Grand fir, *Abies grandis*

Picture Source: *Dendrology at Virginia Tech* Webpage, (http://www.cnr.vt.edu/dendro/dendrology/main.htm)

Range

Canada: British Columbia; USA: Montana, Idaho, Washington, Oregon and California at 0-1500 m in moist conifer forests (Hunt 1993).

Figure: native range of grand fir (Figure Source: Burns, R.M. and B.H. Honkala. 1990. Silvics of North America, Vol. 1, Conifers. Washington DC: U.S.D.A. Forest Service Agriculture Handbook 654. http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm)

Climate, Elevation

Grand fir grows in drier (generally rainshadow) climates: areas with less than 150 cm of precipitation annually.(1) Elevation ranges from Sea level to 5,000 ft.(2)

Local occurrence (where, how common)

Common understory tree under Douglas-fir, occasionally a co-dominant tree. (2)

Habitat preferences

Prefer deep, moist, alluvial soils along streams or on mountain slopes.(2)

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)

Grand fir is a dominant climax species in some habitat types and a long-lived seral species in other types. And is a shade-tolerant species. (3)

Associated species

Western larch, Douglas fir, alpine fir, Engelmann spruce, ponderosa pine, western white pine and lodgepole pine.(2)

May be collected as: (seed, layered, divisions, etc.)

Seed.

Collection restrictions or guidelines

Flowering occurs from mid-April to mid-June, cones ripen in August, and seed dispersal is in late August to early September. Collect cones by hand after they are ripened but before seed dispersal.(4)

Seed germination (needs dormancy breaking?)

Seed should undergo a cold, moist stratification for 15-30 days, Sow stratified seeds in spring at a depth of 0.5 cm and cover with a thin layer of mulch. (Franklin 1974).

Seed life (can be stored, short shelf-life, long shelf-life)

Five or more years.(4)

Recommended seed storage conditions

Stored dry in sealed containers at -5°C.

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)

Collect cones, separate seeds, plant seeds. Separate seeds by breaking up the dried cones, then tumbling, shaking, and screening.(4)

Soil or medium requirements (inoculum necessary?)

At a depth of 0.5 cm and cover with a thin layer of mulch. (Franklin 1974) Germination is best on mineral soil, but on seed-tree cuttings, grand fir germinates nearly as well on duff as on any other surface.(3)

Installation form (form, potential for successful outcomes, cost)

Seeds, container-plants grown from seeds.(5)

Recommended planting density

Spacing of grand fir Tree: 20-30 ft. (6-9 m) (6)

Care requirements after installed (water weekly, water once, never water, etc.)

Coldframe or unheated greenhouse.(6)

Normal rate of growth or spread; lifespan

Mature at 20-30 yrs. Trees 250 years old are common and occasional trees may be more than 300 years old. Without supporting data, ages of over 300 years have been claimed.(5) Initial survival and growth of grand fir are favored by a moderate overwood shade. Under full sun it is largely subordinate to faster growing, shade-intolerant species. Under partial overwood shade, grand fir is aggressive enough to form a dominant part of

the reproduction. After 20 to 30 years, it makes most rapid growth in the open (5).

Sources cited

(1) Jim Pojar and Andy Markinnon 1994 Plants of The Pacific Northwest Coast Washington, Oregon, British Columbia & Alaska. B.C Forest Service, Research Program 34p.

(2) Richard J. Preston, Jr. 1989. North American Trees 4th Edition. Iowa State University Press / AMES. 83p Burns, R. and B. Honkala 1990. Silvics of North America, Volume 2, Hardwoods. Agricultural Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, D. C. 877 p.

(3) US Forest Service Northeastern Area State & Private Forestry (http://www.na.fs.fed.us/spfo/pubs /silvics_manual/Volume_1/abies/grandis.htm)

(4) Rose, R., C. Chachulski and D. Haase. 1996. Propagation of Pacific Northwest Native Plants: A Manual, Volume Two, First Edition. Nursery Technology Cooperative, Oregon State University, Corvallis, Oregon, 182p.

(5)Burns, R.M. and B.H. Honkala. 1990. Silvics of North America, Vol. 1, Conifers. Washington DC: U.S.D.A. Forest Service Agriculture Handbook 654. http://www.na.fs.fed.us/spfo/pubs/silvics_manual /table_of_contents.htm, last accessed 13-Jul-2001.

(6) http://plantsdatabase.com/go/522/

Data compiled by: Yongjiang Zhang, 11 April 2003