

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
WASHINGTON, D.C. 20013

NOTICE OF RELEASE OF 'WHITE PASS GERMPLASM' BLUE WILDRYE

The USDA – Natural Resources Conservation Service (NRCS) announces the selected class release of 'White Pass Germplasm' blue wildrye (*Elymus glaucus* Buckley ssp. *glaucus*). White Pass Germplasm was tested under the experimental designation 9033968.

Blue wildrye occurs in prairies, foothills, and mountains of several western states and Canadian provinces. It can be found near sea level and above timberline. Blue wildrye grows on well-drained, deep to skeletal, rocky soils in areas receiving at least 350 mm of annual precipitation. It tolerates partial shade and is commonly found in conifer forests of the west (Hall 1973, Bailey et al. 1998). Blue Wildrye is fair-good forage for big game and livestock and is relatively compatible with reforestation plantings (USDA 1968, Merrill et al. 1995). White Pass Germplasm blue wildrye is a mid-to-high elevation ecotype and best adapted to the east slope and foothills of the Cascade Range. White Pass Germplasm was selected for rapid emergence, basal growth, and biomass production.

White Pass Germplasm is being released as a selected class (manipulated track) material because it has limited utility beyond reforestation and reclamation plantings along the eastern Cascade Mountain range. Its rapid emergence and growth make it ideal for establishing vegetative cover on areas disturbed by logging and road building activities, e.g. skid trails, landings, etc. Primary beneficiaries are expected to be transportation right-of-way managers, forestland managers, utility right-of-way managers, and the seed industry.

Seed of accession 9033968 was collected by Duward Massey, USFS employee, on 9/15/1994 on an east facing 8% slope of White Pass. The collection was made in SE ¼, Section 2, T13N, R11E in western Yakima County, WA (121° 23.3' W, 46° 38.2' N). The collection site is 1341 m elevation (USFS Seed Zone 641) and is in the USDA NRCS Major Land Resource Area 6 [Cascade Mountains, Eastern Slope] (USDA 2006). Average annual precipitation at the site is 1700 mm. Species growing in association with 9033968 include *Pseudotsuga menziesii* (Mirb.) Franco [Pinaceae], *Vaccinium cespitosum* Michx. [Ericaceae], *Bromus marginatus* Nees ex Steud. [Poaceae], and *Anaphalis margaritacea* (L.) Benth. [Asteraceae].

White Pass Germplasm blue wildrye is a cool-season, native perennial bunchgrass. In Pullman, Washington it typically reaches a height of 180cm and has a basal width of up to 40 cm. This

plant has numerous, leafy stems with broad, flat leaves. The stems are dark green, stiff, upright, smooth, and turn crimson at maturity. It has a short (1 mm), smooth, flat ligule and purple, weakly-clasping auricles. The leaves are wide (up to 9 mm), drooping, smooth, and turn crimson upon maturity. The seed heads are 10–20 cm long and, like the leaves and stems, turn crimson with age. Spikelets usually consist of 3 or more seeds and are tightly clustered to the rachis. Seeds can be as long as 8 mm and have a 10-20 mm straight awn. Glumes are about equal, turn blond at maturity and remain on the rachis after seeds disarticulate. There are approximately 335,000 seeds/kg. It has a relatively shallow but extensive, fibrous, root system.

9033968 was initially compared in a common garden study comprised of 225 ecotypes of blue wildrye. It was among the top 10% performing ecotypes in basal width, culm production, and low incidence of leaf rust. It was the only high elevation blue wildrye ecotype that performed well, so it was selected for further study.

A greenhouse speed of emergence study compared 9033968 with P-6435 *Festuca idahoensis* (Elmer) [Poaceae] and three blue wildrye releases. They were ‘Arlington’, ‘Elkton’, and ‘Union Flat Germplasm’ that originate from Puget Sound, Willamette Valley, and the Palouse Prairie, respectively. Emergence was tabulated daily for 14 days. The first seeds to emerge occurred 8 days after planting (dap) and 9033968 performed as well or better than all the other seed types (Table 1).

Table 1. Speed of emergence of White Pass Germplasm in comparison to P-6435 Idaho Fescue and 3 blue wildrye releases.		-----Percent emergence-----						
Seed	8dap	9 dap	10dap	11dap	12dap	13dap	14dap	
P-6435 Idaho fescue	.3	15	17	17	17	20	20	
Arlington	.3	6	6	12	12	12	12	
Elton	44	64	68	72	72	72	72	
Union Flat	17	66	73	73	73	75	75	
White Pass Germplasm	30	51	76	76	76	76	76	
Std Error	10.0	11.4	4.1	4.2	3.6	2.5	2.5	
P value	.0094	.0017	.0000	.0000	.0000	.0000	.0000	

A greenhouse biomass production study compared the same materials as the emergence study above. The study was Randomized Complete Block (RCB) design with 4 replications. After a 14 week growing period White Pass Germplasm had accumulated the most top growth of those studied. It also had one of the lowest shoot-to-root ratios (2.35:1) of the group. The west side ecotypes, Arlington and Elkton, were less productive and had higher shoot-to-root ratios than White Pass Germplasm.

White Pass Germplasm blue wildrye is largely self pollinated and seed is fairly easy to produce (Stannard 1999). It is large seeded, establishes readily, and grows very rapidly in comparison to many native perennial grasses. Seed production fields need to be drill seeded into a clean seedbed using 60 seeds/linear meter. Seeding should take place in the spring for dryland planting. Irrigated plantings can be seeded in the spring thru early fall. Heavy seed crops typically occur in years 2, 3 and 4. Harvest will require swathing and combining.

Propagation of blue wildrye is by seed. Breeder seed (G0, G1, G2) is being maintained by the Pullman Plant Materials Center. The “manipulated release track” will enable removal of off type plants from the breeding population. The Washington State Crop Improvement Association will produce and distribute Foundation seed (G3) for the production of certified seed (G4) in accordance with guidelines developed by AOSCA (2001). Registered class seed is NOT recognized. White Pass Germplasm will be maintained by the Pullman PMC until 2035.

References:

[AOSCA] Association of Official Seed Certifying Agencies. 2001. Genetic and crop standards of the Association of Official Seed Certifying Agencies. Boise, ID. 72 pp.

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USDA Soil Conservation Service. 1968. Grasses and legumes for soil conservation in the Pacific Northwest and Great Basin States. U.S. Department of Agriculture Handbook 339.

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Signatures for the release of:

White Pass Germplasm Blue Wildrye (*Elymus glaucus*)

Roylene Rides at the Door

Date

State Conservationist

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Spokane, Washington

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Date

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