Growth reactions after selective cuttings in Norway spruce (*Picea abies* L. Karst) stands

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**Background**

Forest management practices in Norway is mainly based on clear cuts as a final harvesting for Norway spruce, and followed with planting at medium and high productive sites. Selection system is not frequently used in Norway, but the mountain forest selective cutting has become a common silvicultural method for spruce or mixed spruce/pine/birch in mountain forest.

The objective in this study is to analyze the effects of different strengths of selective cuttings on yield, stand structure, annual growth and damages.

**Data and methods**

Four Norway spruce stands (replicates) treated with single tree selection were studied 11 years after the cuttings in SE Norway (60.5°N, 12 ºE, Alt. 450-570m). In each of the four replicates, we performed three strengths of selective cutting where about 25, 45 and 65 % of the basal area were cut with one strength in each of the three plots. Each of the totally 16 plots had a size of 0.2 hectare except the 4 control plots with a size of 0.06 hectare. We measured all trees before the cutting and 11 years after. In addition we assessed damages on the sample trees, and analysed increment cores (tree rings) on 300 of the sample trees. We summarised the basal area growth and key figures of all trees, and height development was estimated based on a survey of about 15 % sample trees.

**Conclusions**

1. The diameter distribution displayed a reverse J-shaped curve at all plots both before and after the cuttings. 11 years later the curve is only slightly changed.

2. The response after selective cutting appears very clearly with highest response for heavy cuttings.

3. Increased growth was significant already the second and third year after cutting

4. Increased diameter increment was most obvious for medium sized trees

5. Productivity the first 11 years after selective cutting in an uneven-aged Norway spruce forest is about 10 % less than the estimated yield capacity in even-aged forest.