

**NEBRASKA AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF NEBRASKA-LINCOLN
DEPARTMENT OF AGRONOMY**

RELEASE OF P-845 WINTER BARLEY

P-845 is a winter barley (*Hordeum vulgare* L.) cultivar developed by the Nebraska Agricultural Experiment Station and released in 2013 by the developing institution. It was released primarily for its superior grain yield and adaptation to rainfed small grains production systems in Nebraska and in states south of Nebraska. P-845 was selected from the cross Krasnodar 'K304/2'/NB90701, where the Krasnodar line K304/2 was developed in southern Russia and used as a parent for its diversity and expected winterhardiness and the pedigree of NB90701 is NE80725 sel./OK77422. The pedigree of NE80725 is Sabbaton/Meimi*2/Decatur/3/Dundy//Nebar sel./Dundy. The pedigree of OK77422 is CI 13855/NC 6005-15.

The cross was made in 1993. The F₁ generation was grown in the greenhouse in 1994 and the F₂ to F₃ generations were advanced using the bulk breeding method in the field at Mead, NE in 1995 and 1996. In 1996, single F₃-derived F₄ rows were planted for selection in 1997. There was no further selection thereafter. The F_{3:5} was evaluated as a single four row plot at Lincoln, NE in 1998. P-845 was identified in 1999 as the experimental line, NB99845, and selected for further testing.

P-845 was evaluated in Nebraska replicated yield nurseries starting in 2001 to 2011 and in the USDA-ARS Uniform Winter Barley Yield Trial in 2010. In the Nebraska Barley Variety Trial (2004 to 2011, Table 1), P-845 performed well across Nebraska and in western Kansas. Compared to the four commercially available cultivars, P-845 was the highest yielding line at Lincoln, NE and Colby, KS. It was the second and third highest yielding line at Mead and Sidney, NE respectively. These data are supported by the 2010 USDA-ARS Nursery where P-845 ranked 6th region-wide of the 16 entries tested. It was not significantly (P<0.05) lower than the highest yielding lines in the nursery. Based upon these data, P-845 is adapted to Nebraska and western Kansas and adjacent areas of the Great Plains.

Other measurements of performance from comparison trials indicate that P-845 is moderately early in maturity (flowering 136.6 d after Jan.1), about 1 d later flowering than TAMBAR 501 and 1 day earlier flowering than P-713, P-721, and P-954. P-845 is a relatively short winter barley cultivar (26.7 in tall) which is similar to P-721 and P-954, but one inch shorter than TAMBAR 501 and 2 inches shorter than P-713. P-845 has moderate straw strength (8% lodged) which was lower than the comparison cultivars. The winter hardiness of P-845 is good and comparable to other winter wheat cultivars adapted and commonly grown in Nebraska and Kansas.

In Nebraska, winter barley is mainly affected by winter injury and there are relatively few diseases on the crop. Based upon data from the USDA-ARS Uniform Winter Barley Yield Trial in 2010 using field races, P-845 is moderately resistant to moderately susceptible to net blotch (incited by *Pyrenophora Drechs. F. teres* Smedeg.), moderately susceptible to powdery mildew (*Blumeria graminis* f. sp. *hordei* Speer) and susceptible to stripe rust (incited by *Puccinia striiformis* Westend. f. sp. *hordeii* Eriksson). P-845 has average grain volume weight (44.2 lbs/bu) which is similar to P-713 (44.7 lbs/bu), lower than P-721 (45.1 lbs/bu) and P-954 (45.3 lbs/bu), and higher than TAMBAR 501 (42.8 lbs/bu) in comparison trials.

In positioning P-845, based on performance data to date, it should be well adapted to most rainfed small grains production systems in southeastern, south central, west central, and western Nebraska, in western Kansas, and in adjacent areas of the Great Plains. P-845 has not been tested under irrigation, so its performance in that production system is unknown. P-845 is genetically complementary to virtually all barley cultivars grown in Nebraska and Kansas except for P-721 that also has Dundy as a parent.

P-845 is a straight, tan-glumed winter barley cultivar that has long and rough awns with many teeth. The juvenile growth habit is prostrate. The plant color at heading is green and anthocyanin is absent from the stem and leaf sheath. The leaf is glossy. The auricle is white. The spike is six-row, square headed, and erect at maturity. The glume is one half of the lemma and has no hairs. The rachis is pubescent. The lemma is long.

The seed is slightly wrinkled, hulled or covered, and the rachilla has short hairs. The aleurone is colorless.

P-845 has been uniform and stable since 2010. Less than 0.5 % of the plants were rogued from the Breeder's seed increase in 2010-12. The rogued variant plants were taller in height (5 - 15 cm) or were awnless. Up to 1% (10:1000) variant plants may be encountered in subsequent generations. Paramount Seed Farms, 7682 County Road Z, Quinter, KS 67752 has the exclusive rights to market P-845 and will have seed available to qualified growers in 2013. The Nebraska Foundation Seed Division, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE 68583 will not have foundation seed. A research and development fee will be assessed on all seed sales. Small quantities of seed for research purposes may be obtained from the P. S. Baenziger and the Department of Agronomy and Horticulture, University of Nebraska-Lincoln for at least 5 yr from the date of this release. In addition, a seed sample has been deposited in the USDA-ARS National Small Grains Collection, Aberdeen, ID and seed is freely available to interested researchers.

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date

Table 1. Data on flowering date, plant height, grain yield, test weight, lodging, and moisture from the Barley Variety Trial from 2004 to 2011 at three rainfed locations (Mead, Lincoln, Sidney) in Nebraska and one rainfed location (Colby) in Kansas for a total of 25 rainfed environments (locations * years). for the named lines that were in common all eight years.

VARIETY	-----Lincoln-----					-----Mead-----					--Sidney-----					-----Colby-----				
	Flowering Day after 1/1 (7)*	Height in. (7)	Yield Lbs/a (7)	Rank (7)	Win. Survival % (5)	Flowering Day after 1/1 (5)	Height in. (5)	Yield Lbs/a (5)	Rank (5)	Flowering Day after 4/30 (7)	Height in. (8)	Lodging % (5)	Yield Lbs/a (8)	Rank (8)	Moisture % (5)	Test Wt. lbs/bu (7)	Average lbs/a (25)	Rank		
P-713	135.4	33.6	4433	3	77.9	138.7	29.5	3426	1	23.2	3341	1	16.5	28.8	16.3	3909	2	11.4	3846	2
P-721	135.8	31.8	4029	4	81.3	139.8	27.3	3036	4	21.1	3330	2	17.3	27.1	11.3	3657	4	12.3	3572	4
P-954	135.8	32.0	4486	2	80.7	140.3	27.7	3231	3	19.7	2858	4	18.1	27.5	10.0	3692	3	12.2	3655	3
TAMBAR 501	133.9	33.4	3972	5	64.4	137.4	27.8	2307	5	21.7	2437	5	14.3	28.9	13.8	3367	5	11.0	3138	5
NB99845	134.8	31.5	4849	1	89.0	138.2	26.6	3415	2	21.5	2887	3	14.3	27.3	7.5	4246	1	12.7	3977	1

*Years tested. Some years were lost due to adverse weather.