GLYPHOSATE DRIFT TO DRYLAND RED 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 Research site near Grand Forks, ND to evaluate three red potato cultivar's (Red Lasoda, Red Norland, and Sangre) response to glyphosate simulated drift that may have occurred to plants at one of three growth stages (tuber initiation, early bulking, and late bulking. Glyphosate was applied at rates one-third, one-sixth, and one-twelfth the standard use rate (0.25, 0.125, and 0.0625 lb ai/A) at the tuber initiation (TI), early tuber bulking (EB), and late tuber bulking stages (LB).

Seed pieces (2 oz) were planted on 36-inch rows and 12-inch spacing on June 10, 2009. Plots were 4 rows by 25 ft arranged in a split-block design with cultivar as the main factor and the combination of application timing and herbicide rate as sub-plots with 3 replicates. Glyphosate was applied with a CO_2 pressurized sprayer equipped with 8001XR flat fan nozzles with a spray volume of 5 GPA and a pressure of 35 psi. The first application timing (TI) occurred on July 23, 2009. Extension recommendations were used for cultural practices throughout the year.

Red Norland appeared to be the most sensitive cultivar to glyphosate. Plants treated with glyphosate at the TI stage or with at least 0.125 lb ai/A glyphosate at the EB stage produced significantly more cull tubers (< 4 oz) compared to the untreated control. In contrast, potatoes treated with glyphosate at the TI stage or with at least 0.125 lb ai/A glyphosate at the EB stage produced significantly less 4-6 oz. tubers compared to the untreated and other treatments. This resulted in 37 to 50% decrease in marketable tubers size-wise. Unfortunately, excessive tuber cracking and russet skinning occurred with most of the tubers in these application timings, further reducing marketable yields. A slight shift to smaller tubers occurred when plants were treated with 0.063 lb ai/A glyphosate at the EB stage. No yield differences and few visible tuber defects were observed when plants were treated with glyphosate at the LB stage.

Red LaSoda was the next most sensitive cultivar to glyphosate. Plants treated with 0.25 lb ai/A glyphosate at the TI stage or with at least 0.125 lb ai/A glyphosate at the EB stage produced significantly more cull tubers (< 4 oz) compared to the untreated control. Other grade categories were similar regardless of the glyphosate treatments. Marketbale yields were reduced 34 to 57% when plants were treated with 0.25 lb ai/A glyphosate at the TI stage or with at least 0.125 lb ai/A glyphosate at the EB stage. Excessive tuber cracking and russet skinning was most severe in the EB stage with 70 to 100% rejection of marketable tubers due to visible tuber defects.

Sangre was the least sensitive tested cultivar to glyphosate. Plants treated with 0.25 lb ai/A glyphosate at the TI or EB stage produced significantly more cull tubers (< 4 oz) compared to the untreated control. Other grade categories were similar regardless of the glyphosate treatments. Marketbale yields were reduced 31 to 58% when plants were treated with 0.25 lb ai/A glyphosate at the TI or EB stage. Excessive tuber cracking and russet skinning was most severe in the EB stage with 30 to 100% rejection of marketable tubers due to visible tuber defects.

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