For circulation to:-
~~all~~ M.D.C members

Res [illegible]

1. Director [illegible] See note at end
~~⑤ 2. Mr G B Ryle~~ 18/2
④ ~~3. Mr J J McLe[illegible]~~
② ~~Mr [illegible]~~
③ ~~Brig [illegible]~~ 22/2

J 516/5

④ Report [illegible]
July 1st 1954.

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ENGLAND)
17 JUL 1953
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7-7-53

H.Q. MACHINERY DEVELOPMENT COMMITTEE

REPORT NO. 22

A LIGHT TWO THROW PLOUGH FOR HEATH AND DOWNLAND PLOUGHING

Origin A requirement has been put forward for a mounted plough suitable for heath and downland forest planting that will plough a shallow furrow throwing slices to left and right with a subsoiled path in the furrow centre to a depth of up to eighteen inches. The slices are required to be thrown widely to suppress weed competition in close proximity to the plants.

Description The design was undertaken with low cost ploughing as one of the objectives. The Fordson half tracked tractor (covered by Report No.20) was chosen as the carrying unit as it seemed to be the smallest and cheapest tractor that would pull a plough of this type. In order to use standard commercial parts to the greatest possible extent the plough was based on the Ransome type T.S. 55 mounted deep digger. Instead of the deep digger mouldboard two general purpose mouldboards, one left and one right handed, were fitted so that the slice would be smoothly and widely laid on each side of the furrow. A single disc coulter was mounted ahead of the apex of the points on the two mouldboards.

The subsoiler was mounted on a special bracket behind the beam. A special stalk was used but the cutter and point were standard parts. Photographs attached to this report show a rear view of the plough in operation and a side view in the raised position.

The building of this plough including the manufacture of all non standard parts, was carried out on behalf of the Forestry Commission

By:- Roadless Traction Ltd. of Hounslow.

The cost in prototype form was £110.

Observations 1. Trials were carried out at Ascot, Abinger and Friston during which it was established that the plough produced the results intended where the ground was not heavily impacted and was boulder free. Clearly this plough will not meet the more difficult heathland conditions but the proportion of the ploughing programme that it can undertake will require some time to prove. As in the case of most ploughs difficulty is found in ploughing land carrying a strong crop of heather without previous burning. On the hard impacted soils of Wykeham in Yorkshire this plough has so far failed. Maximum subsoiling depth is at present 16 inches (not quite the intended 18 inches).

2. During a user trial at Friston 191 acres were ploughed. Past history in this area was that deep ploughing had been unsuccessful owing to drying out after planting followed by severe losses. Ordinary planting on screefed patches had resulted in better survival but moderate growth. Subsoiling without ploughing had given little better results as rapid growth of grass had checked development of Beech and Pine.

The planting conditions left by the two throw plough are reported to be silviculturally satisfactory but it is too early to make any statement on the ultimate results.

3. The cost of the ploughing operation at Friston quoted at 2 (above) has been recorded as follows:-

Tractor Costs

331 hours work at all in rate of 10/- per hour	=	£165. 10. 0
80 hours maintenance at 7/3 per hour (Machine & driver)	=	29. 0. 0
94 hours plough repairs wet weather, etc. (Machine at 3/3 per hour)	=	15. 5. 0
		£209. 15. 0

Plough Costs

8 Share points at 5/3		£ 2. 2. 0
19 Subsoiler Points at 4/-		3. 16. 0
Miscellaneous repairs by local Blacksmith		13. 1. 6
		18. 19. 6
Total Costs	=	£228. 15. 0
Cost per Acre	=	£ 1. 3.11½

The above figures were those recorded by the users during the trial. The proportion of time spent on maintenance, repairs and wet time compared with working time may appear large, but it is not unreasonable for a trial taking place between December and March.

The heavy consumption of share points and subsoiler points may also arouse comment and although this is unexpectedly heavy, the low cost of the replacements illustrate the value of using standard parts that can be bought from any Ransome Agent. The hourly operating rate of 10/- charged for the tractor is the rate at which Fordson Majors have been assessed for some time, but with the half track conversion and the higher tractor prices now ruling this figure should probably be increased by 33⅓% which would bring the total ploughing cost per acre to £1. 9. 9.

Conclusions

This plough meets the specification to which it was designed except that the maximum depth of subsoiling (16") falls short by two inches. It provides a low cost means of ploughing the easier types of ground for forest planting but the proportion of the annual ploughing programme that it can undertake will only be established by extended use.

R. G. SHAW
Machinery Research Officer
7.7.53.

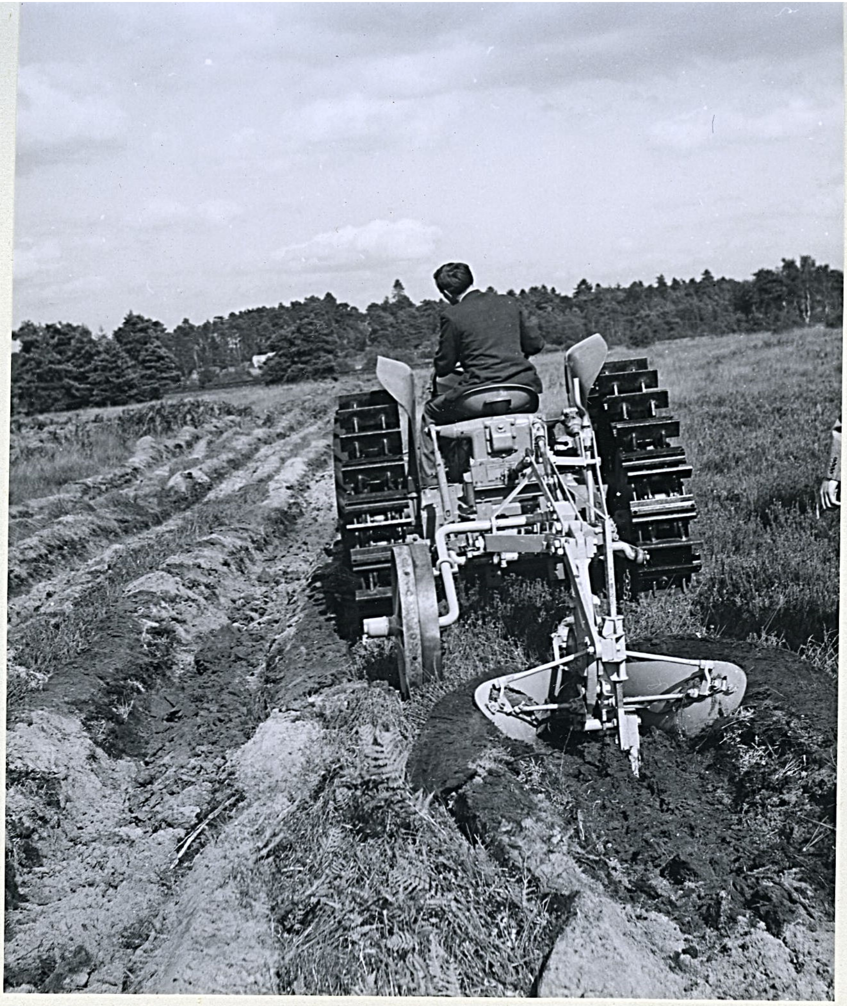
1.) I saw the P.53 work at Dristow last week and was very favourably impressed with the (sylvicultural) results to date i.e. %age 'take' and promise of Beech plants.

DONE. AB 20/7. ✓ 2.) Please so inform M.R.O.

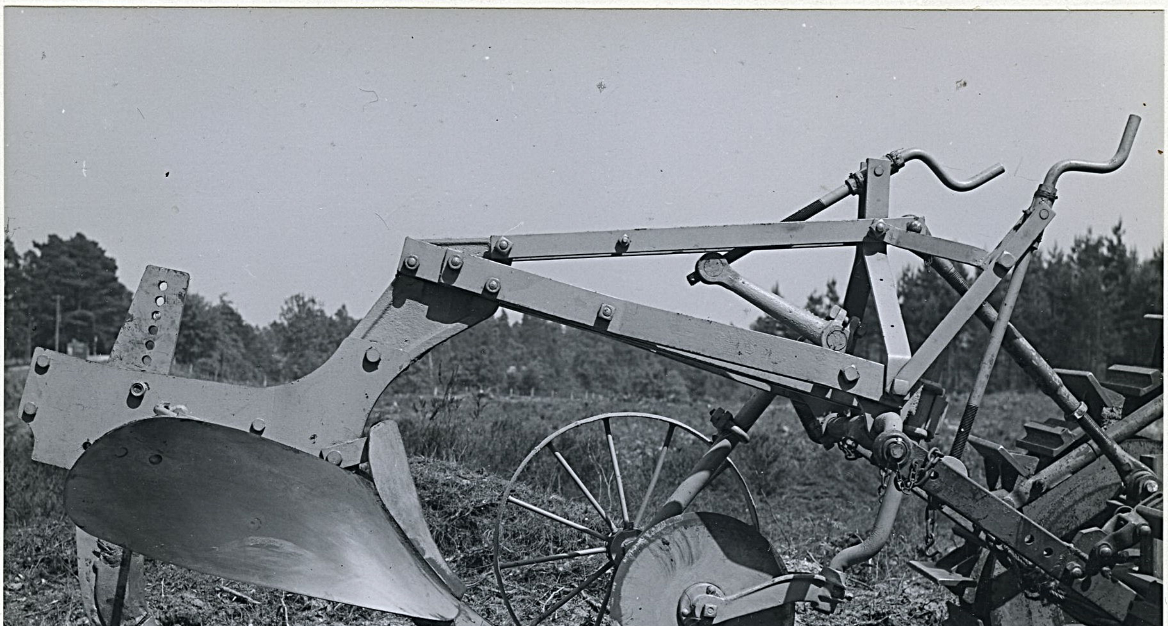
3.) Please follow-up re position and promise this time next year.

Mr Batters AD

18/7/53.



REAR VIEW SHOWING THE SLICES TURNED OVER ON EACH SIDE OF THE FURROW AND THE SUBSOILED PATH DOWN THE CENTRE.



SIDE VIEW OF THE PLOUGH IN THE RAISED POSITION.