

1999 CENTRAL OREGON DRY BEAN VARIETY TRIALS

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Abstract

Results are presented for dry bean variety trials conducted in central Oregon in 1999. Twenty-three varieties of dry bean were evaluated for seed yield in a replicated trial at COARC in Madras, and in an unreplicated small plot trial near Gateway. Three varieties of small red beans and of black beans were tested in on-farm strip trials near Culver and near Gateway, respectively. Among black beans, 'Black Shadow' performed well in the on-farm trials and on-station trials; although in the on-station trial, UI 906 tended to have a greater yield. Among red beans, 'Garnett' and UI 228 performed well in the on-farm strip trial, while 'Ember' and 'LeBaron' gave the greatest yields in the on-station trial.

Introduction

There is continued interest in growing dry beans in central Oregon, and varietal selection remains an issue for farmers. With the support of KBC Trading and local farmers Bryce Vibbert and Lee Bissel, varietal evaluations were conducted in on-farm trials and at COARC at Madras. The objective of these trials was to identify new varieties appropriate for production in central Oregon.

Methods

Evaluations were conducted with 23 varieties of dry bean. All varieties were included in a replicated trial at the research station and in an unreplicated small plot observation on a farm near Gateway. The varieties tested were:

Small Red	Pinks	Blacks	Pintos
NW 63	Rogers 312	T39	Othello
UI 228	UI 537	UI 906	UI 320
UI 239	Rogers 914	Black Shadow	Agassiz
Ember	Rogers 922	UI 911	Pintium
Garnett	PR95-055-2		Pinyata
LeBaron			Topaz
R97030			
U1 259			

Note that the variety 'LeBaron' is a recently released line (from Phil Miklas at Washington State University) that formerly went by the name of 'USRM 11'.

In addition to the small plot studies, a subset of lines was chosen for evaluation in large strip plots as follows: blacks - 'Black Shadow,' 'UI 906,' and 'T39'; reds - 'Garnett,' 'UI 228,' 'Ember,' and 'UI 239'; pinks - 'Rogers 312,' '111 537,' and 'Rogers 922'. The blacks and pinks were

planted in commercial fields of Bryce Vibbert near Gateway, and the reds were planted in a commercial field of Lee Bissel near Culver, Oregon.

On-station trial. The experiment station trial consisted of small plots with 4 rows, 20' long (24" row spacing), planted at a density of 5 seeds per foot of row on 28 May 1999. There were four replications laid out in a randomized complete block design. Weed control was achieved with preemergence application of alachlor at a rate of three quarts per acre, along with hand weeding and cultivation during the season. For fertilizer, 30 pounds of S as gypsum was applied and tilled in with a rotovator ahead of planting. Soil tests indicated that sufficient N was available, so no N was applied at planting. Later on, deficiency symptoms became apparent, so the field was topdressed with 120 pounds per acre of 40-0-0-6 at 33 days after planting (DAP) and 225 pounds per acre of 33-0-0-12 at 41 DAP. All plots were irrigated with a solid set sprinkler irrigation system as necessary to avoid drought stress. Due to an outbreak of white mold (*Sclerotium sclerotiorum*), thiophanate-methyl was applied at a rate of 2 pounds per acre through the irrigation system on August 23.

After plants reached physiological maturity, 10 feet of row out of the center of each plot was pulled by hand for a yield sample. The yield samples were threshed in a small plot combine (Wintersteiger) and seed was cleaned using a benchtop seed cleaner. Seed weight was then recorded and a subsample taken for determination of percent moisture. Yield data was corrected to 14 percent moisture and statistically analyzed (standard analysis of variance).

On-farm trials. A small plot observation of all 23 varieties consisted of four-row plots 20 feet long with 24-inch row spacing, planted at a seed rate of 5 seeds per foot of row on May 28 at a dry bean field near Gateway. The strip plots for the black market class were planted the same day in the same field. The reds strip plots were also planted on 28 May at a field near Culver. All management for these trials was at the farmers' discretion.

The small plots were harvested by hand, transported to COARC, and threshed as noted above for the on-station trial. Yield data for the strip trial with the red market class was obtained by unloading seed from each strip into a weigh wagon as the farmer combined the field. Due to problems with the weigh wagon, yield data for the black market class was obtained by removing parallel sections of 15 feet of windrow from each plot area, transporting them to COARC, and threshing with a small plot combine. No data was obtained from the on-farm strip trial with the pink market class, again due to problems with the weigh wagon.

Results and Discussion

Due to cool spring weather, emergence for the plots occurred from about 13 to 17 days after planting. Nitrogen deficiency symptoms became apparent about 30 DAP and N was topdressed accordingly (see "methods"). There was some outbreak of white mold about 55 DAP. Thiophanate-methyl was applied to control white mold and irrigation was applied more carefully to try and prevent further development of the disease.

Yield data for all the lines in the experiment station trial, sorted according to market class, are presented in Table 1. The new, small red variety 'LeBaron' performed well, though it was not significantly different from 'Ember,' which is currently the most-widely grown small red variety in central Oregon. Except for the small red class, lines that performed well in small plots on the station also tended to perform well on-farm (compare Tables 1 and 2). The exception with the small reds may be because the small red plots were along the edge of the field near a road in the on-farm observation, so there may have been large plot to plot variability; and since it was unreplicated, there is no way to correct for it. Therefore, the small red data in Table 2 should be interpreted with caution.

In the large strip trials, T39 had less yield than did the other black lines. This trend was also observed in the on-station trial. Among the small reds, 'Garnett' appeared to have greater yields than did the other lines on-farm; however, it had the least yield in the experiment station trial. The reason for this appears to be the white mold outbreak at the station. If white mold plots are not included in the analysis, the average yield of 'Garnett' would be 3,290 lb per acre (versus 2,520 with white mold plots). This would put it in the middle of the reds for yield, with no statistically significant difference between it and the best yielders. There was no significant difference between the varieties in disease rating (data not shown); it may be that the 'Garnett' plots happened to be in a bad spot for white mold development. Or, if 'Garnett' is more susceptible to white mold, the effect is subtle enough that our statistics didn't catch it.

Table 1. Initial stand, plants per acre, days to physiological maturity, seed yield, and 100-seed weight for 23 varieties of dry beans grown in a variety trial with four replications at the COARC, Madras, in 1999. Lines are sorted according to market class and yield.

Market Class and Variety	Initial Stand (June 17)	Population at Harvest	Physiological Maturity	Yield	100 Seed Weight
	(%)	(plants/a)	(DAP)	(lb/a)	(g)
Blacks					
UI 906	93	100,200	111	2,990	17.8
UI 911	86	70,800	113	2,570	19.4
Black Shadow	88	80,400	113	2,450	22.7
T39	89	73,000	113	2,170	18.0
<i>Mean</i>	89	81,100	112	2,550	19.5
Pinks					
UI 537	91	90,700	106	3,970	37.3
Rogers 312	96	94,200	108	3,550	37.7
PR 95-055-2	91	95,800	110	3,380	35.4
Rogers 914	96	112,700	111	3,010	43.2
Rogers 922	91	85,500	110	2,860	42.3
<i>Mean</i>	94	97,100	110	3,350	39.2
Pintos					
Othello	88	84,800	107	4,260	43.0
UI 320	95	86,000	110	4,220	44.8
Topaz	89	96,400	107	4,130	39.7
Pinyata	95	86,800	110	3,640	45.4
Agassiz	93	89,800	105	3,690	45.2
Pintium	88	80,300	105	3,470	36.0
<i>Mean</i>	91	88,300	107	3,900	42.4
Reds					
LeBaron	91	87,700	108	4,020	37.0
Ember	83	82,900	108	3,920	36.2
UI 1259	88	81,100	111	3,610	36.1
UI 239	94	92,600	111	3,410	35.9
UI 228	91	85,600	111	3,010	33.5
NW 63	93	81,000	112	2,950	34.8
R 97030	90	86,800	107	2,710	31.5
Garnett	94	104,300	111	2,520	29.8
<i>Mean</i>	92	89,400	110	3,270	34.4
Grand Mean	91	88,200	109	3,330	34.9
LSD (0.05)	NS	12,280		810	4.7
CV (%)	6.0	9.9		17.2	9.5

Table 2. Days to flowering, physiological maturity, harvest, and seed yield for 22 varieties of dry beans grown in an unreplicated on-farm observation at Gateway, OR, 1999. Lines are sorted according to market class and yield.

Market Class and Variety	Flowering Date	Physiological Maturity	Harvest	Yield
	(DAP)	(DAP)	(DAP)	(lb/acre)
Blacks				
Black. Shadow	54	95	103	1,869
UI 906	53	95	103	1,735
T39	53	92	101	1,641
U1911	50	94	102	1,529
<i>Mean</i>	53	94	102	1,690
Pinks				
Rogers 312	51	96	104	2,337
UI 537	52	97	105	2,303
PR 95-055-2	51	96	103	2,008
Rogers 914	45	97	105	1,731
Rogers 922	52	97	106	1,514
<i>Mean</i>	50	97	105	1,980
Pintos				
UI 320	47	95	103	2,404
Pinyata	46	95	102	2,048
Othello	44	93	101	2,048
Pintium	52	92	100	1,499
Topaz	52	92	100	1,346
Agassiz	50	94	102	1,262
<i>Mean</i>	50	93	101	1,770
Reds				
U1259	47	102	109	3,138
NW 63	46	100	108	2,294
Garnett	54	99	107	2,256
UI 228	52	96	106	2,082
R 97030	52	99	108	2,032
UI 239	52	100	108	2,026
Ember	52	99	107	1,628
<i>Mean</i>	52	99	107	2,208
Grand Mean	50	96	104	1,910

Table 3. Yield, flowering date, physiological maturity date, and harvest date for 4 varieties of black beans grown at Gateway, OR and 4 varieties of small red beans grown at Culver, OR, in 1999. Lines are sorted according to market class and yield. The data were collected from unreplicated strip plots that ran the length of the field.

Market Class and Variety	Yield	Flowering Date	Physiological Maturity Date	Harvest Date
Blacks (Gateway)	(lb/a)	(DAP)	(DAP)	(DAP)
Black Shadow (Vibbert's)	2,839			122
Black Shadow (Trial)	2,523	47	103	122
U1906	1,801	46	101	122
T39	1,657	47	102	122
Reds (Culver)				
Gamett	3,130	-		137
U1228	2,940	-	-	137
Ember	2,670			137
UI 239	2,570			137