

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
LOCKEFORD CALIFORNIA

NOTICE OF RELEASE OF PURPLE NEEDLEGRASS FOR
MAJOR LAND RESOURCE AREA 15d
SELECTED CLASS OF NATURAL GERMPLASM

The Natural Resources Conservation Service announces the release of a selected ecotype of purple needlegrass, *Nassella pulchra*, for Major Land Resource area (MLRA) 15d.

As the demand for native seed has grown, so has the demand for ecotypic native seed. Though many native species may be suited for field cultivation and may be excellent candidates for improvement of plant performance through breeding efforts, the seed of a majority of species will continue to be collected from wildland populations. Because of the demand for native seed, it has become important to have seed certification to ensure genetic identity and origin. In order to meet this need a national organization, The Association of Official Seed Certifying Agencies (AOSCA) has developed a certification program to address this need, The Pre-Germplasm Certification Standards.

LK 115d is released as a Select Identified Class of certified seed under the Pre-Germplasm Certification Standards. As a Selected Identified Release, This plant will not be given a "cultivar" name, but will be referred to as LK 115d to document the Lockeford Plant Materials Center, NRCS, USDA as releasing agent and the MLRA the release is best suited.

This alternative release procedure is justified because existing commercial sources of foothill needlegrass are inadequate, propagation material of specific ecotypes are needed for restoration, revegetation, cover crops, and range improvement projects within MLRA 15d. At the current time there are no cultivar releases of foothill needlegrass for California.

Species	<i>Nassella pulchra</i> (A. Hitchc.) Barkworth <i>Stipa pulchra</i> A. Hitchc.
Common Name	Purple Needlegrass
Plant Symbol	NAPU4
Accession Number	9063766

ORIGIN: Tehama County, California; along Highway 36 approximately 0.3 miles west of the intersection of Highway 36 and Bowman Road. Township 28N Range 6W Section 13. Elevation is approximately 2300 feet. Annual precipitation is approximately 25 inches.

Method of Selection: From a purple needlegrass and foothill needlegrass collection found in Land Resource Region (LRR) D; which includes MLRAs 20, 19, 18, 17, 15, and 14.

Collections were evaluated at the Lockeford Plant Materials Center (PMC) From 1992 to 1995. Lk 115d was selected for its early flowering, vigor, height, and plant density. Purple needlegrass does not require special seed treatment.

Description: Culms 60 to 100 cm. tall; blades long, narrow, flat involute; ligule about 1 mm. long; panicle nodding, about 15 to 20 cm. long, loose, the branches spreading, slender, some of the lower 2.5 to 5 cm. long; glumes narrow, long-acuminate, purplish, 3-nerved, the first about 20 mm. long, the second 2-4 mm. shorter; lemma 7.5 to 13 mm. long, fusiform, sparingly pilose, sometimes only in

lines above, minutely papillose-roughed, the callus about 2 mm. long, the summit sometimes with a smooth neck and a ciliate crown; awn 7 to 9 cm. long, short-pubescent to the second bend, the first segment 1.5 to 2 cm. long, the second shorter, the third 4 to 6 cm. long.

Literature Review: Seed can be collected from May to July depending on soils, rainfall, temperature, elevation, etc. There are approximately 109,749 seed per pound. The germination on Purple needlegrass can range from 38 to 81 percent and the purity can range from 70 to 94 percent. *Nassella pulchra*, *N. cernua*, and *N. lepida* can cross with ease under natural conditions. Although *Nassella cernua* and *N. lepida* do not grow together on California range, contiguous plantings of the two species at the University of California, Davis (1954), resulted in the establishment of F1 hybrids without artificial manipulation. Purple needlegrass depends chiefly upon seed for reproduction and on many ranges has been largely killed out by being grazed so close that seed could not mature.

Purple needlegrass can be found from sea level to an elevation of 4,275 feet. Purple needlegrass provides good early forage for grazing animals. Although its palatability is highest in the spring, it is grazed throughout the summer by cattle and horses. It requires some protection from grazing at the flowering period. Purple needlegrass has a strong root system and can be effective for erosion control. It can be found in association with *Nassella cernua*, *Sitanion hystrix*, *Melica californica*, and *Festuca occidentalis*.

Site Description: The soil found in the area of original collection is Hillgate (HgA) loam. The soil depth is 70 inches with an available water holding capacity (AWC) of 11.6 inches. Slope is various 0-3 percent.

Map Symbol	Depth	Texture	AWC in/in	pH	Cation Exchange Capacity
HgA	0-17	Loam	0.15-0.18	5.6-6.5	10.0-15.0
	17-39	Clay loam, Clay	0.15-0.17	6.6-7.8	25.0-35.0
	39-70	Clay loam	0.15-0.17	6.6-7.8	15.0-20.0
Ay	0-14	Gravelly loam	0.10-0.14	5.6-7.3	5.0-15.0
	14-48	Gravelly loam, Gravelly sand, Clay loam	0.11-0.15	5.6-7.3	10.0-20.0
	48-72	Clay	0.14-0.16	6.5-7.3	20.0-30.0

An adjoining soil to the area of original collection is Arbuckle (Ay) Gravelly loam. The soil depth is 72 inches with an available water holding capacity (AWC) of 9.7 inches and a slope of 0-3 percent.

Potential Area of Adaptation: MLRA 15d is located in the Coastal Range from Shasta County south to Santa Barbara County. The 4ETa* is 12 to 15 inches annually and will vary with soil texture and depth. The average annual precipitation is 12 to 40 inches.

MLRA 15 can be found from sea level to an elevation of 2,625 feet, mountains can reach 5,577 feet. Gently sloping to steep low mountains underlain mostly by shale and sandstone and partly by igneous and volcanic rock most of the area. Coastal plains are narrow and discontinuous, and stream valleys are narrow and widely separated. The precipitation can range from 12 to 40 inches annually. Average annual temperature is

55 to 65 degrees F. There are 120 to 270 frost free days each year. The dominant soils are Xererts, Xerolls, Ochrepts, Xeralfs, Orthents, and Psamment. They have a thermic temperature regime (mesic at the higher elevations).

Observed Selected Traits and Performance: From 1992 to 1994 a collection of 32 accessions From Land Resource Region D were evaluated at the Lockeford Plant Materials Center. Each accession was replicated 4 times with 12 individual plants in each replication. In 1995 LK 115d was selected for release because of early flowering date, vigor, survival, and growth. LK 115d had an average flowering date of March 24. It had a mean vigor rating of 1.88**. At the end of 3 years, LK 115d had a mean survival rate of 94 percent. The average plant height at the time of flowering was 122 cm. It was observed during the first year and to some extent in the second year that rabbits and gophers would utilize all purple needlegrass; and in some case, to the point that a replication was destroyed. In order to protect the purity of the ecotype, in the spring of 1996, a seed collection was made from the original collection site before establishing a breeder seed planting at the Lockeford PMC.

Anticipated Conservation Use: Restoration, critical area plantings, cover crop, and wildlife habitat.

Availability of Plant Materials: Foundation seed will be maintained by the Lockeford Plant Materials Center, P.O. Box 68, Lockeford, California, 95237. Access to the property of original collection is not available.

References:

1. Bishop, Gene. 1997. A Vegetative Guide to Selected Native Grasses of California, Technical Note PM-40. United States Department of Agriculture, Natural Resources Conservation Service, California.
2. Climate in Relation to Capability Class and Subclass. February 1970. U.S. Department of Agriculture, Soil Conservation Service. Berkeley California.
3. Crampton, Beecher. 1974. Grasses of California. University of California Press, Berkeley and Los Angeles California.
4. Hitchcock, A.S., revised by Agnes Chase. 1950. Manual of the Grasses of the United States. Dover Publications, Inc. New York.
5. Love, Merton R. February 1954. Interspecific Hybridization In Stipa II Hybrids of Stipa cernua, S. lepida, And S. pulchra. American Journal of Botany, Vol. 41.
6. Land Resource Regions and Major Land Resource Areas of The United States. December 1981. Agriculture Land Services, USDA. Washington D.C.
7. Range Plant Handbook. 1937. United States Department of Agriculture, Forest Service. Dover Publications, Inc. New York.

• **4ETa** Is the actual evaporation, 4 inch available water holding capacity (in inches). **ETa** is for the entire year.

ETa Actual evapotranspiration is a relative index for frost tolerant dry farmed crops and forage. It includes limitations imposed by rainfall, soil moisture storage, and energy.

** Ratings are based on a 1 to 9 scale with 1 being superior.