UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, D.C.

AND

UTAH AGRICULTURAL EXPERIMENT STATION
UTAH STATE UNIVERSITY
LOGAN, UT

NOTICE OF RELEASE OF ANTELOPE CREEK GERMPLASM

The USDA-Agricultural Research Service and the Utah Agricultural Experiment Station announce the release of Antelope Creek Germplasm bottlebrush squirreltail (Elymus elymoides [Raf.] Swezey). This selected class (natural track) of pre-variety germplasm, tested under the experimental designation T-1472, is eligible for seed certification under guidelines developed by the Association of Seed Certifying Agencies (2001). This alternative release procedure is being utilized because propagation material of specific ecotypes is needed for ecosystem restoration, potential for immediate use is high, and commercial potential beyond specific restoration and reclamation objectives is probably limited (Young, 1995). Primary beneficiaries of this release are anticipated to be land management agencies, particularly the U.S. Forest Service, as well as the seed industry.

Squirreltail taxa were described by Wilson (1963), and revised names are summarized by Barkworth (1997). Comparison of E. elymoides ssp. elymoides with ssp. brevifolius and E. multisetus for plant traits was made by Jones et al. (2003). Like most Elymus species, the squirreltails are self-pollinated (Jensen et al., 1990).

Recent work with AFLP molecular genetic markers (Larson et al., 2003; Parsons, 2008) provides justification for a yet undescribed subspecies of bottlebrush squirreltail currently referred to as "race C", which encompasses Antelope Creek Germplasm. While race C keys to E. elymoides ssp. brevifolius according to Wilson (1963), it is genetically (Larson et al., 2003) and geographically (Wilson, 1963) disjunct from ssp. brevifolius races A, B, and D. Races A, B, C, and D were delineated as discrete groups of accessions with AFLP markers (Larson et al., 2003), and races A, B, and C were characterized for whole-plant traits by Jones et al. (2003). For example, race B is early in maturity, race C is intermediate in maturity, and race A is very late in maturity. Also, race A is taller and possesses heavier seeds than races B or C, which were similar to each other. While no key is available to distinguish the races of E. elymoides ssp. brevifolius, race may be deduced from geographic origin. Race C is found in eastern and central Oregon and portions of surrounding states, Races A and B are found in the Rocky Mountains, and Race D is found in the western Great Plains (Larson et al., 2003). The type specimen for the subspecies originated near Silverton, CO (Wilson, 1963), and its description conforms to race A. The only previous releases of ssp. brevifolius are Tusas, Wapiti, and Pueblo germplasms (all race A).

A field trial of 32 race C accessions (Fig. 1) was established at the Millville Experimental Farm, Millville, UT, on 13 May 2005 from greenhouse-grown transplants. Fourteen-plant plots were arranged in a randomized complete block design with three replications. Data were compiled on phenological dates in 2006 and 2007 (Table 1), biomass in 2006 and 2007 and seed yield and mass in 2006 (Table 2), and canopy traits in 2006 and 2007 (Table 3). Seedling data were collected in a greenhouse evaluation (data not shown). Based on a multivariate analysis of trait performance in field and greenhouse evaluations, Parsons (2008) delineated four adaptive zones (AZ) for race C (Fig. 2). Accession T-1472 grouped with

other accessions from the western portion of the Blue Mountains ecoregion and the Eastern Cascade Slopes and Foothills ecoregion into AZ-2. This accession was chosen for release as Antelope Creek Germplasm based on its high seed yield relative to the other AZ-2 accessions collected at sites of similar average annual precipitation (Table 2).

Accession T-1472 was collected 18 July 2003 in Wasco County, OR about seven miles east of Antelope at mile marker 15 on highway 218. Coordinates are 44o54'13.4" N 120o36'04.1" W. Elevation at the site is 1,111 m, average annual precipitation is 360 mm, USDA plant hardiness zone is 6a, and AHS plant heat-zone is 5. The site is classified by USDA-NRCS (Anonymous, 1981) as Major Land Resource Area B10 (Upper Snake River Lava Plains and Hills), by the USDA-Forest Service (Bailey, 1995) as Province M332 (Middle Rocky Mountain Steppe – Coniferous Forest – Alpine Meadow Province), and by the EPA (2002) as Level IV Ecoregion 11a (Blue Mountains, John Day/Clarno Uplands). Bluebunch wheatgrass (Pseudoroegneria spicata) was present at the site, as were the invasive annual introduced grasses, downy brome (Bromus tectorum) and medusahead wildrye (Taeniatherum caput-medusae).

Seed of the G2 generation will be maintained by the USDA-ARS Forage and Range Research Laboratory, Logan, UT and will be made available to growers by the Utah Crop Improvement Association. Seed through the G5 generation will be eligible for certification.

Seed of Antelope Creek Germplasm will be donated to the National Plant Germplasm System. Small quantities of seed can be obtained for research purposes by contacting David Stout, Western Regional Plant Introduction Station, Washington State University, Pullman, WA 99164-6402. Appropriate recognition should be made if this material contributes to the development of a new breeding line or cultivar.

T.A. JONES, M.C. PARSONS, S.R. LARSON, AND IVAN W. MOTT REFERENCES:

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Signatures:

Director, Utah Agricultural Experiment Station — Date: 12-16-09

Deputy Administrator, Crop Production and Protection
Agricultural Research Service, U.S. Department of Agriculture — Date: 12.28.09