variety 'Russet Burbank' was planted on May 24 using a Harrison double-row planter with 12-inch spacing between seed pieces and 36 inches between rows. Glyphosate was applied at one-sixth, and one-twelfth the standard use rate (0.125 and 0.0625 lb ai/A) with a CO<sub>2</sub>-pressurized ATV sprayer equipped with HB/HC #2 and #5 nozzles with a spray volume of 20 GPA (70 psi and 1.8 mph), 5 GPA (25 psi and 3.6 mph), or 1 GPA (25 psi and 7.2 mph). AMS was included to the spray solution and reduced accordingly. The field design was a randomized complete block, factorial arrangement, with four replicates. Maintenance programs were conducted throughout the growing season to apply fungicides and insecticides. Plants were harvested September 25 with a single-row Hasia harvester and then graded at Fargo.

Visual injury symptoms from glyphosate applications were subtle (chlorosis at growing points) regardless of glyphosate rate or application timing. Plants treated with glyphosate recovered quicker and showed less injury symptoms than previous years due to better environmental conditions in 2009. Plants treated with 0.13 lb/A glyphosate at the TI stage when applied at 20 GPA or at the EB stage when applied at 5 GPA had significant marketable and total yield loss from the reduction in tuber size. Plants treated with glyphosate produced similar number of tubers in comparison to the untreated except when plants were treated with 0.06 lb/A glyphosate applied at 20 GPA at the TI stage, which had significantly more tubers. Additional tuber loss would have occurred if tubers were to be sold for fresh market due to growth cracks and elephant hide skin in many of the tubers when plants were treated with glyphosate at the TI or EB stage.