

Hunter Germplasm

Selected Class

Ponderosa Pine

Hunter Germplasm is a selected germplasm of Rocky Mountain ponderosa pine *Pinus ponderosa* var. *scopulorum*. It was selected for rate of height growth, seedling survival, and vigor. It has good heat, cold, and drought tolerance and can withstand a wide range of soil conditions. The 200-tree Hunter Germplasm seed orchard at the Bridger Plant Materials Center represents a composite of 38 seed sources from Nebraska (16), Montana (15), and South Dakota (7). Hunter Germplasm is a large conifer native to the northern Great Plains selected as a tall, evergreen component for windbreaks and shelterbelts east of the Continental Divide, although it is also useful in wildlife enhancement plantings, reclamation projects, and xeriscape landscapes.

Hunter Germplasm was selected and released in 2002 by the Natural Resources Conservation Service in cooperation with the Montana Agricultural Experiment Station, the Wyoming Agricultural Experiment Station, the Agricultural Research Service, the United States Forest Service, and the Montana Department of Natural Resources and Conservation.

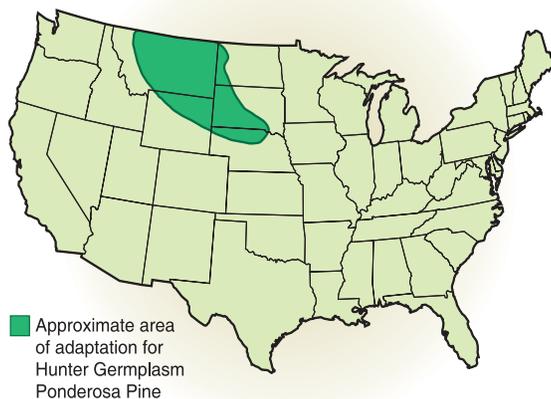
Ecotype Description

Hunter Germplasm increased in average annual height growth each successive year until selection in 1995 when it averaged 25.2 inches of growth under dryland conditions in a 10- to 12-inch precipitation zone with clean cultivation. Average height in 1995 (9 years of age) was 9.1 feet. Projected height at 20 years of age under similar conditions is 30 to 35 feet. Supplemental moisture may increase rate of height growth.

Percentage survival of Hunter Germplasm seedlings was 43.7 percent greater than non-selected plants and averaged 62 percent at the end of the study.

Propagation and Establishment

Ponderosa pine produces male and female cones separately on the same plant. Pollination occurs in early May in Bridger, Montana, with fertilization approximately 13 months later. Cone maturation requires two years. Cones begin ripening in early- to mid-September in Bridger, but maturation varies by year and site. Cones change from predominantly green or purple to yellow or light brown upon initial ripening. Harvest cones within 7 to 10 days of bract separation to assure maximum seed retention. Dry cones immediately after harvesting to prevent molding or internal heating. Good cone crops are



typically produced every 3 to 5 years. This selection averages 12,095 seeds per pound. Store seeds at 5 to 10 percent moisture between 0° and 5°F.

Hunter Germplasm is propagated primarily from seeds. The species can be produced as bareroot or container plants, although out-planting success is typically best with container stock. Fresh seeds germinate without stratification,

whereas stored (embryo-dormant) seeds require 60 to 90 days of cold, moist chilling at 33° to 41°F to germinate. Fall field planting of embryo-dormant seeds is required to break dormancy, or seeds can be artificially stratified and then field sown in the early spring. Adjust seeding rates based on viability. Sow seeds at a rate to produce 35 to 40 seedlings per square foot, or 6 to 8 seedlings per linear foot of row. Sow to a depth of 1/8 to 1/4 inch. Field production is best on fertile, well-drained soils. Both 1-0 and 2-0 stock are acceptable, the latter preferred. Grow container stock in 30- to 40-cubic inch pots for 2 to 3 years for best results. Asexual propagation is most successful by grafting. Vegetative propagation by stem cuttings is poor although limited success has been achieved with trees less than 5 years of age.

Hunter Germplasm transplants well to at least 10 years of age if supplemental moisture is provided. Of 302 dormant trees transplanted in the spring at Bridger with a 45-inch tree spade, 300 survived.



Adaptation

Hunter Germplasm is adapted to a wide range of site conditions. The species has low critical levels of foliar nitrogen and phosphorus, allowing it to tolerate marginal sites such as mine spoils. It grows on various soil types including igneous, metamorphic, and sedimentary; and is found growing on Entisols, Inceptisols, Mollisols, and Alfisols over its natural range. The species performs best on coarse- to medium-textured soils on drier sites over its natural range, and supplemental moisture may be needed on heavy-textured soils in low precipitation areas for optimum survival and growth. Ponderosa pine grows on soils within a pH range of 4.9 to 9.1; however, the surface horizon usually ranges from 6.0 to 7.6. Soil salinity tolerance for the species is "moderate" for a woody plant and typically ranges from less than 4 mmhos/cm of electrical conductivity

to 6 mmhos/cm. Anticipate decreasing growth rates and vigor with increasing salinity above 4 to 6 mmhos/cm.

Hunter Germplasm grows well in USDA Winter Hardiness Zone 3b, tolerating average minimum winter temperatures of -30° to -35° F. Based on the minimum cold tolerance of this species, Hunter Germplasm may tolerate Zone 3a with average minimum winter temperatures of -35° to -40° F.

Hunter Germplasm will perform well in most of central, south central, and southeastern Montana, north central and northeastern Wyoming, northwestern and north central Nebraska, and south central and southwestern South Dakota. This selection should perform well east of the Continental Divide in most of Montana and eastern Wyoming at elevations below 5,500 feet, possibly to 6,000 feet given other favorable conditions.

Availability

Seedlings are available for commercial sale through state forest tree and commercial nurseries. Check with local nurseries for availability. Foundation seeds are available on a limited basis for plant production. Cuttings are available on a limited basis for seed orchard establishment. Contact the Montana Plant Materials Specialist, USDA/NRCS, Federal Building, Room 443, 10 East Babcock Street, Bozeman, MT 59715 or the Bridger Plant Materials Center, Route 2, Box 1189, Bridger, MT 59014 for more information.

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*References for this brochure available upon request.

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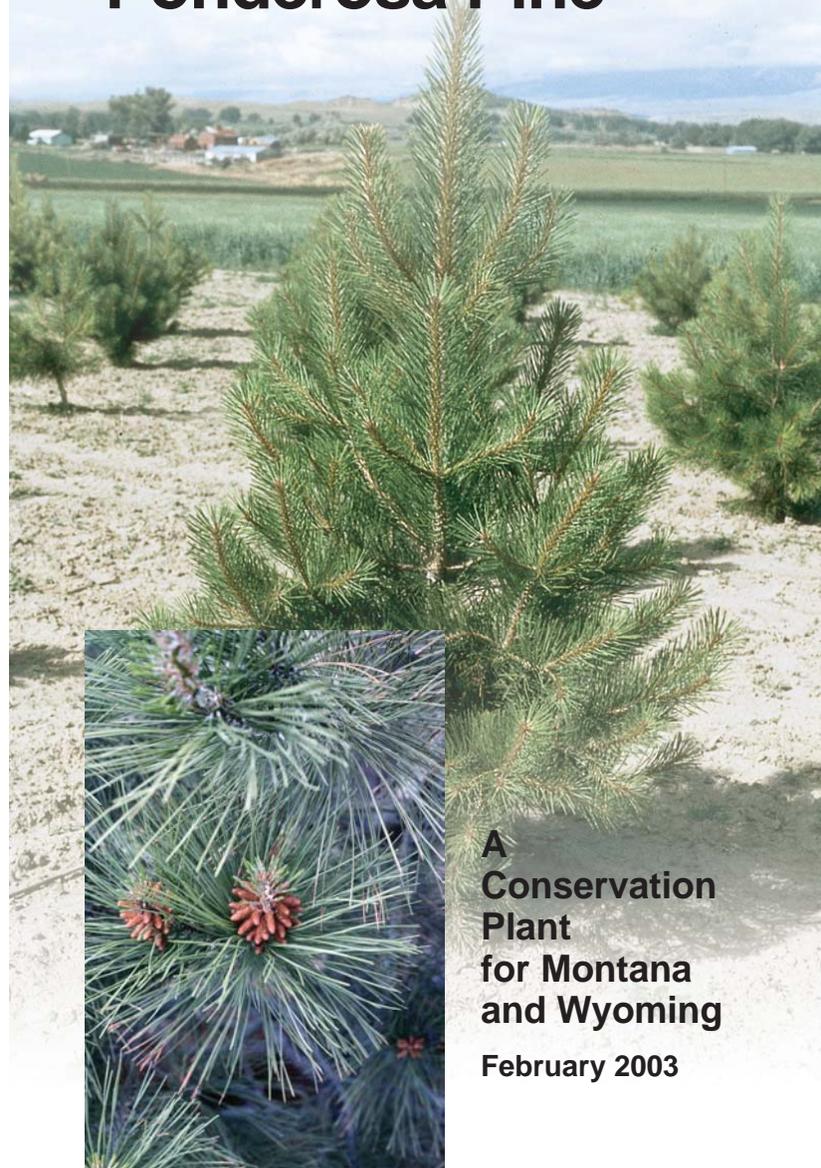
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A
Conservation
Plant
for Montana
and Wyoming

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