

# **PINE WEEVILS - A THREAT TO SUCCESSFUL REGENERATION**

Hanssen, K. H.

Norwegian Forest and Landscape Institute, Norway.

[kjersti.hanssen@skogoglandskap.no](mailto:kjersti.hanssen@skogoglandskap.no)

## **Introduction**

The pine weevil (*Hylobius abietis*) is an important pest to conifer seedlings in large parts of Europe. Pine weevils migrate to fresh clear-cuts in the spring to oviposit on stump roots. Adult weevils feed on the stem bark of planted conifer seedlings, wounding or killing them. The last years, several severe attacks of pine weevils on forest seedlings have been reported in Norway. To get an objective measure of the extent of damages related to pine weevils in South-Eastern Norway, a survey was implemented in 2010 [1].

## **Methods**

Altogether, 155 regeneration stands in nine counties in SE Norway were examined, most of them during the autumn of 2010. Two of the stands were planted with Scots pine (*Pinus sylvestris*), the rest with Norway spruce (*Picea abies*). Planting had taken place during 2009 or 2010, and harvesting had been carried out not more than two seasons before planting. In most of the stands no site preparation had taken place before planting. In each field, all planted seedlings in 20 circular plots of 20 m<sup>2</sup> were examined for pine weevil damages as well as other types of injuries. Field variables like height above sea level, stand size, soil moisture, inclination and seedling type were also registered. To examine whether any of these variables had affected the degree of pine weevil damage, ANOVAs were conducted (GLM, [2]) using the percentage of killed and wounded seedlings as dependent variables.

## **Results and conclusion**

The percentage of seedlings killed from pine weevil attacks varied between 0 and 63 % in the surveyed fields. On average, 7 % of the seedlings were killed by pine weevils, while 23 % had wounds. In addition, 3 % of the seedlings were killed by other causes. There was variation in seedling damage among the different counties (2-18 % of the seedlings killed by pine weevils and 10-40 % wounded).

There was a higher percentage of wounded (31 %) and killed (9 %) seedlings in stands planted two seasons ago compared to one season. It is likely that mortality will increase during 2011 in the stands planted in 2010.

Few of the registered field variables were correlated to the degree of damage, but there was a tendency towards higher mortality at the largest clear cuts, in hilly areas, and for dry soil types. Stands at high altitudes had somewhat lower damages on average, but there were stands with high mortality due to pine weevils also at altitudes of 6-700 m a.s.l. 1-year old container seedlings had higher mortality than 2-year olds. Seedlings treated with the insecticide Merit Forest had lower mortality and fewer attacked seedlings than those treated with Karate Zeon.

The present survey shows that in unscarified stands in SE Norway pine weevils are the most important cause of seedling mortality. A total seedling mortality of at least 10 % should be expected the first two years.

## **References:**

- 1 Hanssen, K.H. 2011. Snutebilleskader på Øst- og Sørlandet 2010. *Rapport fra Skog og landskap* 09/2011. 20 p.
- 2 SAS Institute Inc. 1989. SAS/STAT User's Guide. Version 6, Fourth Edition, Vol 2. Cary, NC, USA. 846 p.