

Irrigated Dry Bean Brandt[®] Product Trial at Otis in 2022

Introduction

A dry bean product application trial was conducted at one location in Northeast Colorado in 2022. The trial consisted of six treatments and an untreated control. Treatments included an inoculant, micronutrient fertilizers (both in-furrow and foliar applied), and plant/soil enzymes. Data collected and summarized included soil test results, field management, yield, seed size, grain moisture, and grain test weight.

Approach

The trial was planted on a farmer field at Otis under center-pivot irrigation. Six combinations of products were tested on the pinto bean variety Windbreaker. The treatments were 1) [EnzUp[®] Zn](#) in-furrow applied at 32 oz/ac; 2) [Smart K B](#), [Smart Trio[®]](#), and [Smart Cu](#) products applied at first bloom at 32, 16, and 24 oz/ac, respectively; 3) [EnzUp[®] P DS](#) in-furrow applied at 4 lb/ac mixed with 4 gal water; 4) [Talc USA Dry Bean Inoculant](#) at ¼ cup per 80,000 seeds; 5) [Smart Quatro[®] Plus](#) and [Smart Cu](#) applied at first bloom at 32 and 24 oz/ac, respectively; 6) [Smart Quatro[®] Plus](#) and [Smart Cu](#) applied at 3rd trifoliate stage at 32 and 24 oz/ac, respectively; and 7) untreated check.

The treatments were replicated six times and planted in 4-row plots that were 10' wide by 31' long (harvested area). Plots were planted using 30" row spacing, and the variety was seeded at a rate of 85,000 seeds/acre. No starter fertilizer was applied. The plots were desiccated to allow for direct harvest using a modified Case IH plot combine equipped with a flex header. Plot seed weight, moisture, and test weight were collected using a Harvest Master H2 grain weighing system on the combine. Seed yield was adjusted to 14% moisture content. Soil samples were pulled at planting (0-12" and 12-24" depth) and were analyzed at American Agricultural Laboratory, Inc. in McCook, Nebraska. Treatment yield results were analyzed using the mixed model procedure in SAS 9.4. Significant differences were determined using an alpha level of 0.05, which protects against false positives (concluding treatments are different when they are actually the same).

Results

The average trial yield was 2,560 lb/ac, test weight was 57 lb/bu, moisture was 9 percent, and seeds per pound was 974. The purpose of the study was to determine how the various product types and applications affected the grain yield compared to the untreated control, therefore a traditional yield table has been omitted. In place of a yield table, a bar graph comparing each product treatment to the untreated control has been provided on the following page. Error bars were added to the bars to help visualize treatment differences (or lack thereof). When the bars overlap between the two treatments being compared, it indicates that those treatments were likely not significantly different.

There were no significant differences among the seven treatment yields ($p = 0.13$), and no significant difference was found when comparing each of the product treatments to the untreated control. Test weight, moisture percentage, and seeds per pound for each treatment were not significantly different among the seven treatments.

Soil test results for the site appear before the yield results. The soil type at the trial site is a Haxtun sandy loam.

Soil Test Results (Pre-Season)

Organic Matter percent	Total N ₃ Available lb/acre	Soil pH	Phosphorus	Potassium	Sulfur (SO ₄)	Calcium	Magnesium	Sodium	Zinc	Iron	Manganese	Copper
			parts per million									
0.8	96	6.6	3	129	5	540	87	23	1.6	1.6	3.6	0.1

*Samples were pulled down to 24 inches, nitrate is total for the 24-inch depth. Other results are based on top 12 inches of soil profile.

Trial Results

