MONTEREY PINE AS A FOREST TREE IN IRELAND

(With some notes on its growth at Sliabh na mBan Forest)

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Monterey Pine (Pine insignis) is one of the loveliest of our exotic conifers. But apart from its beauty, it is, I suggest, a species which it might prove worthwhile to keep under observation here, with a view to deciding on its suitability for large-scale economic use.

It comes from warm California where the climate differs from ours—in so far as the tree is concerned at any rate—in its high minimum winter temperature. One of the fundamental questions, therefore, with regard to the growing of Pinus insignis in Ireland is that of its ability to withstand our winter cold. There have been cases, I believe, where young trees were killed by severe winter frosts. On the other hand there are adequate instances

where they survived and have produced great volumes of timber. Many text-books, dealing with insignis, state that it should only be planted in warmer areas. We should not overlook the important fact that such books are frequently conerned mainly with conditions in Great Britain which, as we know, are not quite the same as those in Ireland. While there might be some risk attached to the widespread use of insignis in that country, in Ireland, because of its more insular position and consequently higher minimum winter temperature, the risk should not be nearly so great. If sufficient evidence is forthcoming that this tree can successfully mature under average forest conditions here, then I submit that it should be given a more prominent place in our planting programmes.

We cannot overlook the fact, however, that Pinus insignis is a somewhat difficult tree to establish. Due to its habit of forming a long poorly-furnished tap-root right from the seedling stage, it is difficult to obtain those profusely and compactly rooted transplants, so well liked by tree planters. Because of this, the percentage of failures amongst newly planted crops is often considerable. This drawback should not, of itself, however, bar the use of insignis unless and until thorough investigations have shown it to be unavoidable by any alternative economic method of establishment. In this connection, we should note the Australians' success in transplanting with the roots encased in a narrow tube of galvanised iron which can be used again and again.

We might enumerate the good qualities of Pinus insignis as follows :—

1. It is probably the greatest bulk producer and fastest grower of our exotic pines.
2. It does not need a highly fertile soil for normal growth.
3. If one is to judge by its heavy leaf-fall and the consequent mould formed, it is a soil improving species. Its dense shade is very effective in killing off weeds.
4. It is a storm-firm species and indications are that it is also a good wind resister.
5. It will withstand sea-spray.
6. It is a prolific and early seed producer.
7. It has not so far shown itself to be subject to any serious disease.

In contrast to the above, some foresters may hold that it is not worth planting because of the rough quality and low grade of its timber. Admittedly, many of the specimen trees seen in Ireland to-day contain wide-ringed and knotty

timber. Being planted solitary or in narrow belts as they generally are, such roughness is only encouraged. In close-grown stands the tendency towards knottiness can be reduced to a minimum or even eliminated altogether by pruning. Annual ring width can also be influenced by silvicultural treatment.

We should not forget that the same species was introduced into New Zealand, Australia and South Africa and proved to be a most profitable tree—not because it was slow growing and productive of very high grade timber, but because it produced large volumes per acre and produced it in record time.

Timber has become so scarce a commodity that the demand tends to be for timber of any workable kind rather than for a particular grade.

Even if high volume production and short rotations were the forester's aim or object when planting, he need have little fear that high quality timber must, in consequence, be absent from the resulting crops. High quality in timber is associated with slow diameter growth and long rotations. The former, he need have little difficulty in obtaining—all too frequently it will occur without any encouragement from him! He may on the other hand induce it in fast-growing stands by retaining a somewhat abnormal number of stems when thinning. The latter arises from his own deliberate decision not to fell. Some crops, despite his best efforts will grow slowly. If these are properly treated they will eventually yield high quality timber. Others which produce relatively low quality timber of saw-size in short rotations may, if the forester thinks fit, be retained for an extra span of years for the sake of the quality increment, which would result. It is not suggested that timber quality in general is independent of species, i.e. that all species would produce timber of equal quality if grown at equal rates. Quality, in the sense in which I use the term here, is related to the most profitable, large-scale, commercial use to which a particular timber can be put — which use in turn is determined ultimately by the inherent characters of the species concerned. That Pinus insignis has inherent properties which render it fit for large-scale commercial utilization is obvious from its extensive use in the Southern Hemisphere.

But to come back to Ireland for indications of good-quality timber production, I may say that amongst the Pinus insignis stems growing at Sliabh na mBan Forest, I noticed a certain diversity of character. One strain is extremely vigorous both in stem and in branch growth. A second strain of less vigorous stems, sub-dominant to the above, also appears present. Between these two types, one finds an occasional stem as vigorous as the first in height growth, but

differing remarkably from it in its restricted branch growth —even when surrounded by smaller trees. The stems of the first group are obviously undesirable in a crop. Belonging to a type frequently described as " wolves," they are unmanagable and are destructive of more useful trees. They would have to be removed as early as practicable. The stems of the second group, which are of better shape, would then form the main crop and would yield good quality timber. The third type of stem would be of small importance in first crops. It should be preserved wherever present, however, and seed collected from it would provide higher quality stock for subsequent planting.

THE SLIABH NA mBAN PLOTS.

From the general question of the advisability of more extensive use of Pinus insignis as a timber tree here in Ireland, I will turn to give some notes on how the species is faring on an exposed area at Sliabh na mBan Forest.

At a property known as Killavally there are two plots of Monterey Pine. As yet they are but ten years old, but already they have outpaced all other species growing near them, not only in height growth but even to a greater extent in their volume increment. Many foresters would probably except this from Pinus insignis, were the site lowlying and sheltered. These plots, situated between the 500 ft. and 700 ft. contours, are subjected to considerable exposure. Hence I record the following data regarding them.

POSITION OF PLOTS, ASPECT, SLOPE, ETC.

Compartment 44, Killavally Property, where the plots are situated, lies between the 500 ft. and 700 ft. contours on the lower slopes of Sliabh na mBan Mountain, which face south west and which rise abruptly from the flat flood-plain of the Anner river. These slopes (grade 18-20%) are the first raised land mass in the path of the prevailing winds in a stretch of at least fifteen miles. Exposure, therefore, is moderate to severe.

THE SOIL.

The underlying rock formation would appear to represent a transition from the Old Red Sandstone of the Devonian to the shales of the Silurian series. The soil is derived from boulder till of local origin. It varies in composition from a sand to a silty loam. In depth it also varies greatly, though in general it is ample for tree growth. In profile it shows a clear tendency towards podzolisation. Without going into details, there is a pale ashen coloured leached layer or " horizon " extending 8 ins.—16 ins. below the surface. Beneath this is the familiar rust brown " B " horizon, or layer of accumulation, known in its more advanced stage as

"iron pan." In this instance the "B" horizon does not represent a true pan as deposition (or accumulation) has been diffused over a depth of 6 ins—8 ins. Though roots may not find growing conditions too favourable in this horizon, they nevertheless penetrate through it and grow down into the unweathered parent material.

VEGETATION.

The vegetation consists of Ulex Gallii (Dwarf furze), Erica cinerea (Bell heather) Vaccinium myrtillus, various mountain grasses, some briars, and with bracken in inverse ratio to the furze present. The composition is not uniform. There are some areas where the soil is either thin or is hard and sterile in which case Ulex gallii has taken almost complete possession. In the neighbourhood of the plots, however, the more frequent occurrence of grasses and briars indicates a somewhat higher fertility level.

PLANTING DATA.

In 1937, most of the compartment was planted with a mixture of Scots Pine and European Larch. One small square block was planted with Pinus insignis (at 6 ft. x 6 ft.). This block lies approximately on the 500 ft. contour. A belt (half to one chain in width) running from the 500 ft. to the 700 ft. contour along the south east boundary was similarly planted. Outside this belt a row of Beech and Sycamore was put in. The presence of stumps of furze, vaccinium and heather on the now all-but-clean floor under the insignis would indicate that the soil did not vary very greatly from that of adjoining areas. As regards shelter the insignis areas are at least as exposed as the rest of the compartment.

PARTICULARS OF GROWTH.

In general the growth of the crop in the compartment may be described as sub-normal.

The Scots Pine is thin foliaged, showing the effects of exposure. In height it averages 9 ft. (approx.).

The European Larch averages a somewhat greater height growth—being 10-12 feet.

The Beech and Sycamore planted along the south east boundary ranges from 4-7 feet in height.

Some Douglas Fir planted in the compartment immediately below averages 10-12 feet and is thin crowned—again an indication of exposure.

The Pinus insignis itself had apparently to make something of a struggle in its early years, against competing vegetation, or against some other unfavourable biological or physical factor. An examination of the branch whorls shows

that vigorous growth did not commence until the third to the fifth year after planting. Height growth for these early years was not much better than that of the Scots Pine—being only 9 ins—12 ins. per annum. When vigorous growth did commence, however, long leaders averaging 20 ins.—24 ins. (and frequently reaching 3 feet) were produced. Despite the retarded growth in the early years, the Pinus insignis plots, now averaging 15 ft. in height and with frequent stems and groups of stems reaching 20 ft., stand well over the surrounding crops. The floor beneath them is almost clear of vegetation and the lower whorls of branches are dying off.

SAMPLE MEASUREMENT.

Since " brushing " has not so far been carried out, I could not readily measure all the stem Quarter Girths. In order to get some idea of the average girth dimensions, I did measure some random stems in that part of the long plot reaching up to the 700 ft. contour. 19 stems gave an average quarter girth at breast height of $3\frac{1}{4}$—$3\frac{1}{2}$ ins. with variations between 2 ins. and $5\frac{3}{4}$ ins. The largest Scots Pine stems on adjoining similar ground were from $1\frac{1}{4}$ ins.—$1\frac{1}{2}$ ins. Qr. girth.

I do not wish to give the impression that all the Pinus insignis crop did equally well. There are occasional groups of trees which are just as small as the nearby Scots Pine or European Larch. These trees are small, not because of persistently retarded growth, but because they took longer than their fellows to overcome whatever initial adverse conditions the site presented. They are now " pulling out " and are qute healthy-looking. There is little doubt that in the next few years they will have left the Scots Pine and Larch behind and take their places in the insignis canopy.

SUMMARY :

1. The case for more widespread use of Monterey Pine (Pinus insignis) is discussed.

2. An account is given of the growth of the species in an exposed area at Sliabh na mBan Forest, including a comparison with other species of equal age growing on similar ground.