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Organization of the cryostorage of plant seed in the permafrost soils of the Yakutia

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Abstract

Storage of plant seeds at negative temperatures and optimum humidity, allows to keep their viability for a long time – tens probably hundreds years, without resowings. Results of researches earlier conducted in Yakutia on storage within more than 35 years of plant seeds in the conditions of permafrost soils showed that for conservation of their viability and genetic integrity temperatures - 6÷-10°C, framed only due to natural cold of permafrost soils, without additional refrigerator cooling are optimum. The optimum region for creation of such cryostorage are northern territories where are steady permafrost soils. For example, near Yakutsk the layer of permafrost soils is 250-350 m with all the year round stable negative temperatures.

In December of 2012 in vicinities of Yakutsk were organized seed cryostorage of agricultural, cultural, rare and endangered, wood species of plants. The cryostorage is located in a layer of permafrost soils at a depth of 10 m with a natural temperature of soils -2,4°C. Its total area is 150 sq.m. and it is suitable to store about 100 thousand samples of seeds, all-the-year-round temperature inside storage is 6÷10 °C.

Maintenance of stable temperatures (-6÷-10 °C) is carried out, thanks to the developed technology, by using of natural cold, cold of atmospheric air during the winter period accumulates and used to cool cryostorage during summertime. Use of natural cold significantly reduces prime cost of such way of seed storage at high degree of reliability and autonomy even in the conditions of possible natural and/or technogenic catastrophes.

Biography

Khlebnyy E.S. completed his PhD at age 24 in Institute for biological problems of permafrost, were works now as a senior staff scientist. He has more than 30 science publications.