



AW-MEASUREMENT FOR SENSITIVE SEEDS

Water activity measurement plays an integral role at the Tree Seed Centre in British Columbia.

«Rotronic has become the standard for water activity measurement at many seed storage facilities throughout the world.»

Dale Simpson
Tree Seed Working Group, Canada



The Tree Seed Working Group has four objectives related to promoting tree seed science and technology through:

- Seed research from bud initiation to seed use
- Identification of seed problems relating to seed improvement and forest management
- Exchange of information on seed related problems
- Consulting on implementation practices

Water activity continues to be an area of interest to the Tree Seed Working Group TSWG, especially with their genetic conservation collection. “It simply is the best technology to use to maximize longevity of tree seeds” says Dale Simpson of the TSWG. Dale continues, “Rotronic has become the standard for water activity measurement for many seed storage facilities throughout the world.”

Influence on the longevity of the seed

Meghan Duke works for the Ministry of Forests, Land and Natural Resources Operations, and is also a member of the TSWG. Although water activity is a relatively new technology to the Tree Seed Centre, it already plays an important role. Meghan explains: “A water activity meter is a quick, non destructive tool for evaluating moisture in a sample of seed.

The meter outputs a value between 0 and 1, which is equivalent to equilibrium relative humidity (eRH) if the meter and the sample are at the same temperature. It differs from a moisture content test in that it assesses free water rather than the total water content in a sample of seed. The amount of free water in a seed will depend on its relative composition of lipids, starches, and proteins.

Storing seed in the freezer with a water activity measurement that is either too high or too low will decrease the longevity of the seed. The ideal level ultimately depends on the species; however, most people now accept the concept of a universal value. At the Tree Seed Centre, we keep within a range of 0.35 ± 0.05 ”.

The role of water activity measurement

Currently, water activity is used primarily for testing seed collected for genetic conservation and research. The seed is often rare and valuable; thus a non destructive method of assessment is imperative. Collections intended for the seedbank arrive at the Tree Seed Centre grouped by population (noted by location), with each population containing, on average, a sample of 10 parent trees. Populations are stored in the cooler at 2°C to await an initial water activity assessment. If the water activity is too high, the seeds are dried back and retested prior to placement in the freezer at -18 °C to maximize seed longevity.