

SEED TESTING

J. A. Hill - Pennsylvania

All the seed testing for the four nurseries operated by the Department of Forests and Waters is done at the Mont Alto Nursery Laboratory. We test about 40-50 lots per year. These include new seed lots received from dealers, new lots from our own collections, and stored lots to be sown in the fall or the following spring.

Our testing usually starts in September and continues until April. We could probably finish testing in December, but occasionally lots are purchased early in the year.

We use a "Seedboro 36-inch Seed Sampler" to obtain a sample from the storage carboys. If the sample is too large, we pass it through the "Seedboro Seed Divider" to maintain a representative sample. We have found that sampling difference, as it affects final germination percentage, will run between 3 and 5 percent. If a seed lot is large (300 pounds or over), samples are taken from several containers. We have occasionally found that there is a great variation in germination between containers.

If we are working with a new seed lot, the moisture content of the seed will be determined by means of the "Ohaus" moisture meter. For coniferous species, using a heat setting of 55 for 20 minutes, we have found that the resulting percent compares to 8 hours at 105 °C in an oven. We have an oven (Chicago Surgical & Electrical Co.) (heat ranging to 200 °C) in the lab and have run many checks on the Ohaus. We consider 6-10 (percent moisture (Edit.)) as the maximum for safe, long-term storage of conifer seed that we use.

For determination of seed per pound and purity, we use a sensitive torsion balance and a person with patience.

The actual test is made on 4-100 seed samples for conifers and all hardwoods except tulip poplar. For the latter, we use 4-50 seed samples.

If seed is to be stratified before germination (white pine, white spruce, and hemlock each time; and Japanese larch and some other species occasionally), we place the 100 seed samples on blotting paper in covered plastic dishes, and put them in a refrigerator at 40°F for the required stratification time. When stratification is complete, we remove the cover from the plastic dish and put the seed, blotter and plastic dish in the germinator. Seeds to be germinated directly are placed on ruled blotters covering the entire shelf (4 lots to a shelf).

For the actual germination test, we use a "Dalite Jr." manufactured by Stuitz Scientific Supply Co. We operate it at 86°F for 8 hours with light and 68°F for 16 hours without light. The humidity control in the cabinet is relatively good; certain areas, however, tend to dry out. We usually check the cabinet every 2 days to moisten any dry areas. Our counts are made every 7 days and tests are concluded on the 28th day. At this time, the remaining hard seed is counted.

For each test, a seed record sheet is maintained with all test results and other pertinent information recorded. Other forms used include the seed lot record (test results appear on this sheet with the disposition record of the seed lot), the seed inventory sheet (one for each lot), and the seed transfer voucher.

For three years, our average labor costs per test have been \$12.50, \$10.50, and \$5.00. Higher readings for two of the three years reflect some experimental work done along with the testing. There were also more new seed lots which required seed per pound, moisture content, and purity determination. A reasonable estimate as to the cost per sample for complete test, would be about \$8.00 for labor. If supervision, depreciation of equipment, and utilities are added, the cost would be about \$10.00 per sample.