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

Hunter Germplasm ponderosa pine

Pinus ponderosa Lawson & C. Lawson var. *scopulorum* Engelman.

A Conservation Plant Release by the USDA-NRCS Bridger Plant Materials Center, Bridger, Montana

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Hunter Germplasm is a Selected class release of ponderosa pine *Pinus ponderosa* Lawson & C. Lawson var. *scopulorum* Engelm. (accession number 9081843). Hunter was selected and released in 2002 by the USDA-Natural Resources Conservation Service, Plant Materials Center, Bridger, Montana, 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.

Description

Hunter ponderosa pine has the same general botanical (floral, foliage, fruit, seeds) and phenological attributes as the species and variety. It is assumed Hunter traits are heritable and the appearance and performance of the progeny from this selection will be comparable to its parents. Ponderosa pine is a perennial, woody, evergreen tree native to western North America.

Source

Hunter ponderosa pine is a bulk from 38 parent trees from Nebraska (16 trees), Montana (15), and South Dakota (7). It was selected for rate of height growth, seedling survival, and vigor. The average annual height growth of Hunter increased each successive year after planting until selection in 1995 when it averaged 25 inches of growth under dryland conditions in a 10- to 12-inch precipitation zone with clean cultivation. Average height at 9 years of age was 9 feet. Projected height at 20 years of age under similar conditions is 30 to 35 feet. Percentage survival of Hunter seedlings was 44 percent greater than non-selected plants and averaged 62 percent at the end of the study.

Conservation Uses

Hunter ponderosa pine was selected primarily as a tall, evergreen component for windbreaks and shelterbelts east of the Continental Divide (see Figure 1). It is also useful in wildlife enhancement plantings, reclamation projects, riparian forest buffers, and low maintenance landscapes.

Area of Adaptation and Use

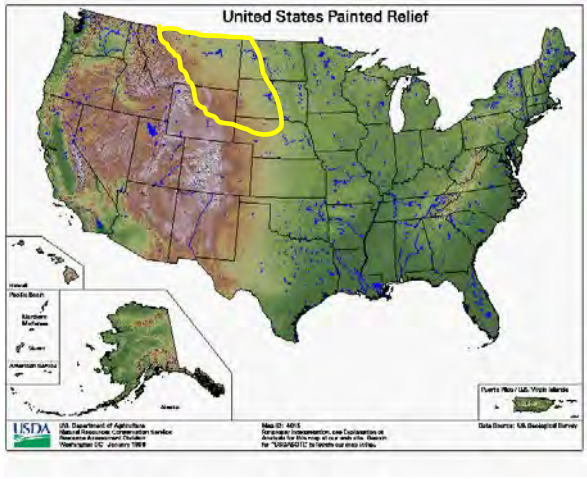

Figure 1. Range of adaptation of Hunter Germplasm ponderosa pine.

Hunter is adapted to a wide range of site conditions and soil types. It grows best on coarse- to medium-textured soils on drier sites, 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 “poor” to “moderate”, depending on soil texture. Salinity tolerance ranges from less than 4 millimhos per centimeter (clay soils) to 6 millimhos per centimeter (sandy soils). Anticipate decreasing growth rates and vigor with increasing salinity above 4 to 6 millimhos per centimeter.

Hunter ponderosa pine 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 may tolerate Zone 3a with average minimum winter temperatures of –35° to –40°F.

Hunter 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.

Establishment and Management for Conservation Plantings

Ponderosa pine can be planted as bareroot or container plants, although transplanting success is typically best with container stock. Both 1-0 and 2-0 stock is 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 by grafting. Hunter transplants well to at least 10 years of age when supplemental moisture is provided.

Soil moisture stress resulting from grass and shrub competition can also limit seedling survival and growth. Ponderosa pine does not tolerate flooding or soil compaction well. It is considered shade intolerant, and should be planted in full sun for best performance.

Ecological Considerations

Hunter ponderosa pine is a native species that reproduces only by seed under natural conditions. It does volunteer into range and pastures thereby reducing grazing value. Initial establishment and spread is often limited by low seed dissemination, inadequate moisture, seed losses to insects and animals, heavy-textured soils, plant competition for moisture and sunlight, low night temperatures, insufficient winter hardiness, frost heaving, and other factors. It does not tolerate shade or predation from rabbits, hares, squirrels, pocket gophers, porcupines, deer, and domestic livestock (primarily cattle and sheep). Ponderosa pine is the host of numerous insect and disease pathogens.

Livestock browsing on needles (fresh and dry), bark, or buds may cause premature birth of stillborn or weak young within 2 to 14 days of ingestion, although animals seldom eat toxic quantities unless there is a lack of other suitable forage. Exclusion by fencing eliminates this problem.

Seed and Plant Production

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 2 years. Cones begin ripening in early- to mid-September in Bridger, but maturation varies by year and site. Dry cones immediately after harvesting to prevent molding or internal heating. Good cone crops are typically produced every 3 to 5 years.

Ponderosa pine is propagated primarily from seeds. Hunter averages 12,595 seeds per pound. Fresh seeds germinate without stratification, whereas stored seeds require 60 to 90 days of cold, moist chilling at 33° to 41°F to germinate. Fall field planting of dormant seeds is required to break dormancy or seeds can be artificially stratified and then field sown in the early spring. 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 ¼ inch. Field production is best on fertile, well-drained soils.

Availability

Commercial seedlings are available from state and private conservation seedling nurseries. Seed of Hunter for commercial seedling production is available by contacting the Foundation Seed Stocks Program, Department of Plant Sciences and Plant Pathology, Montana State University, Bozeman, Montana 59717-3150 or Wyoming Seed Certification Service, Powell Research and Extension Center, University of Wyoming, P.O. Box 983, Powell, Wyoming 82435-9135.

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