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## HEADQUARTERS MECHANICAL DEVELOPMENT COMMITTEE

Report No. 67

A summary of the results of trials carried out on the Gorwood, Kingslaw, Bark Lasse, Cundey, Bezner and Hurricane bark peeling machines.

Bark peeling machines have been the subject of intensive research in all the main timber producing countries over a long period and many different designs are now available. Trials have been carried out by the Forestry Commission on several of these machines which seemed suitable for the conditions in British forests. The machines tested are:-

The Gorwood (British)  
 The Kingslaw (British)  
 The Bark Lasse (Swedish)  
 The Cundey (British)  
 The Bezner (German)  
 The Hurricane (American)

Detailed reports have already been issued as follows:-

|                       |                  |                         |
|-----------------------|------------------|-------------------------|
| H.Q.M.D.C. Report No. | 8                | on the Cole (Hurricane) |
| "                     | " Nos. 47 and 54 | " " Kingslaw            |
| "                     | " No. 61         | " " Bark Lasse          |
| "                     | " No. 65         | " " Cundey and Bezner   |

No report on the Gorwood has been issued but a trial was carried out at Queensferry in November 1954 and figures obtained in this trial have been used as a basis for comparison. The object of this report is to assemble all the available information together so that the machines can be compared on the same basis.

Trial  
Conditions

The trials in each case were carried out in the same way by the same observers. The output rate of each machine was determined by running at the maximum speed at which the machine could turn out peeled props and using the figures obtained to calculate the output rate per hour. This was done to ensure that the maximum output of the machine was obtained uninfluenced by outside delays. Quite clearly for all day running the hourly rate would, in every case, be at least 25% lower to allow for inevitable pauses. In each trial the timber had been felled less than three weeks and cut into prop lengths except where stated otherwise. All the machines were in good order except that the 420 c.c. engine of the Bezner which in this particular case had been converted from

petrol to T.V.O. did not seem to provide adequate power. Costs are calculated on the basis of two men in the team on the Cundey and Bezner and three men in the team on the Kingslaw, Bark Lasse, Gorwood and Hurricane. The extra man in the case of the four larger machines has been allowed in view of the longer carry involved compared with the more mobile Cundey and Bezner. In compiling cost figures depreciation is taken into account based on a machine life of 5,000 hours. Labour is charged at 3/6d. per hour and 40% is added to cover direct overheads. An allowance is made for fuel, lubricants and repairs.

### Results

To avoid giving a mass of figures the results are presented in graphical form as follows:-

- Appendix A giving the output rates of each machine on various sizes of Corsican pine.
- Appendix B giving the same figures for Norway and Sitka Spruce.
- Appendix C giving peeling costs with each machine on Corsican pine.
- Appendix D giving peeling costs with the Cundey, Bezner and Kingslaw on Sitka spruce.

### Observations

1. The output figures revealed in Appendix A show that on Corsican pine the Kingslaw and Bark Lasse are far ahead of the others all the way up the scale except that the Gorwood competes with the Bark Lasse up to  $4\frac{1}{2}$ " diameter. It is interesting to note, however, that the Kingslaw beats the Bark Lasse handsomely until the prop diameter reaches 5 inches when the Bark Lasse forges ahead. The Hurricane has been used exclusively as a stake peeler and no reliable performance figures exist on diameters over 3". Of the two smaller machines the Cundey gives a consistently higher output than the Bezner.
2. On Norway and Sitka spruce (Appendix B) the output figures of the Kingslaw are far ahead of the Cundey and Bezner all the way up the scale and it is interesting to note the very small difference between Norway and Sitka in each case. No figures on the spruces are available on the Gorwood, Bark Lasse and Hurricane.
- The only direct comparison between old and fresh felled produce arising in Appendix B was the Cundey output which was about 30% higher on the fresh felled compared with the older felled material. In an entirely separate trial the difference in output by the Kingslaw was less than 10%.
3. The cost per unit of output is likely to be the final arbiter in making

the choice as to which machine to employ, so detailed costs are given over a range of prop sizes for each machine on Corsican pine and the spruces at Appendices C and D. The lessons learned here are:-

(a) On Corsican pine (Appendix C) the Gorwood beats all others on diameters of  $2\frac{1}{2}$ "-3". At about that point the Kingslaw wins until it gives way to the Bark Lasse at 5" diameter.

The Cundey competes on fairly level terms with the much larger Bark Lasse up to a diameter of  $4\frac{1}{2}$ "-5" but at no point does it come within striking distance of the Kingslaw.

The Hurricane does well in the 2-3 inch size but no figures are available outside this range.

The Bezner gave by far the poorest figures being right off the scale of Appendix C but it is only fair to again mention that this was the only machine on which there was some doubt as to mechanical fitness at the time of the trial.

(b) The limited information on the spruces (Appendix D) shows the Kingslaw giving substantially lower costs than the Cundey though the difference at  $4\frac{1}{2}$ " diameter has closed to just over 1d. per cu. ft. with the indication that above this size the difference is becoming closer still.

The Bezner costs are the highest recorded but the remarks at the end of observation 3(a) on the condition of the machine again apply.

4. Some users have suggested that the Kingslaw can be operated by two men instead of the three allowed for in the cost calculations in this report. If sufficient material is assembled within short range of the machine this is true but if extra cost is involved in preliminary stacking there is no nett gain.

In view of differences of opinion on this point an extra graph is superimposed in broken line on Appendix C giving the operating cost of the Kingslaw if giving the same output with only two men. The same advantage would be gained by the Gorwood and Bark Lasse if it were found that they could give the same output with two men.

5. In considering all machine peeling costs it is necessary to keep in mind the cost of doing the same work by hand under identical conditions. Hand peeling may be done either "in the length" on the forest floor or after props have been cut to size. Trials on certain species were, therefore, undertaken

to obtain the output by hand produced by a man working at his maximum rate over roughly the same periods. The results of these hand peeling trials are included in broken line graphs on the Appendices as follows:-

Appendix A. output figures on Corsican pine with both hand peeling methods.

Appendix B. output figures peeling Sitka spruce props cut to size.

Appendix C. Costs using both hand peeling methods on Corsican pine.

These results show how remarkably well hand peeling in the length on C.P. competes with the machines. They also show how much greater is the output when hand peeling C.P. in the length than when cut to size.

6. The quality of the peeling by all the machines is very satisfactory and it is difficult to pick out any one machine as being noticeably superior to the others. There is one feature, however, in which the Cundey and Bezner excel and that is their ability to clean up a rough and crooked prop which would otherwise be rejected. None of the larger machines possess this ability to the same extent.

7. Information on species not so far mentioned is insufficient to show any consistent figures to include in the appendices to this report. Where figures are available they indicate that:-

(a) Douglas fir in the one trial in which it was used (on the Kingslaw) is rather more difficult to peel than the spruces and pines.

(b) European larch is one of the most difficult species to peel by machine.

Conclusions There are some obvious gaps to be filled in to complete the story of these bark peeling trials but there is sufficient evidence already to show that:-

(a) In the small and very mobile class the Cundey stands out as being the best machine.

(b) In the larger and slightly less mobile class, requiring a tractor to move them, the Kingslaw wins easily on props up to 5" diameter with the Bark Lasse the better performer above that size.

In making the choice in a specific case between the Cundey and the larger machines it is necessary to take into account the volume of work and the degree of mobility that is necessary. The Cundey allows a more flexible organisation with lower standing charges but the Kingslaw (and, on large material, the Bark Lasse) given volume and conditions to suit them, can peel at little more than half the cost by the Cundey.

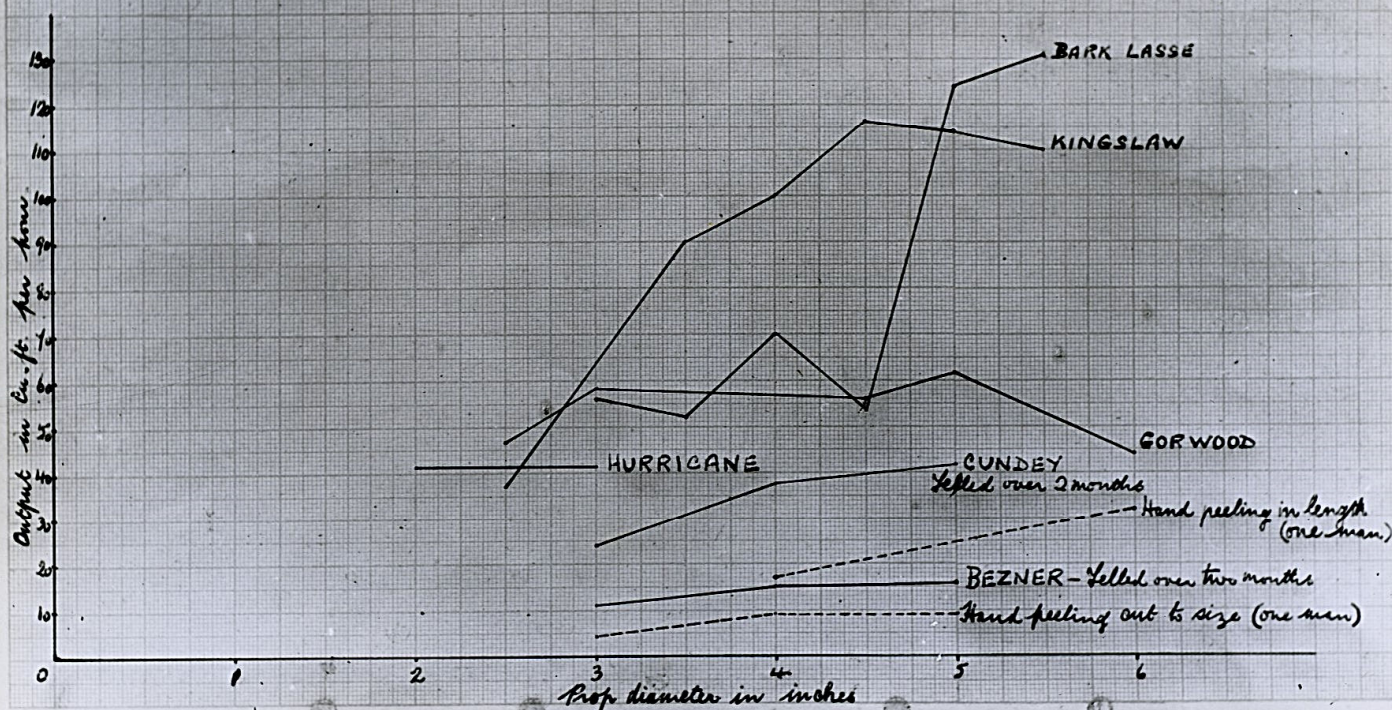
Whilst hand peeling in the length appears to be a strong competitor with even the best of the machines, it must be remembered that all these comparative trials were of short duration. On prolonged work the output by hand could be expected to fall off far faster than by machine.

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Showing output rates by both hand and machine on Corsican pine.



Showing output rates of the Kingslaw, Cundey, and Bezner on Norway and Sitka spruce. Also hand peeling, Sitka only.

