Breeding of Horticultural Plants in Lithuania

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Plan of presentation

- Lithuania in Facts
- LRCAF
- Research Topics
- Breeding on Small Fruits: Blackcurrant, Strawberry
- Breeding on Top Fruits: Apple, Pear
- Breeding on Stone Fruits: Plum, Sour and Sweet Cherry
- Breeding on Vegetables: Radish, Carrot, Red Beet, Onion, Chive, Garlic, Cucumber, Tomato
- National Cooperation
- International Cooperation
Lithuania is the largest and most southerly of the three Baltic States.

**Population:** 2,979,000

**Capital:** Vilnius

**Area:** 65,300 sq km

**Ethnic composition (%):** Lithuanians 84.2, Poles 6.6, Russians 5.8, Belarusians 1.2 and other 2.2.

**Climate:** Ranges between maritime and continental. The average temperatures are +19°C in July and -3°C in January.

**Orchards commercial area:**
- Apple (3000 ha), blackcurrant (3100 ha), strawberry (350 ha), raspberry (230 ha), sea buckthorn (1000 ha), cabbage (1000 ha), carrot (850 ha) et al.
Lithuanian Research Centre for Agriculture and Forestry (LRCAF) was established in 2010 as a merger of three related research institutions:

- Lithuanian Institute of Agriculture,
- Lithuanian Institute of Horticulture,
- Lithuanian Institute of Forestry
Scientists have focused on improving cold hardiness, resistance to diseases and insects, and yield as well as shipping and shelf life qualities.

Research concentrated on fruit quality, plant development and biotechnology applications.

The preservation of genetic resources is also a primary goal.

Inheritance and genetic control of orchard plant traits and creation of new breeding methods;

Modification of plant genetic structure using biotechnological methods;

Study and preservation of gene pool of vegetative propagated plants in vitro, in situ and ex situ, plant cryobiology;

Investigation of plant biodiversity and identification of molecular markers;

Study of orchard plant resistance to abiotic and biotic factors mechanisms;

Breeding of pome fruits, stone fruits and berries.

IH-LRCAF has developed over 90 new improved cultivars.
Breeding on small fruits

Mainly on small fruits:

• blackcurrant (*Ribes nigrum*),
• strawberry (*Fragaria annanassa; Fragaria vesca*),
• raspberry (*Rubus idaeus*),
• and japanese quince (*Chaenomeles japonica*).
Aims and breeding efforts

Breeding for resistance
- to main pests and diseases, (gall mite, BRV and fungal diseases)

Breeding for fruit quality
- suitability for processing and freezing as well as fresh market

Good adaptation
- to local environmental conditions (winter hardiness, spring frost tolerance, chilling requirements and machine fruit harvest)
Blackcurrant cultivar network

Lithuania
Latvia
Estonia
Norway
Denmark
Hungary
Romania

New cultivars from Lithuania

Resistant to powdery mildew, gall mite, high productivity and cold hardiness blackcurrant cultivars

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Two strawberry cultivars were developed at the Institute of Horticulture, Lithuanian Research Centre for Agriculture and Forestry by varietal hybridization:

‘Saulene’ (‘Shuksan’ x ‘Senga Sengana’)
Harvesting of the early cultivar ‘Saulene’ starts 5-6 days prior to standard ‘Venta’. Concentrated and high yield with excellent tasting fruits are characteristic of ‘Saulene’. High quality fruits of this cultivar are suitable for fresh use.

‘Dange’ (‘Venta’ x ‘Redgauntlet’).
Middle late cultivar ‘Dange’ distinguishes itself by good size, attractiveness of fruits and stable, high yield every year.

Breeding on top fruits

‘ALDAS’

‘RUDENIS’

‘SKAISTIS’

Scab resistant apple cultivars

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Breeding on top fruits

‘ALKA’
summer cv.

‘ALNA’
autumn cv.

Scab resistant, winterhardy pear cultivars

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Breeding on stone fruits

‘RAUSVĖ’

‘ALEKSONA’

Large, sweet, winterhardy plum cultivars

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Breeding on stone fruits

‘VYTĖNŲ ŽVAIGŽDĖ’

‘NOTĖ’

‘JURGITA’

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Breeding is aimed at creating competitive vegetable varieties and hybrids by utilizing local genetic resources. Breeding is carried out in tomatoes, cucumbers, sweet peppers, carrots, red beets, white cabbages, radish, garlic, and onions.
Breeding on vegetables

In National plant cultivar list and EU vegetable species general catalogue are:

Radish (*Raphanus sativus*)

‘Babtų žara’

‘Liliai’
Breeding on vegetables

Carrot (*Daucus sativus*)

Breeding on vegetables

Red beet (*Beta vulgaris*)


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Breeding on vegetables

Onion (Allium cepa) ‘Babtų didieji’

Chive (Allium schoenoprasum) ‘Aliai’

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Breeding on vegetables

Garlic (Allium sativum)

‘Vasariai’, ‘Žiemiai’
Breeding on vegetables

Cucumber (*Cucumis sativus*)

Breeding on vegetables

Tomato \textit{(Solanum lycopersicum)}- (for the greenhouse)

**Breeding on vegetables**

**Tomato** (*Solanum lycopersicum*) - (for the open field)


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National Cooperation

Agrarinių ir Miškų Mokslų Institutų Asociacija
The Associacion of Agricultural and Forestry Research Institutes

Kaunas University of Technology
Lithuanian University of Health Science
Aleksandras Stulginskis University
Vytautas Magnus University
Vilnius University

Kauno Grūdai

Lietuvos mokslo taryba
International Cooperation

ISHS (International Society of Horticulture Science)

The European Agricultural Research Initiative (EURAGRI)

International Union of Food Science and Technology

International Union of Forest Research Organizations

European Society for Agronomy

European Fruit Research Institutes Network
Thank you for your attention!