CIS 983

UI 125 and UI 137 — High-yielding Small White and Navy Beans for Idaho

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Small white beans are characterized by small, elongated, slightly flattened seed. Small whites are generally used in slow cooking where they tolerate prolonged cooking without damage.

Navy beans are characterized by spherical seed and are somewhat larger than small white beans. Navy beans generally have shorter cooking times and are primarily used for products cooked in the can.

Because navy and small white beans have similar plant types and yield potentials, they are presented together in this publication.

Pedigree

UI 125 and UI 137 were developed by the Idaho Agricultural Experiment Station at Kimberly using the pedigree method.

UI 125 is an F_7 small white selection made by John Kolar in 1980 from the cross Aurora/UI 76/ 2/Bonus/UI 76.

UI 125 was grown in advanced yield trials at Kimberly and Parma, Idaho, from 1981 through 1992. It was tested in the Cooperative Dry Bean Nursery from 1981 through 1984 and was grown in yield trials at three locations in New York in 1987. UI 125 was previously tested under the experimental number K0125.

UI 137 is an F_5 navy selection made by John Kolar in 1983 from the cross Aurora/4/UI61/R544/2/Aurora/UI 76/3/ Bonus/UI 76.

UI 137 was grown in preliminary yield trials in 1985 and in advanced yield trials at Kimberly and Parma from 1986 through 1992. UI 137 was tested in the Cooperative Dry Bean Nursery at 16 locations in 1988 and 1989 and at 18 locations in 1990. UI 137 has been previously tested under the experimental numbers 6137 and 51033.

Disease resistance

UI 125 showed a blackroot reaction in the Cooperative Dry Bean Nursery in 1983-84, indicating *I* gene resistance to bean common mosaic virus (BCMV).

UI 125 was resistant to strains of bean rust (*Uromyces appendiculatus* (Pers.:Pers.) Unger) found in Lamberton, Minnesota, and moderately susceptible to strains found at Fargo, North Dakota. UI 125 is moderately tolerant to common blight (*Xanthomonas campestri* pv. *phaseoli* (Smith) Dye) and halo blight (*Pseudomonas phaseolicola* (Burk.) Dows) and is less susceptible to white mold (*Sclerotinia sclerotiorum* (Lib.) de Baryl) and air pollution damage than other navy and small white cultivars.

UI 137 was tested for BCMV resistance at Prosser, Washington, by Matt Silbernagel in 1987 and at Kimberly by Jim Myers in 1992. UI 137 showed a blackroot reaction when infected with a necrosis-inducing strain of BCMV, indicating presence of the *I* gene. UI 137 is immune to NY 15 and NL-4 BCMV strains (pathogroups 5 and 7, respectively) but showed systemic necrosis tip kill when inoculated with the NL-5 strain (pathogroup 6), indicating presence of the *I* gene.

UI 137 was tested in Prosser, Kimberly, and Parma for resistance to sugarbeet curly top virus. Symptoms were seen at Parma only 1 out of 3 years. In disease nurseries at Scottsbluff and North Platte, Nebraska, in 1988-90, UI 137 showed reactions similar to those of other navy cultivars. UI 137 was susceptible to common blight, showed moderate levels of white mold incidence, and was resistant to rust strains found in Nebraska. Both UI 137 and UI 125 showed reduced susceptibility to white mold due to their upright growth habits and open plant canopies.

Description

UI 125 plants are tall, with an upright growth habit and short vines (CIAT classification IIA). UI 137 plants have a similar short vine and upright growth habit. Pods are tightly clustered in the upper one-third of the plant. In Idaho trials, UI 137 has been more susceptible to lodging than other Type II navy cultivars.

Performance

UI 125 and UI 137 were tested in advanced yield trials at Kimberly and Parma to determine maturity and seed size (Table 1), seed yield (Table 2), seedfill efficiency (Table 3), and yield efficiency (Table 4). Seedfill efficiency is equal to yield/seedfill duration, while yield efficiency is calculated as yield/maturity. Both efficiencies are measures of reproductive seed growth rates.

UI 125 matured 96 days after planting at Idaho locations, about 2 days after Aurora. UI 137 maturity was 92 days, very similar to that of Fleetwood. UI 125 and UI 137 have acceptable seed size for their respective market classes. UI 125 seed grown in Idaho was slightly larger than Aurora seed, and UI 137 seed was smaller than Fleetwood seed.

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Table 1. Maturities and seed sizes of small white and navy beans grown at Kimberly and Parma, Idaho.

Cultivar	Days to maturity	Seed size (seed/lb)						Combined mean
		Kimberly			Parma			
		1990	1991	1992	1990	1991	1992	
UI 125	96	3,156	2,611	2,647	2,635	2,849	3,047	2,824
UI 137	92	2,638	2,404	2,626	2,369	2,636	2,634	2,551
Aurora	94	3,137	2,857		2,768	3,303		3,044
Fleetwood	93	2,482	2,250		2,038	2,422		2,298

Table 2. Seed yields of small white and navy beans grown at Kimberly and Parma, Idaho.

Cultivar	Seed yield (lb/acre)								Combined mean
	Kimberly				Parma				
	1990	1991	1992	Mean	1990	1991	1992	Mean	
UI 125	2,390	2,251	2,620	2,420	2,262	2,207	2,374	2,281	2,351
UI 137	2,846	2,233	3,441	2,840	2,980	3,031	3,281	3,097	2,969
Aurora	2,389	2,170	2,809	2,456	2,398	2,447	2,221	2,355	2,406
Fleetwood	2,397	2,412		2,405	1,618	2,475		2,047	2,226

Table 3. Seedfill efficiencies of small white and navy beans grown at Kimberly and Parma, Idaho.

Cultivar	Seedfill efficiency (lb/acre/day)								Combined mean
	Kimberly				Parma				
	1990	1991	1992	Mean	1990	1991	1992	Mean	
UI 125	49.43	48.07	64.63	54.04	44.61	52.77	62.01	53.13	53.59
UI 137	61.69	47.71	86.05	65.15	49.90	83.94	78.57	70.80	67.98
Aurora	51.16	51.88	69.85	57.63	47.08	65.32	49.16	53.85	55.74
Fleetwood	52.83	58.79		55.81	32.17	66.19		49.18	52.50

Table 4. Yield efficiencies of small white and navy beans grown at Kimberly and Parma, Idaho.

Cultivar	Yield efficiency, (lb/acre/day)								Combined mean
	Kimberly				Parma				
	1990	1991	1992	Mean	1990	1991	1992	Mean	
UI 125	24.52	23.11	27.41	25.01	22.18	23.97	27.44	24.53	24.77
UI 137	31.11	23.87	37.41	30.80	20.57	35.49	37.83	31.30	31.05
Aurora	15.51	23.87	30.06	23.15	23.86	27.70	23.69	25.08	24.12
Fleetwood	26.07	27.52		26.80	16.78	27.59		22.19	24.49

UI 125 seed yield was very similar to Aurora yield in Kimberly trials, and slightly less than Aurora yield at Parma. At both Idaho locations, UI 137 seed yield was greater than yield for Fleetwood.

Seedfill and yield efficiencies of UI 125 were similar to those of Aurora. UI 137 had higher seedfill efficiency values than Fleetwood at both Kimberly and Parma. Yield efficiency of UI 137 was similar to that of Fleetwood at Kimberly, and higher than that of Fleetwood at Parma.

UI 125 and UI 137 have been tested in canning quality tests by American Home Foods, Vacaville, California, and by American Fine Foods, Payette, Idaho. Both cultivars demonstrated acceptable canning qualities.

Conclusion

UI 125 and UI 137 are good choices for bean growers in Idaho and the rest of the Pacific Northwest. Both are high yielding, with medium maturity, acceptable seed size, and *I* gene resistance to BCMV.

Plant Variety Protection (PVP) with the Title V option is currently pending for UI 137. Under the Title V option, UI 137 may be sold only as a class of certified seed. Foundation class UI 125 and UI 137 seed is available through the Foundation Seed Program, at the Kimberly Research and Extension Center, Kimberly, Idaho.

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