Residual Effects of Rejuvenate on Potato Seed for Stem Management

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Introduction of the Problem

Background: Research shows that stem number and tuber number are highly correlated. Physiologically old seed or varieties with many stems can have high tuber sets causing many undersized tubers. Altering the number of stems can be an effective way to control tuber set. Previous work demonstrated that 1-naphtheneacetic acid (NAA), Rejuvenate, treatments on seed can reduce stem number and increase tuber size and marketable yield. Grower practices vary greatly when treating seed. Some seed is fresh cut and planted without delay. Other seed is cut and stored for many weeks, allowing seed to suberize and providing flexibility for the planting schedule. In some cases, bad weather can delay planting. It is unknown what the effects of seed treated with NAA in storage has on stem number.

Purpose of the Project: To determine the effect of 1-naphtheneacetic acid (NAA) treatments on stem number when applied at 22, 15, 7, and 1 days prior to planting.

What Was Done

Experimental Procedures:

- Location: Inkster, ND
- Cultivar: Russet Burbank and Umatilla Russet
- Planting: 4 June 2014
- Plots: 1 row (36 inches) × 25 ft long, replicated 4 times
- Treatments: Rejuvenate applied on seed at 0 and 0.16 fl oz/ton of seed and stored at 50 °F for 22, 15, 8, and 1 day prior to planting (Table 1)
- The field was irrigated with a linear sectional to maintain proper soil moisture. All other production practices were conducted according to recommended NDSU potato production practices.

Measurements

- Stand and stem counts when plants were 8-10 inches tall
- Harvested the two center rows on 20 October 2013
- Potatoes graded on 10 November 2014

Data Analysis

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

Figure 1 .Difference in tuber number and size when comparing a 2 vs. 6 stem Russet Burbank plant.

What Was Found

Stem Number

- NAA reduced stem number when applied at 8 and 1 day prior to planting for Russet Burbank and at 1 day prior to planting for Umatilla Russet (Figure 2).
- NAA had no effect on stem number when applied at 15 and 22 days prior to planting for either variety.
- Numerically, NAA reduced stem number in most cases.

Yield

- Marketable yield did not change, except when comparing treated and untreated at 22 and at 15 days before planting for Russet Burbank (Figure 3).
- Tubers > 6 oz were generally similar, except for Russet Burbank at 22 days before planting.
- In many instances comparing treated versus untreated at each timing, NAA numerically increased yield.

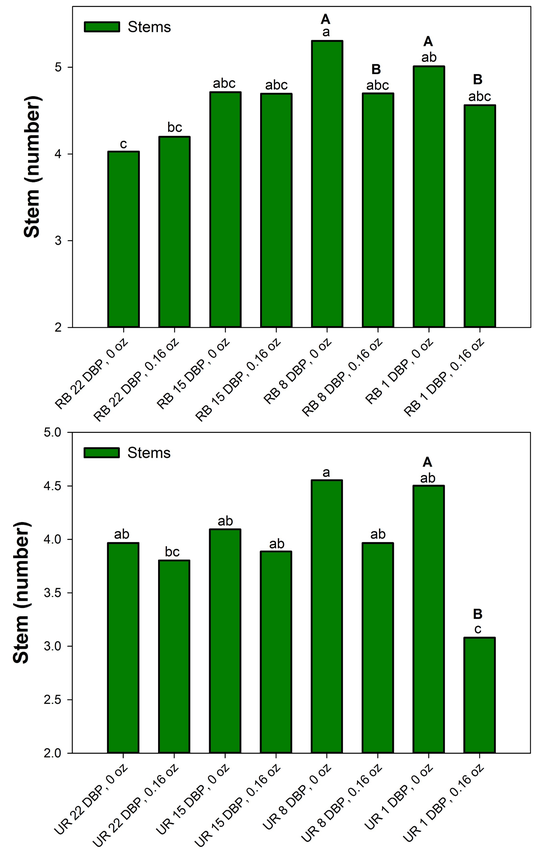
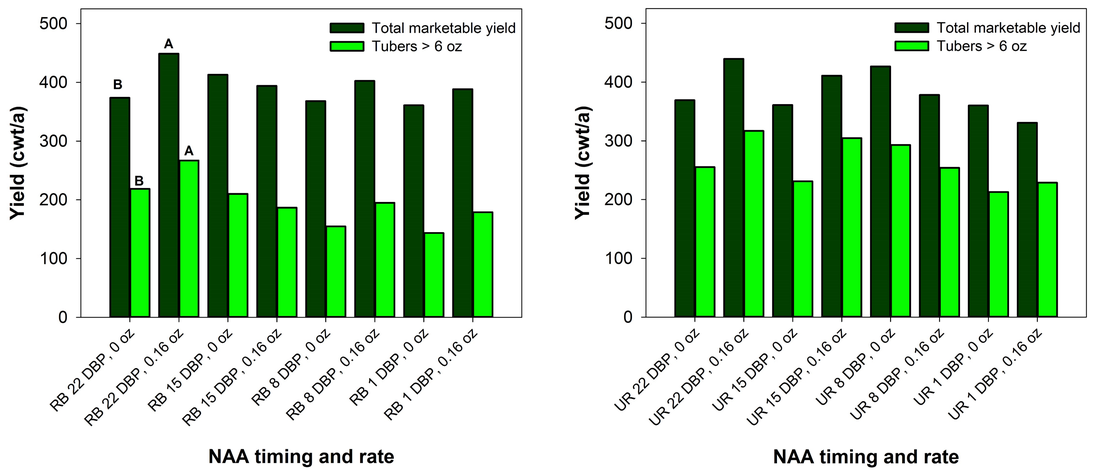


Figure 2. Stem number of Russet Burbank (RB) and Umatilla Burbank (UR) treated with NAA at 22, 15, 8, and 1 day before planting (DBP) at Inkster, ND. Across treatments, means followed by the same lower case letter and within a timing followed by an upper case letter are not significantly different according to Tukey pairwise comparison (P = 0.1).

Figure 3. Marketable yield (tubers > 3 oz) and tubers > 6 oz of Russet Burbank (RB) and Umatilla Burbank (UR) treated with NAA at 22, 15, 8, and 1 day before planting (DBP) at Inkster, ND. Across treatments, means followed by the same lower case letter and within a timing followed by an upper case letter are not significantly different according to Tukey pairwise comparison (P = 0.1).



Take Home Message

- NAA was most effective at reducing stem number when applied to seed close to planting.