

THINNING IN RELATION TO STAND COMPOSITION, AGE AND SPECIES

EFFECTS ON DBH OF TREES

The mixture of oak and pines is of considerable importance and would become more important under climate change, therefore the performance and increase in DBH under different stand composition and age when thinned are therefore being assessed.

Research regarding forest growth and yield has been focused on pure stands and mixed stands, comparing the two with different application of treatment to achieve the highest growth and yield.

Oaks started to spread across Europe immediately after the end of the last glaciation and were the dominating forest species around 5,000 BC. Oak provides high value timber for industry, biomass for bio-energy production, key habitats for biodiversity and valued environments for recreation and other cultural services.

The Scots pine also known as the common pine or red fir is one of the most important tree species in Europe both economically and ecologically. It is the most well-known and in central Europe, the most common species of the genus *Pinus*, to which more than 90 species in the northern hemisphere belongs.

Its range covers all of Eurasia and stretches from the polar circle in the north to the south of Turkey and from the West of Germany to Asia in the East. There are also isolated occurrences in Scotland and the Pyrenees.

Scots pines prefer a continental climate; therefore their natural limit of spread to the west runs across Germany. The focal points of their spread are the sandy regions of Brandenburg and Mecklenburg-Vorpommern, the north western Geest-areas and the upper Rhine rift between Karlsruhe and Mainz/Frankfurt as well as the pre-Alps in Bayern.

Approximately 73 % of German forests nowadays consist of mixed stands. Spruce accounts for the largest share among the tree species (28 %), followed by pine (23 %), beech trees (15 %) and oak trees (10 %). The tree species proportions vary and depend on the specific natural features and site conditions as well as on different historic developments.

The task of German silviculture consists in shaping forests in such a way that timber is being efficiently produced, the biological productive base of forests is being maintained and improved and the services rendered by forests remain usable by humans in a sustainable manner. The multitude of objectives of silvicultural management depending on the respective site has resulted in a multitude of silvicultural operations that is in differentiated treatment and regeneration methods. Thinning is an important means to achieve silvicultural objective and has received considerable attention in forest research. Thinning causes reduction of density and associated reduction in resource use and competition, which increase the growth of the remaining trees and

reduces their mortality rate. Also, photosynthetic rate is highly enhanced in leaves of the lower and middle strata of the canopy through thinning (MEDHURST; BEADLE, 2005).

The objective of this study is to find out if thinning done on a plot of trees has effect on the diameter at breast height (DBH) taking into consideration:

1. Stand composition, whether pure or mixed stand
2. Stand age
3. The species of the tree on the thinned plot in any of the stand composition stated above.

The study area is located in Neuendorf, a town in the state of Brandenburg in Germany with latitude 52° 53' 30" N and longitude 14° 3' 26" E. The study was conducted on installed Pine, Oak and Pine - Oak triplet which have been thinned with data on Diameter at Breast Height (DBH) recorded before thinning. Diameters at 1.3m height were measured. All the field work was carried out using the traditional method of measuring and calculating the DBH of trees. 20 living trees were selected randomly from the pure pine stand, 20 living trees from the oak pure stand, and 40 randomly from pine-oak stand comprising 24 oak and 16 pine trees. The site condition for the research plot is uniform. Measurements are therefore taken after the thinning to assess how responsive of tree species and stand composition to thinning with respect to DBH. The stand age of the pure pine stand, pure oak stand and the pine-oak mixed stand are 87 years, 80 years and 80 years respectively. This research aimed to compare the parameters of the triplet in order to reveal the differences that exist between stand composition, age and species with respect to thinning and based on the findings to define the management form in the future.

A written piece of code is used to determine how thinning affects DBH, as stated by objectives.

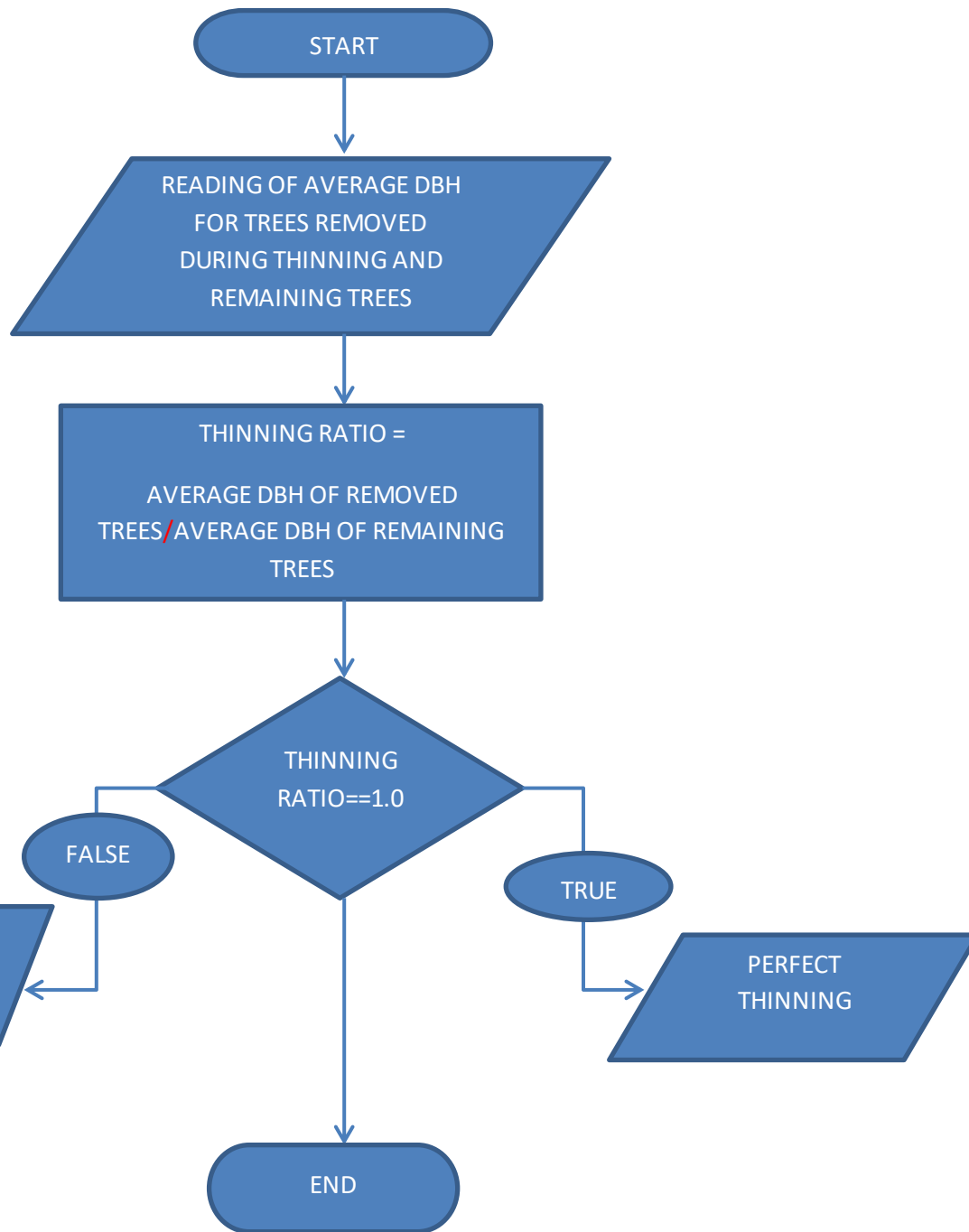
REFERERENCES

Garry K & Jens H (2011) Thinning Practice A Silvicultural Guide

https://www.forestresearch.gov.uk/documents/4992/Silviculture_Thinning_Guide_v1_Jan2011.pdf

Dobrowolska D (2006) Oak natural regeneration and conversion processes in mixed Scots pine stands. Forestry 79(5):503–513

THE FLOW CHART TO ASSESS THE TYPE OF THINNING ON THE STAND



FLOWCHART 2, TO READ DATA AND CALCULATE FOR DBH CHANGE

