

## Session 3 “Forest Health, Methods and Tools for Forest Monitoring, GIS” May 21<sup>st</sup>

### Assessment of sanitary condition in bud scale *Physokarmes piceae* Schnrk. damaged Norway spruce *Picea abies* (L.) Karst. Stands

Olga Miezīte<sup>1</sup>, Modris Okmanis, Jeļena Ruba<sup>3</sup>, Kaspars Polmanis<sup>4</sup>, Lāsma Freimane<sup>5</sup>

<sup>1, 2, 3, 4, 5</sup>Latvia University of Agriculture, Forest Faculty, Latvia, <sup>1</sup>email: olga.miezite@llu.lv, <sup>2</sup>email: modris.okmanis@gmail.com, <sup>3</sup>email: jelena.ruba@llu.lv, <sup>4</sup>email: Kaspars\_polmanis@inbox.lv, <sup>5</sup>email: lasma0505@inbox.lv

Bud scale insects affect spruce in two ways – directly and indirectly. Direct injury by damaging tissues using moth parts and sucking sap from phloem. Indirect injury by honeydew secretion. Plant sap consist mixture of carbohydrates called photosynthate that is hard to digest for scale insects so it is secreted with excrements, which are used by such fungus as black sooty mold. It covers needles, blocking stomata what causes decrease of transpiration and photosynthesis. Already in 2010 in Latvia was registered inexplicable wither of Norway spruce. However there were no signs of bud scale presence. But in 2011 was found mass propagation of these scale insects. In research of Latvian State Forest Research Institute „Silava” was found that bud scale mainly concentrate on third topmost of tree. So objective of this research is to establish if Kraft class has some influence on level of tree foliage damage. Objects of research are six second old class Norway spruce stands. Data were collected in circular sample plots with radius 7.98 m, on one ha were made 2 plots, in which were measured all tree diameters on height 1.3 m, also about 30 tree height for modelling contour line. For all trees were determined Kraft class and level of foliage damage caused by bud scale and black sooty mold. Foliage damage was defined in five levels (0 – healthy tree, 1 – quantity of needles decreased about one third, 2 – quantity of needles decreased about two thirds, 3 – all needles are yellow, 4 – tree has been withered in current year). Highest percentage (21 %) of damage was found on second Kraft class trees with first damage level. Also 10 % of fifth Kraft class trees have the highest damage level (4). Damage intensity overall is 29.3 %.