



United States Department of Agriculture  
Natural Resources Conservation Service  
Plant Materials Program

# 'Ephraim' Crested Wheatgrass

*Agropyron cristatum* (L.) A. Gaertn.

A Conservation Plant Release by USDA NRCS Aberdeen Plant Materials Center, Aberdeen, Idaho



'Ephraim' crested wheatgrass.

'Ephraim' crested wheatgrass is a cultivar released in 1983.

## Description

Ephraim is a long-lived, cool season, drought tolerant, introduced grass with an extensive root system. Although crested wheatgrass is typically a bunchgrass, Ephraim is a weakly rhizomatous grass under conditions exceeding 14 inches mean annual precipitation. Culms are approximately 12 to 15 inches tall. Leaf blades are flat or loosely rolled and ¼ inch wide. The inflorescence is a spike approximately ¾ inches wide at the base with numerous tightly packed ascending florets spreading at wide angles to the rachis.

## Source

'Ephraim' crested wheatgrass was introduced from Ankara, Turkey. Detailed collection site information is not available. Ephraim was originally tested in Utah at Majors Flat in 1946. Later plantings were evaluated at the John K. Olsen farm and the Gilbert Jorgensen farm near Ephraim, Utah. A selection was made from the Jorgensen planting and all subsequent plantings came from this selection. Evaluation plantings were conducted in northern Arizona, Utah, Idaho and Montana. Cooperators in the release include the USDA Forest Service Intermountain Forest and Range Experiment Station, Utah

Division of Wildlife Resources, Arizona, Idaho and Utah Agricultural Experiment Stations and the USDA Natural Resources Conservation Service.

## Conservation Uses

The rhizomatous nature of Ephraim makes it a good candidate for stabilization of disturbed sites and erosion control. Under irrigated conditions Ephraim will develop rhizomes during the establishment year. Under dryland conditions rhizome production is site dependent. In sites exceeding 14 inches of mean annual rainfall, short rhizomes commonly develop by the third growing season

Ephraim has established in rainfall areas as low as 8 inches annual precipitation, but provides the best stands with good forage production in areas with more than 10 inches of annual precipitation. Forage production is comparable to 'Fairway' crested wheatgrass. In arid sites, Ephraim is not as productive as standard crested wheatgrass, but it is adapted to a broader range of conditions than standard crested wheatgrass.

Ephraim has good palatability for livestock and some wildlife. Livestock and wildlife will graze Ephraim throughout the spring growing season until it becomes too coarse, and again in fall if re-growth occurs. Established stands can withstand very heavy grazing.

## Area of Adaptation and Use

Ephraim is adapted to the sagebrush-grass, juniper and mountain brush communities of the Intermountain West. It performs best with 10 to 14 inches annual precipitation. Crested wheatgrass is generally not recommended above 7,000 feet elevation; however Ephraim can be used up to 9,000 feet elevation. Ephraim is adapted to a wide range of soils including disturbed sites and mine spoils. However, it is not well adapted to silty sites with a low moisture intake or to extremely stony sites. It has a moderate tolerance to saline and sodic conditions.

## Establishment and Management for Conservation Plantings

Ephraim should be seeded with a drill at a depth of ½ inch or less on medium to fine textured soils and 1 inch or less on coarse textured soils. Single species seeding rates recommended for crested wheatgrass and its close relatives are 5 pounds Pure Live Seed (PLS) per acre. If used as a component of a mix adjust to percent of mix desired. For critical area stabilization, the seeding rate should be increased to 10 pounds PLS per acre or 40 to 50 PLS per square foot. Mulching and light irrigation on highly disturbed, droughty areas are beneficial for stand establishment.

The best seeding results are obtained from seeding in very early spring on heavy to medium textured soils and as dormant seeding in late fall on medium to light textured soils. Late summer (August - mid September) seedings are not recommended unless irrigation is available.

New stands of Ephraim should not be grazed until they are firmly established and have started to produce seed heads. Six inches of new growth should be attained in spring before grazing is allowed in established stands. Three inches of stubble should remain at the end of the grazing season to maintain the long-term health of the plant. Pure stands are susceptible to damage from the black grass bug (*Labops hesperius*).

Ephraim is a low maintenance plant requiring little additional treatment or care. However, spring/fall deferment or grazing rotations are recommended to maintain plant health and to maximize forage production potential. Ephraim is competitive with weedy species, but can be crowded out by some aggressive introduced weedy species and native woody species.

### **Ecological Considerations**

Monocultures of crested wheatgrass can exclude native grasses and forbs. When inter-seeded into native stands, crested wheatgrass commonly co-exists with native grasses, forbs and shrubs. Some native shrubs, such as big sagebrush and rabbitbrush, often invade crested wheatgrass stands.

Ephraim is not an appropriate component in native plant community restoration. This release is from a species that was introduced to the United States in the late 1800's. Ephraim represents an incremental improvement in performance within a well documented species. Ephraim spreads very little via natural seed distribution. It is not considered a weedy or invasive species but can spread into adjoining vegetative communities under ideal environmental conditions. There are no known negative impacts on wild or domestic animals.

### **Seed and Plant Production**

Seed production of Ephraim has been very successful under cultivated conditions. Row spacing of 24 to 30 inches when irrigated and 36 inches or greater under dryland conditions are recommended. Early spring or late fall seedings are recommended under dryland conditions. Early spring seedings are recommended under irrigated conditions. When irrigated, spring seedings consistently yield more seed during the first year of seed production. To obtain maximum seed production, fall plantings are not recommended.

Control weeds by clipping, hand rousing or light rates of herbicide (2,4-D or Bromoxynil according to label) after the five-leaf stage. Fertilizer is generally not recommended during establishment.

Seed fields are productive for four to five years. Average production of 200 pounds per acre can be expected under dryland conditions in 14 inch plus rainfall areas. Average production of 650 pounds per acre can be expected under irrigated conditions. The seed heads do not readily shatter, but some shatter can be expected. Harvesting is best completed by direct combining when the top of the seed head begins to shatter or wind-rowing at hard dough stage and combining with pickup attachment in about 5 to 7 days. Seed is generally harvested in mid July to mid August.

### **Availability**

*For conservation use:* Certified seed is widely available from commercial seed vendors.

*For seed or plant increase:* Breeder and Foundation seed is maintained by the Aberdeen PMC. Foundation seed is available through the University of Idaho Foundation Seed Program and Utah Crop Improvement Association. Certified seed shall be limited to not more than two generations from Foundation seed (Registered and Certified).

*For more information, contact:*  
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### **Citation**

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