

2014

DRY BEAN VARIETY TRIAL IN THE SAN LUIS VALLEY

Samuel Y.C. Essah¹, Howard Schwartz² and Mark Brick³

¹ Colorado State University, Department of Horticulture and Landscape Architecture, San Luis Valley Research Center, Center, Colorado.

² Colorado State University, Department of Bioagricultural Sciences and Pest Management, Fort Collins, Colorado.

³ Colorado State University, Department of Soil and Crop Sciences, Fort Collins, Colorado.

Background Information

The San Luis Valley has been known to cultivate dry beans in the past. Varieties that were available at that time were not early maturing enough, and dry bean growers could lose a crop to early fall frost damage. In recent years, earlier maturing dry bean varieties have been developed.

Potato growers in the San Luis Valley have expressed interest in an alternate rotation crop to barley. A study was therefore conducted at the San Luis Valley Research Center, Colorado State University, to evaluate the yield and quality performance of eight dry bean varieties. This study was funded by the Colorado Potato Administrative Committee (Area II).

Experimental Procedure

The study was laid out as a randomized complete block design, with each variety replicated four times. Each plot consisted of three beds, 34 inches center to center. Two bean rows (8 inches apart) were machine planted on each bed (double or paired with row spacing of 34 inch centers). The reason for the 34 inch bed spacing was compatibility with potato row spacing.

Bean seeds were planted on June 9, and harvested on October 13, 2014. The 7 pinto and 1 light red kidney (LRK) varieties entered in this trial included Celrk (LRK), Othello, Croissant, Longs Peak, CO91212-4, CO90848-14, Lapaz, and Stampede.

Field emerged beans were evaluated for earliness of pod maturity, plant population density (established plants per acre), bean yield, and seed weight (size).

Results and Discussion

Visual Observation of Bean Maturity

Beans were rated to be mature when all the leaves and pods had turned yellow. Ranking of the varieties in terms of earliness in maturity was as follows:

1. Celrk, 2. Othello, 3. Croissant, 4. Longs Peak, 5. CO91212-4, 6. CO90848-14, 7. Lapaz, and 8. Stampede, with Celrk being the earliest and Stampede the latest maturing variety.

Celrk was harvested as soon as the pods matured; due to its tendency to shatter after pod drying. The varieties Stampede, Lapaz, and CO90848-14 still had some green leaves and pods on October 10, 2014. Some pods of Lapaz were not mature at harvest; and therefore, exhibited some mouldy seeds during threshing and cleaning.

Plant Population

Plants in a ten foot section of one of the paired row beds were counted to estimate established plants per acre (plant population). In this study, Croissant, Othello, Longs Peak, and Lapaz had the highest plant population per acre (94935, 90322, 88401, and 83020, respectively) – Figure 1. Celrk showed the lowest plant population per acre (42663).

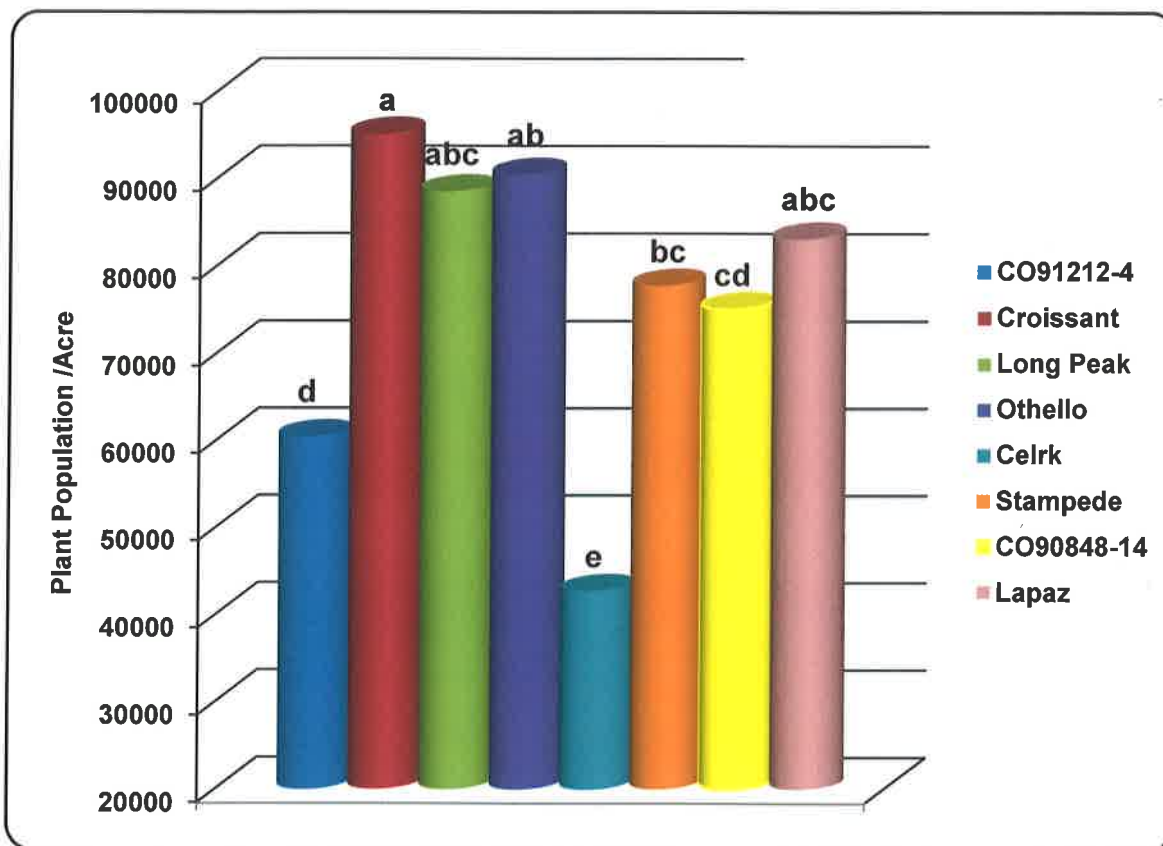


Figure 1. Plant population density of eight dry bean varieties planted in the San Luis Valley of Colorado in 2014; LSD (0.05) = 14902; CV = 13.2%.

Dry Bean Yield

Plants in a fifteen foot section of the middle paired row bed were pulled by hand. After air drying for 3 weeks, the harvested plants were fed into a stationary bean combine for threshing. Threshed beans were cleaned of all trash and weighed for yield. Othello, Croissant,

CO91212-4, and Longs Peak had the highest yields per acre (33, 32, 27, and 27 cwt/acre, respectively) – Fig 2. Lapaz produced the lowest seed yield (17 cwt/acre).

It is interesting to note that three of the varieties with high plant population per acre were among the high yielding varieties. However, variety CO91212-4 which did not have relatively high plant population density (60343 plants/acre) was also among the high yielding varieties in this study (Fig. 2).

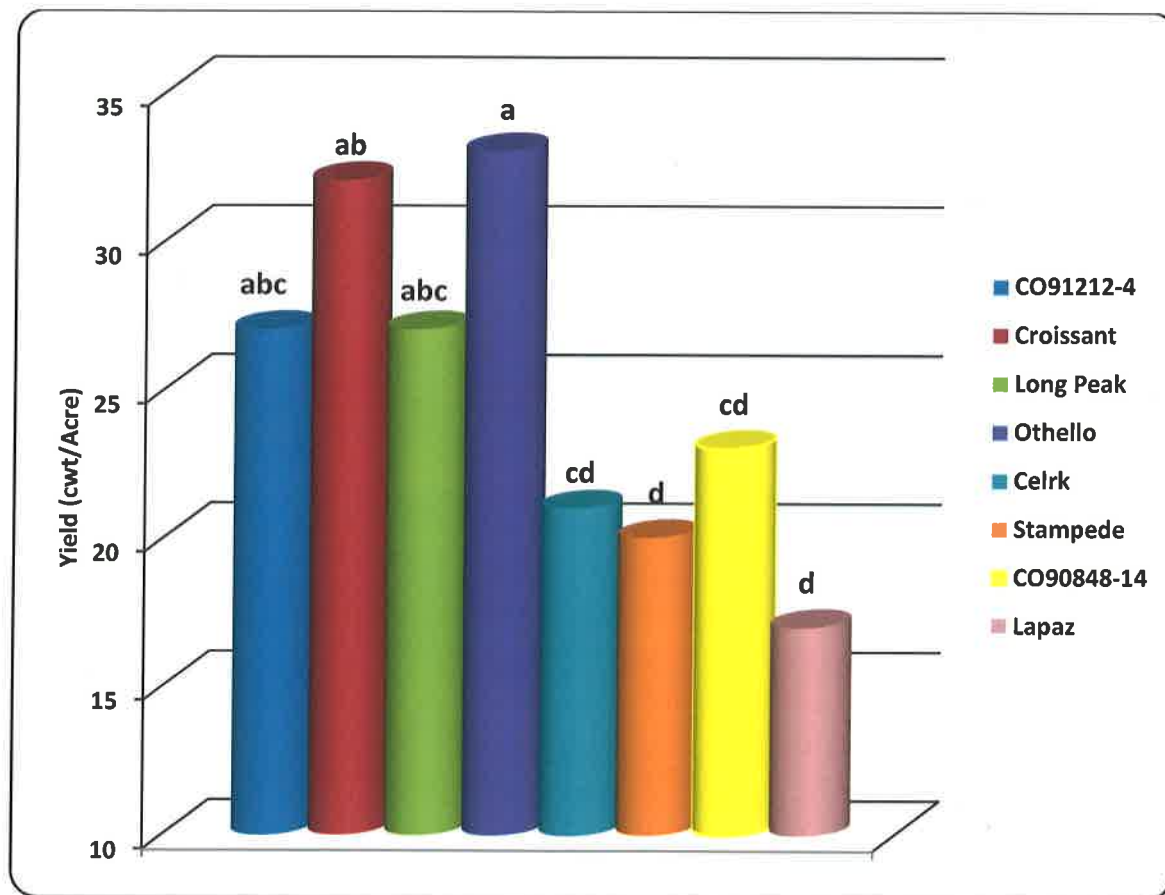


Figure 2. Yield of eight dry bean varieties grown in the San Luis Valley of Colorado in 2014; LSD (0.05) = 6.4; CV = 17.5%.

200-Seed Weight

Seed weight, which is a measure of seed size and/or quality was evaluated. Two hundred seeds were randomly selected from each harvested plot and weighed to evaluate 200-seed weight. Celrk which had the lowest plant population density and was among the low yielding varieties, had the highest seed weight (4 oz.) – Fig. 3. This observation was due to the large seed size of Celrk; which is typical of a light red kidney bean class. Lapaz had the lowest seed weight (2 oz.) and yield (17 cwt/acre), even though it had a relatively high plant population density per

acre (83020). This was because some Lapaz pods and seeds were not mature at the time of harvest.

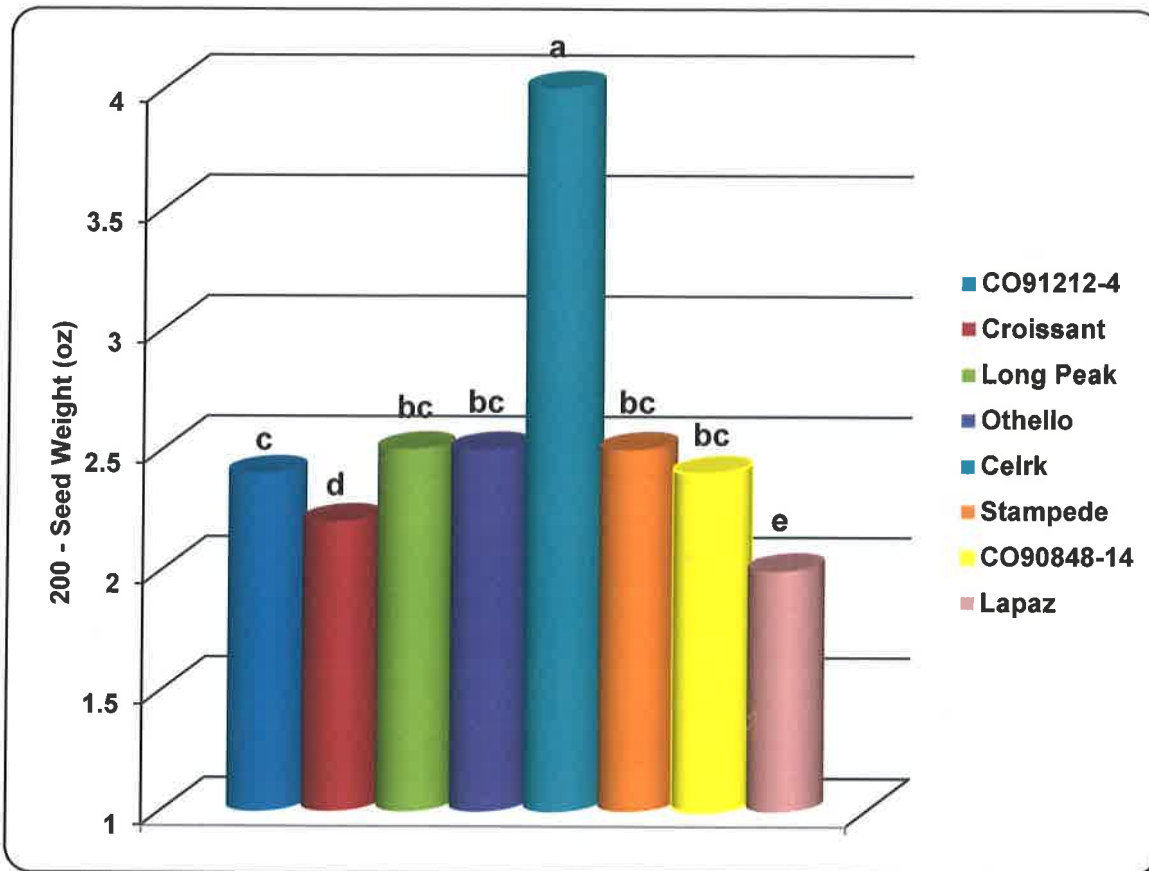


Figure 3. Seed weight of eight dry bean varieties grown in the San Luis Valley of Colorado in 2014; LSD (0.05) = 0.15; CV = 3.9%.

SUMMARY

Results from this study indicate that dry beans can be successfully grown within 120 days in the San Luis Valley with acceptable yields. Varieties that can be successfully planted with acceptable yield include Othello, Croissant, Longs Peak, and CO91212-4.

Dry beans can be planted before June if soil temperatures are 60 °F and above to prolong the growing season in the field. In that case, the variety CO90848-14 could have higher yields with dry pods at harvest. The yield of Celrk which matures very early, with high seed weight, can be improved by increasing the plant population density at planting. Celrk showed the lowest plant population density in this study. Additional testing of these top varieties and other candidates is warranted in the San Luis valley in 2015.