

SUMMARY OF 2018 RESEARCH DATA

Field Management of Potatoes for Maximum Tuber Yield and Quality

Nitrogen Fertilizer Management:

Evaluation of two Russet Potato cultivars (AC05039-2RU and CO05068-1RU) for their response to nitrogen fertilizer application rate was repeated in 2018. A total of 269 lb N/acre of available N (soil residual N + irrigation water N + applied fertilizer N) was required for optimum production of AC05039-2RU. To increase premium size tuber yield, N rate of 209 lb N/A of available N is recommended. Tuber external and internal defects were observed to be low (0.2% and 1.5%, respectively) at the 269 lb N/A rate. Tuber specific gravity was high (1.102) at the 269 lb N/A nitrogen fertilizer rate. Urea Ammonium nitrate was used as source of nitrogen fertilizer in this study.

CO05068-1RU is a medium to late cultivar. A total of 272 lb N/acre available nitrogen (soil residual N + irrigation water N + applied fertilizer N) was used to produce maximum marketable (> 4 oz.) tuber yield of 465 cwt/A. Ninety two percent of the total tuber yield were marketable when available N rate of 272 lb N/A was applied. No external or internal tuber defects were observed in this cultivar. Tuber specific gravity was observed to be high (1.095) for CO05068-1RU at the 272 lb N/A fertilizer application rate.

Timing of nitrogen fertilizer application is very important for maximum tuber production of CO05068-1RU. This study was repeated in 2018. The results indicate that to achieve maximum total, marketable, and premium size tuber yield of CO05068-1RU, about 50% of the required seasonal nitrogen fertilizer should be applied pre-plant or at planting, and the remainder of the required nitrogen should be applied in split applications after tuber formation. A total of 150 lb N/A was applied to all treatments in this study. Nitrogen fertilizer application should be completed early in the season to allow for tuber growth and maturity. In the San Luis Valley, nitrogen application should be ended by July 30.

Plant Population Management:

In-row seed spacing management studies were conducted for cultivars CO05068-1RU and CO05037-3W/Y. At between row spacing of 34 inches, potatoes were planted at different in-row seed spacing, ranging from 10 inches to 16 inches. Maximum economic tuber yield and quality was achieved for potato cultivar CO05068-1RU at in-row spacing of 14 inches. This cultivar produced 431 cwt/A marketable tuber yield, which was of 85% of total yield. At 14 inches seed spacing, no external defects were observed on the tubers. Tuber specific gravity was high (1.102) at the 14 inches row spacing.

Similarly, cultivar CO05037-3W/Y produced maximum total tuber yield (528 cwt/A) at in-row spacing of 14 inches. This cultivar is a specialty potato with relatively smaller tuber size. No external or internal defects were observed in this cultivar at the 14 inches in-row spacing. Tuber specific gravity was high at 1.083.

Effect of Potassium Acetate and other Supplemental Nutrient Application on Tuber Yield and Tuber Size Distribution of Colorado Rose.

Supplemental application of potassium acetate (Nachurs K-fuel) improves the production of large potato tubers. A 2-gallon/A in-furrow application of potassium acetate (K-Acetate), followed by a 1-gallon/A foliar application of K-Acetate produced similar tuber yields as applying 1 gallon/A of K-Acetate at 28 days before vine kill, and these yields were higher than all other yields produced from other supplemental nutrient treatments evaluated in this study. The yields produced with supplemental application of K-Acetate ranged from 509-534 cwt/A marketable (> 4 oz.) tuber yield.

No external or internal tuber defects were observed in Colorado Rose when K-Acetate was foliar applied at a rate of 1 gallon/A, at 28 days before vine kill. Tuber specific gravity was highest (1.096) with this nutrient management practice, when compared to all other nutrient management practices evaluated in this study.

Data from this study indicate that the timing and rate of K-Acetate application do influence potato tuber yield and quality. It is suggested that a 2-gallon/A supplemental application of K-Acetate in-furrow or at planting, followed by 1 gallon/A foliar application of the same nutrient, or a 1 gallon/A supplemental application of K-Acetate 28 days before vine kill be practiced for maximum tuber yield and quality.

Evaluation of Advanced Selections in Grower Farms

Several advanced selections from the Colorado State University potato breeding program were planted in grower farms to evaluate their genetic yield and quality potential under grower farm practices. Among the Russets evaluated, CO09076-3RU yielded the highest, with a marketable (> 4 oz.) tuber yield of 454 cwt/acre, which was 83% of total yield.

Among the yellow flesh advance selections planted, CO100972-2W/Y yielded the highest, producing a total yield of 537 cwt/acre, with 57% US #1s.

CO08037-2P/P was the only purple flesh cultivar evaluated. Yields were 290 cwt/acre with 62% US #1s.

For chippers, CO10076-4W yielded higher (564 cwt/acre), with 80% US #1s.

NOTE: For details of all research studies conducted in 2018, please refer to the “2018 Colorado Potato Cultivar Management Research Data Summary” found on this website.