Forest regeneration and management of young stands in Estonia

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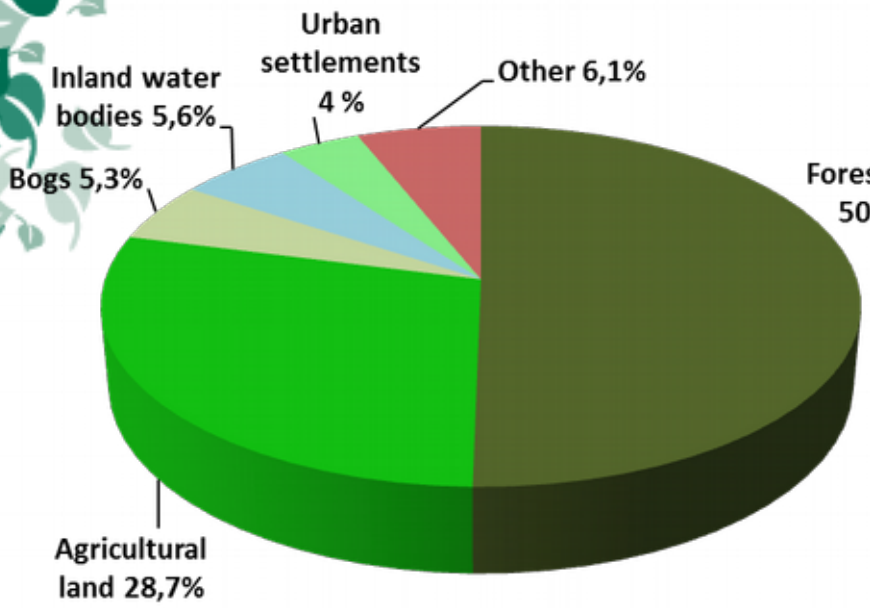
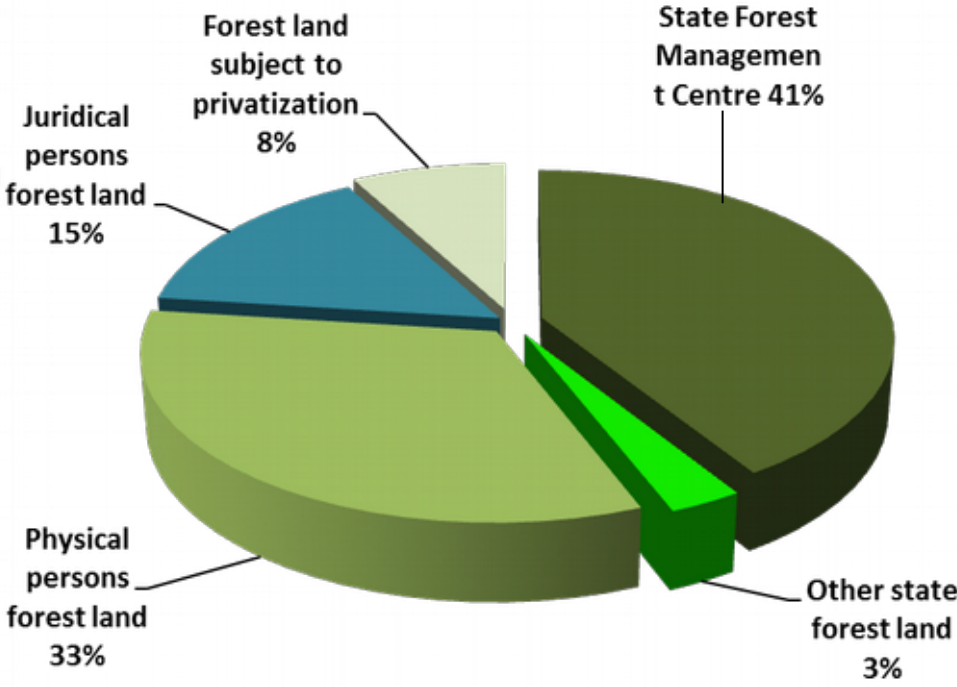
Total area of Estonia by land categories and ownership categories





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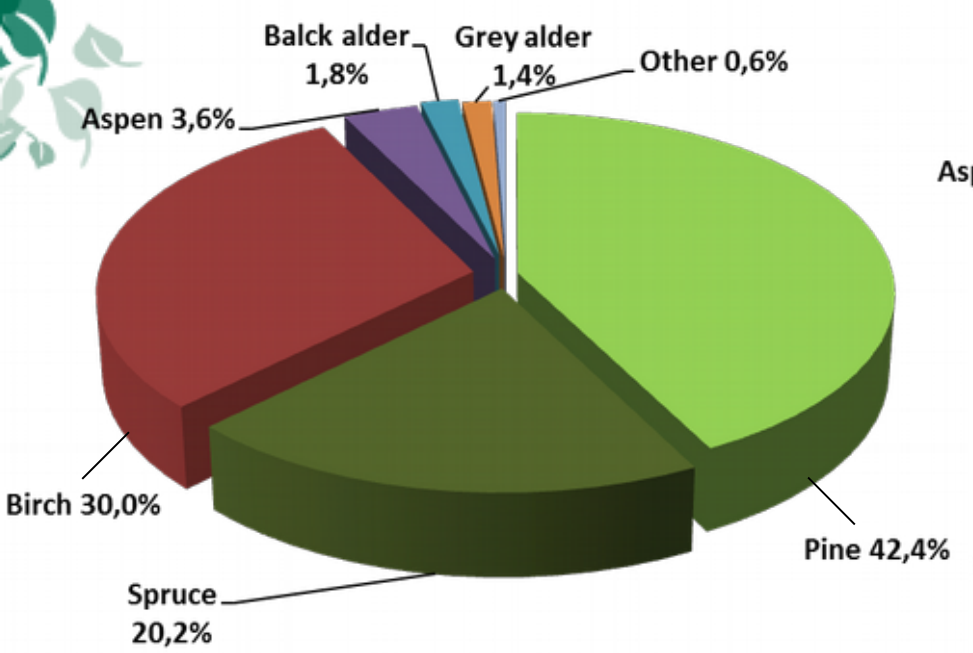
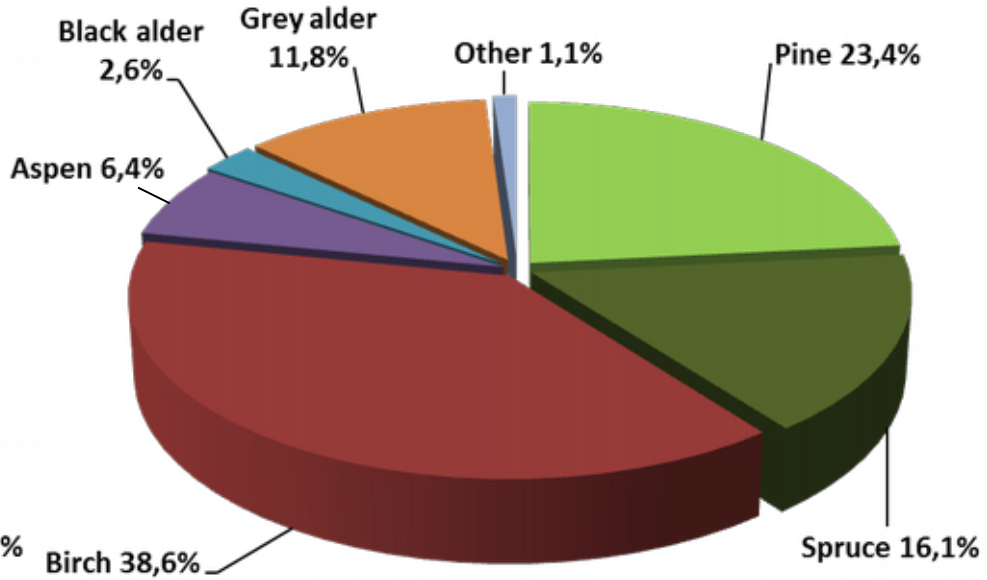
Source: Estonian Environment Agency
Yearbook FOREST 2014

Distribution of forest land area by tree species

State forest



Private forest



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Source: Estonian Environment Agency
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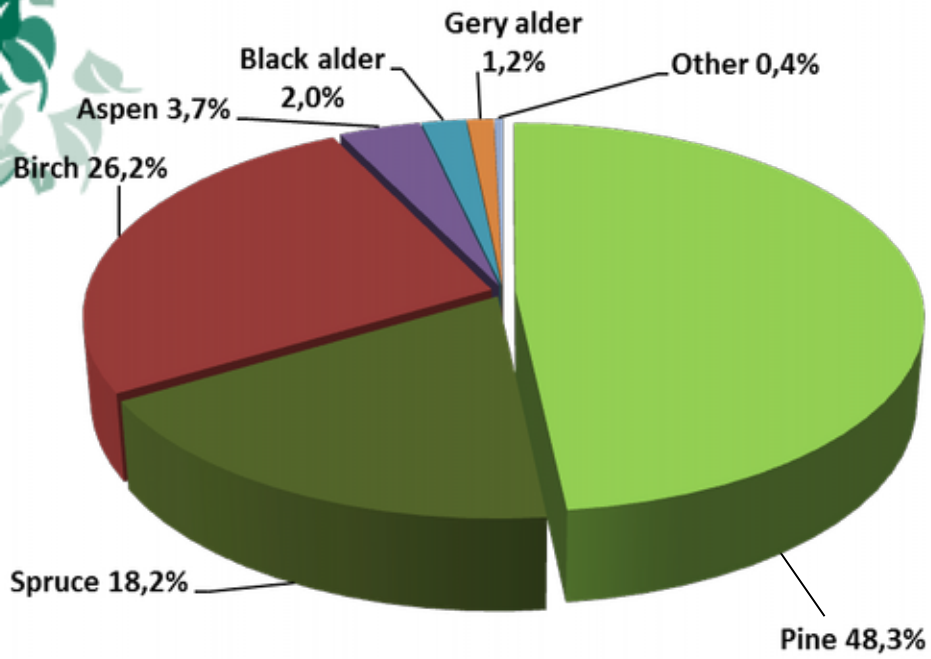
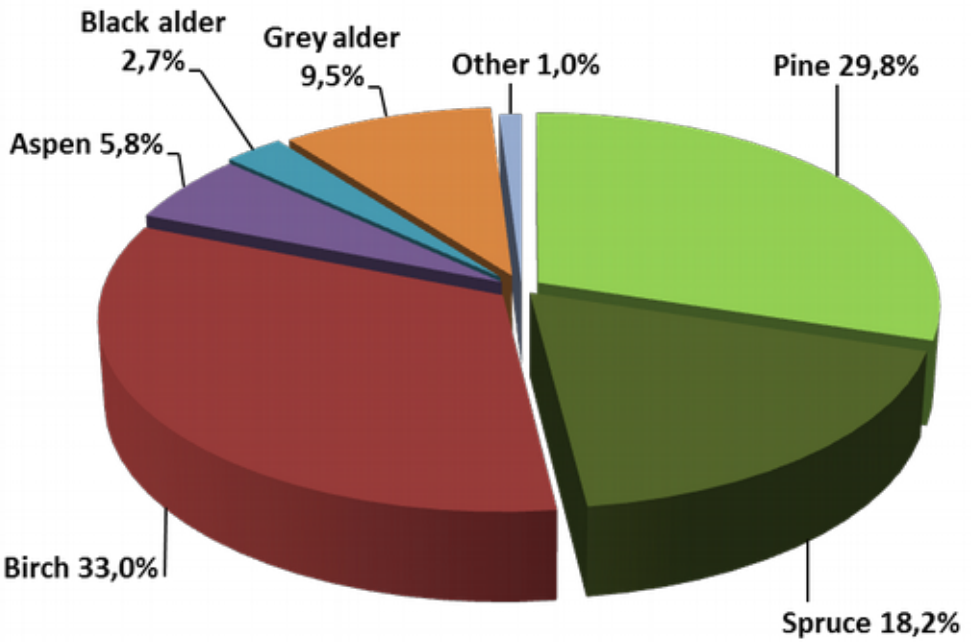
Distribution of growing stock by tree species

State forest



Private forest



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Source: Estonian Environment Agency
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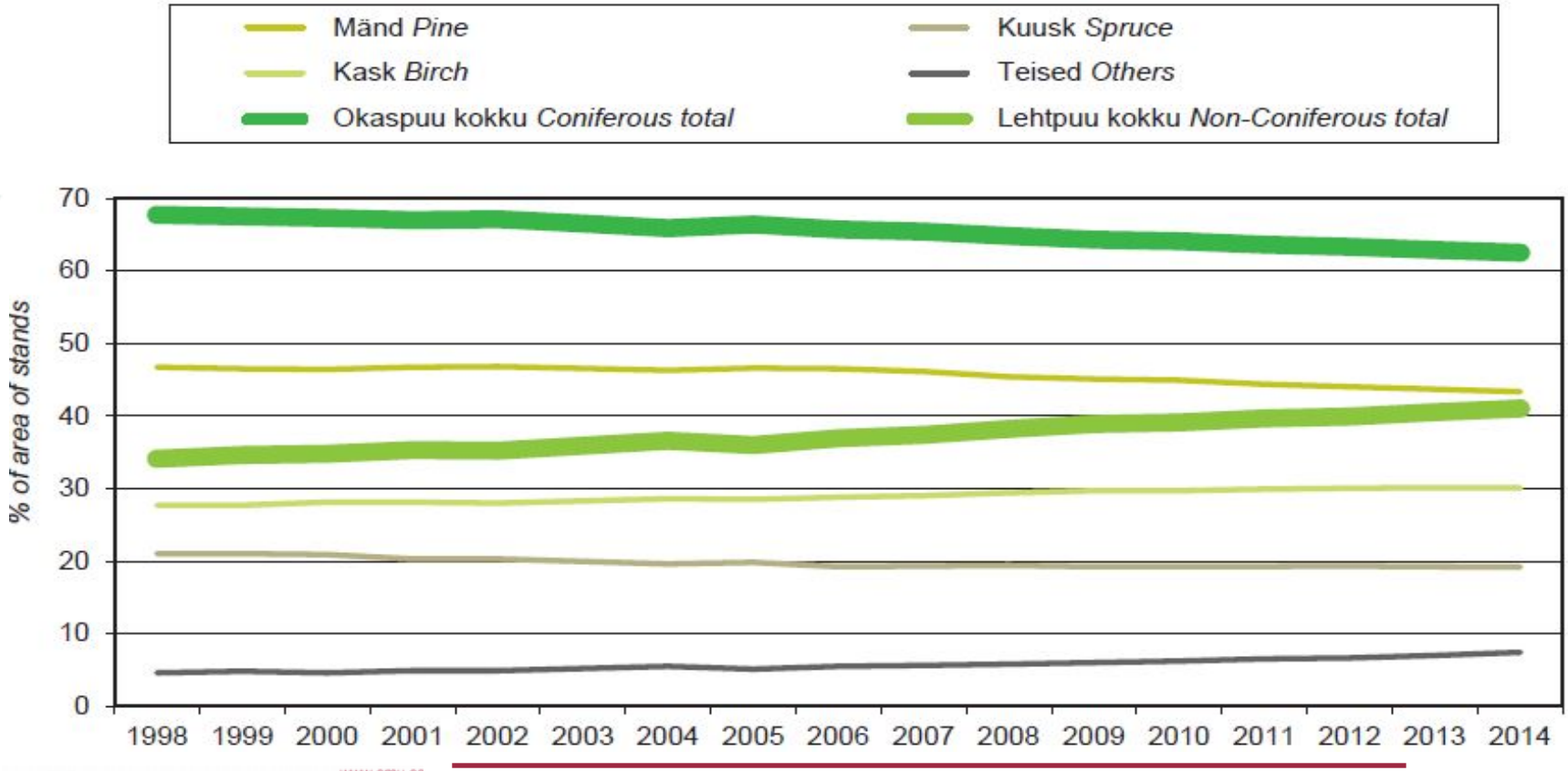
Changes in dominant tree species in forests with management plan: State forests



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Source: Estonian Environment Agency
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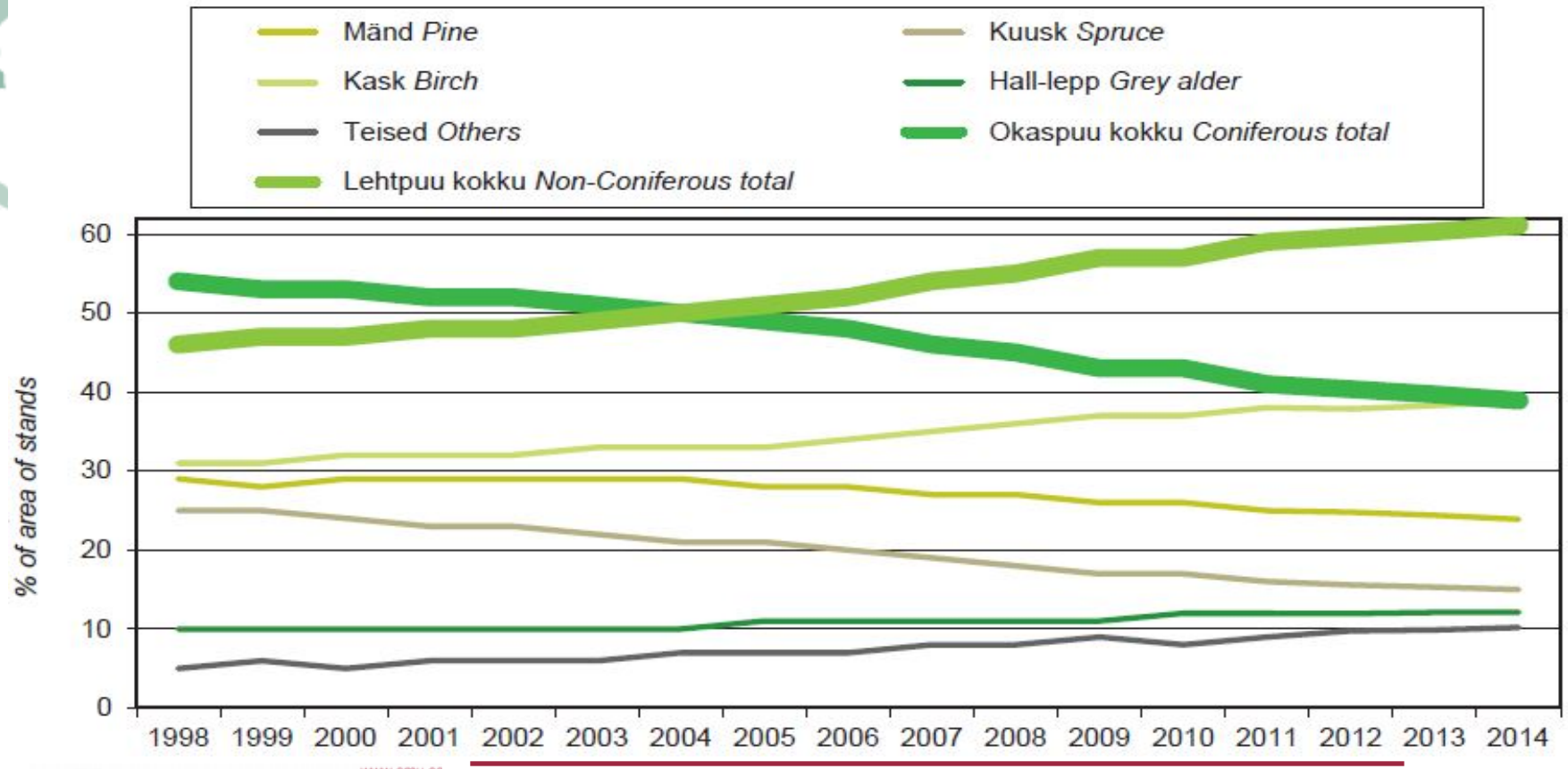

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Source: Estonian Environment Agency
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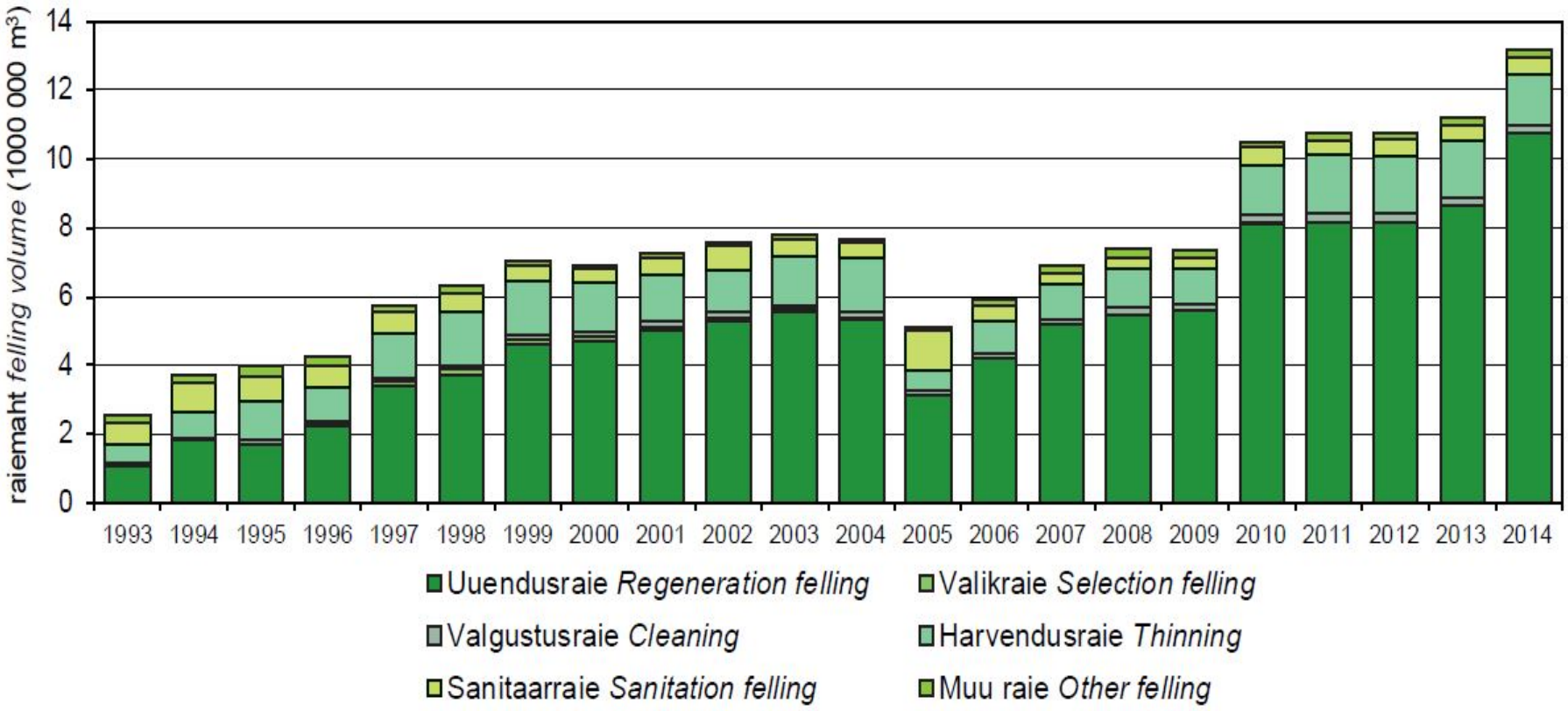
Felling volume by felling types in 1993-2014



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Source: Estonian Environment Agency
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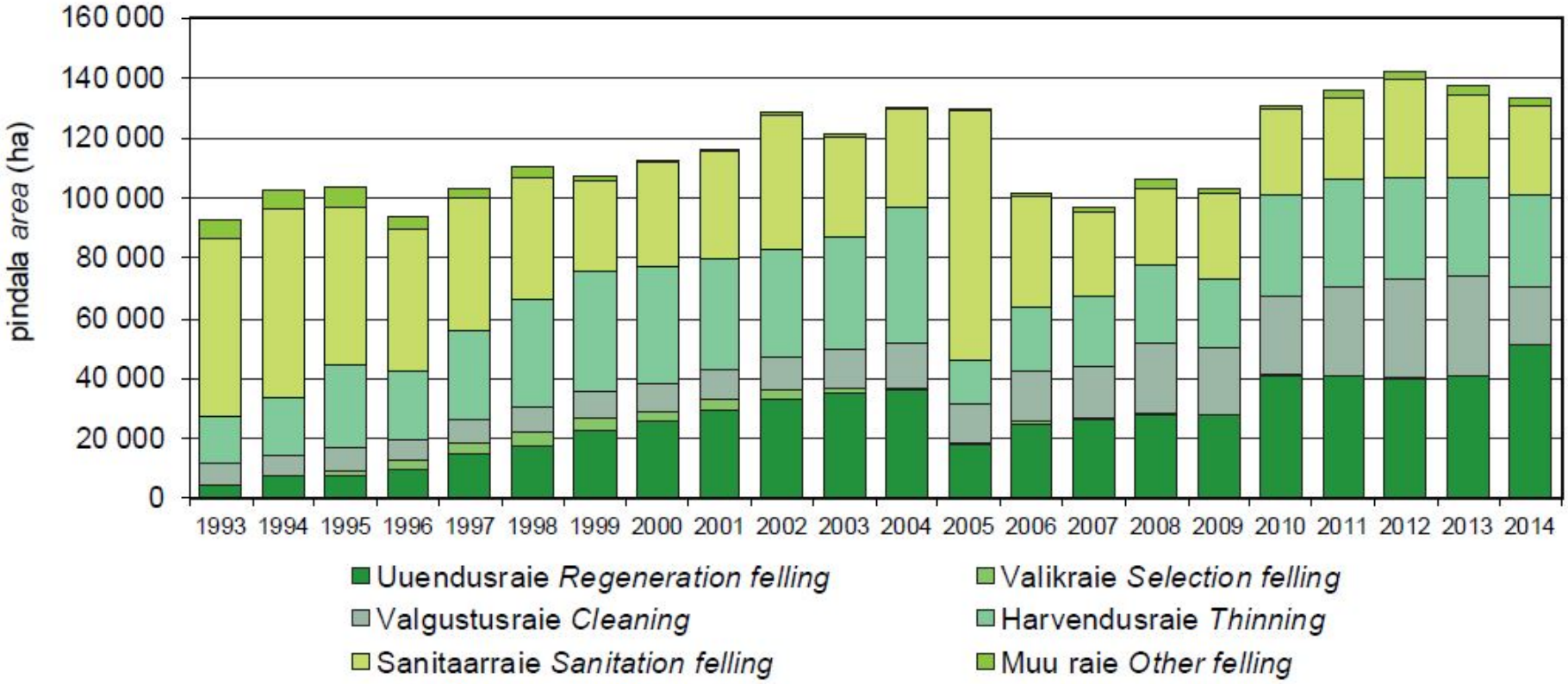

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Source: Estonian Environment Agency
Yearbook FOREST 2014

Tree nurseries

Year	Number of forest nurseries	Number of producers	Total area (ha)	Area of greenhouses (m²)
2002	144	66	259.1	27 652
2003	133	71	265.3	28 159
2004	144	104	81.8*	40 428
2005	164	129	85.9*	55 206
2006	157	140	97.4	51 814
2007	131	115	85.9	63 763
2008	103	82	68.7	64 595
2009	84	77	59.0	39 048
2010	81	69	67.9	48 733
2011	77	67	75.1	53 185
2012	80	68	76.6	61 434
2013	83	70	72.4	68 126
2014	86	75	74.7	77 311

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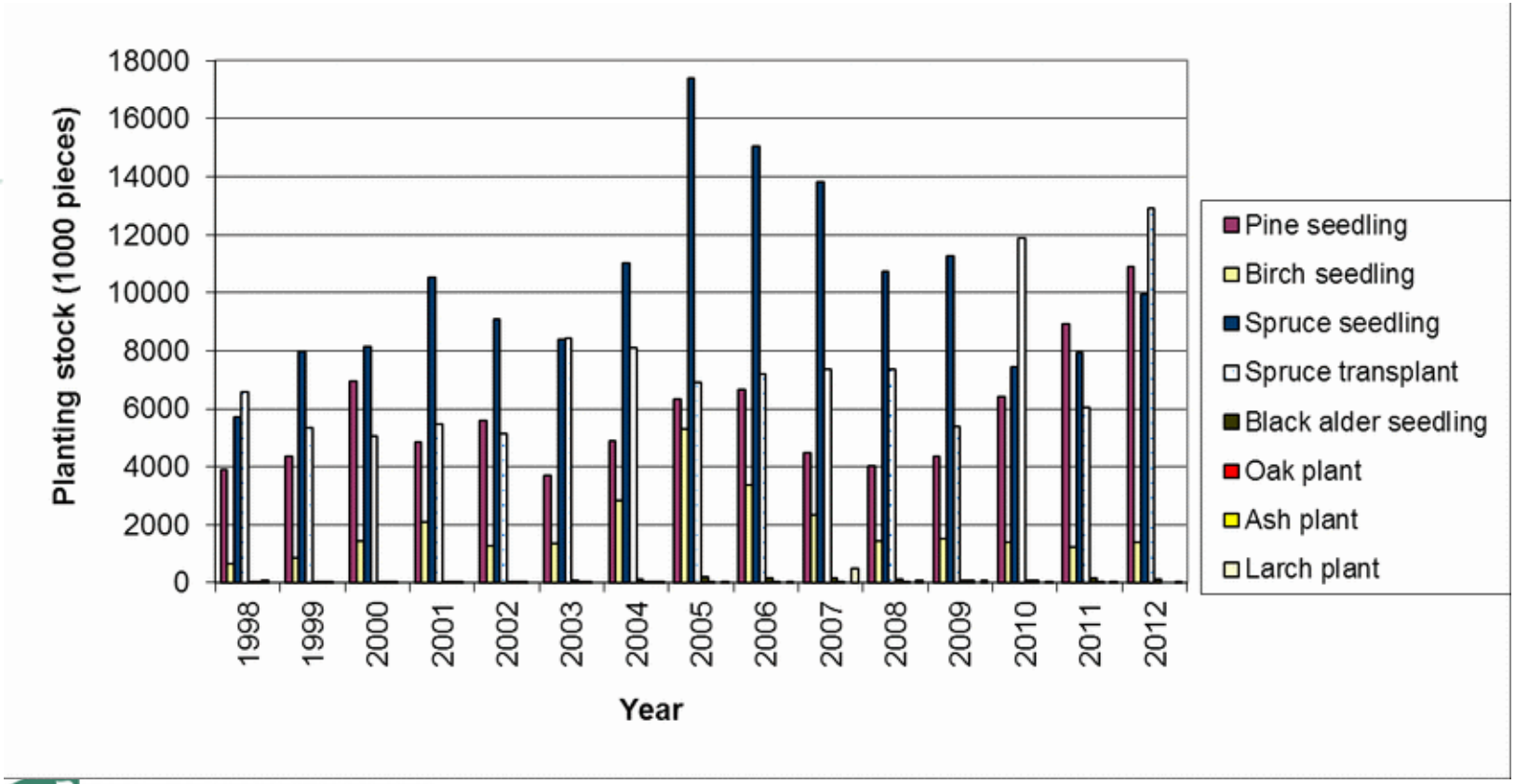
*Production area – without fallow

Source: Estonian Environment Information Centre
Yearbook FOREST 2007; Yearbook FOREST 2009

Source: Estonian Environment Agency
Yearbook FOREST 2014

Planting stock produced in forest nurseries in 1998-2012



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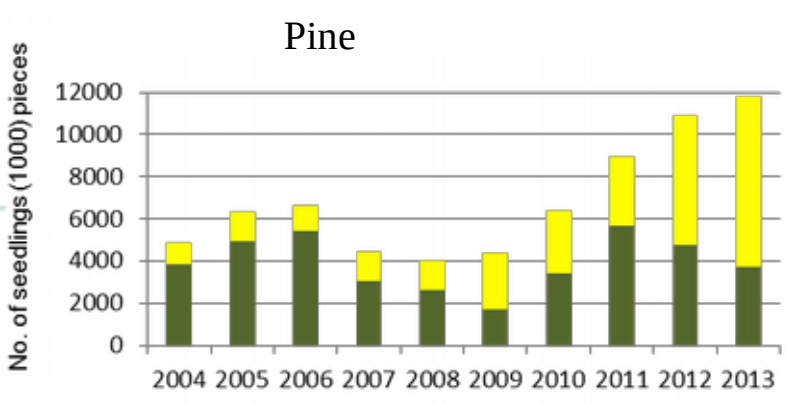
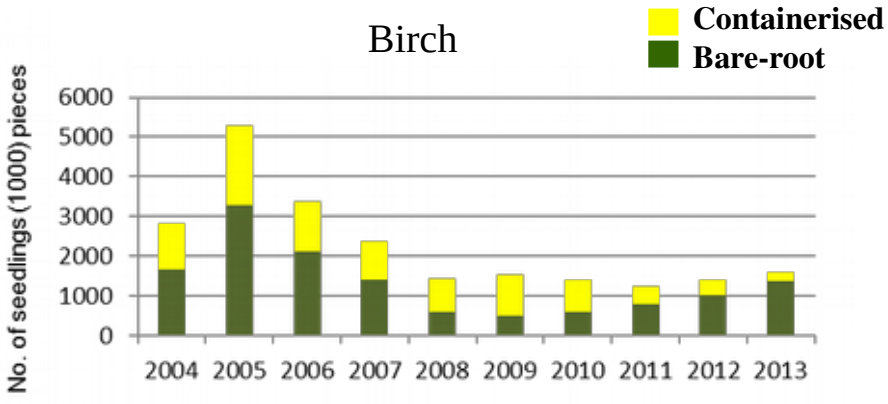
Source: Estonian Environment Agency (KAUR)
Yearbook FOREST 2013

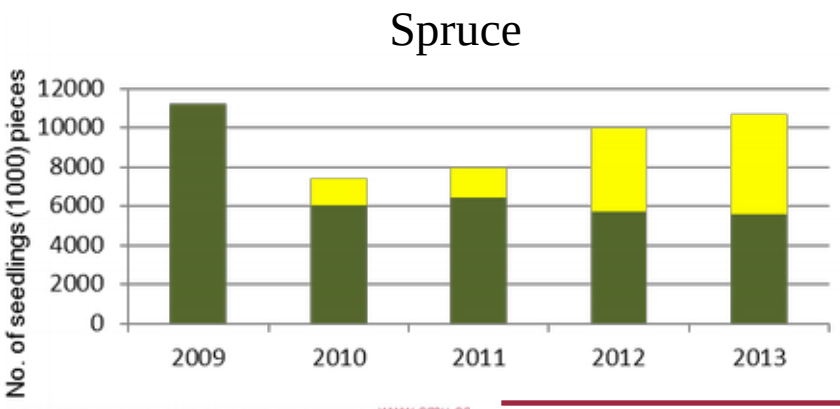
- Norway spruce transplants and containerised seedlings
- Scots pine seedlings and containerised seedlings
- silver birch seedlings, transplants and containerised seedlings
- black alder seedlings and containerised seedlings
- oak (*Quercus robur*) seedlings
- larch (*Larix sibirica*) and hybrid larch (*Larix* × *eurolepis* Henry) seedlings and containerised seedlings
- hybrid aspen (*Populus tremula* × *Populus tremuloides*) micropropacated containerised seedlings

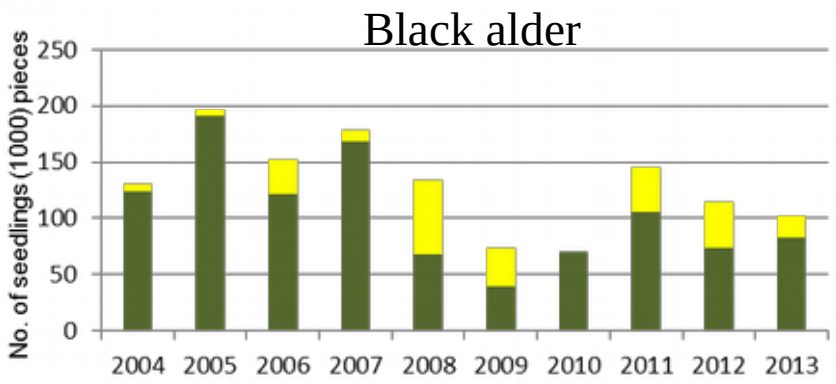
Source: Estonian Environment Agency (KAUR)

Containerised seedlings vs. Bare-root seedlings









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Source: Estonian Environment Agency
Yearbook FOREST 2014

Recent trends in plant production

- In 2012-2014, in average 27 million seedlings was produced annually:

  - 78% produced by the state

  - 48% containerised seedlings

- In 2012-2014, in average 1.8 million seedlings were imported annually

Source: Estonian Environment Agency (KAUR)

Plant production in private forests

- Origin of Norway spruce bare-root seedlings in private forests in 2015:

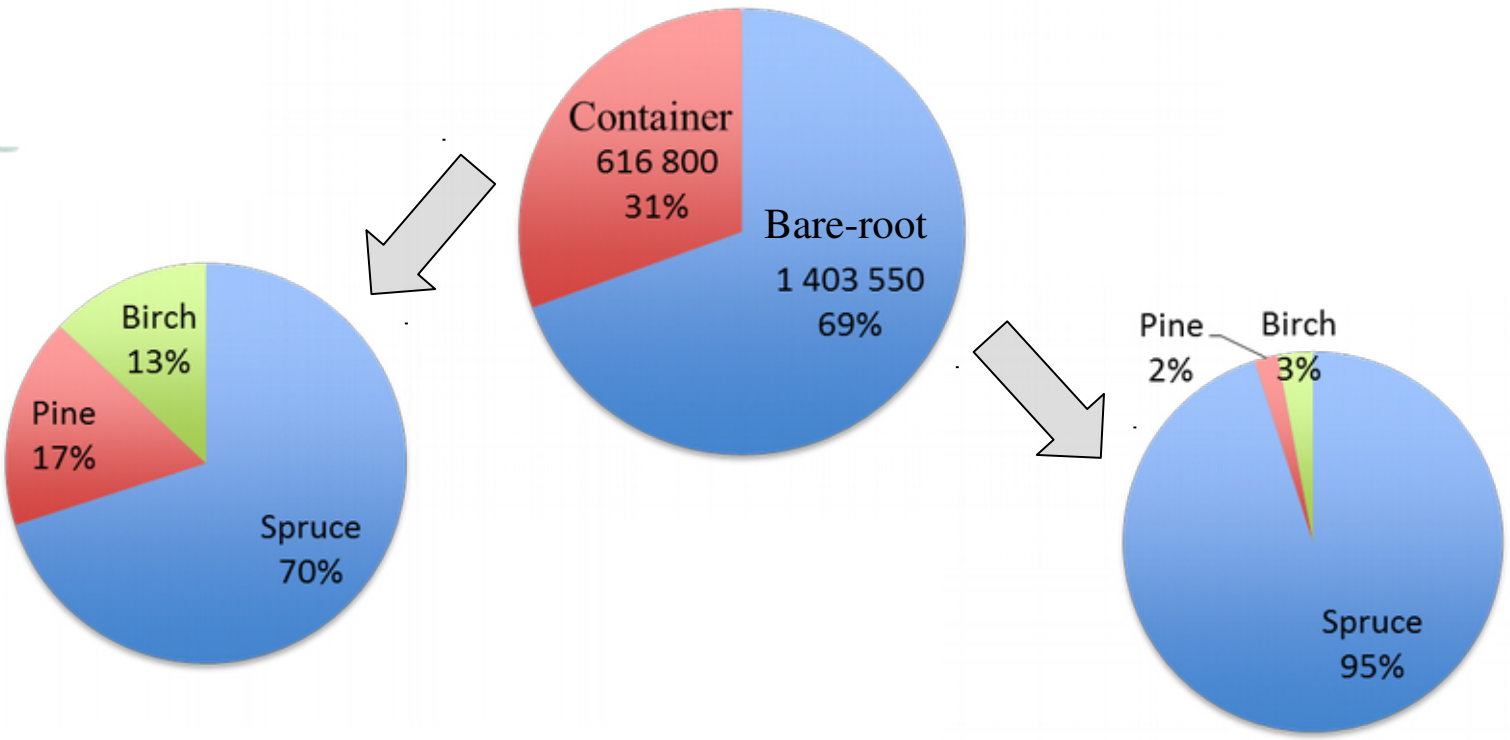
  49% from Latvia

  27% from Estonia (80% from RMK nurseries)

  24% from Lithuania

Source: The Foundation Private Forest Centre (PFC)

Plant production in private forests



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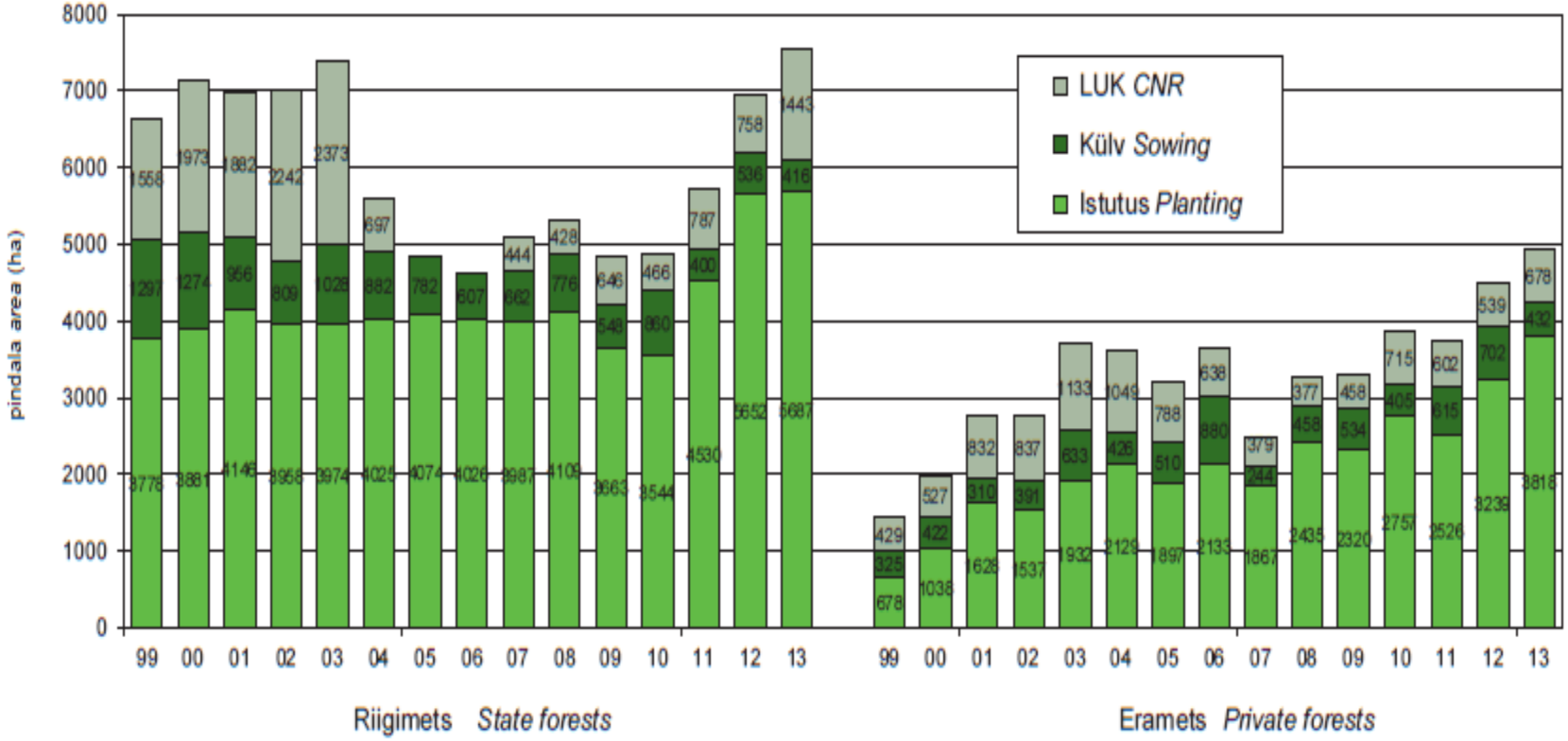
Source: The Foundation Private Forest Centre (PFC)

Forest regeneration in state and private forests in 1999-2013



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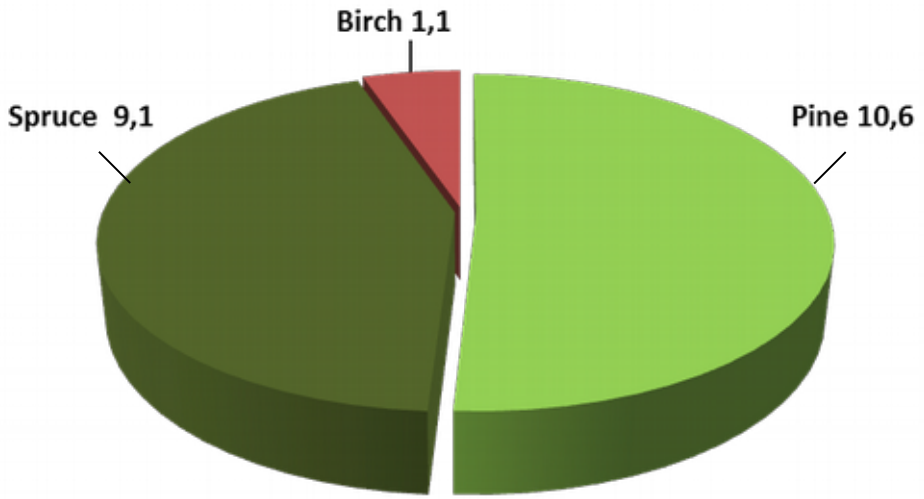
Source: Estonian Environment Agency (KAUR)
Yearbook FOREST 2013

Planting of different tree species in state forest by number of plants in 2017

- Regeneration area: 11 000 ha;
- 21 million of trees are going to be planted:



Source: RMK

Forest regeneration works in State Forest Management Centre (RMK) in 2015

- Planting mainly in spring and since 2012 planting also in autumn
- 19.3 million seedlings in 2015 (0.8 million in autumn)

  (*18.5 million seedlings in 2014*)
- Autumn planting – September/October – Norway spruce
- Regeneration area – >10 000 ha (1/5 left for natural succession)

  - expected natural regeneration of birch, aspen and black alder
- Plants needed by RMK are produced in 8 nurseries all over Estonia

Source: State Forest Management Centre (RMK)
http://www.rmk.ee/organisation/press/news/news-2015/a-total-of-19-dot-3-million-trees-were-planted-in-the-state-forest-this-year

Mechanical site preparation

- In State forests different soil scarification methods are used:
  - disc trenching (75%)
  - patch scarification (20%)
  - mounding (5%)

- In private forests the most common methods are:
  - disc trenching;
  - followed by patch scarification;
  - recently (in drained peatland forests) excavators are used to reconstruct forest drainage systems and to make soil scarification simultaneously (quite expensive).

Mechanized planting

- In **State forests** mechanized planting is not practiced, and only manual tree planting is used to regenerate the forests.
- Seedlings are planted with spades, planting tubes (e.g. *Pottiputki*) or other similar tools.
- Similarly, in **private forests** manual tree planting is still the most widespread planting method used today.
- In **State forests** mechanized seeding is carried out on 90% of sowing sites.
- In **private** forests mechanized seeding in conjunction with disc trenching is used.

Pre-commercial thinning

- In Estonia, motor-manual pre-commercial thinning with a clearing saw is prevalent method in young stand management.

  - rather cheap method, with the main costs related to labour, and no need for expensive equipment, tools as well as materials.

- In some cases chainsaws are also used in pre-commercial thinning .

THANK YOU!

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