

# Productivity and biomass parameters of annual and biennial plantings of willows in Latvia western coastal area

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# Aim



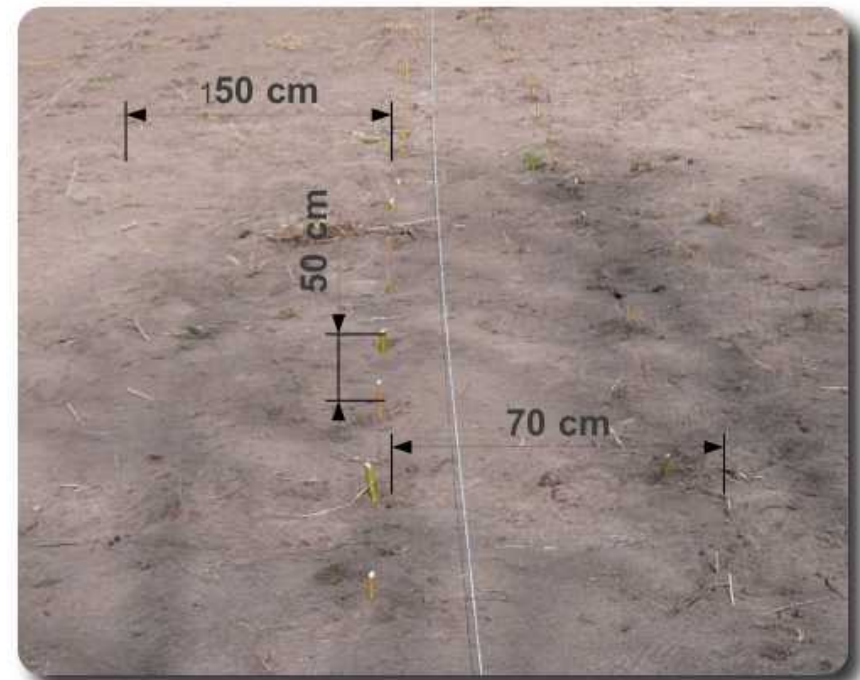
The aim of the study is to evaluate the growth of willow clones in the northwestern region of Latvia.

Clones *Tora*, *Torhild*, *Sven*, *Tordis*, *Gudrun*, *Inger*, *Klara* and local Latvian *Salix burjatica*, *syn. dasyclados* were planted in Latvia's Northwestern part close to the Baltic Sea.



# Field

- ✓ Length of the planted cutting 20-25 cm.
- ✓ Space between:
  - ✓ paired rows 70 cm,
  - ✓ plants 50 cm,
  - ✓ double rows 1.50 cm.



# Measurements of morphological parameters:



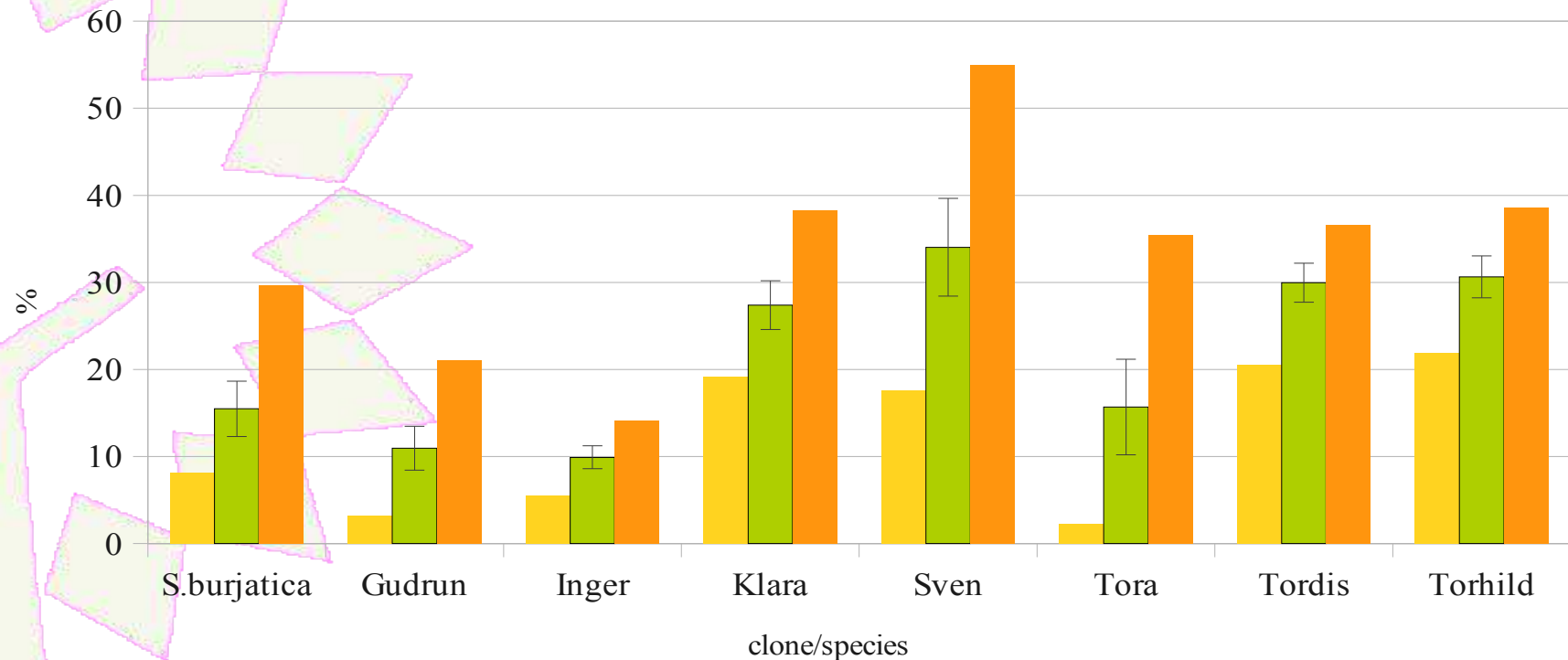
- ✓ shoot height,
- ✓ sprouting point diameter
- ✓ number of sprouted shoots from cutting,
- ✓ fresh shoots weight,
- ✓ moisture content of shoots,
- ✓ soil nitrogen content.



# Animal damages



■ min damages % ■ average damages % ■ max damages %



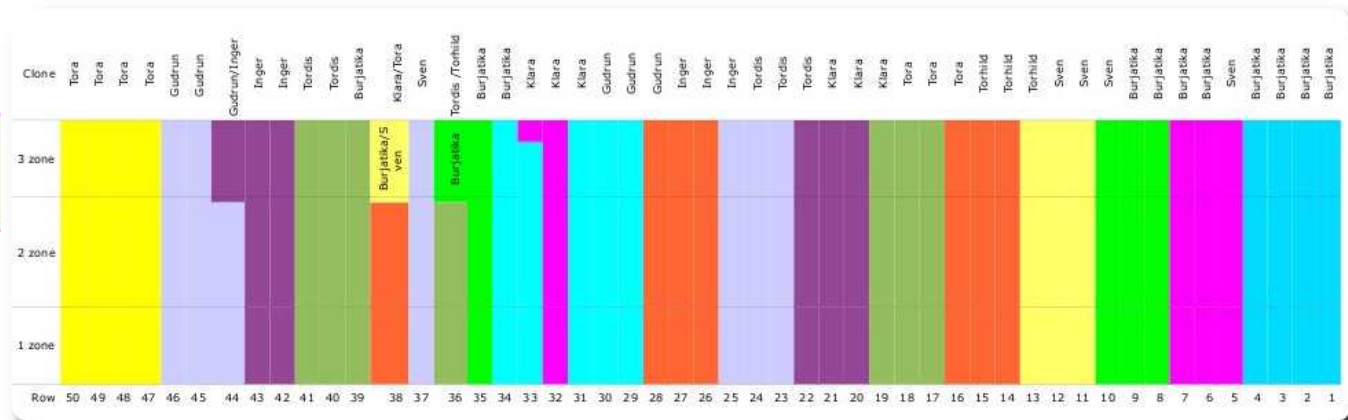
# Soil analyses



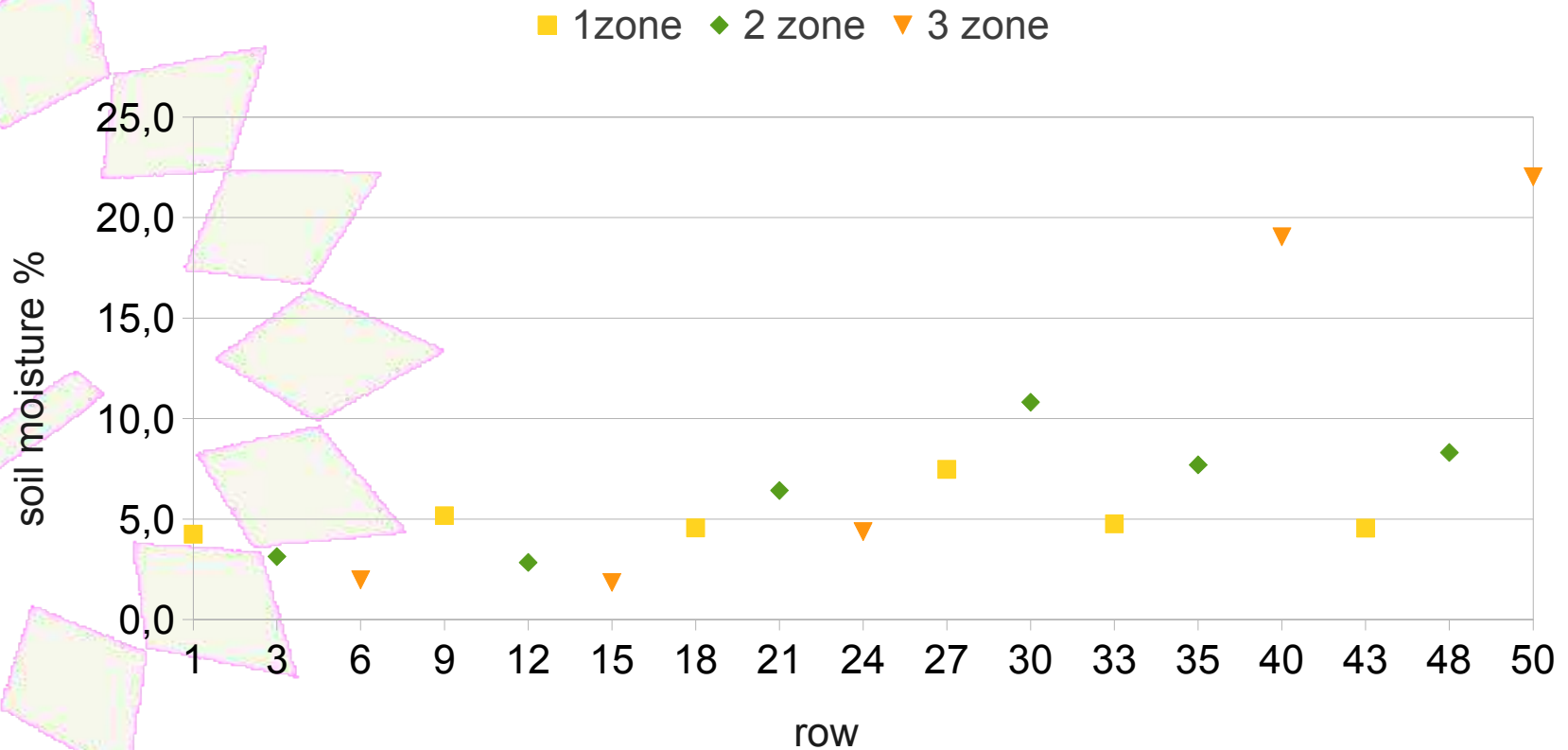
Content of N ( $\text{N-NH}_4^+$ ,  $\text{N-NO}_3^-$ ) was determined by spectrophotometry - significant difference was between zones (nitrogen  $\text{N-NO}_3^-$  content ( $p=0.02$ )).

Soil moisture was detected - willows having different water availability ( $p=0.06$ ) in points where shoots were collected.

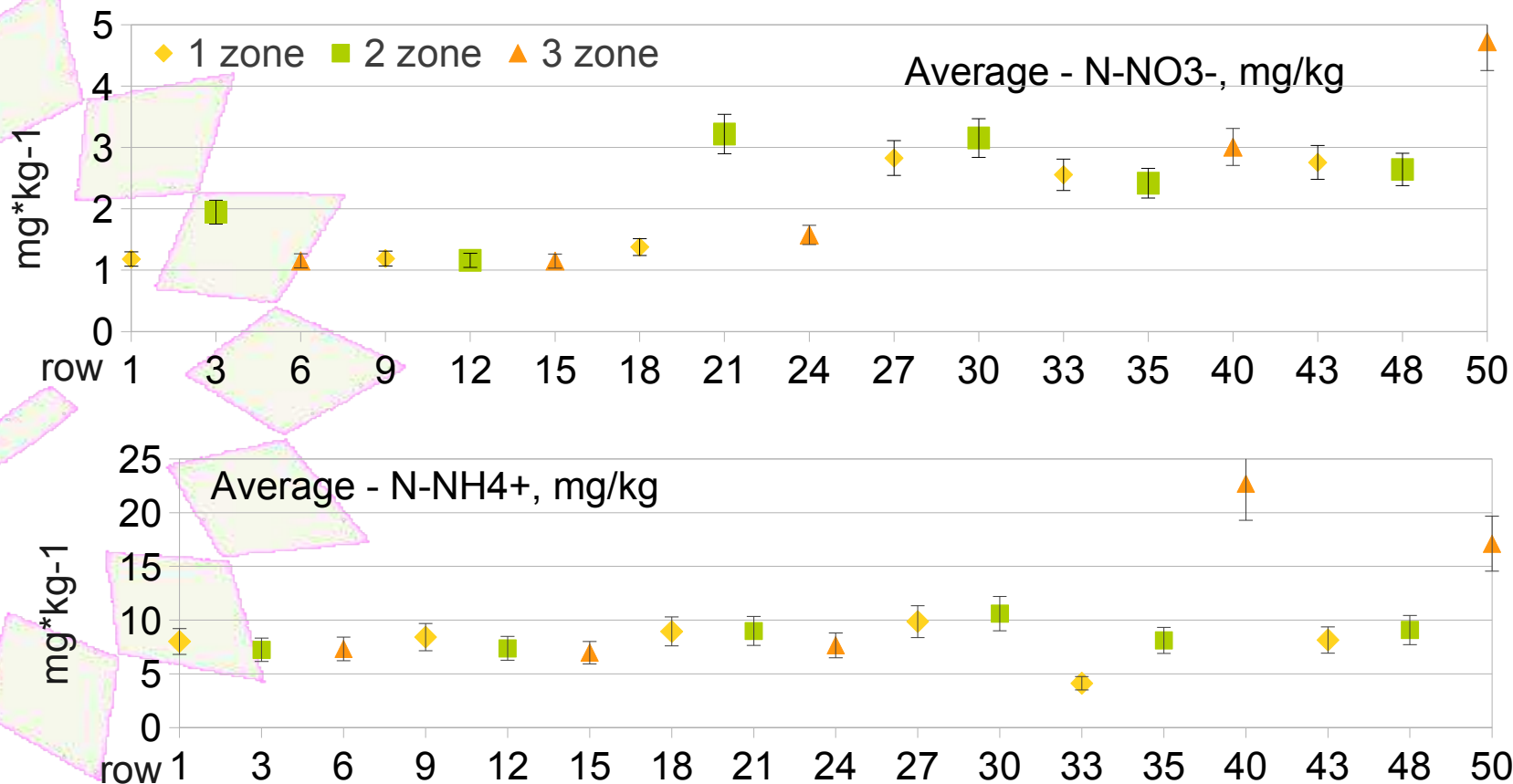
No significant differences for average growth conditions of each clone.



# Soil moisture



# Results of soil N analyses

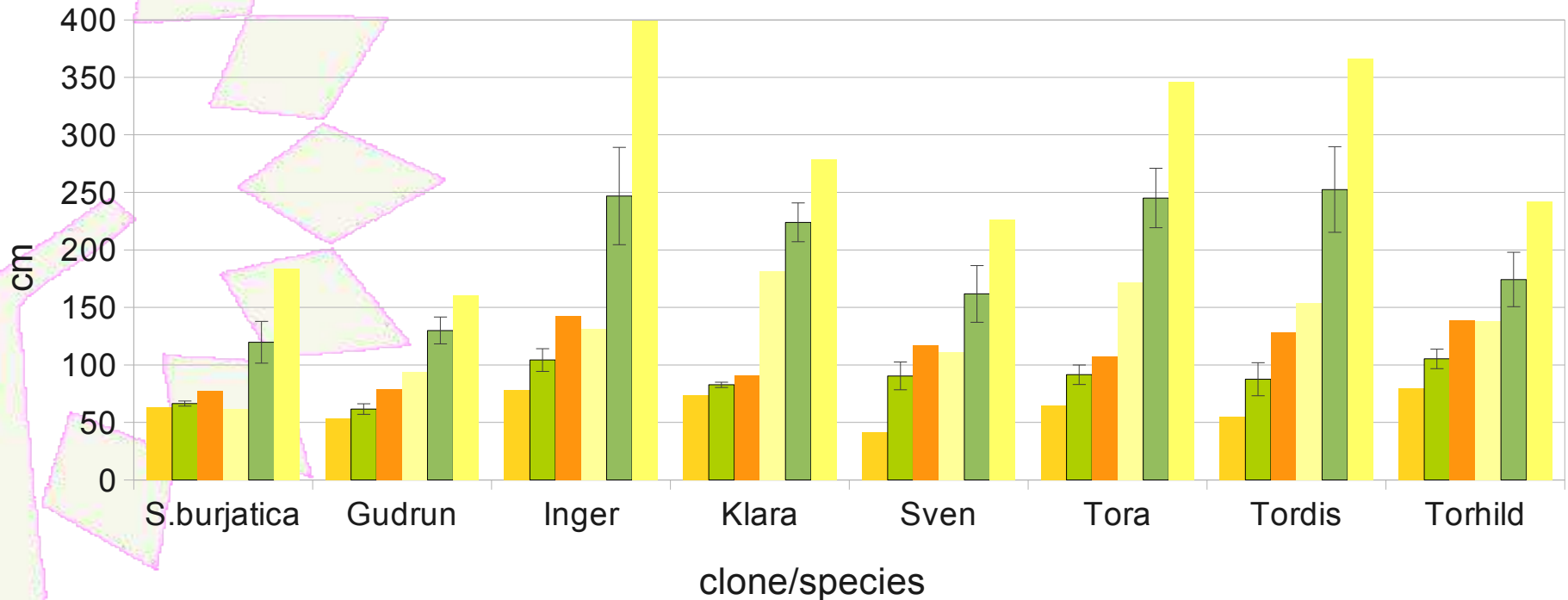




# Height and annual increment



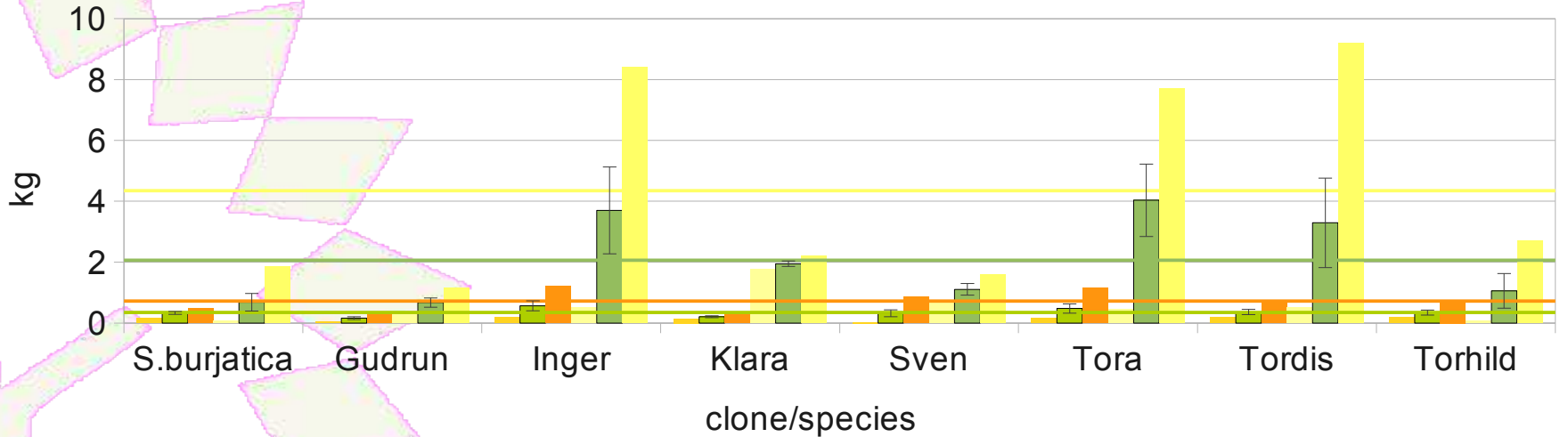
■ min Height 2010    ■ Height 2010    ■ max Height 2010  
■ min Height 2011    ■ Height 2011    ■ max Height 2011



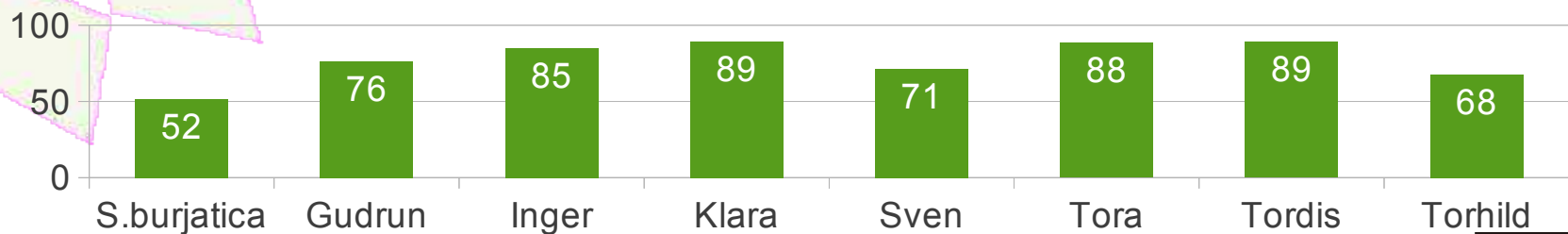
# Biomass



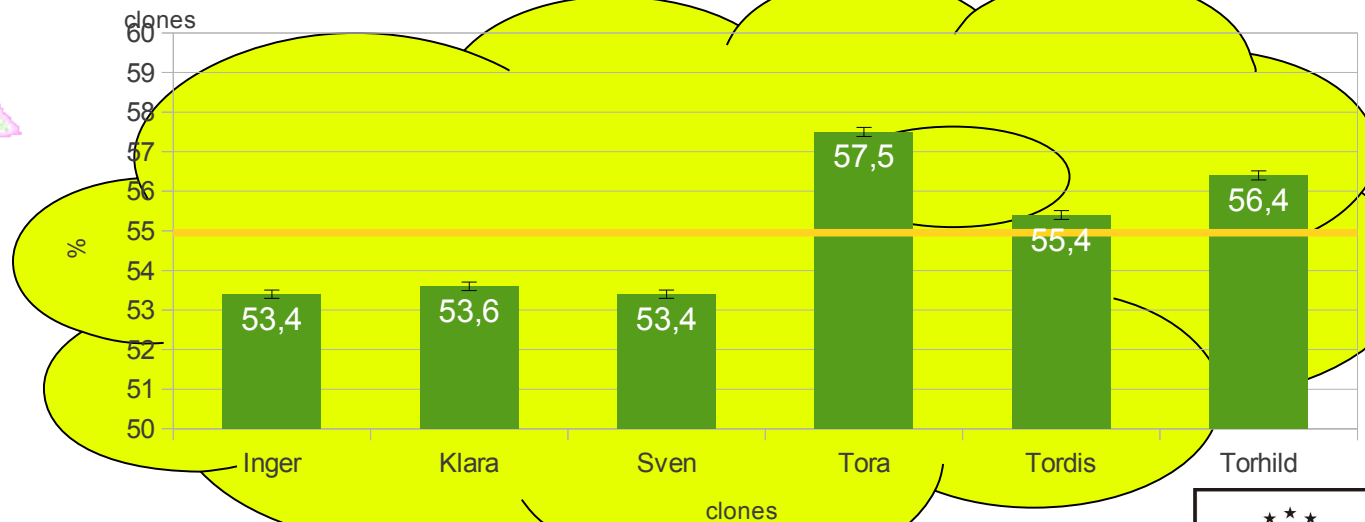
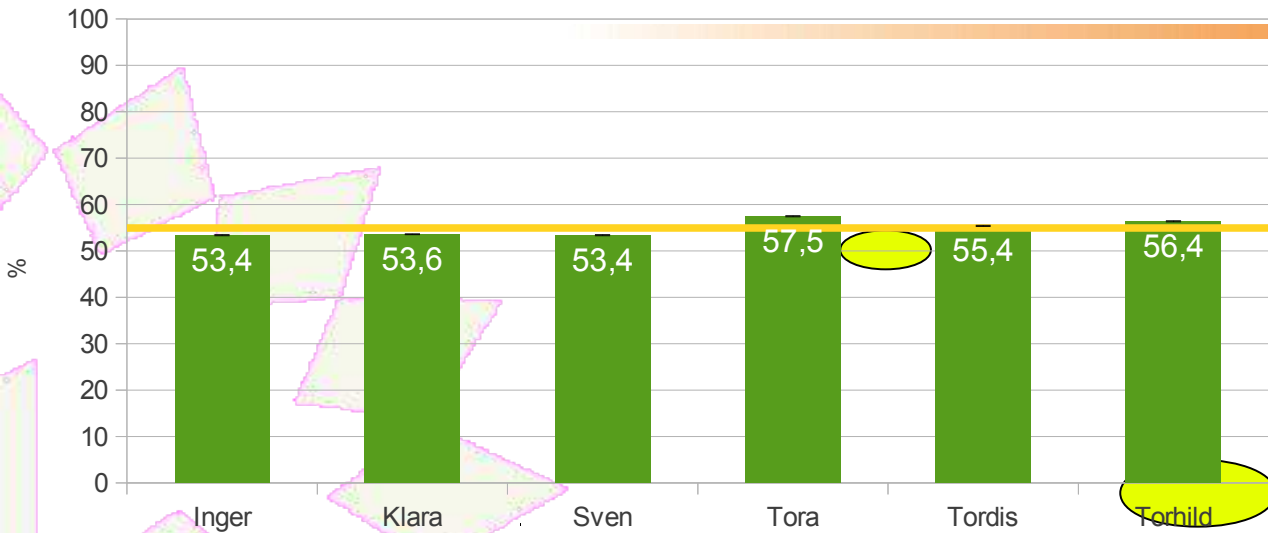
- Min DM from cutting 2010   ■ DM from cutting 2010   ■ max DM from cutting 2010
- Min DM from cutting 2011   ■ DM from cutting 2011   ■ Max DM from cutting 2011



Increment of productivity



# Moisture



# Significance and correlations



Significant factor for the height of stems is the clone ( $p=0.002$ ).

Just since the second year, there are significant differences of shoot biomass grown up from one cutting ( $p=0.05$ )

Stem moisture were significantly correlated only with clone ( $r=0.62$ )

Significant correlations in first year were between height of annual shoots and yield ( $r=0.53$ ), soil moisture ( $r=0.38$ ),  $N-NO_3^-$  ( $r=0.39$ ) and clone ( $r=0.41$ ).

Diameter of annual shoots significantly correlated with yield ( $r=0.81$ ), but soil moisture content ( $r=0.41$ ),  $N-NH_4^+$  ( $r=0.31$ ),  $N-NO_3^-$  ( $r=0.46$ ) had a weak correlation in first year.

In second year weak correlation appeared between the number of shoots from cutting with soil moisture content ( $r=0.36$ ) and  $N-NH_4^+$  ( $r=0.43$ ).

# Conclusions



Clones Tora, Inger, Gudrun and Salix dasyclados were less preferred by game animals and could be recommended for planting in the plantations close to forest areas with a high animal density.

Local Salix burjatica in comparison with clone Gudrun selected from S.dasyclados syn. burjatica shows a similar and, in the first year, even better productivity and morphological results and could be recommended as an admixture for biodiversity targets as well as buffer zone.

Near to the Baltic Sea, coastal areas with a marine climate higher increments had clones Tora, Inger, Tordis, Klara, but because of a larger quantity of stems and thicker shoots, more productive were Tora, Inger and Tordis.

The average height of the most productive clone biennial shoots was 245-252 cm, average number of shoots was close to 2.

Average moisture content of biennial shoots was 55%, moisture content at clone level varied significantly from 53.40% to 57.49%.

# Time for questions!



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