Timing of Linuron Treatments in Potato Production

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Introduction

Background: Timing of herbicide treatment can be the difference in having a one-pass weed control system or needing multiple herbicide applications. Linuron can provide beneficial weed control in potato, especially when tank mixed with other herbicides. Linuron provides control of hard-to-control weeds such as common lambsquarters, red root pigweed, and nightshade species. However, aerial applications are not allowed and it does not work well in soils with high clay content or high organic matter. It may be advantageous because it may cause less damage to potato plants as they are emerging when compared to other herbicides.

Objective: To determine the effects of linuron plus metribuzin or rimsulfuron treatments on crop injury and marketable yield.

Materials & Methods

Experimental Procedures:

- Location: Ottertail, MN (2014); Inkster, ND (2015); and Park Rapids, MN (2015)
- Cultivar: Russet Burbank or Umatilla Russet
- Treatments:
  - Preemergence (PRE) (Linuron 12 or 24 oz/a + 0.67 lb/a metribuzin)
  - 50-75% emergence (EMERG) (Linuron 12 or 24 oz/a + 0.67 lb/a metribuzin)
  - 4-6 inch tall plants (MIDPOST) (Linuron 12 or 24 oz/a + 0.67 lb/a metribuzin or 1.5 oz/a rimsulfuron)
  - 8-10 inch tall plants (LATEPOST) (Linuron 12 or 24 oz/a + 0.67 lb/a metribuzin)

Measurements

- Crop injury 2 and 4 weeks after treatment
- Harvested and graded yield

Data Analysis

- Proc Mixed model with a Tukey pairwise comparison at P<0.1 with SAS v. 9.3.

Figure 1 . Crop injury 4 and 8 days after emergence treatment on Russet Burbank potato in 2014.

Results & Discussion

Crop Injury

- Crop injury was observed at 4 days after the emergence treatment, but the chlorotic leaves quickly returned to green when evaluated at 8 days after treatment (Fig. 1).
- Crop injury at 2 weeks after treatment was found at all the postemergence treatments from 27 to 48% (Figure 2).
- At 4 weeks after treatment the crop injury persisted on the 8-10 in tall plants (LATEPOST) treatments. This was expressed as a reduction in canopy.

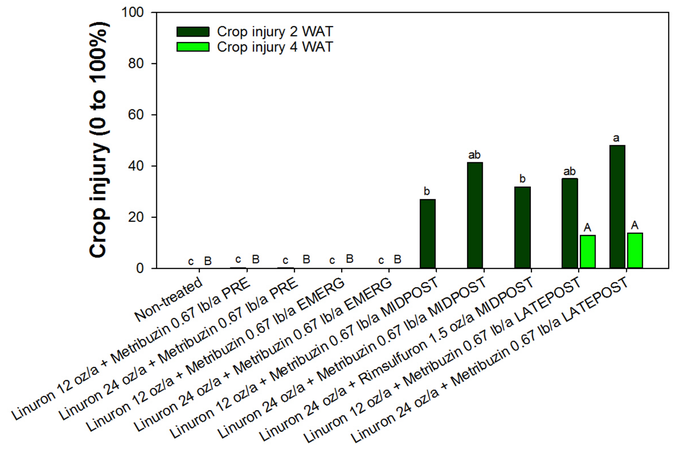

Figure 2. Estimated crop injury (0 to 100%) of Russet Burbank and Umatilla Russet treated with linuron tank mixtures at preemergence (PRE), emergence (EMERG), 4-6 inch (MIDPOST), and 8-10 inch tall plants (LATEPOST). Means followed by the same letter (lower case for 2 weeks after treatment and uppercase for 4 weeks after treatment) are not significantly different according to Tukey pairwise comparison (P = 0.1).

Yield

- Total yield was similar at the preemergence (PRE), emergence (EMERG), and 4-6 inch tall plant (MIDPOST) treatment timings.
- Total yield was reduced when linuron + metribuzin were applied to 8-10 in tall plants (LATEPOST) when compared to EMERG with linuron at 12 and 24 oz/a and the MIDPOST with linuron at 12 oz/a treatments.
- Marketable yield was similar to total yield. There was a numerical advantage when 24 oz/a of linuron + 0.67 lb/a metribuzin was applied at emergence (EMERG).

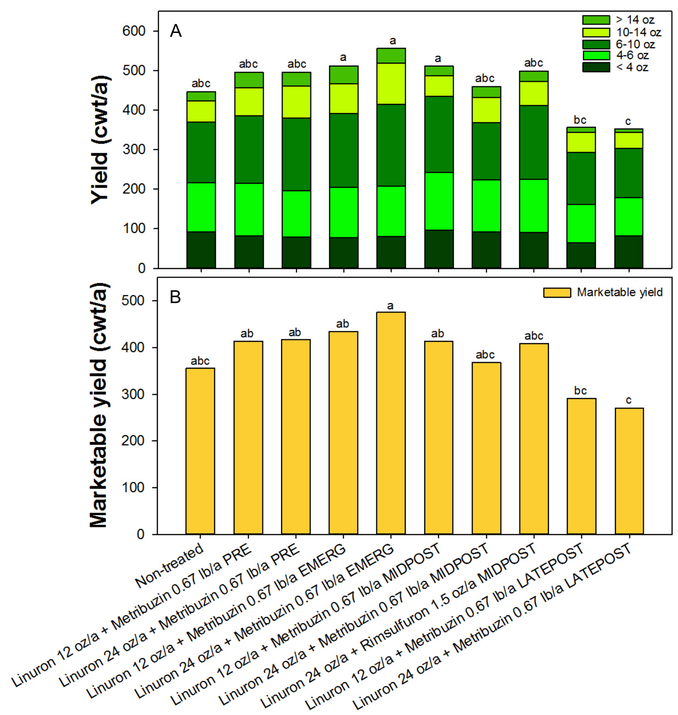

Figure 3. Graded yield (A) represented by the stacked bars and marketable yield (B) of Russet Burbank and Umatilla Russet treated with linuron tank mixtures (described in Figure 2). Total yield means followed by the same letter are not significantly different according to Tukey pairwise comparison (P = 0.1).

Conclusion

- Linuron mixed with metribuzin was a good preemergence herbicide option that did not effect potato yield or quality.

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