
Climatic change and genetic resources in northern Europe

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cooperation and germplasm exchange with renowned companies such as Svalöf and Weibull. Among these important contributions were those from collecting missions and explorations undertaken by Vavilov himself.

The material acquired needed to be studied and to undergo ecogeographic trial analysis. Thus, in 1923 he decided to establish the northernmost experiment station in the USSR – the Polar Station. Today at the Polar Station 3631 crop accessions belonging to 38 species are maintained in a viable condition, including potato (2758 accessions), berries (419), vegetables (262) and fodder crops (174).

Almost all the plant material of Nordic origin accumulated since 1921 and stored in VIR's collections is now being studied, supplied with passport and evaluation databases, utilized in breeding practice and placed in long-term storage. It is freely accessible, and various users, including those from foreign countries, utilize the germplasm from VIR's genebank. For example, in the past decade over 2000 accessions of different crops have been shipped to foreign users (1285 to Canada, 517 to Sweden, 183 to Finland, 168 to Denmark and 10 to Norway). We also continue to receive germplasm samples from our colleagues. During the same period 910 accessions have been received from the above-mentioned countries.

Notwithstanding its notable achievements, the potential of such cooperation, in our opinion, is far from being exhausted. It is recommended to enhance mutually advantageous collaboration between the countries of the Nordic region both within the ECPGR framework and on bilateral bases for the benefit of the world community.

Such collaboration may have the following priorities:

- Study, screening and evaluation for commercial qualities of the existing genetic diversity of various crops suitable for northern regions.
- Collecting in northern and Siberian meadows, pastures and forests it is possible to find valuable plant genetic resources (forage grasses, fruit and berry plants) deserving exceptional attention in terms of their conservation (*in situ*/on-farm/*ex situ*) and utilization in breeding practice.
- Monitoring of genetic erosion in the crop plants of the northern region.
- Regeneration of the available accessions of crop diversity collections in the areas of their origin.
- Identification of duplicates in different national collections by means of modern techniques (DNA markers).

Alaskan efforts in collecting, cataloguing and the regeneration of high latitude accessions

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The Alaska Plant Materials Center (AkPMC) was established by the State of Alaska in 1972. AkPMC functions in cooperation with the United States Department of Agriculture (USDA) and among its missions are the mandates to:

1. assemble, evaluate, select and increase plant materials needed in soil and water conservation, agriculture and industry, and maintain genetic purity of these materials;
2. increase promising plant materials for field scale testing.

Collection of wild, native species for commercialization has been a primary activity of the AkPMC from inception. However, significant resources were not spent on exploration and

acquisition until 1990 when an infusion of funding from the US Department of Defense arrived. This continued through 1996 with most of the collection activity on the Aleutian Islands. In 1994 the Alaska Department of Transportation became the primary funding agency for seed acquisition projects. The entire AkPMC germplasm programme significantly expanded in 1998 with funding from the USDA, Agricultural Research Service and Natural Resource Conservation Service. This funding allowed and facilitated exploration efforts in the Falkland Islands, South Georgia Island, Iceland, Faeroe Islands, Spitzbergen (Svalbard), Greenland and the Canadian High Arctic. The primary target species (at least by this author) have been grasses. Species identical to or closely related to Alaskan species are the primary goal. However, other species of interest may include those requested by the host country or those that have a special habit or niche, such as the Tussock grass (*Poa flabellata*) from the South Atlantic. In the northern hemisphere the targeted genera have been *Deschampsia*, *Poa*, *Festuca*, *Leymus*, *Elymus* and *Alopecurus*. To date the AkPMC has assembled 3688 accessions of high latitude plant germplasm with complete passport data, plus an additional 1285 accessions of this material with partial passport data, amounting to a total of 184 species. All material collected from 1998 to date has been fully shared with the USDA. The material recently collected in Canada has been divided between the US and Canadian germplasm systems. The AkPMC only retains 50–100 seeds from an accession and conducts all germination tests, field evaluations and regeneration from this small sample of the main collection. The AkPMC remains fully committed to the prospect of making available well-equipped seed testing and cleaning laboratories as well as clean ground for regeneration, storage and acquisition of high latitude plant germplasm. We take pride in our abilities and commitment to serve the cause of plant genetic resources preservation.

Swedish PGR activities above 64°N

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More than one-third of the Swedish landmass lies above the 64°N line of latitude. Most of this land comprises forests, mountains, bogs and mires, and other difficult terrain. While natural grasslands cover a fairly large area (16%), agricultural land represents only a small fraction (1%). Nevertheless, agriculture is still important in areas along the Bothnian coast and up the great river valleys, not least from the point of view of regional politics.

The area in question includes three vegetation zones: boreal, sub-alpine and alpine. North Sweden represents the most westerly extension of the taiga that stretches around half of the northern Palaearctic. This means that many species live here at the very margin of their normal distribution.

Sweden can be considered as part of the centre of origin for a few plant groups, notably many forage grass and legume species, as well as berries. The inventory and collecting of mainly agricultural plant genetic resources has been carried out since the late 1970s within the framework of the Nordic Gene Bank. In recent years these activities have partly been taken over by the National Programme for diversity of cultivated plants, POM (<http://www.pom.info/english/index.htm>). The current mandate also includes plant groups of horticultural importance.

On the basis of climate models, predictions have been made primarily regarding possible changes in temperature. In contrast, predictions about the effects of the proposed global warming on precipitation have been more speculative. So far, the possible consequences of climate change have mostly been considered in terms of the wild flora.