

EFFECT OF LATE-SEASON GLYPHOSATE DRIFT TO SEED POTATO. Harlene M Hatterman-Valenti*, Collin P Auwarter, and Paul G Mayland, Assistant Professor, and Research Specialists, Plant Sciences Department, North Dakota State University, Fargo, Fargo, ND 58105.

A field trial was initiated during 2004 at a NDSU Agriculture Experiment Station dryland site near Prosper, ND to evaluate the effect of simulated drift from glyphosate to Russet Burbank and Red Lasoda seed potato during early the early senescence stage. Glyphosate was applied at rates one-third, one-sixth, one-twelfth, one-twenty-fourth, and one-forty-eight the harvest aid rate for spring wheat on September 10, 2004 and September 2, 2005 with a CO₂ pressurized sprayer equipped with 8002 flat fan nozzles with a spray volume of 30 GPA and a pressure of 40 psi. The amount of AMS added to the spray solution was also reduced accordingly. Following harvest, samples from each plot were placed into cold storage until the following March. A subsample from each plot was slowly warmed to initiate sprout formation and the visual evaluation of bud break. The remaining samples were cut into 2 oz pieces with at least two eyes to each piece; dusted with a seed piece treatment, and stored at 65° F with approximately 90% RH until planted. Plots consisted of two 10 ft rows at 36 inch row spacing with a border row on each side and three spacer plants between plots. The trial was arranged as a randomized complete block with four replications. Extension recommendations were used for cultural practices. Plots were desiccated on September 5 and 12, 2005 September ? and ?, 2006. Plot harvest occurred September 21, 2005 and September ?, 2006. Tubers were graded into the various categories shortly after harvest.

Results indicated that glyphosate at 0.0625 lb ae/A or more inhibited tuber bud break by 75% or more compared to untreated. In the field, injury was observed as delayed emergence and in several instances, no plants emerged. In the instances where no plants were present, seed pieces had numerous short sprouts at each eye that never elongated beyond 2 inches in length. Only tubers from the Total yield in 2005 for Red Lasoda was 311 cwt/A for the untreated, which was significantly greater than glyphosate treatments of 0.25, 0.125, and 0.0625 lb ae/A. Yield of tubers \geq 4 oz were similar indicating that the injury suppressed tuber initiation and bulking. Russet Burbank total yield was considerably less at 210 cwt/A for the untreated. Both the untreated and glyphosate at 0.0156 lb ae/A had significantly greater total yields compared to glyphosate treatments of 0.25, 0.125, and 0.0625 lb ae/A. Number of tubers \geq 4 oz data indicated that yield reduction was due to decreased tuber initiation (resorption or tubers smaller than spaces in harvest belt) and decreased tuber bulking. Yield data in 2006 mimicked those of 2005. Results show that even though visible injury symptoms were not obvious following glyphosate treatment, significant injury to daughter tubers can occur. This injury may not be visible until tuber sprouting is to occur.