

2019 Bean Variety Trial Results

Takeaways

On two research sites, we dry-farmed Whipple alongside five new bean varieties containing different degrees of drought-tolerant tepary bean genetics. On average, Whipple was the highest yielding variety across sites. In cool, wet weather, Whipple and Sacaton Brown Tepary had the highest and lowest germination rates, respectively. We also conducted a dry-farmed vs. irrigated comparison of Whipple at one site. Dry-farmed Whipple beans yielded 40% of an irrigated control. Dry-farmed Whipple beans dried down faster than irrigated beans, were easier to thresh, and less prone to lodging and mold.

Site Descriptions and Soil Preparation

Peoria Gardens (PEO) has a Woodburn-Willamette silt loam soil series. This site had multi-species, legume/cereal cover crop mix and also had received one ton per acre of Calpril lime in the fall. The cover crop was mowed in late April, and then plots were rototilled in early May and planted on May 8th. Soil was cultivated with a wheel and hand hoe.

OSU Vegetable Research Farm (VRF) has a silt loam Chehalis soil series. A winter cover crop of triticale and field peas had been sown at a rate of 95 lbs per acre each, and then mowed, disced and power harrowed on the 24th of May. Beans were planted on the 28th of May, and all beans were watered-in with 1.5" of overhead irrigation. Whipple beans were also irrigated at this site, using overhead irrigation at a rate of 1.5" per week, until the first week of September. Beans at this site were cultivated using an Allis-Chalmers G tractor, wheel hoe, and hand hoe.

Replicate plot description

Each bean variety was planted in 3 or 4 spatially-randomized replicate plots per site. Each replicate plot was 100 ft² in area, measuring 5' wide and 20' long. In each plot, beans were direct-sown every 6" in double rows, 2.5' apart.

Varieties Trialed

Code	Variety	Description	Source	PEO Yield per Plot (lbs), % Germ.	VRF Yield per Plot (lbs), % Germ.	Average Yield per Plot (lbs), % Germ.
WH	Whipple	Early bush dry bean with maroon and pink speckles	Adaptive Seeds	5.8 78%	4.3 72%	5.1 75%
RO	Rockwell	Extra-early bush dry bean with red splotches on a white background	Uprising Seeds	4.9 55%	4.6 90%	4.7 72%
JM1	Jim Myers 1	Mid-season cross of a common black bean and a tepary; black seeds	Jim Myers	4.1 61%	4.9 84%	4.5 72%
JM2	Jim Myers 2	Mid-season cross of a common black bean and a tepary; mix of white, black, red, and beige seeds.	Jim Myers	4.2 54%	5.0 80%	4.6 67%
JM3	Jim Myers 3	Mid-season cross of a common black bean and a tepary; black seeds	Jim Myers	4.7 54%	4.7 82%	4.7 68%
SA	Sacaton Brown	Early tepary bean with a golden brown seed coat	Adaptive Seeds	3.5 34%	5.3 83%	4.4 60%

Qualitative Observations

The PEO site had low bean germination because cool, wet weather arrived right after planting. Otherwise, plants showed little disease, deer, or insect pressure. Rockwell (RO) was the earliest variety, but was prone to shattering, which caused significant yield losses, particularly at VRF. The Sacaton Brown tepary (SA) also experienced some shattering, but not as much as Rockwell. SA produced densely-branched bushes with moderate runners that tangled plants together, which proved more difficult for mechanical threshing. The three breeding lines from Jim Myers (JM1, JM2, and JM3) contain tepary bean genetics, but their growth habit resembles a tall, common bush bean, which bear their seeds farther off the ground, and thus may be ideal for combine harvesting.

Quantitative Observations

On average, bean germination was 82% at the Vegetable Research Farm, and only 56% at Peoria Gardens. However, average yield per plot was roughly the same between sites (4.5 lbs at PEO and 4.8 lbs at VRF), as beans grown at PEO ultimately produced more per plant than at VRF (0.100 lbs and 0.075 lbs, respectively). Overall, the bean varieties performed differently at each site, with no single bean variety performing consistently better than any of the others. The 2019 growing season was relatively mild, so differences in drought tolerance between varieties may have been more pronounced, had they been trialed in hotter, drier years. Nevertheless, Whipple (WH) produced the best average yield across both sites, largely due to its superior germination under cool, wet conditions at the PEO site. Sacaton Brown Tepary was the highest-yielding variety at VRF, though not at PEO partly due to low germination in cool, wet weather, as tepary beans are adapted to warm, arid climates. Notably, despite containing tepary bean genetics, JM1, JM2, and JM3 germinated significantly better than the tepary beans under cool, wet conditions at PEO.

