Sitka Spruce Yield Class 500!?

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THE purpose of this article is to put on record the details of a small stand of Sitka spruce which is growing at a remarkable rate and to suggest some possible conclusions and their effects.

The location of the site is 110m (360 ft.) above sea level on the Eastern slopes of Slieve Callan in West Clare, some 10 miles (16 km) from the Atlantic. It is in a sheltered position and the rainfall averages 163 cm (64 in.).

The soil is a loamy gley which before planting carried a mixed sward of rushes, poor grasses, sedges and bird's foot trefoil. This for many years was used for grazing but was not relished by stock. As far as is known there had been no attempt at improving it with manure but some land drains were put in some 60 years ago. The present crop was planted on mounds at 6 ft. x 6 ft. (1.8m x 1.8) spacing in the Spring of 1961. No manurial treatment was given. In February 1971 when the top height was 29 ft. (8.8m) it was thinned by removing every alternate line of trees. This yielded 740 hoppus feet per acre (66m³/ha). The top height in February 1974 was 42 ft. (12.8m).

In Figure 1 the Total Production for Yield Classes 120 to 280 (hoppus) has been plotted against Age. These figures were taken from the Forestry Commission Booklet No. 16 (Bradley *et al*, 1966) pp 152 to 157. Onto this has been plotted the Total Production for the stand in question for 9, 10, 11 and 13 years. As can be seen, the slope has fallen away after the 10 year figure. This is due to the 50% thinning done that year and is expected to start to 'steepen' again in the next year or two and should give a figure for total production at 15 years in the region of 4500 hoppus feet per acre 400m³/ha). This could mean a Yield Class of 500!

There are two observations to be made:

1. If we take a price of 50p per cubic foot as an average standing price for the crop, this gives an average annual income of *£250 per acre.*

    Similar land under grass in this area without improvement would let (selling the crop standing) for *£3* and if 'reclaimed' and manured possibly *£25 per acre.*

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1. Mount Callan, Inagh, Co. Clare.
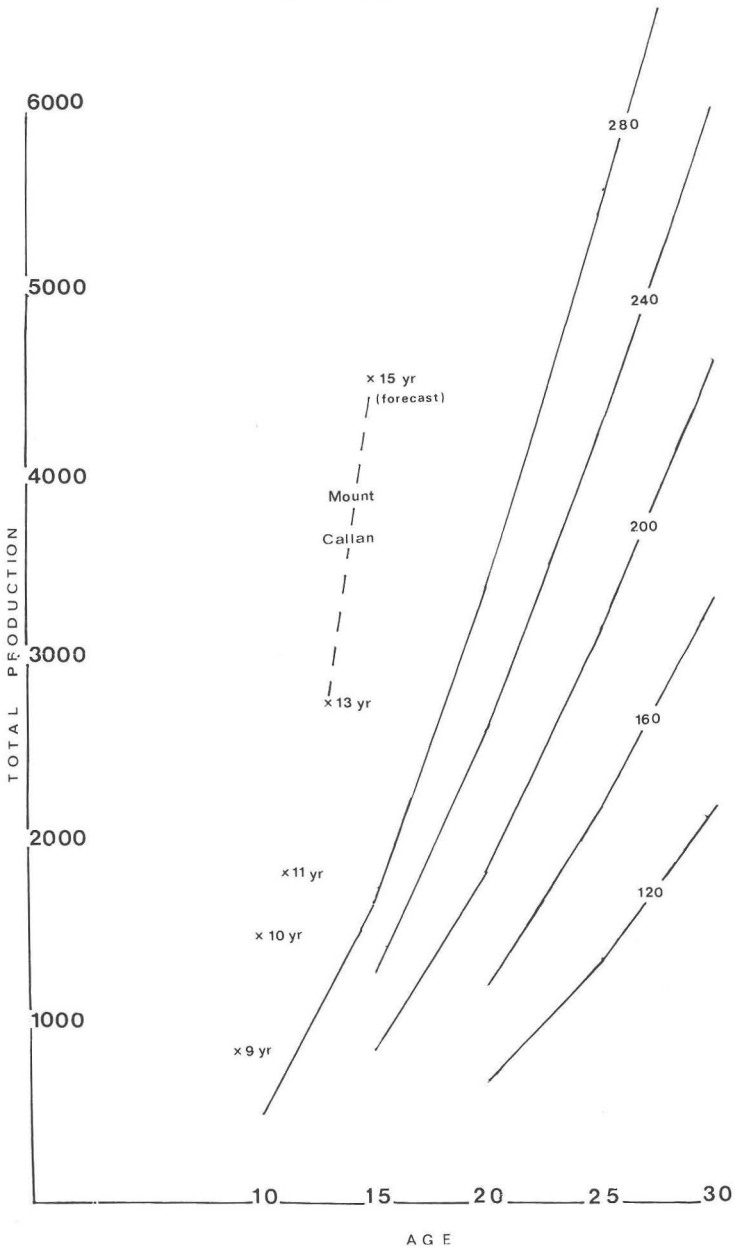2. Forestry Department, University College, Dublin.

Figure 1 : Total production (Hoppus feet per acre) for yield classes 120-280 (B.F.C.) and past and projected total production for Slieve Callan stand.

Given the same support that Agriculture is getting: Sitka spruce on the better lands would be a very real answer to the problems of the West.

2. There must be crops of Sitka spruce in this country potentially yielding greater than 280 hoppus feet per acre (25m³/ha) per annum, the maximum in the Forestry Commission Booklet No. 17 (Bradley, 1967). If these crops are being thinned at the rate given for Y.C. 280 (70% of the Yield Class per annum), the dangers of wind damage will progressively increase due to overstocking during the life of the crop. There is, therefore, a very urgent need for producing tables for and recognising the fact that there are yield classes well in excess of 280.

<div align="right">R. T.</div>

In May 1974 I had the opportunity to measure a 1/20 acre (.02 ha) sample plot in the above mentioned stand. Data for this plot are given in the Table 1.

TABLE I—DATA FROM SAMPLE PLOT

QGBH (inches	No. of stems	
3	—	
$\frac{1}{4}$	1	MEAN QGBH = $5\frac{1}{2}$ inches
$\frac{1}{2}$	—	MEAN HEIGHT = 40 feet
$\frac{3}{4}$	1	MEAN VOLUME = 4.02 hoppus ft.
4	1	
$\frac{1}{4}$	1	
$\frac{1}{2}$	1	VOLUME PER PLOT = 116 hoppus ft.
$\frac{3}{4}$	2	VOLUME PER ACRE = 2,320 hoppus ft.
5	3	
$\frac{1}{4}$	4	
$\frac{1}{2}$	4	
$\frac{3}{4}$	4	TOP HEIGHT = 42 feet
6	—	
$\frac{1}{4}$	2	NOTE: Mean volume was obtained from Forest
$\frac{1}{2}$	1	Record No. 10, (Hummel *et al.*, 1951)
$\frac{3}{4}$	2	
7	2	

The two important crop characters are top height and volume per acre. the top height of 42 feet at 13 years is 50 per cent greater

than that of the highest tabulated yield class for Sitka spruce at this age. Since the highest tabulated yield class is 280 (hoppus) it might reasonably be assumed that the yield class for the plot exceeds 400 and might possibly approach 500. The total volume production to date tends to support this. If volume per acre is added to the volume removed in thinnings it gives a cumulative volume of approximately 3000 hoppus feet per acre. The mean annual increment is therefore 230 hoppus feet and the crop, at 13 years of age, is presumably not yet half way through a rotation of maximum mean annual increment!

It is interesting to compare this remarkable growth rate with the performance of exotic pines in South Africa. Marsh (1957) gives a yield chart for *Pinus patula* which shows a total volume per acre of approximately 4000 cu. feet (3140 hoppus feet = $280m/^3ha$) at 13 years. Is it possible that yield tables applicable to South African conditions might be suitable for Sitka spruce in Ireland? Be that as it may, the above growth rate has major implications for land use on much of the land in the West.

<div align="right">P. M. J.</div>

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