**SUMMARY OF 2017 RESEARCH RESULTS**

**Field Management of Potatoes for Maximum Tuber Yield and Quality**

**Nitrogen Fertilizer Management:**

Two Russet Potato cultivars (AC05039-2RU and CO05068-1RU) were evaluated for their response to nitrogen fertilizer application rate. A total of 180 lb N/acre of available N (soil residual N + irrigation water N + applied fertilizer N) was required for optimum production of AC05039-2RU. This cultivar did not exhibit any external or internal tuber defects at the 180 lb N/acre available N rate. Urea Ammonium nitrate was used as source of nitrogen fertilizer in this study.

CO05068-1RU is a medium to late cultivar, and it is a heavy nitrogen feeder. A total of 240 lb N/acre available nitrogen (soil residual N + irrigation water N + applied fertilizer N) was needed for maximum tuber yield and quality. At 240 lb N/acre available nitrogen fertilizer rate, one can harvest a total of 480 cwt/acre of tubers with, 90% US #1s. At the 240 lb N/acre available nitrogen rate, no external or internal tuber defects were observed in this cultivar. CO05068-1RU has a high specific gravity of between 1.096 to 1.098.

Timing of nitrogen fertilizer application is very important in the production of CO05068-1RU. Studies conducted in 2017 indicate that between 30 to 35% of the required 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. 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:**

Potato cultivar CO05068-1RU was evaluated for its response to plant population. At a row spacing of 34 inches, potatoes were planted at different in-row seed spacing, ranging from 10 inches to 16 inches. Data from this study indicated that planting potato cultivar CO05068-1RU at a row spacing of 34 inches, and in-row spacing of 14 inches produces maximum tuber yield and quality. At this recommended spacing, the cultivar can yield up to 450 cwt/acre, with 90% US #1s. Tuber specific gravity can go up to 1.102 with no tuber internal defects.

**Reducing Irrigation Water Use in Potato Production**

Due to limited irrigation water for potato production in the San Luis Valley, studies were conducted to optimize irrigation water use in different potato cultivars. Results from the study indicated that Russet Norkotah requires maximum ET replacement for maximum tuber yield. In 2017, 22 inches of irrigation plus rain water was measured for 100% ET replacement.

Maximum yield and quality of Canela Russet and Mesa Russet were obtained with 18 inches of irrigation plus rain water. For Yukon Gold, 15 inches of irrigation plus rain water during the growing season was sufficient to produce maximum tuber yield and quality.

Results from this study emphasizes the importance of evaluating for cultivar specific water management in potato production.

**Evaluation of Advanced Selections in Grower Farms**

Several advanced selections from the Colorado State University breeding program were planted in grower farms to evaluate their genetic yield and quality potential under grower farm practices. Among the Russets evaluated, CO08065-2RU yielded the highest, with a total yield of 581 cwt/acre and 92% US #1s. The high yield obtained was produced with 170 lb of applied nitrogen per acre during the growing season.

Among the yellow flesh advance selections planted, CO08155-2RU/Y yielded the highest, producing a total yield of 630 cwt/acre, with 86.3% US #1s. These high yields were produced with 150 lb. applied nitrogen fertilizer per acre during the growing season.

CO08037-2P/P was the only purple flesh cultivar evaluated. Yields were 437 cwt/acre with 62% US #1s. 170 lb. nitrogen fertilizer applied per acre was used to produce this yield.

For chippers, AC01144-1W yielded higher (590 cwt/acre), with 83% US #1s. A total of 160 lb nitrogen fertilizer per acre was sufficient to produce these yields.

**NOTE:** For details of all research studies conducted in 2017, please refer to the “Colorado Potato Cultivar Management Research Data Summary” found on this website.