Latvia State Institute of Fruit-Growing in the context of fruit industry in Latvia

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Fruit growing has longstanding traditions in Latvia. The climatic conditions and soil are favorable for it, especially in the eastern regions of Latvia. Our fruits and berries may taste less sweet than the cultivars grown in the south, yet they have more aroma and organic acids, and significantly less pesticide sprayings are needed for their growing.
Climate, relief and soil of Latvia

- The climate of the western part of Latvia is maritime, but continental climate prevails in the eastern part.
- Precipitation (rainfall and snow) is 560 – 850 mm
- Monthly average temperature is about -2.6 to -7.5 °C in January and +16.8 to +17.6 °C in July
- The lowest temperature recorded is -43.2 °C, the maximum is +36.4 °C
- One of the biggest problems for resultative fruit growing are frequent temperature fluctuations during the winter period from January to March;
- Active growth season (t° over +10 °C) is 135 – 140 days
- Average temperature sum in active growth season: 1700 – 2150 °C, depending on region

- Lowlands are prevailing in central part, in other regions they are separated by hilly uplands to 300 m above sea level.
- Soil is very variable. The most productive - soddy calcereous soils, mostly loams and drained soddy clay - are found in southern Latvia.
- The other parts of Latvia are covered by more humid, acid soils - podzolic, podzol and gley. Coastal areas are sandy.
Briefly about history of fruit growing in Latvia

Before the 2nd World War, successful development began in fruit growing: fruit and berry export was started.

Collectivization and nationalization of farms interrupted this process. Large extensive orchards were planted for the needs of the processing industry. The quality of production was lacking.

After the renewal of independence of Latvia in 1991, when the agricultural reform was started, many large-sized orchards were split up and returned to the previous landowners.

Only since the middle of 1990s a new system of commercial fruit growing was introduced (transfer to intensive western-type orchard management), Latvia State Institute of Fruit Growing (LSFGI) has been the initiator: (1) in new growing technologies, (2) in choice of cultivars, (3) in the transfer of best available knowledge and technologies in the world, and (4) testing and adaptation of knowledge and technologies to Latvian conditions.
Briefly about fruit industry in Latvia

By the statistical data of Latvia Fruit Growers Association, in 2012 there were about 4,300 ha commercial orchards, including – apples 1,900 ha, pears 140 ha, plums 105 ha, Japanese quince 112 ha, cranberries 60 ha, blueberries 160 ha, black currants 550 ha, red currants and gooseberries 70 ha, strawberries 396 ha, raspberries 220 ha, seabuckthorn 275 ha.

Potential of fruit industry in Latvia:

• The market and consumer’s demand increase for locally grown fruits, the supply still does not meet the demand.

• Income from one hectare is high (with appropriate growing technologies the profitability may reach 180 %), which helps the development of small farms.

• Increasing number of processing SMEs, their multishaped, original products have good market potential.

• The EU financed project “School Fruit” needs large amounts of fresh fruits.
Briefly about fruit industry in Latvia

The farm size is different – small farms with orchard area 1 to 3 hectares dominate and about 10% are larger farms over 15 hectares. Insufficient cooperation is an obstacle to faster development of fruit growing, although three producer groups and three cooperatives have been formed. Specialized farms dominate. The integrated growing system due to contribution of LSIFG was introduced in the most of farms since 2006.

Main problems for the development of fruit industry in Latvia:

- Lack of training and consulting system for fruit growers;
- Slow development of fruit grower’s cooperation;
- Insufficient investment for introduction of innovative technologies in commercial orchards;
- The crops and cultivation methods are highly different, the plantations need long-term investment with relatively slow return - so fruit growing needs scientific expertise and long-term research.
Latvia State Institute of Fruit-Growing:

General Information

The beginnings of the Institute can be traced back to 1956, when plant breeder Peteris Upitis started planting a experimental orchards in this place. He was talented and erudite scientist and breeder. He worked here till the end of his life, 1976; and left a rich heritage of fruit trees and ornamentals for further breeding.

Over the years, the experimental orchard has changed its name and owners several times.

The independent Experimental Station of Fruit-Growing was founded in 1995, when 35 ha of the orchard was separated from the 6000 ha large Soviet type collective farm.

The Latvian State Institute of Fruit-Growing was founded on 2nd of May, 2006 by reorganizing the Experimental Station.

LSIFG is supervised by the Ministry of Agriculture.

All buildings and the land on which the buildings and field trials are located, is the property of the Institute.
General information

1995

1999

2001

1995

2010

2007

1995

2010

2013
General information

At present the Institute’s regular staff are 62 people, of which 50 are full-time researchers and technicians, including:

- doctors of sciences – 16 (incl. 3 foreign scientists)
- masters of sciences – 14 (incl. 10 PhD students)

Distribution of researchers by age groups

77% of the researchers are women.

Academic research personnel (FTE)
General information: The structure of the Institute

Scientific Council

Consultative Council

Director

Unit of breeding and variety testing

Unit of orchard management research

Unit of fruit and berry experimental processing

Laboratory of experimental processing

Laboratory of biochemistry

Laboratory of storage research

Unit of plant pathology and entomology

Laboratory of plant pathology

Unit of genetics and molecular biology

Laboratory of molecular biology

Deputy director

Unit of orchard management

Nursery

Greenhouses

Storage facilities

Laboratory of DUS testing

Accounting

Secretariat

Museum
General information: Funding

- **Funding for science**: 77%
- **Incomes from business, royalties etc.**: 17%
- **Research infrastructure (Renovation of laboratory building block)**: 6%

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<th>Year</th>
<th>Funding, thousands, LVL</th>
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**General information:**

**Sources of funding for science**

- Base funding: 58%
- Grants of the Latvian Council of Science: 10%
- State research programmes: 8%
- Ministry of Agriculture funding: 4%
- ESF, ERDF funding: 1%
- FP 7 and other international projects: 11%
- Contract research, private funding, royalties, etc: 8%
Main Tasks of the Institute

- To provide scientific knowledge and expertise for the development and implementation of National Fruit Growing Strategy and regulatory framework
- To elaborate recommendations for environment-friendly technologies in fruit growing and storage
- To develop guidelines for commercial orchard management in different regions of Latvia
- To perform breeding of fruit and berry varieties suitable to Latvian climate
- To provide maintenance and sustainable use of fruit, berry and lilac genetic resources
- To work out scientific background for a system of the production of healthy planting material in Latvia
- To develop new products and technologies for food industry, incl. functional food.
The quality of research at LSIFG

- Institute is the **centre of fruit** (both growing and food) **research in Latvia** with a sufficiently high intellectual potential and an advanced research infrastructure and capability to create new knowledge.

- Institute is **successful in the balancing applied and basic research**, which allows to publish the results in the pre-reviewed editions, as well as to develop innovative technologies and products thus contributing to the competitiveness of fruit industry, **smart** and sustainable rural development.

- LSIFG has **relatively high evaluation rate per doctor of science** in comparison with other agricultural research institutions in Latvia.

- LSIFG has the **potential to become one of the leading fruit research centre in the Baltic and Scandinavian countries** because of Institute's fast development over the past decade: increased human resources, improved research infrastructure and opportunity to expand. It is supported also by the fact that in the Baltic region fruit and berry targeted breeding is taking place only in Latvia, on limited scale also in Lithuania, Estonia and Finland.
The quality of research at LSIFG

• Owing to research results of the Institute, **fruit growing in Latvia has developed**, areas of commercial plantations increase, Latvian grown fruits and berries are available on market and at schools!

• Latvia can compete with other countries in **fruit variety breeding** (trials go on at institutes and nurseries of 13 countries). 4 cultivars have been internationally registered. For Japanese quince the 1st fruit cultivar has been registered worldwide, and processing technologies have been developed for this crop.

• **Innovative processing technologies** have shown good competitiveness:
  
  • Success at the international exhibition **“Fruit Logistica 2012”** – product developed and patented by Institute and produced by „Amberbloom” Ltd. - **Dried Candied Cido** was nominated among the top ten new products of the year **“Innovation 2012”**;
  
  • At the international exhibition **“Riga Food 2012”**, in competition "Latvian ecological products of 2012", the gold medal was granted to "Rūdolfs Mom’s Tasty Puree", produced by "Lat Eco Food" Ltd., which was developed by the support of Institute scientists;
  
  • Successful implementation of processing products in medicine and cosmetics, etc.
Every year we are selling 10-20 licences of our cultivars to the nurseries in Latvia and abroad.
At present more than 10 products are sold on shops, produced using technologies developed at LSIFG.
The quality of research at LSIFG

Citation in horticulture science in Latvia - 1.80 (includes papers published by LSIFG), worlds average - 0.76.

- Original articles in anonymously refereed scientific journals cited in Thomson Reuters Web of Science, SCOPUS
- Articles in other refereed scientific edited journals and conference proceedings
- Presentations in international scientific conferences, working groups etc.

Articles per researcher
The quality of research in LSIFG

- Authors of the papers are still working at the Institute
- All authors of published papers are employed at the Institute, except Dr. Jamshid Fatehi (part time employed in Sweden)
- All publications included in self assessment were based on research performed at the Institute
- The main LSIFG partners and international co-authors are in Sweden, Lithuania, Poland. Also - USA, Finland, Norway, Estonia, etc.
Place of LSIFG in Latvian science

In 2011 6 National Research Centres were formed in Latvia, in the most important fields of science. For each Centre long-term (2011-2030) and medium-term (till year 2015) strategies have been developed. Inside these strategies it is planned to improve the research infrastructure, perform common planning of research strategy, as well as increase competitiveness of science.

LSFGI is the leader of “National Research Centre for Use of Agricultural Resources and Food” (NRC ARF). Six the most advanced and competitive Latvian scientific institutions working in agriculture and food sciences are involved in the realization of the strategy of this Centre.

The long-term aim of NRC ARF: To develop agricultural and food sciences as a foundation for their sustainable development, based on knowledge and innovation. Medium-term aim: Facilitation of sustainable development of agricultural and food sciences by consolidation of resources, increasing competitiveness, carrying out research demanded by the industry and fundamental research.

The activities of NRC ARF will be developed in 6 directions, of which LSIFG participates in 4 (Sustainable use of soil and plant productivity; Genetics and breeding of agricultural plants; Plant protection in agriculture and research of organisms harmful to plants; Food technologies, quality and nutritive value). Development of this Centre under the guidance of the Institute shows its capacity and role in agricultural science.
For each research direction strategy has been developed, defining aims, tasks, planned results, as well as evaluating the available resources and the need for investments.
The planned improvement of LSIFG infrastructure in frame of NRC ARF

The implementation of the project "Renovation of the Experimental research laboratory building" was started in 2013.

Project implemented by the LSIFG included: renovation of the laboratory building (construction of the 2nd floor, insulation of building), renovation and modernization of present laboratory facilities, as well as the construction of additional laboratories, their equipment to increase research and study operations.

This is an essential priority, because most part of the necessary research is carried out in the building; it does not meet the energy saving requirements; rain and melting snow damages the ceilings in several rooms, which endangers the equipment. Experimental fruit and berry processing is limited by the inability to consider Food and Veterinary Service requirements.

Currently six laboratories are located in the building; the largest area is occupied by research equipment located therein. Here in total work 25 staff members (during the season - additional 5-8 people).
International cooperation

During Soviet times the main cooperation existed with the countries of Soviet Union (Russia, Ukraine, Belarus, Moldova etc.). Since the beginning of 1990ies successful cooperation was developed among the scientific institutions of East and West European countries, as well as between Canada and USA. We have foreign collaborators in 31 Universities and research institutes. Scientists of institute are members of International Horticultural organisations – ISHS, ECPGR, Eucarpia, EUFRIN, European technological platform „Food for life”, etc.
Main competitors at national and international level

In Latvia - we have no competitors in fruit science; there are 22 cooperation partners - university departments, research institutes, experimental stations, with whom we work together in the framework of research projects.

Abroad – taking into account regional and climate differences, the actual competitors may be found in Lithuania, Estonia and Scandinavian countries, partly – in Belarus and Poland. In breeding we are leaders among Baltic and Scandinavian countries, real competitor is Belarusian Institute of Fruit Growing in apple breeding. In orchard management large-scale research is done at Research Institute of Pomology and Floriculture, in Skierniewice, Poland. Yet results of rootstock/variety trials and also about some aspects of growing technologies we can use only partly, as the climate in Poland is milder.

In field of genetics and molecular biology Institute compete with all worlds institutes dealing with fruit crops, especially regional ones (e.g. Research Institute of Pomology and Floriculture, in Skierniewice, Universities and research institutes in Sweden, Finland, Norway, Denmark). At the same time they are partners in common research projects.
Main competitors at national and international level

At national level basically no competition exists - we are the only group working in fruit plant pathology concerning all its aspects - virology, mycology, bacteriology and entomology. With other institutions covering some aspects of our field we try to collaborate and to do not overlap (e.g. Plant Protection Centre).

At international level every one is the competitor related to fields we are working and it depends of the subject.

Fruit processing - main competitor and partner is Faculty of Food technology, LUA. LSIFG has efficient scientists in wide range of fruit studies and in development of new products, which are an essential support for local small and medium enterprises.
LSFGI cooperation with fruit growers and food companies

- The Institute has developed successful cooperation with fruit and berry growers in Latvia. Our Institute was the initiator of the Latvian Fruit Growers’ Association founded in 1997. Our Institute is the collective member of the Association. All newest information obtained by scientific research, which can become useful for commercial growers, is passed on to the farmers with the help of the Association.
- The Institute has successful cooperation also with processing companies and Latvian Food Federation
- Seminars for farmers are organized regularly. The scientists of Institute participate in lectures organized by the regional Departments of Agriculture.
- Every year Farmers Days take place at Dobele in March and August, collecting numerous visitors.

As there is no State consulting system for fruit growers in Latvia, to solve this problem at least partly, Technology Transfer Centre for Fruit Industry (TTC) has been developed together with Lithuanian Institute of Horticulture.
Activities at TTC

- Teaching and consultations at the Institute, seminars for fruit growers and processing units at different commercial farms in Latvia and Lithuania, travels for exchanging experience;

- Improvement of research infrastructure, including equipment for demonstrations and training in modern technologies, aimed at fruit and berry growers and processing enterprises.
Activities at TTC

- Working out of different informative materials (leaflets, booklets, Handbook and DVD materials) and development of methods (incl. homepage www.fruittechcentre.eu) to help the information to reach the target group
Public Homepage is regularly renewed, providing information about TTC activities and the created informative materials, and answering questions both from growers and consumers.

www.fruittechcentre.eu
Institute activities to promote fruitgrowing industry not directly related to science

Activities **strategic goal** – use the Institute's cultural potential and long-term experience of trials, increase public awareness about development opportunities for fruit growing in Latvia and promote healthy foods.

**Activities:**
- Maintenance of **lilac** collection (more than 200 cultivars) and activities associated with the lilac flowering
- The **Cherry flowering** Festival and Science Day
- **Apple Festival**, organized by the Institute in collaboration with local Dobele municipality
- Institute organizes or participates in **fruit and berry exhibitions** in Dobele, Riga and other towns of Latvia.
- Activities connected with **museum** of breeder Pēteris Upītis. Every year thousands of people visit our museum and lilac garden, especially during lilac flowering. Since 2002 a new tradition has been organized: concerts of classical music in the garden during lilac flowering. The famous solists of Latvian National opera take part in these concerts.
Cherry flowering festival in the Institute orchard...
......and science day
Apple Day in Dobele district

Apple Decoration - for the first time in Latvia Institute's senior researcher Māra Skrīvele was rewarded

Largest apple in Latvia

Different events for visitors raising interest in fruit growing
Exibition in Riga Museum of Nature
Our Institute is a fast growing research institution, which successfully competes with the fruit research institutions in the Baltic and Scandinavian region and its competent and motivated scientists rationally use their resources by providing new knowledge, products, technologies and services.
Two things LSIFG would like to suggest You to remember

- LSIFG has good results in development of fruit industry balancing applied and basic research

- Diverse cultural, societal activities and demonstration of long-term trials have raised awareness in fruit growing potential and in use of healthy food products.
Vision of the Fruit Scientists

Every person living in Latvia can buy high quality fruits and berries grown in Latvia, as well as healthy fruit products made by small enterprises. Latvian grown fruits, berries and fruit products are found also in shops of the neighbouring countries.

The answer to Your question “why we should invest in your Institute?”:
We are working hard to fulfill our vision.
Thank you for your attention!!!!!!