

Crop Plant Genetic Resources

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Raasepori

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Levels of Biodiversity

- genetic diversity = within species diversity



- between species diversity

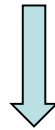


- between ecosystems diversity

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Function of Genetic Diversity

- adaptation of organisms to variable environmental conditions



- natural selection: wild organisms: forest trees, fish species
- human selection: crop plants and domestic animals

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What are Crop Plant Genetic Resources

- native crop plants and landraces
- cultivated varieties of crop plants
 - wild relatives of crop plants

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Definitions

- **cultivars:** varieties produced by plant breeders, usually uniform and adapted to high farm management standards
- **landraces:** varieties developed over time in traditional farming systems, usually variable and adapted to local conditions

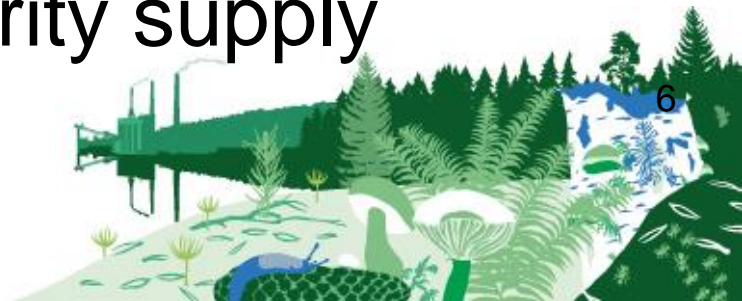
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Agricultural Genetic Resources

- crop plant varieties and animal races
- agricultural genetic resources are the basis of our food security and economically most important part of biodiversity
- part of the society's security supply

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Conservation of Genetic Resources

- 75% of the global diversity of crops have been lost in the last century
- 50% of domestic animal races have been lost, 30% of the endangered
- 50% of the world's tree species are endangered
- fish genetic resources, no data but large losses at the species level

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Change of the Share of Landraces During 1902-1955 %

(Maarit Heinonen, 2001)

	1902	1921	1930	1955
autumn wheat	100	100	~60-70	0,7
spring wheat	100	94,3	~5	0,1
barley	100	69,8	~25	1,0
oats	100	33,8	~5-10	0,2
autumn rye	100	100	~70-80	18,0



International Agreements

- Convention of Biological Diversity, CBD 1992
- International Treaty on Plant Genetic Resources for Food and Agriculture, ITPGRFA 2004
- objectives: the protection of ecosystems and plant and animal species diversity, the sustainable use and equitable sharing of benefits derived from the use of natural resources

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National Plant Genetic Resources Programme for Agriculture and Forestry

- Principles, objectives and proposals for action for conservation and sustainable use of plant genetic resources in agriculture, horticulture and forestry
- Natural Resources Institute Finland (Luke) coordinates
- Advisory Body for Genetic Resources acts as a steering body
- close collaboration with Nordic Genetic Resources Center, NordGen

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Conservation of Plant Genetic Resources

Agricultural and horticultural plants



Activities

- Making surveys and **calls** for landraces still not in the collections
- **Maintaining** collections
- **Evaluating** collections
- Enhancing **sustainable use** and **research**
- **Training, teaching** and information sharing
- Participating to the **preparation** of the national and international **agreements** and **legislation**



National Plant Genetic Resources Collections

vegetatively propagated plants:

- fruits and berries
- vegetables
- spices, herbs and medicinal plants
- ornamentals

Vegetatively propagated, long term preserved PGR collections

Field collections
Cryopreservation
In vitro



Northern ornamentals
and berries,
potato onions



Spices,
herbs and
medicinal
plants



Jokioinen Manor Park,
Wendla's garden,
Ferraria slope

Temporary preservation,
demonstration



Field collections of fruits and berries,
Ornamentals and vegetables



Elite plant station,
in vitro and *cryo* storage,
field collections



Accessions with long term storage mandate in the Finnish field genebanks

Shallot	6
Potato onion	27
Chives	8
Horse radish	26
Japanese quince	18
Strawberry	12
Wild strawberry	1
Sea-buckthorn	5
Hop	11
Apple	129
Sour cherry	32
Plum	13
Bullace	7
Pear	6
Rhubarb	34
Black currant	24
Red currant	11
Gooseberry	9
Arctic bramble	6
Nectar bramble	3
Cloudberry	1
Raspberry	12
Rubus other	5



- Herbs and medicinal plants: 24 acc.

- Ornamentals: conservation strategy under development



406 acc.

Source: FAO country report 2008, collections are improved after that

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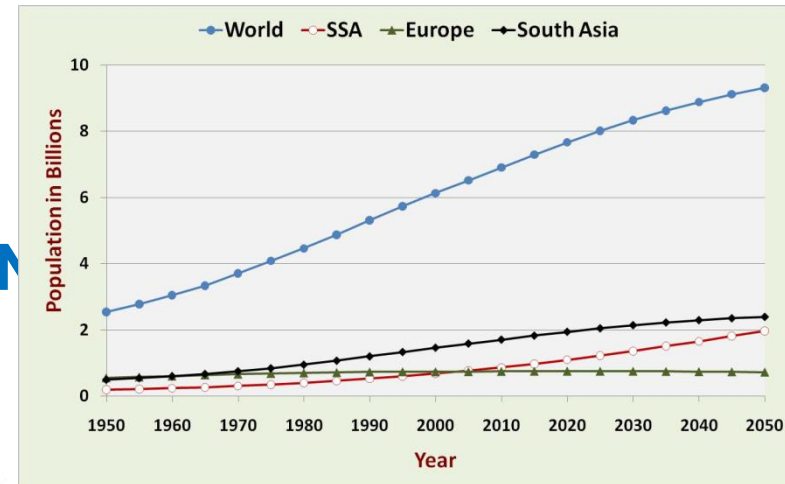
Use: Plant breeding, pre-breeding

To improve

- high yield
- good quality
- resistant to diseases and pests
- resilience
- nutrient use efficiency
- Abiotic stresses



PROFITABLE PLANT PRODUCTION
FOOD SECURITY



Evaluation of collections is important!

Seed are preserved in the NordGen Ex Situ Seed Bank

- ◆ Active collection - Alnarp, Sweden
 - Distribution, characterisation, regeneration, analyses of material and development tests
- ◆ Base collection - Årslev, Denmark
 - Base storage, rejuvenation
- ◆ Safety deposit – Svalbard Global Seed Vault (SGSV), Norway
 - Duplication of Base collection

