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'Prairie Snow' Penstemon

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'Prairie Snow' is a white-flowered, seed-propagated bulk population of *Penstemon grandiflorus* selected for home landscape use that also can be used for prairie and roadside plantings. It was released in 1988 in conjunction with, and to honor, the 10th anniversary of the Nebraska Statewide Arboretum. It is unique to this species because of its pure white flowers. A native population of *P. grandiflorus* was manipulated using a modified bulk population selection scheme so that plants with specific traits could be isolated from plants without the desired traits.

Two similar cultivars, Albus and Lena Seeba, have been mentioned in the literature. The source of the *P. grandiflorus* 'Albus' listing in *Hortus Third* (Liberty Hyde Bailey Hortorium, 1976) was based on a catalogue listing in the late 1940s (E. Koop, Liberty Hyde Bailey Hortorium, personal communication). Another reference, however, lists 'Albus' as *P. fruticosus* (Peterson, 1984). The cultivar Lena Seeba is listed as a hybrid of "*P. grandiflorus* (white) × unknown *Pentstemon* species" in the American Penstemon Society Cultivar Registry (D.T.L., personal communication). Neither cultivar is currently available.

Origin

P. grandiflorus, commonly known as the shell-leaf penstemon, is endemic from North Dakota to Texas and from Wyoming to Illinois (Gleason, 1952). Native populations are generally pink- or lavender-flowered with a low percentage of white-flowered plants. Observations of native populations indicate that <1% of the plants are white-flowered.

Seeds collected near Dunning, Neb., from a population of pink-flowered *P. grandiflorus* plants containing one white-flowered plant were cold-stratified for 8 weeks at 1C, then placed in a greenhouse and germinated. Plants were transplanted to field plots and observed for flower color. There was a strong correlation between stem color and flower color, as plants with nonpigmented stems produced white flowers and plants with pigmented stems produced pink or lavender flowers. Plants with white flowers displayed no reddish stem/

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leaf pigmentation. Further observations indicated that newly emerged seedlings grown in the greenhouse also exhibited either reddish pigmentation in hypocotyls and leaves or no apparent pigmentation. Seedlings in the greenhouse with no red pigmentation were transplanted to field plots 0.5 km from other *P. grandiflorus* plants. About 95% of these plants were white-flowered, while the remainder were pink. The pink-flowered plants were rogued out before pollen release, leaving only white-flowered plants in the population. Seeds were collected from these white-flowered plants and planted. Of these seedlings, 95% were white-flowered, with the remaining plants flowering a very light pink. A follow-up study using seed from the white-flowered plants in the previous study indicated that >99% of the seedlings were white-flowered. These white-flowered plants were used as a source of seed for the 'Prairie Snow' bulk population. Future generations of 'Prairie Snow' will continue to be reselected for the desired trait.

Description

'Prairie Snow' has the general traits of the common *P. grandiflorus*, except for the white flowers. Plants in field plots at North Platte, Neb., averaged 70 cm (range of 54 to 84 cm) in height, 6.8 (range 2 to 13) stalks per plant, 50 (range 35 to 110) flowers per stalk, 35 (range 6 to 90) seed pods per stalk, and ≈18,000 seeds per plant.

Floral characteristics include (all averages): calyx length 7.3 mm; corolla length 38 mm; upper corolla lip width (2 lobed) 13.4 mm; lower corolla lip width (3 lobed) 22.2 mm; stamen length 30 mm; staminode length 31 mm; pistil length 27 mm. The staminode (sterile stamen) is hooked and minutely pubescent at the apex. Seeds are ≈2 mm x 2.5 mm. The white-flowered selections have light brown seeds, while pink- and lavender-flowered types have dark brown seeds.

Foliage is a greenish gray with thick leaves and glabrous stems. Basal leaves are entire, glabrous, and obovate to obovate-oblong, 2 to 4 cm wide, and 6 to 9 cm long. Stem leaves are entire, ovate to broadly ovate to rounded, subcordate, and somewhat clasping at the base, 5 to 8 cm long. Foliage is slightly to moderately susceptible to several diseases, including rust, powdery mildew, and leaf spots. Spider mites are a potential pest.

Plants form a rosette the first year of growth and flower beginning the second year. Plants

at North Platte flower for about 3 weeks beginning, on the average, the last week of May.

This cultivar is considered a short-lived perennial surviving 3 to 4 years. Flower stalks should be removed after flowering to increase the longevity of the plant. The plants will self-sow.

Propagation

'Prairie Snow' is a seed-propagated selection, although plants can be propagated vegetatively by division. Seed parent plants should be isolated from other *P. grandiflorus* plants and other *Penstemon* spp., especially *P. murrayanus*, to ensure a high percentage of white-flowered plants in the progeny. *Penstemon grandiflorus* is an insect-pollinated species. A seed germination study was conducted in 1988 comparing cold stratification periods, from 0 to 10 weeks, and seed scarification with sandpaper vs. no seed scarification before planting (Table 1). Seed germinated best when stratified for 6 to 10 weeks at 0 to 3C. Scarification with sandpaper may be beneficial with short stratification periods but detrimental with longer ones.

Availability

'Prairie Snow' seed is available to commercial seedsmen, nurseries, and experiment station personnel in limited amounts. Inquiries concerning seed availability should be addressed to: Dale T. Lindgren, Univ. of Nebraska West Central Center, Rt. 4, Box 46A, North Platte, NE 69101.

Literature Cited

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Table 1. Germination of 'Prairie Snow' seed of unscarified and scarified seed stratified for 0 to 10 weeks.

| Duration of stratification ² (weeks) | Percent germination | |
|---|---------------------|------------------------|
| | Unscarified | Scarified ³ |
| 0 | 2.6 | 5.0 |
| 2 | 1 | 3.6 |
| 4 | 13 | 11 |
| 6 | 40 | 31 |
| 10 | 60 | 49.6 |
| Significance Linear | ** | ** |

²Seed was cold-stratified with a moist/chilling period at 0 to 3C.

³Seed was scratched with sandpaper before planting.

**Significant at $P = 0.01$.