Temperature Impact On Distribution Of Entomological Damage In Norway Spruce *Picea abies* (L.) Karst. Young Forest Stands

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24. – 26.10.2012

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The research is financed by European Regional Development Fund (ERDF), contract number: 2010/0208/2DP/2.1.1.1.0/10/APIA/VIAA/146 - "The support system of planning and decision making for the sustainable forest management“ (*ERAF projekts „Meža resursu ilgtspējīgas apsaimniekošanas plānošanas lēmumu pieņemšanas atbalsta sistēma”)*, carried out in Forest Faculty (Latvia University of Agriculture)

Topicality of research

- Norway spruce takes the second place in list of economical importance of different tree species in Latvia
- Almost ½ of all stands of *Picea abies* in Latvia belong to category of young forest
- Increase of temperature and precipitation lead to changes in forest stand soil conditions
- Flat root system can be the cause of root mortality in situation of changing precipitation
- **Negative factors** effecting Norway spruce stands (according to research results in Russia and Belorussia):
    - precipitant temperature change in winter,
    - late spring and early autumn frost,
    - strong cold wind,
    - heightened level of precipitation,
    - depleted soil etc.

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IMPACT OF CLIMATE CHANGE

DIRECT
(changing of individual tree growth)

INDIRECT
(interaction to other species and abiotic components)

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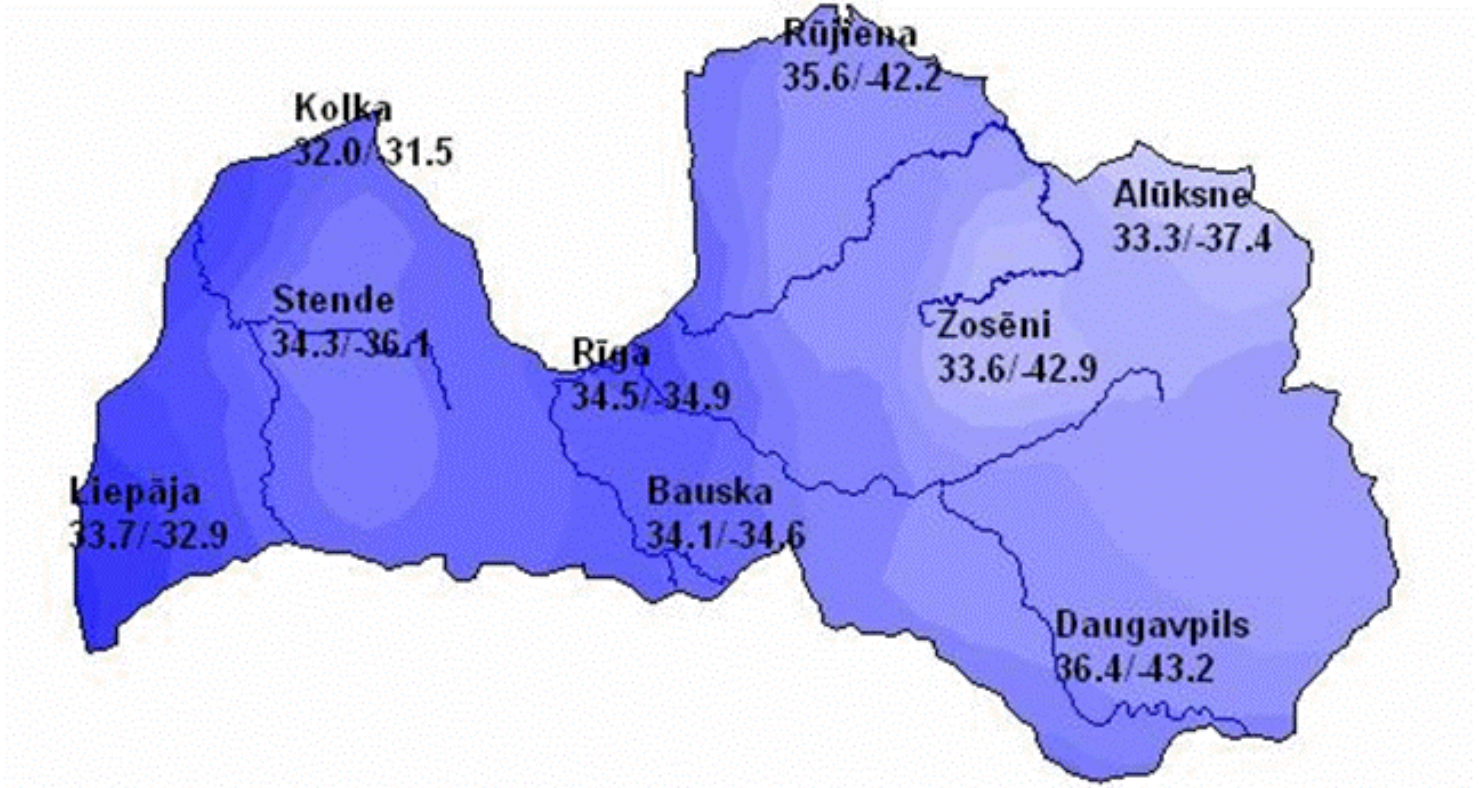
Annual **mean** temperature and absolute **minimal** and **maximal** temperatures in Latvia



Average temperature, °C

http://kalme.daba.lv/faili/VPP_informativie_materiali/VPP/Atskaites_2008/Publ_prezentacija_28.11.2008./Briede_klimata_parm_raksturs_28.11.2008.ppt

AIM OF RESEARCH –

evaluation of sanitary conditions of Norway spruce *Picea abies* (L.) Karst. young forest stands in Zemgale, Kurzeme and Vidzeme regions

TASKS OF RESEARCH:

1) analyse of occurrence of forest pests in Norway spruce *Picea abies* (L.) Karst. young forest stands;

2) description of proportion of forest pests occurrence and proportion of damage intensity in different regions of Latvia (diverse temperature)

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Methodology of research

- Randomly chosen 24 stands, 94 sample plots in them
- 3 regions – Zemgale, Kurzeme and Vidzeme
- Age of Norway spruce stands – 1-40 years
- Number of trees per hectare -> 1200 – 5600 trees
- Range of tree height -> 1.0 – 17.0 m
- Proportion of occurrence of forest pests

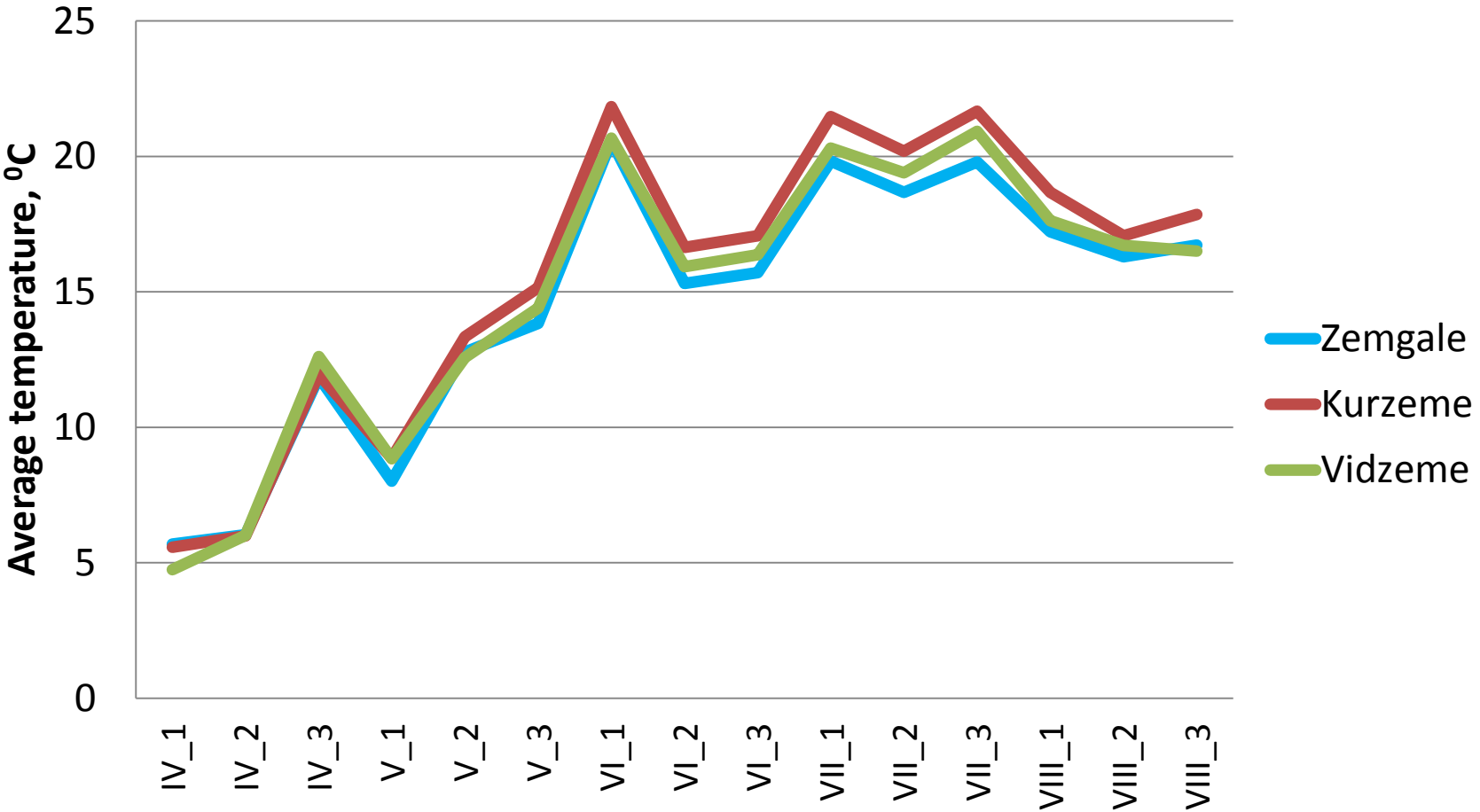
$$P = \frac{n \times 100}{N}$$

- where P – proportion of occurrence , %;

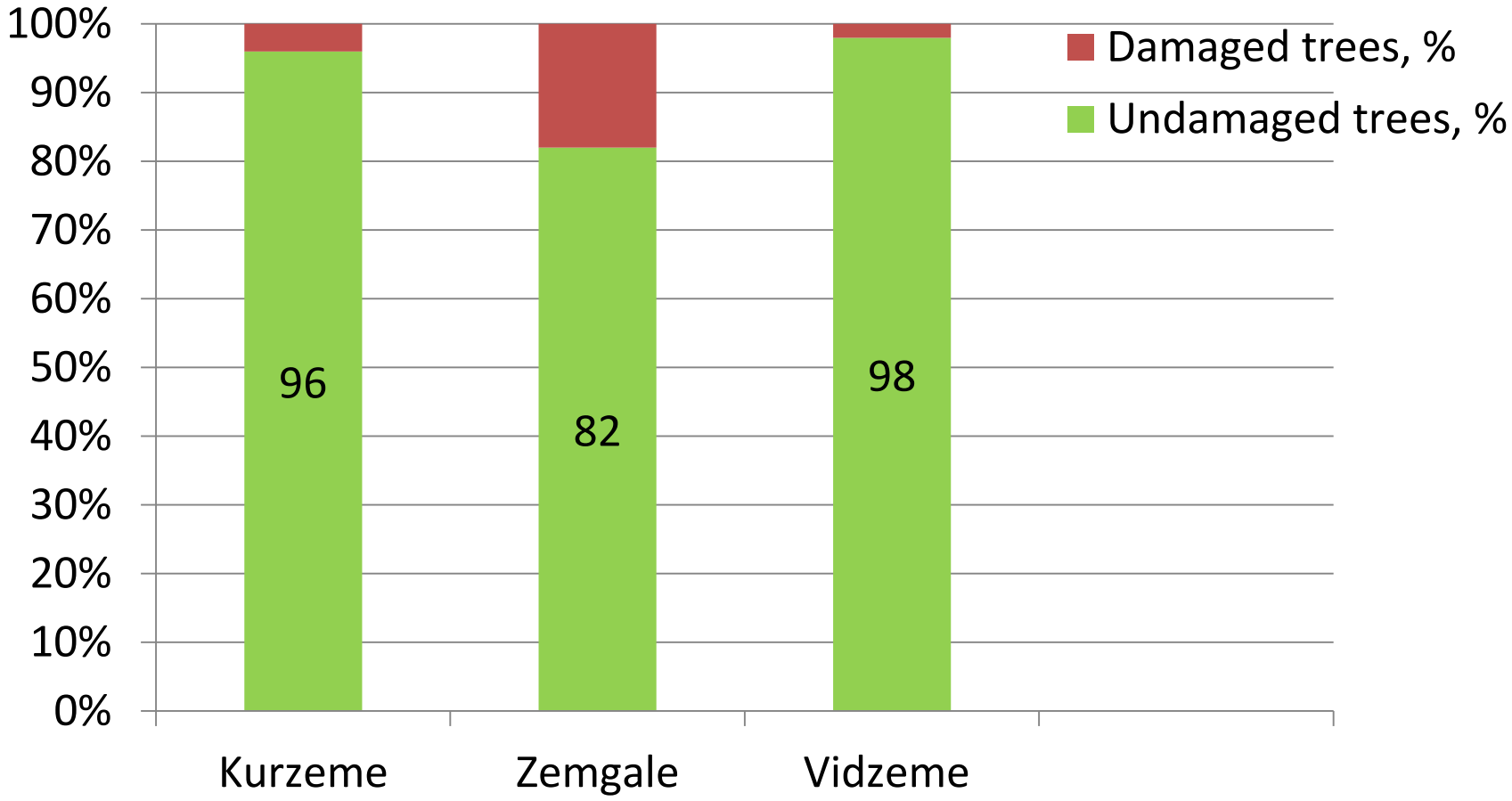
n – amount of damaged trees, pieces per ha;

N -total amount of trees, pieces per ha

Decade average temperature 2011 (IV_1 – VIII_3) in different regions of Latvia



Proportion of occurrence of pests in inspected Norway spruce *Picea abies* (L.) Karst. young forest stands in different regions of Latvia



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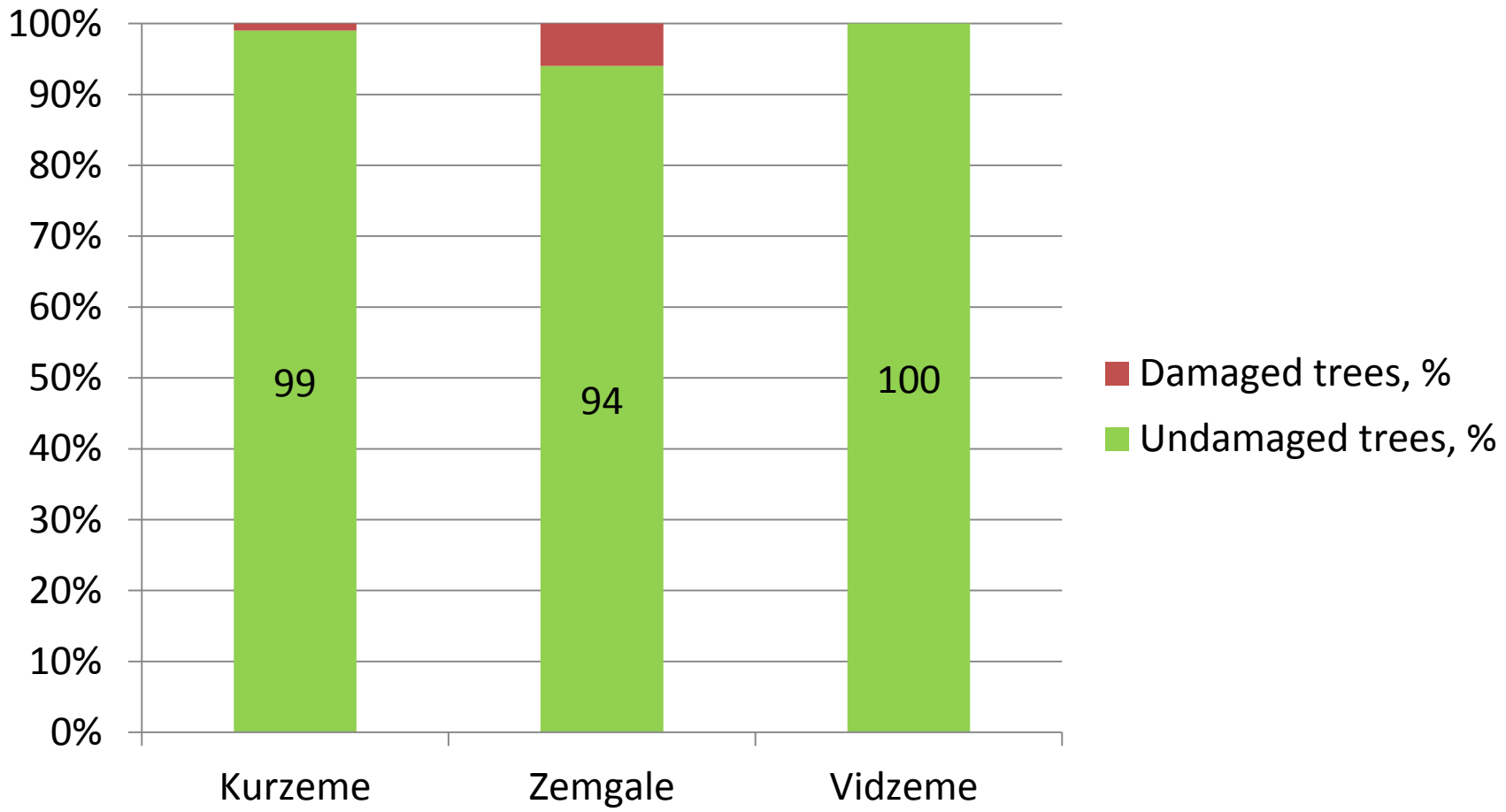
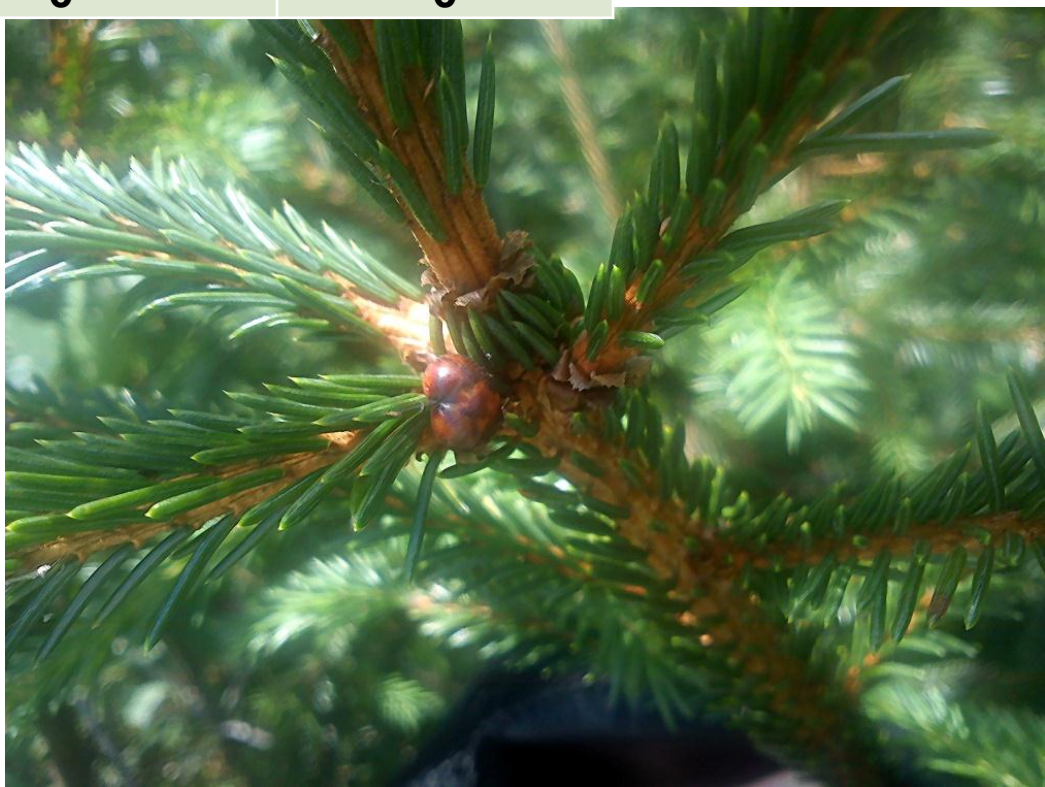
Proportion of intensity of pest damage in inspected Norway spruce *Picea abies* (L.) Karst. young forest stands in different regions of Latvia



Occurrence of pests in inspected Norway spruce *Picea abies* (L.) Karst. young forest stands in different regions of Latvia

	Physokermes piceae	*Sacchiphantes abietis*	*Cephaleia abietis*
Zemgale	106	3	33
Kurzeme	0	5	0
Vidzeme	0	0	0



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Conclusions

1. Main forest pests observed in sample plots in different parts of Latvia are spruce bud scale *Physokermes piceae* Shrnk., eastern spruce gall aphis *Sacchiphantes abietis* L. and bud moth *Cephaleia abietis* L..
2. Proportion of occurrence of different damage is significantly different among regions as well as in separate forest stands.
3. Variance of temperature in Zemgale is statistically different comparing to other too regions of Latvia (Z – K -> $F_{fact.} = 0.81 > F_{crit.} = 0.77$ and Z – V -> $F_{fact.} = 0.89 > F_{crit.} = 0.77$, $\alpha = 0.05$) .
4. Average temperature does not show significant differences among tested regions ($\alpha = 0.05$).
5. Biggest damage in inspected Norway spruce young forest stands is done by spruce bud scale *Physokermes piceae* Shrnk., its occurrence in several stands reaches 90%.
6. Highest proportion of pest occurrence (18%) and proportion of damage intensity (6%) is found in Zemgale region but the lowest – in Vidzeme region.

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THANK YOU FOR YOUR ATTENTION!

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