Latvian Fruit Growing Research for the Industry

D.Seglina, Dr.sc.ing.

Latvia State Institute of Fruit-Growing

Berlin, 2010

Content of the presentation

- Latvia State Institute of Fruit growing – general overview;
- Sea buckthorn growing and processing in Baltic States - general overview.

Berlin, 2010

Latvia State Institute of Fruit – Growing

www.lvai.lv

The leading institution in fruit and berry science

Berlin, 2010

General information

The Institute's regular staff is 58 people:

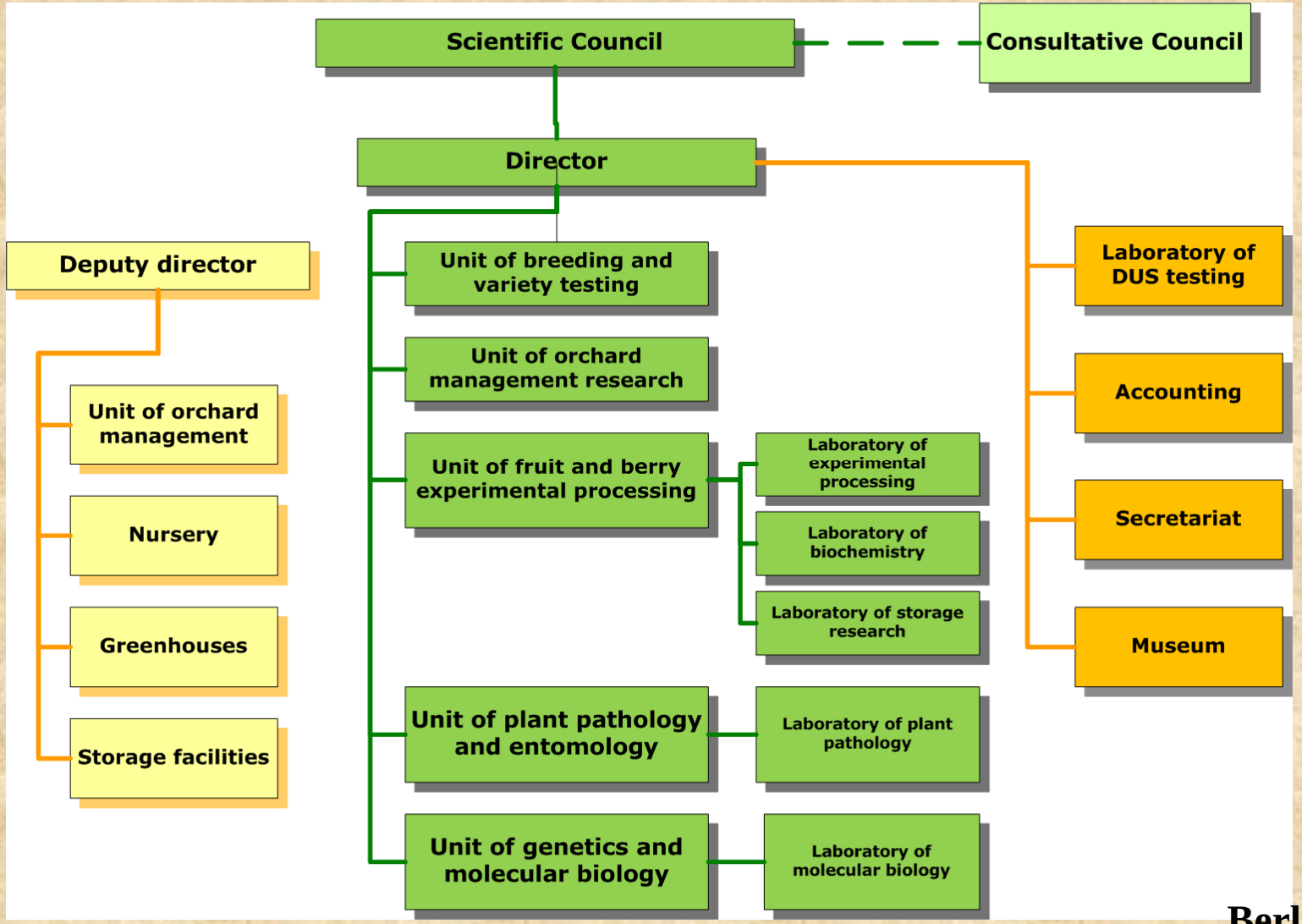
21% of the research staff are Doctors of Science;
5% Masters of Science working at their Doctor's thesis;
7% are doing their Master's studies.

The age of 20% of researchers is below 35

Berlin, 2010

General information

Latvia State Institute of Fruit-Growing has five research units:



Berlin, 2010

General information

The main tasks of the Institute are:

- To provide scientific background and expertise for the working-out and implementation of the development policy in fruit-growing;
- To work out recommendations for environment-friendly (integrated and organic) technologies in fruit growing, processing and storage;

General information

The main tasks of the Institute are:

- To provide scientific background and expertise for the working-out and implementation of the development policy in fruit-growing;
- To work out recommendations for environment-friendly (integrated and organic) technologies in fruit growing, processing and storage;
- To develop models for commercial orchard management in different regions of Latvia;
- To perform breeding of fruit and berry varieties suitable to Latvian climate;

General information

The main tasks of the Institute are:

- To provide scientific background and expertise for the working-out and implementation of the development policy in fruit-growing;
- To work out recommendations for environment-friendly (integrated and organic) technologies in fruit growing, processing and storage;
- To develop models 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;
- Practical basis for Bachelor, Master and Doctor research at the University of Latvia, faculty of Biology and Chemistry, and Latvia University of Agriculture, faculties of Agriculture and Food Technology.

Fruit breeding and genetic resources

The Institute holds vast collections of fruit crop cultivars and selections. The rich collection material serves for breeding aims, as well as a source for genetical resources collections, which include numerous varieties and landraces of Latvian origin.

The main goal of fruit crop breeding at the Institute is to develop new varieties, which are:

- **adapted for cultivation in Latvia,**
- **with fruit quality suitable for commercial growing,**
- **resistant to diseases,**
- **ripen during an extended period of time,**
- **have tree or shrub habit easy for training and cultivation.**

Berlin, 2010

Breeder's rights in Latvia are protected for:

- **Apple varieties:** 'Ausma', 'Ilga', 'Magone', 'Agra', 'Atmoda', 'Ella', 'Olga', 'Baiba', 'Dace', 'Edite', 'Gita', 'Ligita', 'Roberts';
- **Sweet cherry varieties:** 'Aija', 'Aleksandrs', 'Indra', 'Jānis'
- **Apricot varieties** 'Daiga', 'Lāsma', 'Velta'
- **Plum varieties:** 'Agrā Dzeltenā', 'Inese', 'Minjona', 'Zemgale'
- **Raspberry cultivars:** 'Arta', 'Dita', 'Ina', 'Ivars', 'Līna'
- **Pear cultivars:** 'Jumurda', 'Paulina'

Registered grapes cultivars in Latvia and Sweden: 'Zilga', 'Guna', 'Supaga', 'Sukribe', 'Veldze'.

Berlin, 2010

Research in growing techniques

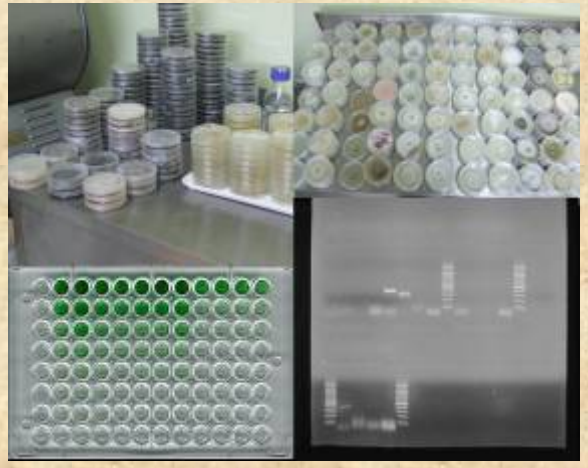
- Evaluation and screening of the suitability of fruit crop varieties for different training systems and tree shapes, different time of training;
- Development of economically justified, environment-friendly (integrated and organic) technologies for growing of more popular fruit crops and cultivars in different soil and climate conditions;
- Working out growing techniques for novel fruit crops.

Berlin, 2010

Research in plant pathology and entomology

Unit of Plant pathology and entomology started its activities as Plant pathology laboratory in summer 2006.

- **Main tasks and lines of the research:**
  - **The development of scientific and theoretical basis for economically viable and environment friendly (integrated and organic) fruit growing technologies which are based on research of harmful organisms in Latvian orchards.**
  - **The development of methodical basis for establishing of the system of certified planting material for fruit crops in Latvia.**
  - **Diagnostics of insect pests and diseases of fruit crops.**



Research in genetics and molecular biology

Unit of Genetics and Molecular Biology was established in 2007.

Major research interests of the unit can be roughly divided into the following areas:

- **Coordination of fruit and berry crop genetic resources maintenance, evaluation and characterization:**

- **Introduction and utilization of molecular marker methods in the fruit and berry crop breeding:**

  - **Introduction of gene- specific genetic markers in breeding;**
  - **Evaluation of genetic diversity using molecular markers.**
  - **Laboratory has adapted microsatellite (SSR) marker methods for major fruit and berry crops – apple, sweet and sour cherries, black currants, raspberries.**

Processing, biochemical investigation and postharvest management

The aim of the research at the Centre is to find out the suitability of fruit and berry varieties for different processing products (juices, pulps, jams, purees, drying, freezing), research on fruit and berry storage (CA and ULO) and the working out of new products.

A part of all research projects is worked out in cooperation with processing companies. Patents of processing technologies worked out at Dobele are registered in Latvia. Several new processing products worked out at the Processing Centre are introduced into production.

Processing, biochemical investigation and postharvest management

Unit of Experimental Fruit and Berry Processing consists of:

- **Laboratory of the Experimental Fruit and Berry Processing;**
- **Laboratory of biochemistry;**
- **Fruit storage complex (incl. ULO type storage experimental chambers).**

Berlin, 2010

Most important research projects

- EU structural funds “Scientific capacity building in fruit-growing, forestry and information technology sectors, providing research on environmentally friendly growing strategies, product development and introduction aided by computer technologies” (2009-2012).
- EU COST project “Euroberry Research: From Genomics to Sustainable production, Quality and Health” (2004 - 2010).
- State Research program project “High-value Latvian berries: from cultivars to healthy, safe and quality product” (2006 - 2009).
- EUREKA E! 3490 “Functional food ingredients from plant products” (2006 - 2008).
- EU structural funds “Possibilities of raising the qualification of unemployed young people in the work market of fruit growing and related fields” (2007 - 2008).
- Development of sea buckthorn processing products, testing of their functional properties for improving of human health (Market oriented project) (2005 – 2007).

Transfer of technologies developed at the Institute to producers

- The Institute organizes or participates in seminars and exhibitions in Dobele, Riga and other towns in Latvia, where experimental fruit and berry processed products are presented.
- Scientists provide consultations both at the Institute and at processing enterprises.
- Scientists are seeking contacts with producers for testing and introducing new products.
- Enterprises come to researchers with their ideas about development of new technologies or products.
- Every year Farmers Days take place at Dobele in March and August, collecting numerous visitors.
- The Latvian Food Technology Platform (LPTP) has been formed, inside which active cooperation is taking place between producers, researchers, lawmakers and consumers. LPTP is an official member of EU Technology Platform "Food for life".

Berlin, 2010

Sea buckthorn growing and processing in Baltic States

Berlin, 2010

General overview - Lithuania

Varieties widely grown in Lithuania:

‘Botanicheskaya’
‘Podarok Sadu’
‘Trofimovskaya’
‘Augustinka’

Berlin, 2010

General overview - Estonia

Varieties widely grown in Estonia:

<u>Russian varieties:</u>

‘Botanicheskaya’
‘Botanicheskaya Lubitelskaya’
‘Botanicheskaya Aromatnaja’
‘Prozrachnaya’
‘Podarok Sadu’
‘Otradnaja’
‘Trofimovskaya’
‘Augustinka’
‘Gibrid Perchika’
‘Vorobjovskaya’

<u>German varieties</u> under investigation:

‘Askola’
‘Dorana’
‘Habago’
‘Hergo’
‘Leikora’
‘Sirola’

Historical overview - Latvia

- **<u>1981</u> - failed trials to grow continental *Hippophae rhamnoides ssp. mongolica* varieties;**
- **1984 - successful introduction of the first generation of crossings *ssp. mongolica x {ssp. rhamnoides + ssp. fluviatilis};***
- **<u>Since 1990</u>**

- baccrosses with *ssp. Rhamnoides;*

- harvesting innovations;

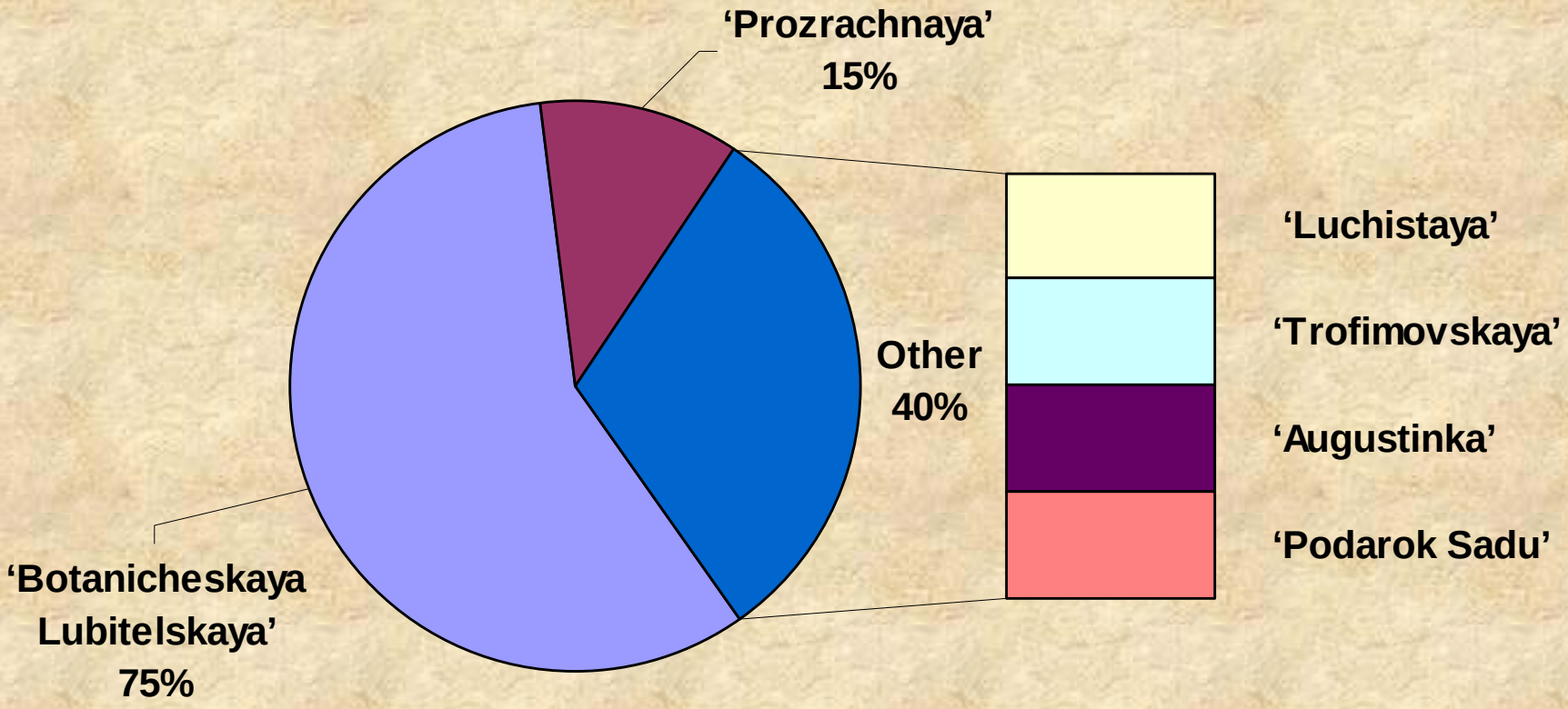
- research on soil requirements;

- establishing commercial plantations;

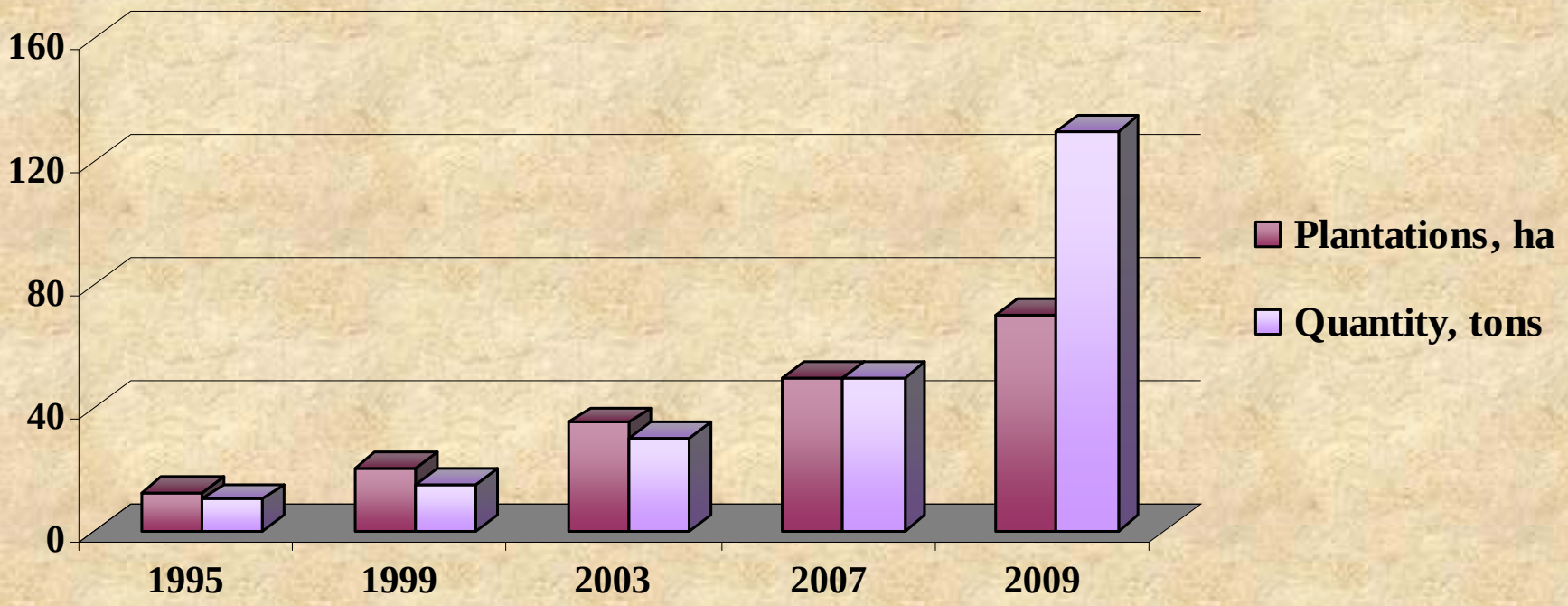
- breeding specific varieties for nordic climate.

General overview - Latvia

Varieties widely grown in Latvia



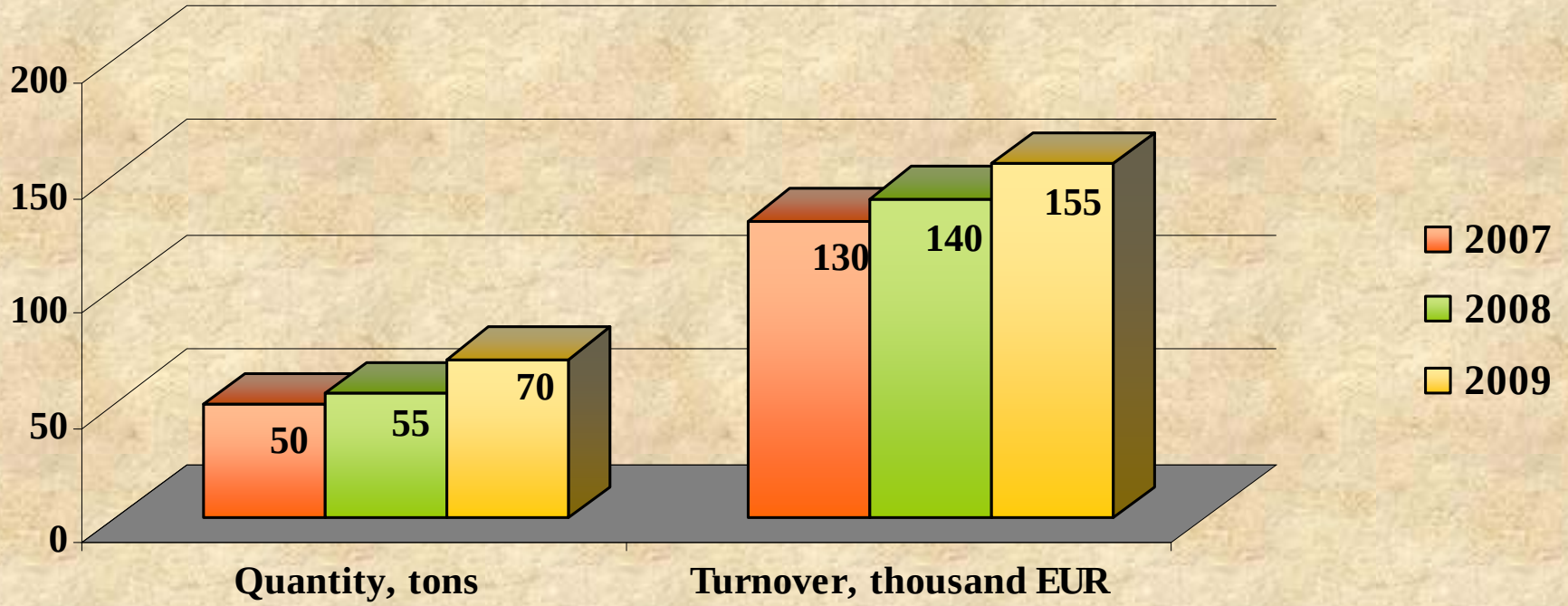
Comercial plantations



Export – 20 tons (each year)

Berlin, 2010

Quantity of processed sea buckthorn berries and turnover in 2007-2009



Berlin, 2010

Satori Alfa, Ltd

www.oblepiha.times.lv

Berlin, 2010

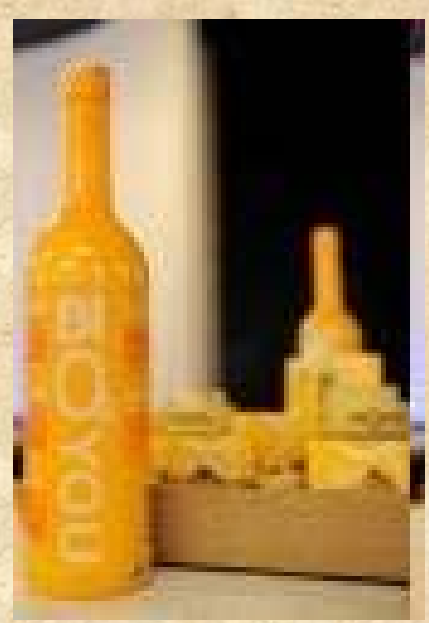
Dienvidi +, Ltd

www.zeltoga.lv

Berlin, 2010

Bio 2 You

www.bio2you.lv



Berlin, 2010

Challenges Introduction of innovative processing technologies in the production process

•Development of specific, healthy, high quality products in order to enter the saturated food market

•Export of products from non-traditional fruit crops (seabuckthorns, Japanese quince, high bush blueberries, American cranberries, etc.), which can be produced by small, specialized processing enterprises.

Berlin, 2010

Thank you for your attention !

Berlin, 2010