

# UI 425 and UI 60 Great Northern Bean Cultivars

K.D. Stewart-Williams, M.W. Lancaster, R.E. Hayes, J.R. Myers, and J.J. Kolar

Great northern dry beans (*Phaseolus vulgaris* L.) are the principal white-seeded bean market class grown in Idaho. Nationally, Idaho usually ranks second only to Nebraska in commercial great northern bean production. Idaho is also a major producer of great northern bean seed for other bean-producing states. 'UI 425' and 'UI 60' were developed at the Idaho Agricultural Experiment Station in Kimberly. They have performed well in yield trials in all major bean-producing areas of the United States.

## Pedigree

**UI 425** is derived from the 1975 cross between 'Emerson' and an F<sub>6</sub> line selected from the cross between R544 and 'UI 61'. R544 was a white-seeded selection from the Fusarium root rot-tolerant breeding line 5MF67-1. UI 425 was tested in preliminary yield trials in 1979, in the Cooperative Dry Bean Nursery from 1981 through 1983, and in advanced yield trials from 1980 through 1995. UI 425 was tested under the experimental designation K0425.

**UI 60** is a selection from the cross UI 61 x R221. The original cross was made in 1966 by Dr. L. L. Lafferiere. R221 was an experimental line with Fusarium root rot tolerance. UI 60 was tested in the Cooperative Dry Bean Nursery from 1979 to 1981 and in advanced yield trials in Idaho from 1976 to 1995. UI 60 was previously tested under the experimental designation KL 10.

## Disease Reaction

**UI 425** showed necrotic tip kill (black root reaction) when inoculated with bean common necrosis virus (BCMNV) (formerly BCMV serotype A) isolate NL-3 but was resistant to the NL-8 isolate. This reaction is typical of bean cultivars that possess the *I* gene and recessive resistance genes such as *bc-1*. UI 425 is expected to be immune to bean common

mosaic virus (BCMV) at low growing temperatures but may show black root reactions when infected with some strains of BCMV at elevated temperatures or when infected with Pathogroup-6 strains of BCMNV at any growing temperature. Because of the *I* gene, UI 425 will not transmit BCMV or BCMNV through seed.

**UI 425** is moderately resistant to beet curly top virus. Under moderate curly top virus pressure, occasional plants become infected. UI 425 was tested for rust resistance and proved resistant to races found in Michigan and North Dakota but susceptible to races present in Colorado, Nebraska, and Maryland. UI 425 has an intermediate reaction to white mold in comparison with other great northern cultivars. UI 425 is less sensitive to air pollution damage than other great northern cultivars.

**UI 60** is resistant to Type, NL-8, and NY-15 strains but susceptible to NL-3 and Mexican strains of BCMV and BCMNV. This resistance pattern indicates that UI 60 possesses recessive *bc-1<sup>2</sup>* gene resistance to BCMV and BCMNV. UI 60 is moderately resistant to curly top virus, tolerant to common blight, slightly susceptible to halo blight, and susceptible to white mold. UI 60 is also more sensitive to air pollution damage than many other great northern cultivars.

## Description

**UI 425** plants are intermediate in size with a semi-erect, indeterminate (Type III) growth habit and medium-short vines. Under high soil fertility conditions, UI 425 plants may become more prostrate but will still have shorter vines than UI 60 or 'Valley'. This growth habit may make UI 425 more desirable under sprinkler irrigation or in areas with a high incidence of white mold. UI 425 pods are green with a purple mottle at maturity. They usually bear five to seven

Table 1. Days to maturity and seed size of great northern beans grown at Kimberly and Parma, Idaho.

	Days to maturity	Seed size (seed/lb)						Mean
		Kimberly			Parma			
		1995	1994	1993	1995	1994	1993	
UI 425	94	1,328	1,267	1,351	1,395	1,377	1,426	1,357
UI 60	94	1,463	1,518	1,541	1,591	1,573	1,666	1,559
US 1140	88	1,498	1,314	1,390	1,568	1,588	1,440	1,466
Beryl	92	1,527	1,420	1,491	1,761	1,568	1,616	1,564

**Table 2. Seed yield of great northern beans grown at Kimberly and Parma, Idaho.**

	Seed yield (lb/acre)								Combined mean
	Kimberly				Parma				
	1995	1994	1993	Mean	1995	1994	1993	Mean	
UI 425	3,108	3,289	2,419	2,939	3,339	3,403	3,958	3,567	3,253
UI 60	3,451	3,319	2,830	3,200	2,668	3,100	3,666	3,145	3,172
US 1140	3,322	3,006	2,121	2,816	2,920	3,207	3,333	3,153	2,985
Beryl	3,152	3,326	2,480	2,986	2,890	2,848	3,205	2,981	2,984

**Table 3. Yield per day of great northern beans grown at Kimberly and Parma, Idaho.**

	Yield per day (lb/acre/day)								Combined mean
	Kimberly				Parma				
	1995	1994	1993	Mean	1995	1994	1993	Mean	
UI 425	33.4	36.5	22.7	30.9	37.6	38.1	41.8	39.2	35.0
UI 60	37.3	36.3	26.4	33.3	42.1	34.3	39.2	38.5	35.9
US 1140	38.8	36.2	30.7	35.2	36.3	37.3	37.3	37.0	36.1
Beryl	35.0	37.4	23.8	32.1	35.3	30.3	34.3	33.3	32.7

Note: Yield per day = yield ÷ days to maturity. It measures rate of reproductive growth.

seeds. UI 425 seeds are similar in size to Emerson seeds. Their shape is similar to that of other great northern seeds. The semi-shiny seed coat luster is similar to that of 'UI 59'.

**UI 60** plants are light to medium green and have a floppy, long vine growth habit. UI 60 has shorter vines than Valley but may become too vigorous when grown on high-fertility soils. UI 60 seeds are semi-shiny and may be slightly smaller than seeds of typical great northern cultivars.

## Performance

UI 425 and UI 60 have been tested in advanced yield trials at Kimberly and Parma, Idaho, to determine maturity and seed size (table 1), seed yield (table 2), and yield per day (table 3). UI 425 and UI 60 mature 94 days after planting in Idaho, about six days later than 'US 1140' and two days later than 'Beryl'.

UI 425 has about 1,360 seeds per pound and is larger than either US 1140 or Beryl. UI 60 averages about 1,560 seeds per pound in Idaho. Like Beryl, UI 60 seed is smaller than seed of either UI 425 or US 1140.

UI 425 seed yields at Kimberly were higher than yields of US 1140 and slightly lower than those of Beryl. UI 60 seed yields at Kimberly were higher than those of UI 425, US 1140, or Beryl. At Parma, UI 425 seed yields were higher than yields of UI 60, US 1140, or Beryl. Combined seed yield data from both Idaho locations showed that UI 425 and UI 60 had higher seed yields than either Beryl or US 1140.

UI 425 mean yield per day (yield ÷ maturity) was slightly lower than that of UI 60, US 1140, or Beryl at Kimberly and higher at Parma. When data from both locations was combined, UI 425 and UI 60 had very similar yields per day. UI 425 and UI 60 mean yields per day were higher than those of Beryl and slightly lower than those of US 1140.

## Summary

UI 425 and UI 60 are well-suited for both seed and commercial production in Idaho and for commercial production in other parts of the United States and Canada. UI 425 and UI 60 yield well in Idaho and are resistant to NY-15 and Type strains of BCMV. UI 425 possesses *I* gene resistance to BCMV and shows less sensitivity to air pollution damage than other great northern cultivars. Both cultivars are moderately resistant to curly top virus. UI 425 seed size is larger and more acceptable to processors than that of other great northern cultivars.

## The authors

Kathryn D. Stewart-Williams, research support scientist in bean breeding and genetics; Michael W. Lancaster, coordinator, Idaho Agricultural Station Foundation Seed Program; Richard E. Hayes, assistant superintendent, Kimberly Research and Extension Center; James R. Myers, plant breeder and geneticist, all at the University of Idaho Kimberly Research and Extension Center. John J. Kolar, professor emeritus, plant science, resides in Twin Falls.

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