



INSTITUTE OF  
**HORTI**  
CULTURE

THE LEADING  
SCIENTIFIC CENTRE  
IN LATVIA  
FOR FRUIT-GROWING  
AND HORTICULTURE





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ERDF project No. 1.1.1.5/18/I/004 Promotion of international cooperation projects in research and innovation at LLU and scientific institutions under its supervision.

NATIONAL  
DEVELOPMENT  
PLAN 2020



**EUROPEAN UNION**

European Regional  
Development Fund

INVESTING IN YOUR FUTURE





## DIRECTOR'S MESSAGE

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“The most extraordinary people in the world today don't have a career. They have a mission. Our team's mission at the Institute of Horticulture is to share the knowledge and know-how needed to enable access to fresh, high-quality local fruits and vegetables throughout the year.

We are inclusive – our institute is an open space for scientists, believers, dreamers, growers, artists, musicians, poets, students, local community, government and tourists, as well as everyone else.

We believe learning and achieving personal excellence is a lifelong adventure. We believe in leadership as a process of self-knowledge and social innovation.

We transform ourselves, and we transform gardens. This is a story about love – we love our work, we love sustainable ideas, and we create with love.

We believe happiness and passion are the most powerful tools for getting excellent results.”

### Inese Ebele

Director, Institute of Horticulture

Below artist Māris Subačs mural painting  
"God did not give himself an infinity, but the garden"







## SHORT HISTORY

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**The beginnings of the Institute of Horticulture can be traced back to 1945, when it was founded at the Laucini nursery.**

After some years, the plant breeder Pēteris Upītis (1896–1976) started planting new experimental orchards in this place. The goal of this horticulturist was to cultivate winter-hardy fruit crops that would be compatible with the climatic conditions of Latvia, and that would bear high-quality fruit.

Over the years, the orchard has changed its name and owners several times (to the Laboratory of Fruit growing, the Dobeles Horticultural Plant Breeding Experimental Station, and the Latvia State Institute of Fruit-Growing).

The institute was given its present status on 1st January, 2016 – it is now under the jurisdiction of the Latvia University of Life Sciences and Technologies.







## INSTITUTE'S MISSION

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LatHort is fast-growing research institute providing basic and applied research in horticulture. The scientists are motivated to be at the forefront of the current research topics in bioeconomy and plant biology. New research directions are under development currently – smart technologies and sustainable growing technologies in order to ensure the growing demands on implementation of the green policy of the EU.

The collaboration of experienced and new researchers is the driving force of research achievements. The increasing number of peer-reviewed publications demonstrates the acknowledgement of the research results among the scientific society. Good collaboration with farmers and broad society through open communication ensures knowledge uptake and development of horticulture, thus contributing to the national economy.

### **Dr. agr. Līga Lepse**

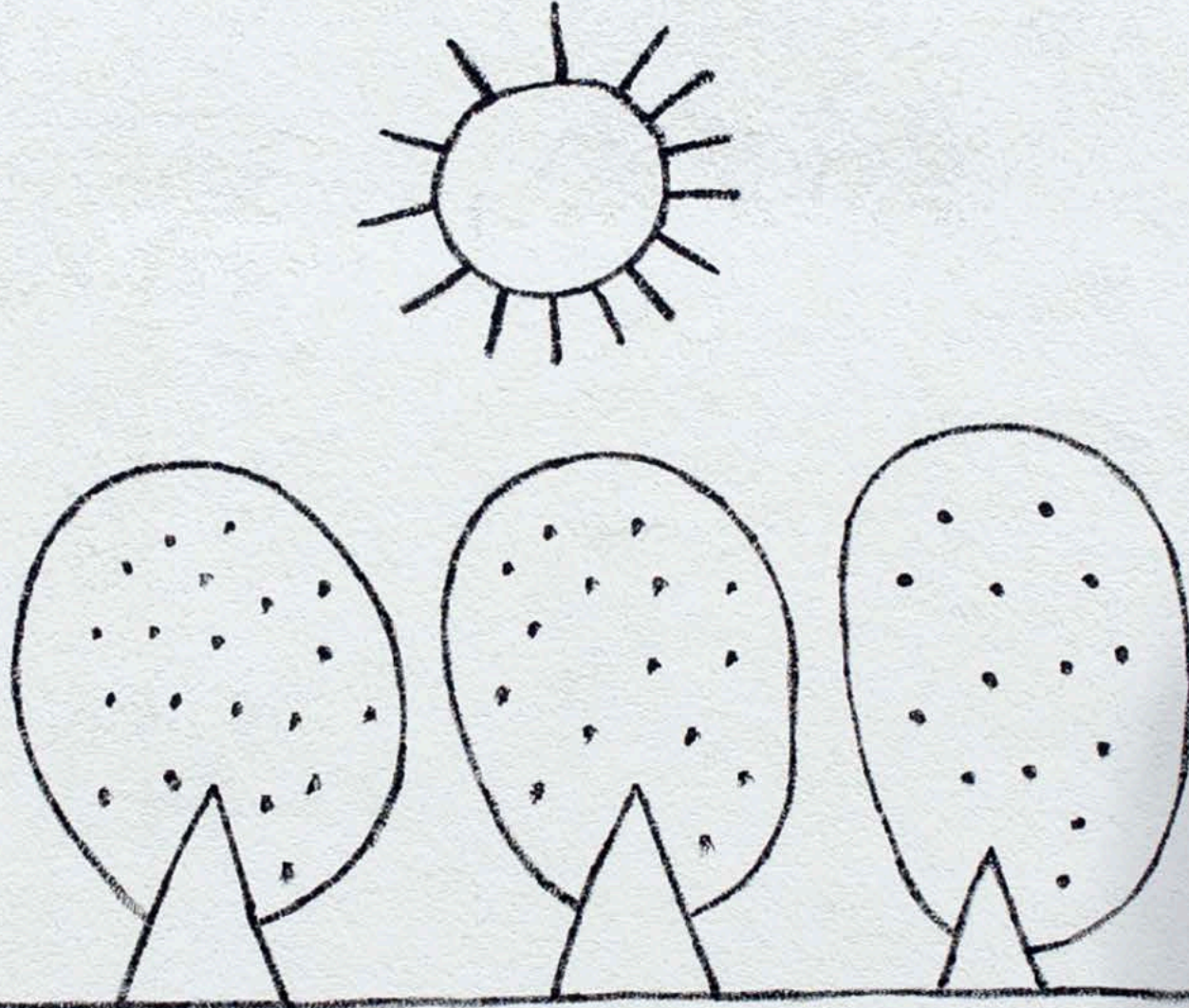
Head of the Scientific Council,  
Leading Researcher





**SCIENTIFIC COUNCIL OF  
THE INSTITUTE OF HORTICULTURE:**

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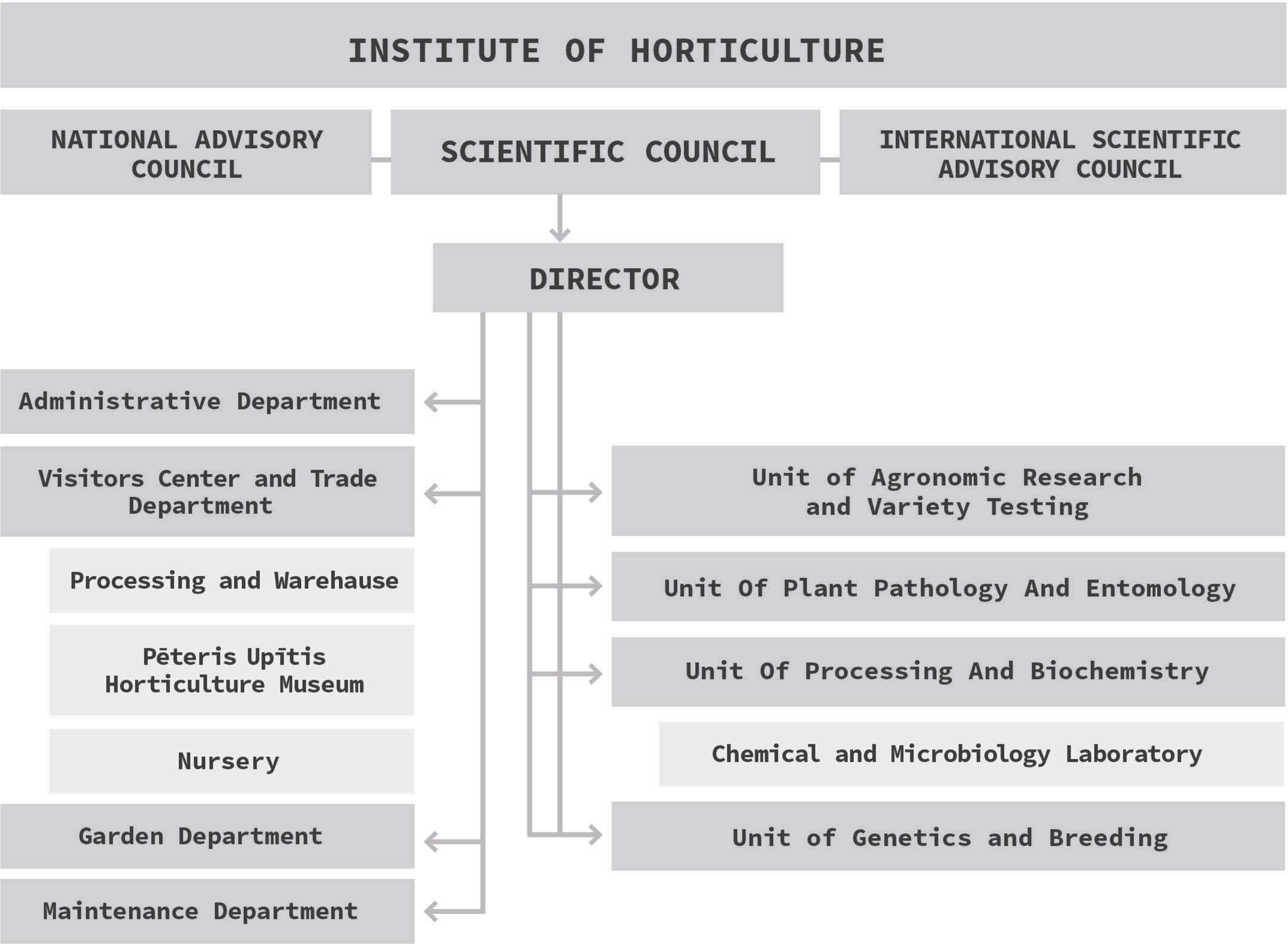
**Dr. agr. Valda Laugale**, Researcher  
**Dr. agr. Līga Lepse**, Head of Scientific Council,  
Leading Researcher  
**Dr. agr. Daina Feldmane**, Leading Researcher



**Dr. biol. Sarmīte Strautiņa**, Leading Researcher  
**Dr. agr. Edgars Rubauskis**, Leading Researcher  
**Dr. biol. Edīte Kaufmane**, Leading Researcher  
**PhD Inga Moročko-Bičevska**, Leading Researcher  
**PhD Gunārs Lācis**, Leading Researcher,  
Vice-chairperson of Scientific Council  
**Dr. agr. Ilze Grāvīte**, Leading Researcher  
**Dr. sc. ing. Dalija Segliņa**, Leading Researcher,  
Vice-chairperson of Scientific Council



STRUCTURE OF  
THE INSTITUTE OF HORTICULTURE:







## SCIENTIFIC UNITS OF THE INSTITUTE OF HORTICULTURE

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### UNIT OF GENETICS AND BREEDING

Head of the Unit:

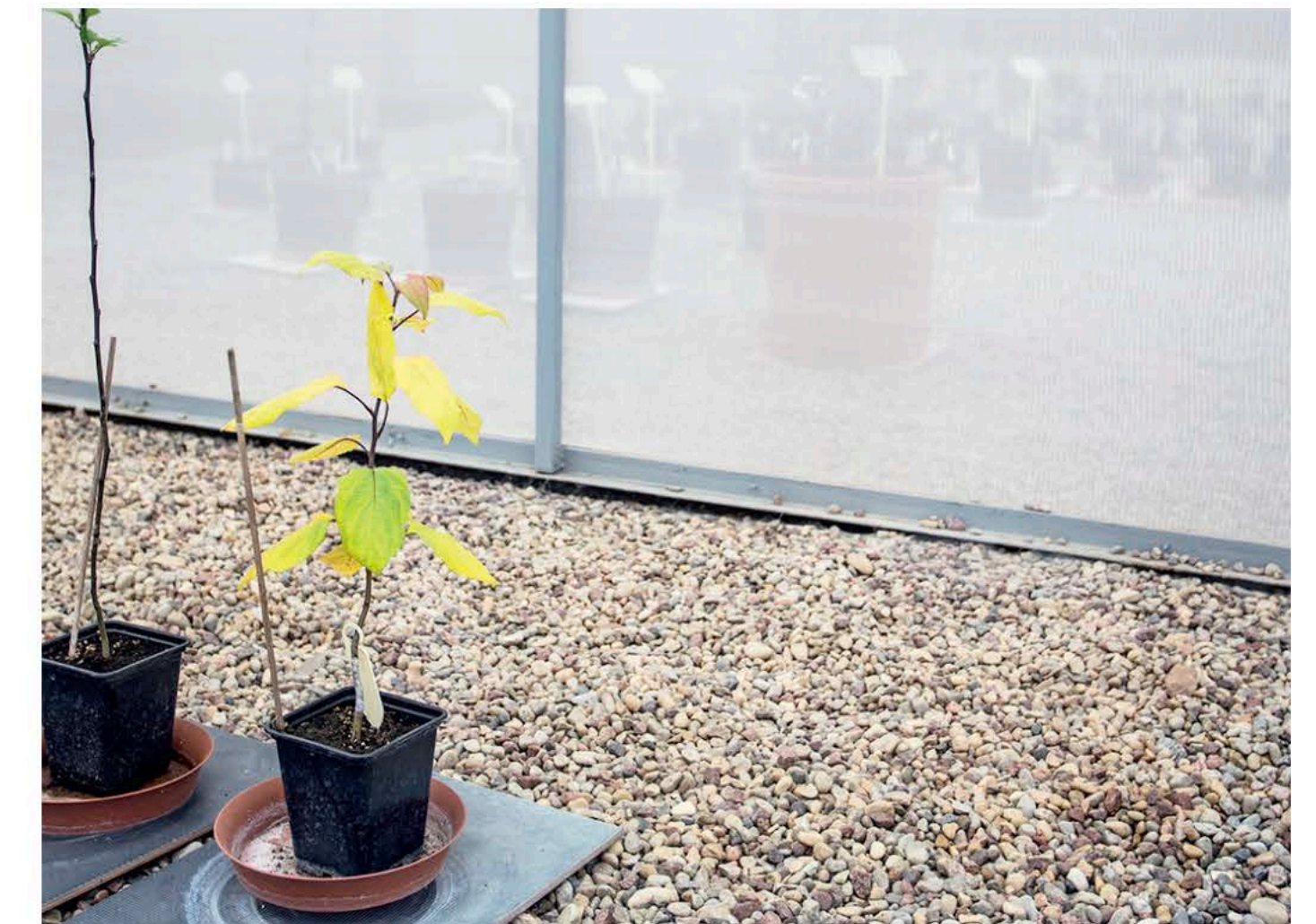
**PhD Gunārs Lācis**

Leading Researcher

**GOAL:** ACQUISITION OF KNOWLEDGE ON THE HEREDITY AND GENETIC DIVERSITY OF HORTICULTURAL CROPS; THE BREEDING OF CULTIVARS ADAPTED TO THE BALTIC SEA REGION, HAVE ADEQUATE LEVEL OF ECOLOGICAL PLASTICITY, PRODUCTIVITY, PRODUCT QUALITY, AND RESISTANCE TO DISEASES AND PESTS

#### Directions of activity:

- The development of a scientific and theoretical basis for research into horticultural crop heredity mechanisms and breeding material by applying molecular genetics methods
- Breeding of cultivars adapted to the agro-climatic conditions of the Baltic Sea region and that are resistant to diseases and pests
- Coordination of conservation, documentation, and research on horticultural crop genetic resources and their inclusion in breeding programmes
- The introduction of less common vegetable species to Latvia







**SCIENTIFIC UNITS OF  
THE INSTITUTE OF HORTICULTURE**

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**UNIT OF AGRONOMIC RESEARCH AND VARIETY  
TESTING**

Head of the Unit:  
**Dr. agr. Edgars Rubauskis**  
Leading Researcher

**GOAL:** TO DEVELOP AND ADAPT ENVIRONMENTALLY FRIENDLY  
HORTICULTURAL CROP CULTIVATION SYSTEMS AND  
TECHNOLOGIES TO PROVIDE SECTORAL AID IN ORDER  
TO ENSURE PRODUCTION EFFICIENCY

- Directions of activity:**
- Research in sustainable growing technologies for horticultural crops
  - Evaluation of fruit tree and berry cultivars and rootstocks and cultivar-rootstock combinations
  - Research on the physiology of horticultural crops and solutions to improve winter-hardiness, to ensure photosynthetic efficiency, regulation of plant growth and productivity
  - Study on the sustainable use of soil resources and increasing its fertility for horticultural crops







## SCIENTIFIC UNITS OF THE INSTITUTE OF HORTICULTURE

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### UNIT OF PROCESSING AND BIOCHEMISTRY

Head of the Unit:

**Dr. sc. ing. Dalija Segliņa**

Leading Researcher

**GOAL:** CREATION OF NEW KNOWLEDGE AND PRODUCTS,  
DEVELOPMENT OF INNOVATIVE TECHNOLOGIES THAT PROMOTE  
THE SUSTAINABLE DEVELOPMENT AND COMPETITIVENESS OF  
THE LATVIAN HORTICULTURE AND FOOD SECTORS

#### Directions of activity:

- Testing the suitability of cultivars to various processing methods and new product and technology development
- Chemical analysis of plant-based raw materials, products and by-products, biologically active compound and technological process research using green technologies
- Research on horticultural crop storage technologies (including controlled atmosphere conditions, and research with 1-MCP)







## SCIENTIFIC UNITS OF THE INSTITUTE OF HORTICULTURE

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### UNIT OF PLANT PATHOLOGY AND ENTOMOLOGY

Head of the Unit:

**PhD Inga Moročko-Bičevska**

Leading Researcher

#### Goals and directions for activity:

- Development of a scientific and theoretical basis for economically sound and sustainable cultivation technologies by researching the occurrence and prevalence of the pathogens and pests of horticultural crops in Latvia, as well as the pathogens and pests' development characteristics, diversity, biology, ecology and interaction with hosts.
- Development of a theoretical and methodical basis for the establishment of a certified planting material system for fruit crops in Latvia by testing propagation material, virus elimination, and the establishment and maintenance of nuclear stock collections.
- Diagnostics of pathogens and pests of fruit crops.
- Maintenance of the collection and characterisation of fungi and of bacteria pathogenic to horticultural crops.





DIRECTIONS OF THE INSTITUTE  
OF HORTICULTURE’S ACTIVITIES

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- 1/ RESEARCH IN THE SECTORS OF HORTICULTURE AND HEALTHY FOOD
- 2/ CONSERVATION AND SUSTAINABLE USE OF GENETIC RESOURCES
- 3/ PROMOTING THE INTEGRATED DEVELOPMENT OF INDUSTRY, SCIENCE AND EDUCATION
- 4/ PROMOTING THE VISIBILITY OF THE INSTITUTE AND THE HORTICULTURAL INDUSTRY



DIRECTIONS OF THE INSTITUTE  
OF HORTICULTURE’S ACTIVITIES / 1

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1/ RESEARCH IN THE SECTORS OF HORTICULTURE  
AND HEALTHY FOOD

- **Diversification and breeding of horticultural crop cultivars suitable for the Baltic Sea Region**

**Research aim** – development and selection of cultivars adapted to Nordic/Baltic Sea region with high ecological plasticity, productivity, quality, resistance to biotic and abiotic stresses.

- **Environmentally friendly horticultural production systems**

**Research aim** – development or adaptation of environmentally friendly horticultural production systems suitable for Latvian agro-climatic conditions and cultivar biological characteristics.

- **Storage and processing technologies**

**Research aim** – to develop horticultural crop processing technologies and products suitable for commercial companies by assessing biochemical composition and testing various storage technologies for extending fruit and vegetable shelf life.

- **Basic biological research for horticultural science**

**Research aim** – to acquire new knowledge through scientific methods, promoting the sustainable development of horticulture and related fields of biology, chemistry, food sciences, creating an informative base for applied research.







**DIRECTIONS OF THE INSTITUTE  
OF HORTICULTURE’S ACTIVITIES / 2**

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**2/ CONSERVATION AND SUSTAINABLE USE OF  
GENETIC RESOURCES (GR)**

**Goal** – contribute to sustainable conservation and utilisation of genetic resources of Latvian agricultural and food plants’ (including fruit crops, vegetables, and lilacs) for future generations in accordance with Latvia’s international commitments and the expertise of the Institute.

**Objectives:**

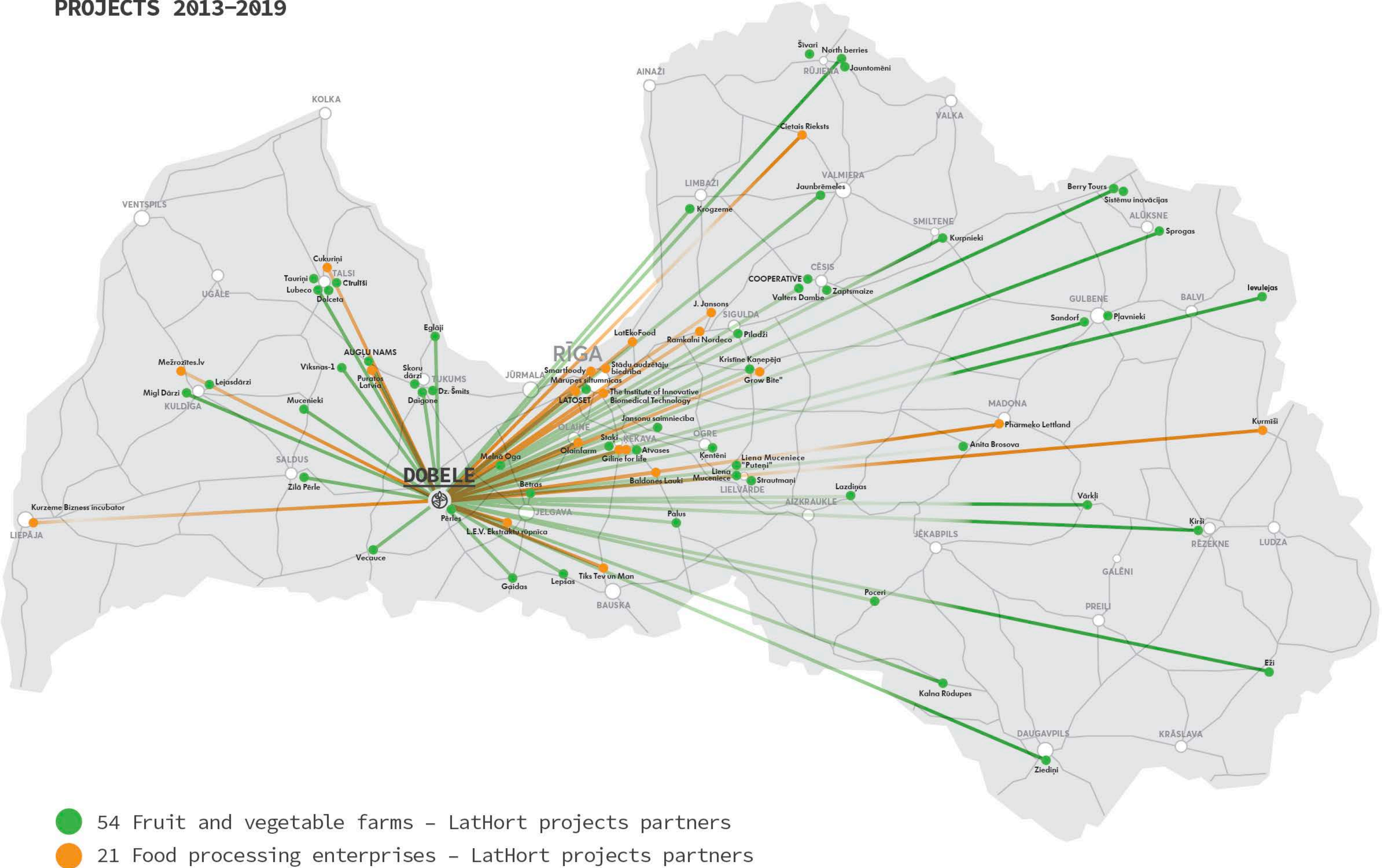
- To maintain and regularly update collections of genetic resources from horticultural crops
- Identify, evaluate and describe ex situ collections of genetic resources of fruit trees, berries, vegetables and lilac; engage in the in situ conservation activities
- To maintain the GR data bank of Latvia's horticultural crops according to the data exchange requirements for inclusion in the GR information systems nationally and internationally

- To promote the utilisation of GR of Latvian horticultural crops in breeding, production of traditional food products, development of new uses, etc.

The collection of the Institute of Horticulture currently holds more than 6000 accessions of different horticultural crop species, of which 1290 accessions are included in the collection of national genetic resources. The Institute holds the most extensive genetic resource collection of lilacs in the Baltics, where almost all cultivars of Latvian origin are included. The Institute takes part in ECPGR Malus/Pyrus, Prunus, Allium and Cucurbitaceae working groups; all data on national genetic resources is included in SESTO (NordGen) and EURISCO, as well as in specific databases for cultivated crops. The Institute also takes part, as an associated partner, in the AEGIS initiative: the creation of a European genetic resource collection.



FARMS, ENTERPRISES INVOLVED IN LATHORT  
PROJECTS 2013–2019



DIRECTIONS OF THE INSTITUTE  
OF HORTICULTURE’S ACTIVITIES / 3

3/ PROMOTING THE INTEGRATED DEVELOPMENT  
OF INDUSTRY, SCIENCE AND EDUCATION

• **Sectoral collaboration**  
**Goal:** to increase uptake of technological innovations and increase the competitiveness of SMEs by introducing developed technologies and by expanding the diversity and the amount of research. We collaborate with related producers associations in Latvia, organising knowledge transfer events and demonstrations, as well as providing consultations. Participation in the development of documents, laws and regulations for the horticulture and food sectors. Collaboration with processing companies in improving technology and developing new products.

In 2010, a **technology transfer centre** was established (<http://fruittechcentre.eu>), promoting collaboration with other countries in the Baltic Sea region. The centre provides various informative and educational materials for entrepreneurs.

• **Collaboration with scientific institutions, universities and educational institutions**  
**Goal:** to promote national and international collaboration in advancing the development of interdisciplinary and internationally competitive research, coordination of research activities, efficient use of scientific potential and infrastructure, and strengthening of international recognition.





DIRECTIONS OF THE INSTITUTE  
OF HORTICULTURE’S ACTIVITIES / 3

• **International collaboration**

The Institute of Horticulture actively collaborates with more than 40 foreign scientific institutions in 23 different countries, of which 6 institutions – in Lithuania, Poland, Finland and Switzerland – are strategically important partners.

- Collaboration activities: joint research projects, publications, scientist exchange programs, exchange of breeding material and research information.

- Collaboration results: participation in FP7/Horizon2020, EUROSTAR, EUREKA, INTERREG projects, as well as participation in COST Action activities; exchange of breeding material with 35 other institutions is carried out on a regular basis; the researchers of LatHort represent Latvia in several sectoral organisations – EUFRIN, EUVRIN, ECPGR, ISHS, EUCARPIA, ISA.



• **Collaboration with scientific institutions in Latvia**

**Goal:** to introduce and expand interdisciplinary research that will contribute to sustainable agriculture.

The LatHort collaborates with 13 scientific institutions and university departments in Latvia. Close collaboration has been developed with the Latvian Plant Protection Research Centre; the Latvia University of Life Sciences and Technologies (Faculty of Agriculture, Faculty of Food Technology); the Latvian State Forest Research Institute “Silava”; and the Latvian Biomedical Research and Study Centre.

• **Integrated development of science and education**

LatHort has developed collaboration with educational institutions that prepare experts in horticulture and food sectors.

We provide the trial basis for bachelor's, master's and doctor's thesis drafting for students of the Latvia University of Life Sciences and Technologies, University of Latvia, and Riga Stradins University. LatHort scientists are members of the doctoral council and the master's examination board, as well

as the state examination board at LUoLSaT and Bulduri Horticultural Secondary School.

The staff of the Institute participates in the development of professional standards and in educational, study and internship programmes. LatHort have internship programmes for students from LUoLSaT, the Bulduri Horticultural Secondary School and Dobeļe Crafts and General Secondary School. The Institute works with high-school students, leading their research work.







## DIRECTIONS OF THE INSTITUTE OF HORTICULTURE'S ACTIVITIES / 4

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### 4/ PROMOTING THE VISIBILITY OF THE INSTITUTE AND THE HORTICULTURAL INDUSTRY

The institute has **registered 18 patents in Latvia**, including 6 developed in cooperation with other institutions.

**In total 55 fruit and lilac cultivars have been registered in Latvia, including 8 that have also been registered in Sweden and Belgium.**

In recent years, the Latvian Academy of Sciences has included the results of five of the institute's research projects in lists of the ten best inventions of the year. The institute has received the most prestigious national award: a certificate of gratitude from the Cabinet of Ministers.





CONTACTS  
DISLOCATION



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