

TEMPERATURE IMPACT ON DISTRIBUTION OF ENTOMOLOGICAL DAMAGE IN NORWAY SPRUCE *PICEA ABIES* (L.) KARST. YOUNG FOREST STANDS

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Due to the climate change annual temperature in Latvia increases. According to different authors rise in last 50 years ranges 0.8 – 1.4 degrees. Total sum of annual precipitation during last 40 years vibrates in between 169 mm and 692 mm but common tendency especially in winter period shows increase as well. Both the climatic factors mentioned above lead to changes in soil condition of forest stands.

Norway spruce is the second economically important tree species after Scots pine in Latvia. According to statistical data (State Forest Service, 2011) large territories of Latvia are covered with young stands of Norway spruce (in state owned forests – 178643 ha, in other owner forests – 104274 ha) – that is almost a half of the total area of all spruce stands.

Spruce is productive and precocious especially in young forest stand period. Because of being flat root system is subject for different risk factors – risk of root mortality is very height if some heightened precipitation period acquires that, could lead to massive tree die off. Prolonged draught periods cause similar effect: water deficit restricts root formation, initiates prolonged peace period of petite roots and obstructs longitudinal growth of main roots holding down process of mycorrhization.

Research results in Russia and Belorussia show that main negatively effecting factors of Norway spruce young forest stands are precipitant temperature change in winter, late spring and early autumn frost, strong cold wind, heightened level of precipitation and depleted soil. All of these factors can lead even to total degradation of trees. Forest biological stability is negatively caused by recession of groundwater level, ropy aeration and industrial pollution.

Climate change cause not only growth of forest stands but also dynamics of number of forest pests. Impact can be direct – resulting in changing parameters of individual tree growth and development as well as indirect – interaction to other species and abiotic components of environment, e.g. pests fertility arise and pupal growth occur faster if weather is quite dry.

Because of increasing impact of risk factors in forestry – both abiotic and biotic – can do cause significant economical loss to forest owner. Studying complex impact of all risk factors, choosing the most suitable model of forest management afterwards allow to avoid possible loos or at least decrease its impact.

In frames of research there is sanitary condition of Norway spruce *Picea abies* (L.) Karst. young forest stands evaluated in Zemgale, Kurzeme and Vidzeme regions. Main forest pests

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observed in sample plots in different parts of Latvia are spruce bud scale *Physokermes piceae* Shrnk., eastern spruce gall aphid *Sacchiphantes abietis* L. and bud moth *Cephaleia abietis* L. Proportion of occurrence of different damage is significantly different among regions as well as in separate forest stands.

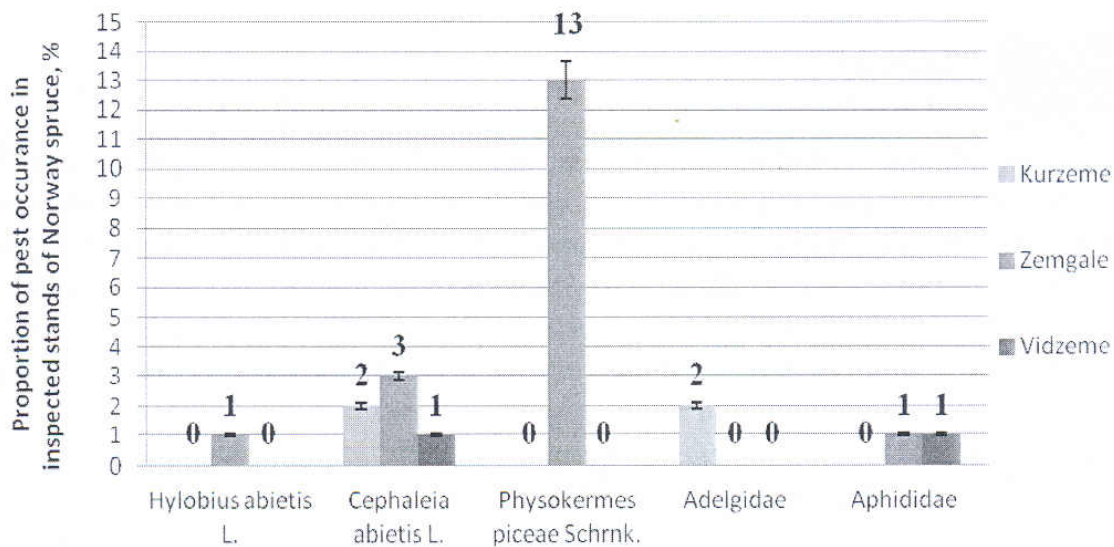


Figure 1. Proportion of pest occurrence in inspected Norway spruce *Picea abies* (L.) Karst. young forest stands in different regions of Latvia.

The most damage in inspected Norway spruce young forest stands is done by spruce bud scale *Physokermes piceae* Shrnk. (Fig. 1) as its occurrence in several stands is 0–90%.

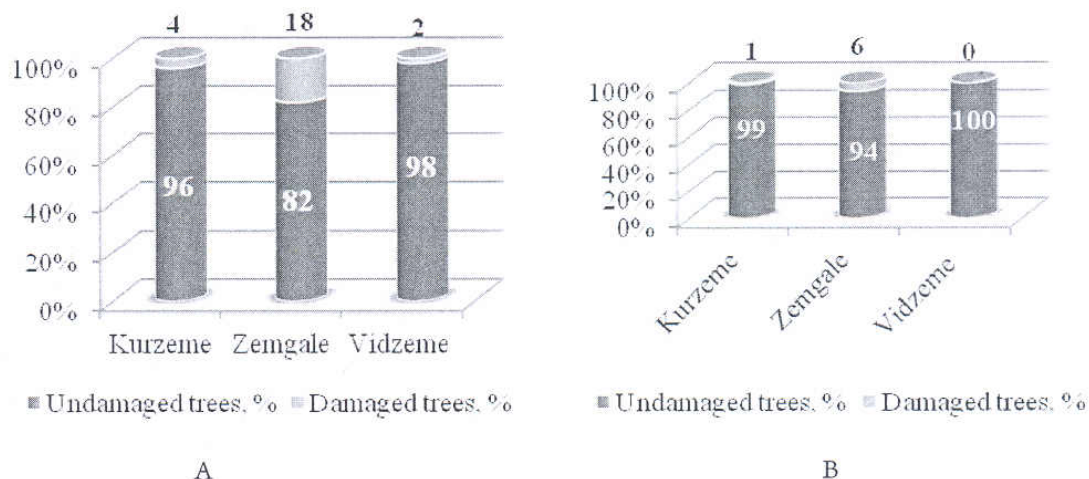


Figure 2. Pest damage situation in inspected Norway spruce *Picea abies* (L.) Karst. young forest stands in different regions of Latvia: A – proportion of occurrence, %, B – proportion of intensity, %.

Proportion of pest occurrence (18%) and proportion of damage intensity (6%) is found in Zemgale region but the lowest – in Vidzeme region.

Keywords: Picea abies, entomological damage, temperature



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