Hydrophyllaceae—Waterleaf family

Nama lobbii Gray

woolly nama

Eamor C. Nord and Andrew T. Leiser

Dr. Nord (deceased) retired from the USDA Forest Service's Pacific Southwest Forest and Range Experiment Station; Dr. Leiser is professor emeritus at the University of California's Department of Horticulture, Davis, California..

Other common names. Lobb fiddleleaf.

Growth habit, occurrence, and use. There are 2 perennial species in this genus, both low-growing, suffruticose plants native to California, Nevada, and Utah. Only the subshrub woolly nama—*Nama lobbii* Gray—has potential for revegetation use, as it can provide a rather persistent, dense groundcover. The other species—Rothrock fiddleleaf, *N. rothrockii* Gray—furnishes only a sparse cover that dies back to the roots each year.

Woolly nama is native to the Sierra Nevada and Cascade ranges in east central and northern California, and western Nevada at elevations of 1,220 to 2,100 m within ponderosa (*Pinus ponderosa* Dougl. ex Laws.) or Jeffrey (*P. jeffreyi* Grev. & Balf.) pine and California red fir (*Abies magnifica* A. Murr.) forests. It occurs in sunny, exposed locations with slightly to moderately acid soils derived mostly from volcanic mud flows and decomposed granites. Plants 15 to 60 cm tall are generally sparse and widely scattered (McDonald and Oliver 1984). However, where the tree or associated shrub overstory is removed, such as by logging or other mechanical means, woolly nama spreads rapidly to form dense crowns up to 1.5 m in diameter on individual plants (McDonald and Fiddler 1995). Fast-growing roots that extend up to 5 m or more in a single year contain a profusion of adventitious buds that sprout to form new plants.

Woolly nama has many characteristics that make it desirable for revegetation on adapted

sites. The low growth habit helps reduce fire hazards in brush-cleared areas, and its abundant, aggressive sprouting habit together with dense foliage provides good groundcover. It is known to offer strong competition and thus reduce growth of young conifers within plantations (McDonald and Oliver 1984). Although it is not regarded as a serious weed pest in areas where it occurs naturally, care should be exercised to prevent introduction and possible spread of this plant into cultivated croplands, mainly because of its aggressive rooting habits, which enable the plant to withstand cultivation.

Flowering and fruiting. The numerous small purple flowers are borne in reduced terminal cymes or in axillary angles along slightly erect stems; they appear from May to September. The fruit is a capsule containing 10 to 12 oval, angular, very dark brown seeds up to 1.5 mm long (figures 1 and 2). The capsules mature in late August, September, and October. In a test of a cleaned seedlot, seeds measured 1 to 1.3 mm in diameter; 85% of the seeds in the lot were filled and there were about 2,000 seeds/g (56,875/oz).

Collection, extraction, and storage. Mature seeds may be hand-stripped or flailed directly into containers, or seed heads together with some foliage may be harvested mechanically during late September and thereafter until snow covers the ground. One means is to use a rotary lawnmower equipped with a collection bag and set at maximum height that clips and gathers the material, which is later dried and threshed. The seeds may be extracted by threshers or hammermills, and cleaned with aspirators or air-screen cleaners. A collection made in the Tahoe basin, using this type of equipment, yielded over 1.8 kg (4 lb) of clean seeds from about 59 kg (130 lb) of dry clippings (Nord and Leiser 1974). Only half of the total number of seeds was released from capsules during clipping and drying, and the remaining seeds had to be extracted and separated by a hammermill and South Dakota Seed Blower. No precise data are available on longevity of woolly nama seeds, but they are presumed to be orthodox in storage behavior and should remain viable for a number of years when stored dry at low temperatures.

Germination. Woolly nama seeds exhibit what apparently is seedcoat dormancy. Stratification has no effect, but when the seedcoats are removed, up to 60% of the seeds will germinate. The dormancy may be due to a chemical that is found in the seedcoat. Extracts of the colored leachate obtained from seeds kept under intermittent mist contained an anionic polyphenol that may inhibit germination (Nord and Leiser 1974). Leaching woolly nama seeds

for 3 days under intermittent mist for 3 seconds at 2-minute intervals, followed by soaking in 200 ppm gibberellic acid, yielded 39% germination. Other treatments in which gibberellic acid was used yielded as much as 30% total germination, but sulfuric acid, thiourea, hydrogen peroxide, and hot water treatments were not effective in improving germination. In laboratory tests , the first observed germination was at 12 days and germination continued intermittently thereafter throughout a 4-month period (Nord and Leiser 1974).

Because of the very low and slow germination, it is most unlikely that woolly nama can establish itself satisfactorily from direct field seeding unless seeds are treated in some manner to break dormancy. This appears to be the case even in native stands, where seedling plants are rarely found; presumably most natural establishment or spread of this species comes from root segments transported during some form of soil disturbance.

Nursery and field practice. The best method known to prepare the seeds for sowing calls for leaching the seeds under intermittent mist or running water for 2 to 3 days, soaking in gibberellic acid that is constantly agitated, and air-drying thoroughly. The seeds should not be rinsed or washed. Soaking for 2 hours in 200 ppm or stronger gibberellic acid solution is suggested if seeds are to be sown within a few days after treatment. If seeding is to be delayed for more than about 10 days and soil moisture conditions are unpredictable, stronger solutions and longer soak times (probably up to 500 ppm for periods up to 24 hours) should be used to reduce risks of leaching should rains occur before seeds germinate. Seeding should be done in the late fall or very early spring to take advantage of the most favorable moisture conditions for germination and seedling establishment. Seeds may be sown separately or mixed with rice hulls as a diluent and carrier at a depth of about 12 mm (½ in) on properly prepared, firm seedbeds where competing vegetation has been previously removed.

The plant makes its best development on medium-textured, well-drained soils that are neutral to moderately acid in reaction. The plants are susceptible to gopher damage to the roots in southern California, but they appear to be immune from damage to the foliage by animals, including rabbits, which often damage or destroy many other shrub or herbaceous species.

Rooting either stem cuttings or root sections of woolly nama has not been too successful. In several trials, only 30% of stem cuttings rooted, and none survived when transplanted into pots. Root cuttings failed to regenerate new plants, although some fresh shoots became green and

grew slightly (Nord and Goodin 1970).

References

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Figure 1—*Nama lobbii* Gray, woolly nama: seed.

Figure 2—*Nama lobbii* Gray, woolly nama: longitudinal section through a seed.