PLANTATION ESTABLISHMENT (HILLS)

by D. Spriggins

General

Nearly all our plantations, hills or coastal, have been established with the object of growing wood products that we expect to be able to sell in the future.

With wood production as the main goal, it is therefore important that the growing of these products should be run on businesslike lines, i.e. that the return from the sale of the wood products should aim to exceed the cost of growing them. We would not expect a farmer to plant a crop of potatoes if he could not sell that crop at a profit when it was ripe. Foresters should not be any the less wiser.

Not to aim for this result could lead to the situation described by Parkinson where "the British Forestry Commission was busily draining and planting poor Welsh pastures apparently unaware that the resulting crop of pit props would cost 20 times that of imported timber. By the time the trees had matured, pit props would probably have gone out of use".

It is therefore important to look critically at each aspect of current hills establishment practice, as it could be that there are better and more importantly, cheaper ways of achieving the same end.

Hills Establishment

The decision to plant in the hills has been largely due to the greater growth rates that can be obtained from P. radiata when grown on the basic soils found in the hills, i.e. average yields of $> 300^{+}_{-}$ cubic feet per annum compared with 100 + cubic feet from P. pinaster on the coastal plain.

This initial benefit in favour of a hills plantation is not however sacrosanct; for the trend in timber harvesting seems to be towards the use of large, low operating cost units designed for working on relatively flat country. As the cost of harvesting a timber crop by current methods, is a major item in the price a sawmiller etc., has to pay for his raw material, e.g. $8 for chipwood ex Gnangara out of a nett $10.70 price, it seems likely that topography of the plantation area could become increasingly important in the future. Most hills plantations already established are on reasonably steep country.

Current Establishment Practice

Current hills establishment usually follows in this order:

(a) Utilization of native timber.

(b) Initial clearing.

(c) Pre-planting hormone spraying in lieu of ploughing.

(d) Final clearing.

(e) Construction of roads, firebreaks, water points and grade drains etc.

(f) Planting.

Initial Clearing

The normal practice is for this operation to commence in summer, after all native timber that can be utilized has been removed. An alternative, the pushing down of all material so that there are no stumps left and then carrying out utilization has not been practised to date. The reasons being:

(a) The higher cost of such an operation.

(b) The greater difficulty in removing mill logs, etc.

(c) No great advantage to current plantation management.

With the development of larger type harvesting units, not suited towards dodging stumps there could, in the future, be financial advantages in total clearing.

Initial clearing is usually carried out by pushing and heaping into windrows at about two chain centres. The operation especially in the heavier timber country is best carried out by a HD.21, D8 or similar powered machine on a per acre contract basis. Provision should be made in the contract to include in the windrows, all logs and stags, etc., up to half a chain outside the soil boundary.

Windrowing is preferred to broadcast pushing because of -

(a) Less fireweeds, etc., are stimulated by burning of windrows compared with a broadcast burn. This means cheaper weed control.

(b) Weed control can take place between the windrows well prior to the final burning, thus avoiding expensive post-planting weed control.

(c) Final burning can be a more "controlled" operation than a broadcast burn.

(d) There is no significant difference in final clearing costs by either method.

Windrowing is still an expensive operation ranging from $30 per acre upwards for most hills areas. The operation is slow because logs, etc., must be lifted over intervening stumps when

constructing each windrow. Due to the presence of stumps, chaining has not been widely practised in the hills areas but could be the cheaper method if total stump removal ever becomes accepted practice.

Weed Control (Pre-planting Spray).

Due to the rich soils, weed growth is always a problem and must be checked before planting so as to avoid undue competition and costly eradication after planting.

Ploughing as a method of weed control has been generally dispensed with because of dangers of top soil loss and the greater amount of final clearing required before ploughing can take place.

The current practice of application of 245-T hormone spray by a CONNOR-MIST type spray (2 lbs. of 245-T in five gallons of water per acre) appears to give adequate weed control between the windrows if carried out in summer, 12 months after windrowing. In severe cases, a second pre-planting spray may be required in the summer prior to planting. It is emphasized that weed control should be adequate before planting. Costs vary with topography but would probably average $3 - $4/acre. On easy going an operator could cover 50 acres per day.

Final Clearing

Windrows should lie for at least two summers to ensure a thorough burn in early autumn. The operation can become expensive if attempts are made to thoroughly "clean up" the area. In most cases it is easy to exceed $20 per acre for this operation.

The amount of clearing required should be sufficient to: -

(a) Allow reasonable access for planting, pruning and fire control

(b) Permit the use of logging equipment likely to be used in the future removal of thinnings.

Generally speaking, at the time of final clearing, the interests of future loggers are not given the priority they deserve, and the comment "that's their problem" is not unknown.

To reduce the amount of final clearing required, it has been recently suggested that windrowing on up to 1 in 8 slopes should be across the contour and final clearing should aim, in one operation, to remove two out of every three chains of windrow.

Recent first thinning trials involving the complete removal of only every third row, have shown that this method has many advantages - mainly easier and cheaper logging. If this

method becomes general practice, it could be necessary in the future to ensure that every third row was fully cleared.

Much of the difficulty in disposing of windrows is peculiar to W.A., due to the durability of the native timber. In the eastern states a considerable amount of debris can be left after clearing as it is soon broken down by saprophytic fungi.

As burning is only one means of timber disposal, there could be an opening for Entomologists or Pathologists to breed a super termite or wood destroying fungi especially for this purpose.

Roading

Roading in steep country in hills areas is always expensive and with this in mind, an intensity of one mile of road to every 100 acres of planting has been set as a maximum guideline.

Roads should be located almost along the contour and at about 30 chain centres. One road should follow as closely as possible, (consistent with good grade and location), to the top soil boundary and one at the foot of the main slope.

Forming to 22 feet with adequate drainage is essential but gravelling should only be sufficient to permit access by planting and pruning crews as the roads should not be heavily used until the time of first thinning.

Water points should be constructed such that from any point within the plantation a heavy duty unit should be able to travel to, fill and return from the water point within twenty minutes.

Construction costs vary with topography and amount of rock but would probably average $2000 per mile. The work is best done by contract dozer after final clearing had been completed. A D.7E with rippers is usually the minimum class machine required. It pays dividends to expend adequate officer time in selection and supervision of construction.

Grade Drains

Where the plantation is on water supply catchment areas, grade drains have been used between the contour road systems to prevent erosion and excessive turbidity in the water supply.

The grade drain consists of a drain formed by a grader or D4, so that run-off is collected and discharged into the main gullies on a 1 in 30 or less grade. Care is required in selection and construction. Stumps on the alignment are often a problem and are either removed during initial clearing by pushing, or explosives at the time of construction. Costs of construction are approximately $2/chain.

Firebreaks

In the past, provision and maintenance of firebreaks has been an expensive item which has been of questionable value in fire control. Current thinking is to dispense with conventional internal cleared firebreaks and to rely on roads, control burnt strips and access rows as fire control lines.

External breaks adjoining hardwood forest are to be the external road only, improved by the removal of stags up to five chains outside the boundary and all ground wood debris to 1 chain outside. Regular burning to be practiced in adjoining hardwood forest. It is considered that this is a realistic approach to protection of a hills plantation.

Planting

Considerable progress has been gained in recent years by the use of piecework hand planting and planting rates have risen to in excess of 1,000 plants per man day at rates of ± $1/100 plants.

Hand planting will probably continue whilst less than total clearing and stump removal is an accepted practice. A planting gun, capable of imbedding seedlings into the ground could be a further refinement and cost saver.

Conclusion

Hills establishment methods must be constantly critically examined for it is easy to accept the view that because a practice has been carried out that one way for many years, it is the only way.

In considering whether to alter existing practice, the major criterion should be whether it will alter the cost to the manufacturer of his raw wood material.

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