



# Overview of cultivation technologies and their challenges

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# Structure of the presentation

1. Introduction
2. Propagation of the sea buckthorn plants
3. Sea buckthorn varieties
4. Cultivation of sea buckthorn
5. Plant protection, plant diseases, pests
6. Harvesting of sea buckthorn
7. Summery



# 1. Introduction





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## 2. Propagation of the sea buckthorn plants



Hardwood cuttings in the end of June in Germany





## 2. Propagation of the sea buckthorn plants



Hardwood cuttings in the October in Germany





## 2. Propagation of the sea buckthorn plants



Green cuttings in Estonia, research-station Rõhu



### 3. Sea buckthorn varieties

#### Acreage

#### German varieties

Hergo, Askola, Habego, Leikora, +Nr. 1161

600 ha in  
Germany







● large Seabuckthorn orchards



### 3. Sea buckthorn varieties

#### Acreage

#### German varieties

(Frugana), Hergo, (Askola), Habego, Leikora

600 ha in  
Germany

#### Russian varieties

Botanitscheskaja, Botanitschskaja Ljubitelskaja,  
Gibrid Pertsika, Otradnaja, Podarok Sadu,  
Trofimovskaja

600 ha (?) in  
Baltic States





### 3. Sea buckthorn varieties

In Europe, new sea buckthorn varieties are wanted in several countries



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In Finland





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In Sweden



### 3. Sea buckthorn varieties

In Europe, new sea buckthorn varieties are wanted in several countries

In Romania



**Clara**- Varietät mit kompakter Krone, für super-intensive Plantagen geeignet, mit über 2200 Bäume/Ha. Produktionspotenzial: 15.3 T/Ha im 3. Jahr, 24.5 im 5. Jahr. Große, gelb-orangen Früchte, 78 g/100 Beeren, 340 mg% Vit C, Karotin 3.9 mg%, Öl 4.8%. Erntezeit: ± 15 August.

Ernten. 14.2 T/Ha im 3. Jahr, 21.8 im 5. Jahr. Runde, gelb-orangen Früchte, 54 g/100 Beeren, Vit.C 690 mg%, Karotin 8.9 mg%, Öl 5.8%  
Erntezeit: Clara + 15 Tage.



**Mara**- aufrechte Varietät, geeignet für 100% mechanisierte Ernte. 14.7 T/Ha im 3. Jahr, 23.1 im 5. Jahr. Große, helle gelb-orangen Früchte, 64 g/100 Beeren, Vit.C 380 mg%, Karotin 12.84%, 6.2% Öl.  
Erntezeit: Clara + 7 Tage.

**Dora**- intensen rot-orangen und sehr aromatisierten Früchte, 12.2 T/Ha im 3. Jahr, 18.1 im 5. Jahr; außergewöhnliche Fruchtqualität. 50 g/100 Beeren, Vit.C 1040 mg%, 17.3 mg% Karotin, Öl 7.2%. Erntezeit: Clara + 20 Tage





### 3. Sea buckthorn varieties

#### Acreage

#### German varieties

(Frugana), Hergo, (Askola), Habego, Leikora

600 ha in  
Germany

#### Russian varieties

Botanitscheskaja, Botanitschskaja Ljubitelskaja,  
Gibrid Pertsika, Otradnaja, Podarok Sadu,  
Trofimovskaja

600 ha (?) in  
Baltic States

#### Swedish varieties

Eir, Fenja, Idune, Lotta, Sol, Svenne

unknown  
???

#### Romanian varieties

Clara, Dora, Mara

unknown  
???



### 3. Sea buckthorn varieties

In Europe, new sea buckthorn varieties are wanted in several countries



In Germany





### 3. Sea buckthorn varieties

A great problem is the frost susceptibility of the male sea buckthorn varieties



**Estonia 2010**



**Sweden 2013**

**In Germany also in 2012 -25°C in winter (Pollmix 1)**





## 4. Cultivation of sea buckthorn



Dried plants 2006 in Ludwigslust/Germany



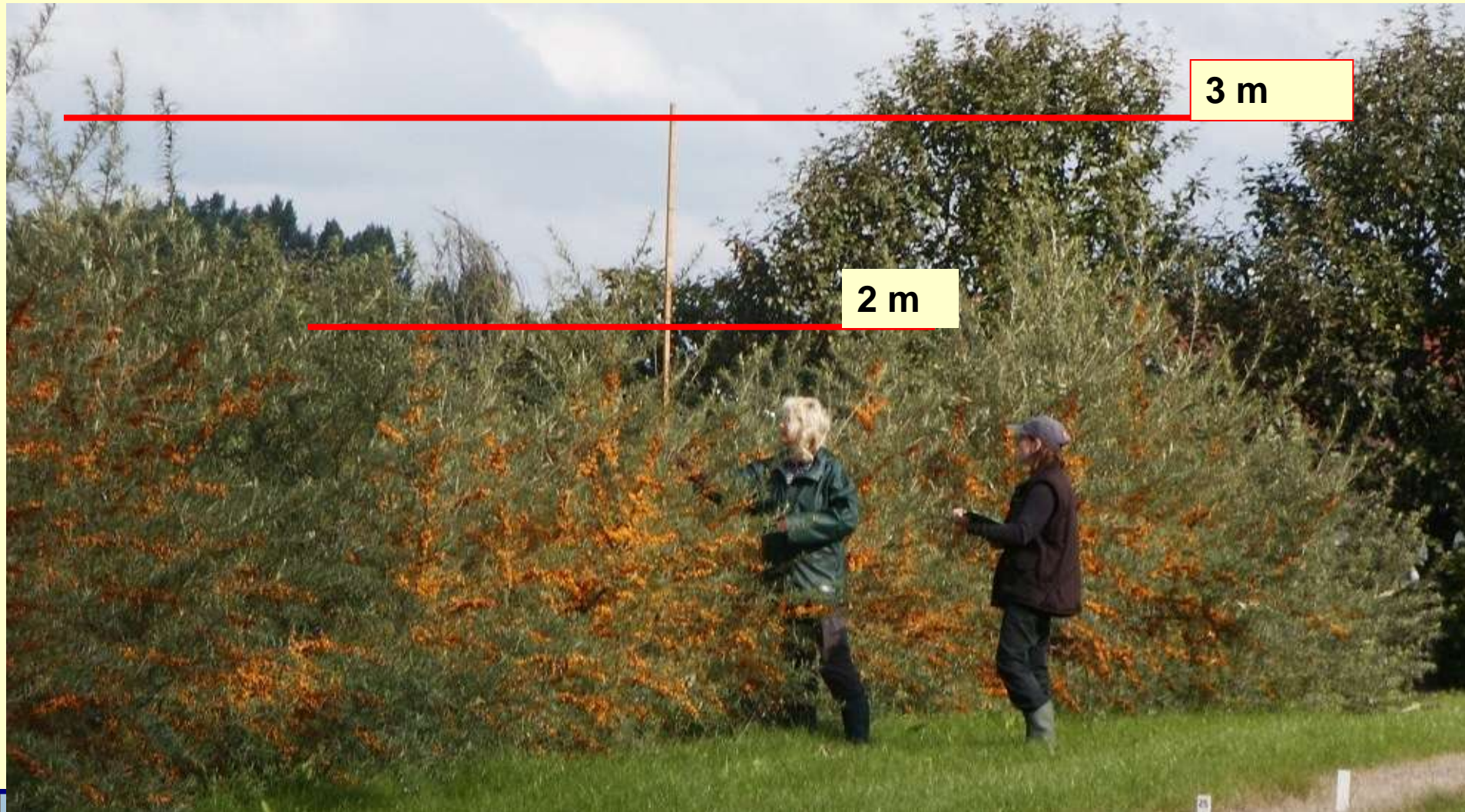


# Bush height in the non-irrigated variant, bevor and behind irrigated variants in Gülzow 2010





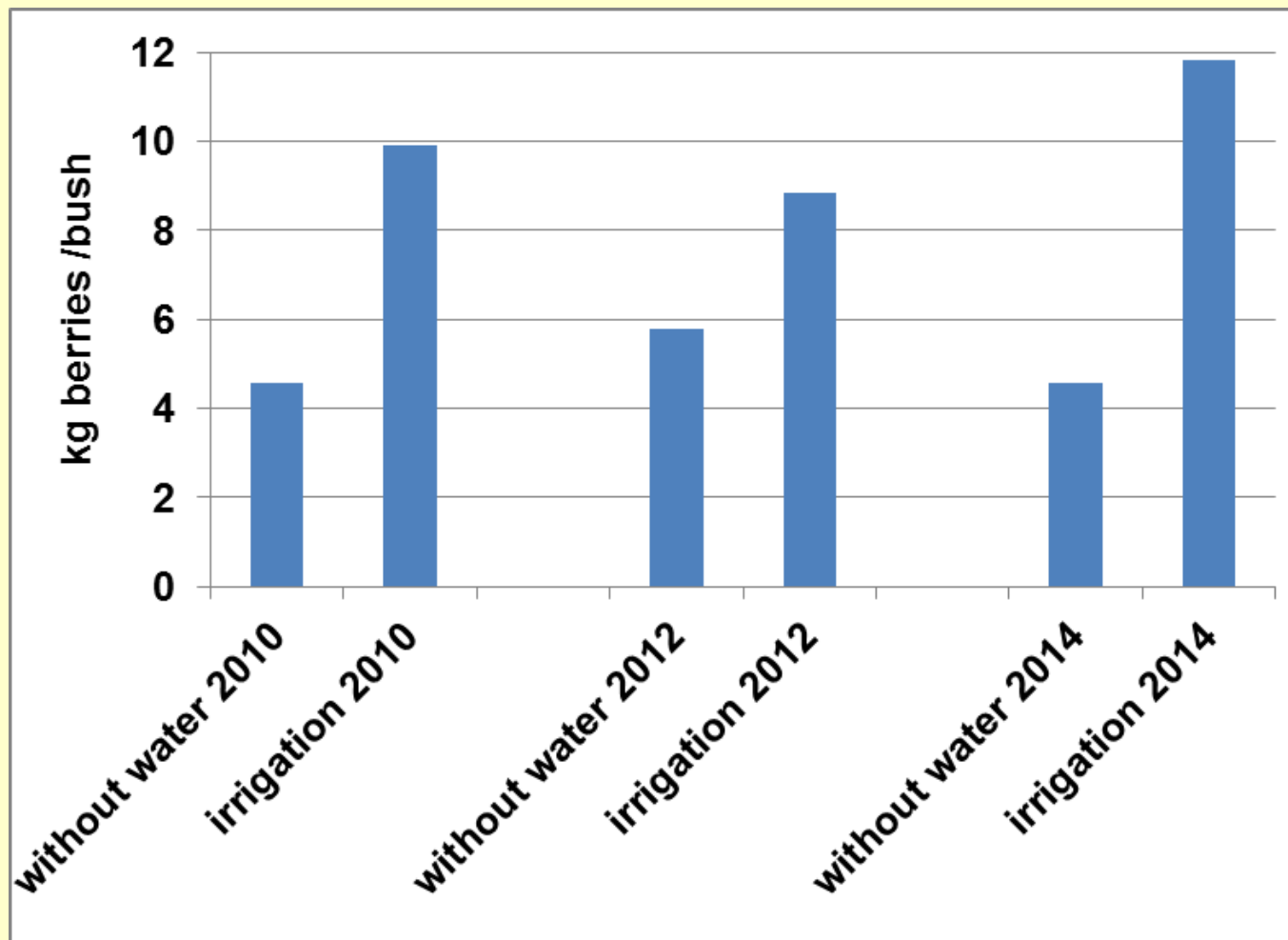
# Bush height in the non-irrigated variant, bevor and behind irrigated variants in Gülzow 2010





## 4. Cultivation of sea buckthorn

Yields of sea buckthorn berries with and without irrigation in Gülzow



## 5. Plant protection, plant diseases, pests

**Verticillium and other fungi**

**Sea buckthorn fruit fly (*Rhagoletis batava*)**

**Starling (*Sturnus vulgaris*)**

**Stigmina**





## 5. Plant protection, plant diseases, pests



Gibrid Pertsika



Podarok Sadu



Trofimovskaja



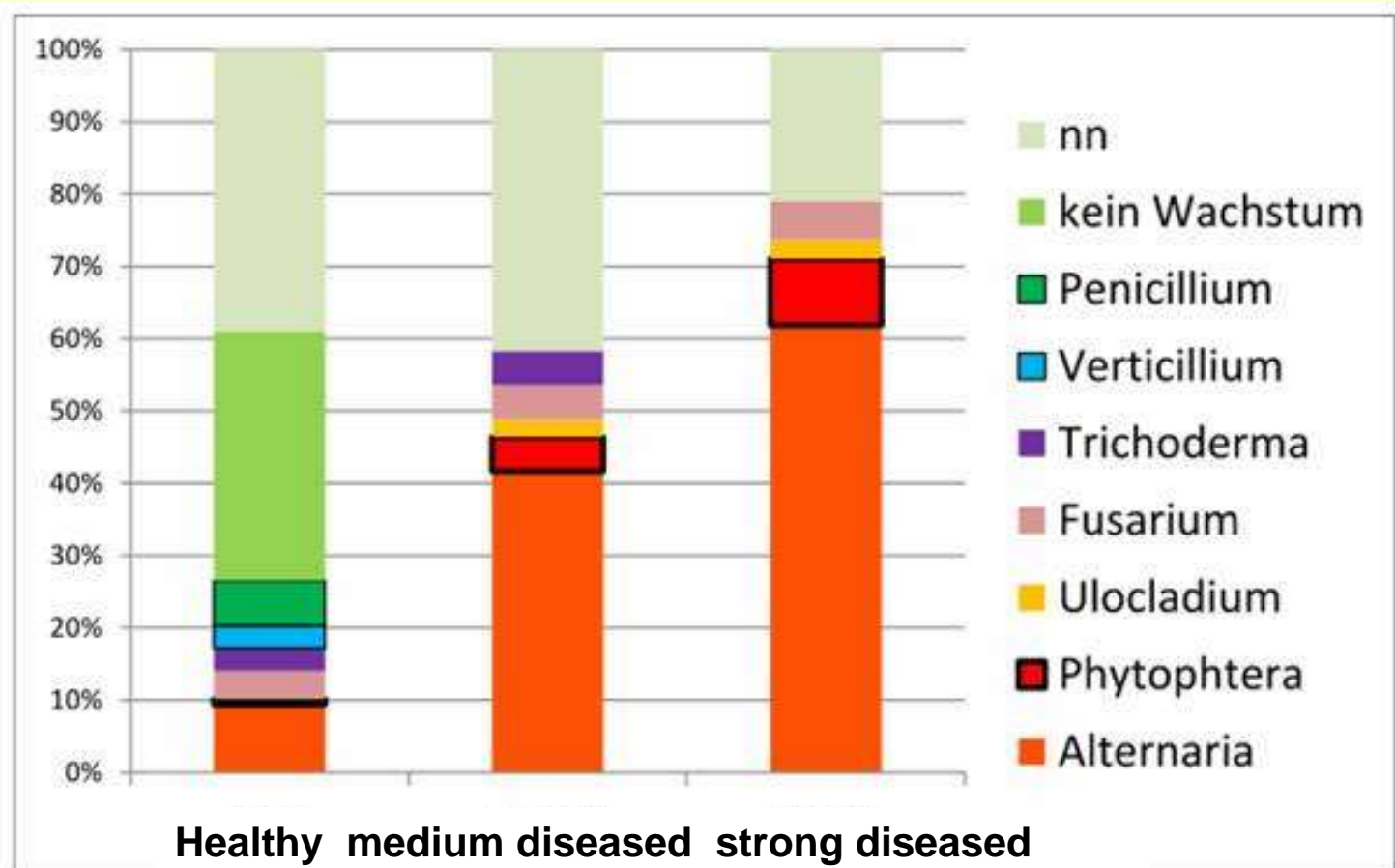
Otradnaja

**Verticillium and other fungi 2007 in Gülzow**



## 5. Plant protection, plant diseases, pests

Types of fungi on part of Seabuckthorn plants, which were healthy or diseased by *Verticillium*, Gölzow 2012





## 5. Plant protection, plant diseases, pests



**23. November 2011  
in Gülzow**

**was nothing to see  
from the fruit fly**



## 5. Plant protection, plant diseases, pests



**The first occurrence of maggots on August 19, 2013 at frozen berries**





## 5. Plant protection, plant diseases, pests



**Damage in the experimental field  
on August 22, 2013 in Gülzow**





## 5. Plant protection, plant diseases, pests



**Gauze cages with fly pupae  
in October 2013**





## 5. Plant protection, plant diseases, pests

Sea Buckthorn Fly (*Rhagoletis batava*)



KUHNKE, LALFF MV, 2014



## 5. Plant protection, plant diseases, pests

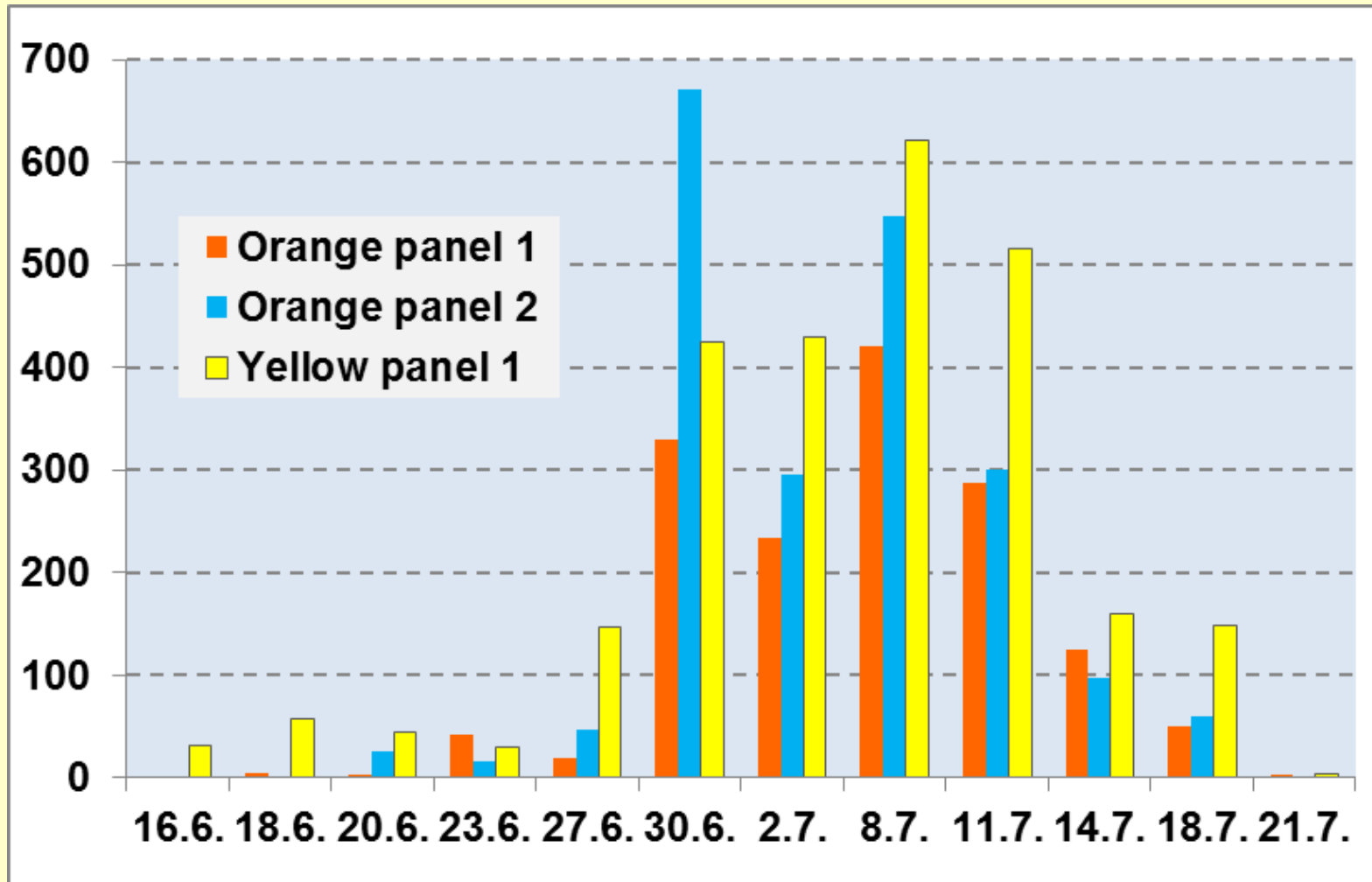
Sea buckthorn flies trapped by an orange panel on July 3, 2014





## 5. Plant protection, plant diseases, pests

Number of trapped sea buckthorn flies per day in 2014 Gülzow



## 5. Plant protection, plant diseases, pests



**This flock of birds has over  
3,000 Starlings (Sturnus vulgaris)**





## 5. Plant protection, plant diseases, pests



**eaten by starlings sea buckthorn berries**





## 6. Harvesting of sea buckthorn

**We know a lot of harvest methods, but no one is perfect.**

**1. Picking by hand,**

**2. Shaking off the fruit from the bush,**

**3. Cutting of the branches, freezing of branches with berries, shaking off the frozen berries.**





## 6. Harvesting of sea buckthorn



**Hand picking in the experimental station Rõhu, Estonia**





## 6. Harvesting of sea buckthorn



**Hando Kruuv with the berry-shaker „HK-2“ 2006 in Estonia**





## 6. Harvesting of sea buckthorn



**The berry-shaker HK-2 2007 in Gülzow**





## 6. Harvesting of sea buckthorn





## 6. Harvesting of sea buckthorn



## 6. Harvesting of sea buckthorn

**The berry-shaker is suitable for the harvesting of sea buckthorn berries. The optimum thickness of the branches is 1-2 cm.**

**There is a large differentiation of variety suitability.**

**The best result is obtained at almost hard ripe berries.**

**By berry-shaker harvests of 20-30 kg / h can be reached.**





## 6. Harvesting of sea buckthorn

**Work with the berry-shaker is hard physical work.**

**The "Berry Shaker HK2" is for large-scale plantations in Germany no alternative.**

**Applications are limited seen in small-scale cultivation, when the heavy physical work is not shunned.**



## 6. Harvesting of sea buckthorn

Cutting height by harvesting of sea buckthorn





## 6. Harvesting of sea buckthorn



**Sea buckthorn harvester in Quellendorf**





## 6. Harvesting of sea buckthorn



**with harvesting machine harvested sea buckthorn plants**





## 6. Harvesting of sea buckthorn



## 6. Harvesting of sea buckthorn



**Shaking of the frozen berries, clean the berries and fill into container**





## 6. Harvesting of sea buckthorn



The quality of the harvested berries is very good.



## 7. Summary

**The seedling production is not very problematic.**

**The number of Sea buckthorn varieties is too low.**

**For the sea buckthorn cultivation water is very important.**

**There are many problems in plant protection. The most important are *Verticillium* and other fungi and sea buckthorn fruit fly.**

**For harvesting, there are several methods, but no one is perfect.**







**Thank you for your attention**

