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U.S. Department of Agriculture Forest Service
Intermountain Forest and Range Experiment Station

and

Utah State Division of Wildlife Resources

and

U.S. Department of Agriculture Soil Conservation Service

and

University of Idaho Agricultural Experiment Station

and

Utah State University Agricultural Experiment Station

and

University of Arizona Agricultural Experiment Station

NOTICE OF RELEASE OF 'EPHRAIM' CRESTED WHEATGRASS

The United States Department of Agriculture Forest Service Intermountain Forest and Range Experiment Station, Soil Conservation Service, Utah State Division of Wildlife Resources and the Agricultural Experiment Stations of Utah State, Arizona, and Idaho Universities announce the release and naming of Ephraim crested wheatgrass (Agropyron cristatum L., Gaertn.) Ephraim was introduced from Ankara, Turkey. The first planting in Utah was made in 1946 at Majors Flat near Ephraim, Utah. From Majors Flat, seed was planted on the John K. Olsen farm at Ephraim. Continued testing was conducted on the Gilbert Jorgensen farm at Ephraim. Selection was made from this planting for all subsequent plantings to date. Evaluation plantings have been made in northern Arizona, Utah, Idaho and Montana.

Ephraim is rhizomatous and has shown good characteristics primarily for stabilization of disturbed sites, critical area stabilization and erosion control. It is equal to standard crested wheatgrass for range forage.

Ephraim will grow and produce adequate forage with 8 inches annual precipitation. It does best between 10 and 14 inches. The higher the precipitation, the sooner the rhizomatous characteristics develop. It is adapted to a wide range of soils, including disturbed areas and mine spoils. Salt and alkali tolerance is moderately high. It is not well adapted to silty soils having a very low water intake rate or extremely stony sites. When in pure stands, it is susceptible to the black grass bug, Labops hesperus.

Ephraim is a good seed producer when standard cultural practices are followed. Seed matures fairly evenly in early August and can be harvested with a field combine. On rangeland, stands are well maintained by seed and the strong rhizomatous characteristic. Recommended seeding rate for seed production is 3 pounds per acre. When drilling on rangeland, 7 pounds per acre is recommended.

Breeder plants will be maintained by the Aberdeen Plant Materials Center, Aberdeen, Idaho, which will have responsibility for production of foundation seed. Recognized classes of seed are breeder, foundation, registered and certified. Foundation seed is available through local soil conservation districts and agricultural experiment stations. Certified seed should be available in the fall of 1984.

SIGNATURES:

Roger R. Bay, Station Director
USDA, Forest Service Intermountain Forest & Range
Experiment Station

Feb 7, 1983

Douglas F. Day, Director
Utah Division of Wildlife Resources

Feb 4, 1983

Dr. Lee A. Bulla, Associate Director
University of Idaho Agricultural Experiment Station

Dec 20, 1982

Dr. L. W. Dewhirst, Director
University of Arizona Agricultural Experiment Station

Dr. D. J. Mathews, Director
Utah State University Agricultural Experiment Station

Jan 31, 1983

Thomas Shiflet, Director, Ecological Sciences and
Technology Division, USDA, Soil Conservation
Service, Washington, D.C.

2/2/83

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE
INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION (INT)
UTAH STATE DIVISION OF WILDLIFE RESOURCES (DWR)
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE (SCS)

recommend the naming and release of "Ephraim" crested wheatgrass for commercial production and marketing of seed.

INTRODUCTION

Scientific Name: Agropyron cristatum (L.) Gaertn.

Common Name: Rhizomatous crested wheatgrass

Varietal Name: "Ephraim"

Other Identification Used: PI-109012, AB447, U-5, L28, L28B, L28B2, L28A3, A-1770, P-8116, FC-24238, BN-1330-67.

Origin: Originally collected from a dry gravelly-clay soil near Ankara, Turkey.

Description: Ephraim crested wheatgrass is a persistent sod-forming grass adapted to arid ranges of the Intermountain West. It was selected for its ability to produce rhizomes as opposed to common or standard crested wheatgrasses that are bunchgrasses. Ephraim crested wheatgrass has 2n = 28 chromosomes.

Under irrigation, Ephraim will develop rhizomes in one year. On range sites rhizome development is dependent on site conditions, the more harsh the site the slower rhizomes develop (Table 1). On most pinyon-juniper and sagebrush-grass sites, rhizomes will develop by the third year and in some cases the second.

Leaf height and forage production is comparable to common crested wheatgrass. Culm length is, however, a little shorter.

Wolf plants have not developed in stands of Ephraim as does occur in stands of standard or common crested wheatgrass.

Method of Development: The first planting in Utah was made in 1946 at Majors Flat near Ephraim, Utah. From Majors Flat, seed was planted on the John K. Olsen farm, Ephraim. Continued testing was conducted on the Gilbert Jorgensen farm in Ephraim. Selection was made from this planting for all subsequent plantings to date. Experimental plantings have been made in northern Arizona, Utah, Idaho and Montana (Table 1, 2).

Uses: Ephraim has good attributes primarily desired for stabilization of disturbed sites, critical area stabilization, and erosion control. Equal to standard crested wheatgrass for range forage, Ephraim greens up in the spring and fall and matures similarly to standard.

Areas of Adaptation: Ephraim will grow and produce adequate forage with approximately eight inches annual precipitation, however, it does best between 10 and 14 inches. The higher the precipitation, the more rapidly rhizomes develop. Winter and early spring moisture is needed for optimum production. It is adapted to salt-desert shrub, sagebrush-grass, pinyon-juniper, and mountain brush communities. It is also adapted to a wide range of soils including disturbed areas and mine spoils. Salt and alkali tolerance is moderately high. It is not well adapted to silty soils having very low water intake rates or extremely stony sites in the semi-desert climatic zone.

Diseases or Insect Problems: Susceptible to black grass bug, Labops hesperus, when in pure stands.

Seed Characteristics and Production: Ephraim is a good seed producer when standard grass seed production practices are followed. At Aberdeen, Idaho, seed production (pounds/acre) was 373 in 1980, 588 in 1981, and near zero in 1982 because of black grass bug damage.

Seed production on arid rangeland is good. Stands are well maintained by seed and the strong rhizomatous characteristic.

Seed matures fairly even in early August and can be direct-harvested with a standard combine, followed by drying. At 100 percent purity there is an average of approximately 220,000 seeds per pound. Recommended seeding rates for seed production in 28 to 40 inch rows is three pounds per acre. When drilling on rangeland, seven pounds per acre is recommended. When seeding in mixture or broadcasting, adjustments should be made accordingly.

Germination of seed has averaged better than 90 percent (Table 3).

Increase and Distribution: Breeder plants will be maintained at the Aberdeen Plant Materials Center, Aberdeen, Idaho which will have responsibility for production of foundation seed. Recognized classes of seed will be breeder, foundation, registered, and certified.

Foundation seed will be available in 1983 through local soil conservation districts and agricultural experiment stations in Idaho and Utah. Certified seed should be available in the fall of 1984.

Prepared by: Richard Stevens* (DWR) with the assistance of Stephen B. Monsen, Nancy Shaw, E. Durant McArthur (INT), George James, Gary Davis (SCS), Kent R. Jorgensen, and James N. Davis (DWR).

*Federal aid in Wildlife Restoration Project W-82-R

Table 1. Responses of Ephraim crested wheatgrass

Site	Elev-ation	Annual precip. (in.)	Vegetative type	Vigor*	Yrs. for rhizome develop-ment	Avg. leaf ht. (in.)	Avg. seed stock ht. (in
Henry Mtns. Wayne Co., UT	7,600	14.0	Pinyon-juniper	7.5	3	12	21
Manti Sanpete Co., UT	5,600	10.0	Blacksage	9.0	3	13	20
Rasmusson Field Sanpete Co., UT	5,600	12.5	Pinyon-juniper	9.5	3	14	22
Balt Mtn. Sanpete Co., UT	5,900	10.0	Pinyon-juniper	9.0	4	12	22
Stauffer Chem. Unitah Co., UT	5,500	11.0	Phosphate mine spoils	5.0	--	8	17
Salt Creek Juab Co., UT	5,400	10.0	Limestone shale outcrop	5.5	5	7	15
Rulon Mortenson Sanpete Co., UT	5,500	9.0	Salt desert	5.5	5	7	14
Millville Cache Co., UT	4,200	11.5	Sagebrush	7.5	3	12	19
Salina Canyon Sevier Co., UT	6,200	14.0	Roadcut and fill	7.0	3	11	18
Snow Field Stn. Sanpete Co., UT	5,500	10.5	Sagebrush	9.5	2	16	24
Fredonia Mohave Co., AZ	5,200	9.5	Sagebrush	7.0	--	--	--
Decker Montana	4,000	15.0	Coal mine spoils	9.0	--	22	25

* Vigor = 1 low vigor, 10 high vigor

Table 2. Areas where Ephraim crested wheatgrass has been tested by the Aberdeen PMC with good response

Year seeded	Areas*
1942, 1955, 1967, 1973, 1977, 1978, and 1982	Aberdeen
1952, 1955, 1980, and 1982	Tetonia
1969, and 1973	Aberdeen Airport
1970	Knoll Creek
1980	Bradbury Flats
1982	Challis

*All areas except Knoll Creek, Nevada are located in Idaho.

Table 3. Percent germination of Ephraim crested wheatgrass seed grown at Snow Field Station; Ephraim, Utah, and Aberdeen Idaho Plant Materials Center

	1962	1971	1973	1974	1976	1978	1979	1980	1981	Average
Snow Field Station	89.0	100.0	89.0	96.0	97.0	96.0	92.0			94.14
Aberdeen						90.0	86.0	94.0	91.0	90.25
% Purity						93.8	94.0	95.2	97.9	

INFORMATION FROM NANCY SHAW FOR RICHARD STEVENS REPORT

GRASS RELEASE

Information from Decker Mine

15" annual precipitation

elevation 3,500 feet

Sagebrush steppe area

Wyoming ARTRW

Planted 10/10/74

Evaluated 8/75

AGCR $U5^{1}$-73

Two plots

Plot #	No. plants	Distribution %	Plot rating	Leaf height Inches	Stem ht. Inches	Crown spread Inches	Total plot yield kg	Vigor	Uniformit
108	250	99	99	19	25	11	1.8	9	9
302	250	99	99	24	26	6	1.8	9	9