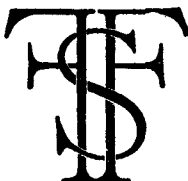


DET FORSTLIGE FORSØGSVÆSEN I DANMARK

THE DANISH FOREST EXPERIMENT STATION
STATION DE RECHERCHES FORESTIÈRES DE DANEMARK
DAS FORSTLICHE VERSUCHSWESEN IN DÄNEMARK

BERETNINGER UDGIVNE VED
DEN FORSTLIGE FORSØGSKOMMISSION

REPORTS — RAPPORTS — BERICHTE



BIND XXXV

HÆFTE 1

INDHOLD

SØREN FL. MADSEN: Egene ved Bremerhus. (An Old Permanent Sample Plot in Oak). S. 1—10. (Beretning nr. 283).

H. HOLSTENER-JØRGENSEN and E. HOLMSGAARD: The Dependence of the Increment on the Water Supply in a Young Norway Spruce Stand. (Tilvækstens afhængighed af vandforsyningen i en ung rødgranbevoksning). S. 11—14. (Beretning nr. 284).

B. OVERGAARD NIELSEN: Seasonal and Annual Variation in Litter Fall in a Beech Stand 1967—75. (Sæson- og årsvariation i løvfaldet i en bøgebevoksning 1967—75). S. 15—38. (Beretning nr. 285).

A. YDE-ANDERSEN: Angreb af *Fomes annosus* i granbevoksninger i relation til plantemetode samt kalk- og fosfertilskud. (Attacks by *Fomes annosus* in Spruce Stands in Relation to Planting Methods and Fertilization with Lime and Phosphate). S. 39—59. (Beretning nr. 286).

A. YDE-ANDERSEN: *Fomes annosus*-angreb ved fosfor- og kvælstofgødskning af gamle rødgranbevoksninger. (*Fomes annosus* and the Fertilization of Old Norway Spruce Stands with Phosphorus and Nitrogen). S. 61—68. (Beretning nr. 287).

E. C. L. LØFTING: Danmarks ædelgranproblem. 3. del. (Denmarks Silver Fir Problem. Part III). S. 69—133. (Beretning nr. 288).

KØBENHAVN

TRYKT I KANDRUP & WUNSCH'S BOGTRYKKERI

1977

THE DEPENDENCE OF
THE INCREMENT ON THE WATER
SUPPLY IN A YOUNG
NORWAY SPRUCE STAND

TILVÆKSTENS AFHÆNGIGHED
AF VANDFORSYNINGEN I EN UNG
RØDGRANBEVOKSNING

BY

H. HOLSTENER-JØRGENSEN AND
E. HOLMSGAARD

The precipitation during the growing season is a minimum factor for the increment of Norway spruce in Denmark. Tree-ring analyses have shown that the width of the annual ring is first and foremost a function of the precipitation in May, June and July of the year in which the ring is formed (*Holmsgaard, 1955*). An irrigation experiment in a young Norway spruce stand on heathland shows great effects of water supply (*Holstener-Jørgensen and Holmsgaard, 1975*).

The investigations cited cannot elucidate the form of the yield curve, and therefore an experiment has been established in which the water supply is varied. The experiment was established in a Norway spruce stand at Springforbi. The stand was 20 years old in spring 1976, and irrigation was carried out in the years 1974 and 1975.

In this stand 8 plots were laid out completely isolated from each other beneath the soil surface by plates of asbestos-cement dug into the soil before planting. The plots are thus self-contained but freely drained vessels. The size of the plots is 45.5 sq.m.

The experiment includes the following treatments —

- (a) 2 control plots,
- (b) 2 plots on which from 1st April to 30th September part of the surface of the ground is screened off by plates, so that 73.3 % of the through-fall is diverted. The quantity of carried off water is measured,
- (c) 2 plots where 20 mm of water is supplied to the soil whenever the difference between precipitation + irrigation water and a computed evaporation curve (*Holstener-Jørgensen and Holmsgaard, 1975*) exceeds 40 mm. The irrigation period is 1st April to 30th September,
- (d) 2 plots where 40 mm of water is supplied to the soil whenever the difference mentioned under (c) exceeds 40 mm.

The irrigation is made by a drip-sprinkler system (see *Holstener-Jørgensen and Johansen, 1975*).

Fig. 1 shows the average annual increment for each plot in 1974—75 as a function of the quantities of water supplied (precipitation + irrigation). In the figure a free-hand adjustment curve has been inserted. Furthermore, three dotted lines have been superimposed, showing the yield curve inclinations which, from the results of his tree-ring analyses, *Holmsgaard (1955)* was able to compute for three localities.

Fig. 1 shows quite clearly —

- (1) that there is a decreasing excess yield with increasing water supply,
- (2) that the results of the irrigation experiment conform very closely to *Holmsgaard's* regression-analytical results (1955). The lower part of

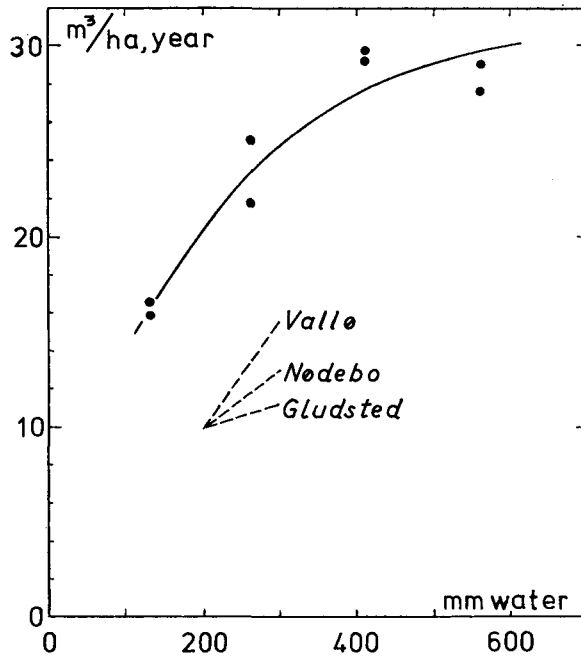


Fig. 1.

the yield curve in the figure has the same degree of inclination as the one indicated by Holmsgaard for Vallø.

The irrigation experiment will be continued for a number of years.

RESUMÉ

På figur 1 vises de foreløbige resultater af en undersøgelse i en ca. 20-årig rødgranbevoksning, hvori der er indlagt vandede parceller og parceller, hvorfra en del af nedbøren i vækstperioden afledes. Beregningsperioden for vandtilførsel (mm) er 1. april til 30. september.

Den på figuren skitserede udbyttekurve (m^3/ha) har i sin nedre del en lignende hældning som Holmsgaard (1955) fandt på Vallø ved at sætte årringsbredden i relation til maj—juli-nedbøren; men det er tydeligt, at mertilvæksten aftager med stigende vandtilførsel.

LITERATURE

- Holmsgaard, E., 1955: Årringsanalyser af danske skovtræer. (Tree-ring analyses of Danish forest trees). Forstl. Forsøgsv. Danm. 22: 1—246.
- Holstener-Jørgensen, H. and E. Holmsgaard, 1975: Fertilization and irrigation of young Norway Spruce on sandy soil. (Gødskning og vanding af ung rødgran på sandjord). Forstl. Forsøgsv. Danm. 34: 263—270.
- Holstener-Jørgensen, H. and V. Johansen, 1975: Vanding af Nobilis-klippebevoksninger. (Irrigation of decoration-greenery stands of *Abies nobilis*). Forstl. Forsøgsv. Danm. 34: 307—316.