



Germinating Seeds of Alaska's Nootka Lupine

by
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The Nootka lupine (*Lupinus nootkatensis*), grows wild along the southern coast of Alaska from Ketchikan to Attu Island, Aleutian Islands. It does not occur north of the Alaska Range, but limited tests at the GBG have shown that it can thrive in Interior gardens. The bushy herbaceous perennial grows to an average 24-inch (61 cm) height and 28-inch (71 cm) spread in full sunlight. Racemes of blue flowers emerge atop the dissected foliage in June, providing some much needed early garden color that lasts about three weeks. In late June, the flowers are succeeded by clusters of short green pods, called legumes.

The legumes resemble small garden pea pods. In August these legumes turn black, and when the seeds are fully mature, they shatter sending seeds flying in all directions.

The plants grow well in silt loam or sandy, well-drained soils. They usually bloom the second year after planting. If seeds are started indoors in March or April, some flowering may occur the first year. Full sun is best for the most vigorous growth. In partial shade, the plant becomes leggy and not as well-branched.

Nootka lupines usually produce an abundance of seeds, but propagation by seeds can be difficult. Because the legumes shatter when ripe, timing is critical in collecting seeds. The legumes do not ripen evenly, and if collecting is delayed even a few days, the fat black legumes will have split and twisted corkscrew fashion flinging the seeds everywhere.

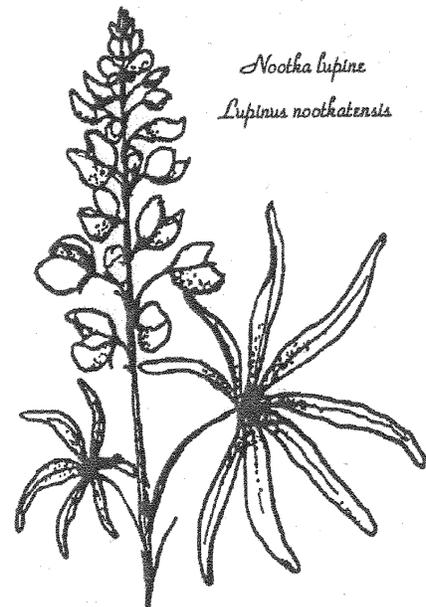
I usually wait until the lower-most legumes begin to turn black then cover the entire seed stalk with a cheesecloth-bag or knee-high stocking, securing the bag to the stem with a twist-em. As the legumes shatter, the seeds are collected in the bottom of the bag. Don't use plastic bags for this purpose because temperature and moisture inside the bag can get very high resulting in rot. Paper bags also don't work because they get soggy fast, and they exclude the light necessary for seed development.

Wild-collected seeds are nearly always heavily infested with insect larvae that burrow into the legume and munch on the seeds. The plants growing in the GBG have not yet shown signs of larval infestations probably because they are isolated from wild stands. The seeds are a mottled gray-brown or black in color and resemble tiny bean seeds.

Nearly all of the seeds are "hard." The term, hard seeds, is characteristic of many leguminous species including clover and alfalfa. The germination percentages on packages of the seeds will always contain a total percent germination plus a percent hard seeds. Hardseededness refers to the presence of a thick, waxy seed coat that prevents the uptake of water by the seed. Seeds are alive, but they will not germinate because they cannot take up water.

Seeds need to be scarified before they germinate. Scarification is the process of breaking through a very hard seed covering that is preventing the uptake of water. Gardeners can sow the seeds immediately outdoors and expect a small percentage of the seeds to germinate over several years.

Alternatively, several methods of abrading the seed coat can be used to get faster germination. The late Dick Baldwin, Baldwin Seed Company in Kenai, Alaska, recommended nicking the seeds with a razor blade on the rounded end or scratching them with a file for quick germination. Other gardeners have rubbed seeds between layers of sandpaper or tumbled them in



stone polishing mills for a minute or two.

One process used commercially is acid scarification. Seeds are soaked in concentrated sulfuric acid for a specific period of time. The acid eats through the seed coat and permits water to enter the seed. Timing is critical since a lengthy soak can kill the seed. This process is also dangerous and requires protective clothing and eyewear,

I conducted an experiment to determine the acid scarification treatment necessary for Nootka lupine seeds. I soaked seeds in acid for up to 40 minutes, removing some seeds at two-minute intervals. I washed the seeds thoroughly in running water, then placed them on moistened paper for germination. More than 90% of the seeds soaked for 32-40 minutes germinated very rapidly.

The response to the acid treatment was so rapid the seeds more than doubled in size as they took up water within 1/2 hour of treatment. Seeds I had not yet sown onto the paper changed radically in size and appearance. It was easy to determine which seeds had not been adequately scarified. They simply didn't swell and remained a dark brown color. Within 24 hours, more than 70 percent of the seeds soaked in acid at least 32 minutes had germinated!

I have germinated many legume species during the past five years, and one thing they all seem to have in common is an extreme susceptibility to damping off (especially *Pythium* species). If seeds are sown directly onto potting soil, even sterilized soil, apparently healthy seedlings will grow until the first true leaves appear. Invariably, a large percentage of these seedlings will suddenly wilt and die. A close examination of the stem reveals the typical soft, mushy tissue just near the soil surface. Because of this problem, I routinely treat the seedlings with a fungicide drench immediately after sowing. Despite all the difficulties, seed germination still offers the best method of propagating this plant. Mature plants do not transplant well from the wild.

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