

Report No. 14 on

An Experimental Inter Row Cultivator for transplant beds

Origin

under ideal conditions

The increasing use of the American Holland machine for lining out nursery transplants means that the row spacing will be far more accurate than has formerly been achieved by hand methods. This, in turn, simplifies the mechanisation of the subsequent inter row cultivation for the suppression of weed growth. Some development work has been done on a machine for this purpose and a prototype has been built.

Description

The machine (shown in photograph No.1) is a self propelled 4 wheel carriage carrying an operator seated in the centre. A 5 H.P. air cooled Petter engine drives through a normal clutch to a 10 to 1 reduction gear from which the drive is taken both to the cultivating rotor and through a differential to the rear wheels. Speed is controlled by throttle but the working speed is 100 yards in 5 minutes.

The rotor carries 5 sets of double cultivating blades to cover the spaces between 6 rows of plants at a time. A further set of blades on each end of the rotor cultivate the outer edges of the two outer rows. For 8 inch spaced rows the width of inter row cultivation is 5 inches so a $1\frac{1}{2}$ inch strip is left uncultivated on each side of the rows of plants.

The height of the rotor can be quickly adjusted (on the move) to control depth of cultivation. Rotor speed is only 3 times the ground wheel speed so movement of the cutters through the ground is slow, the object being to reproduce the action of a hand hoe. The price of this prototype machine was £260.

Observations

1. It was found that the machine was very easy to steer with the great accuracy required when cultivating between the rows of plants lined out by the Holland transplanter. Many different operators have used it and none have found any difficulty. Local inaccuracies in row spacing up to $\frac{1}{4}$ " can be tolerated.

all up?

2. On beds where weed growth had already appeared the weeds were lifted and dropped on top of the cultivated surface. It is, in fact, one of the advantages of the machine that it can deal with weeds which are well established. Photograph No. 2 gives a rear view of the machine actually operating.

3. The rate of output is 100 yards of 6 row transplant bed in 5 minutes (8 minutes allowing for turning the machine at the end of the row). The piece work rate for this operation by hand is 2/6d. As the operating cost of the machine, including the driver's wages, is 7/6d. per hour the cost of 8 minutes work is 1/- showing a saving of 60% on hand work. A strip of $1\frac{1}{2}$ inches on each side of the row is not touched by the machine but this also applies to the hand piece work rate mentioned above. (The rate for hand weeding in the lines of plants is a further 2/6d. per 100 yards). *supplemental?*

4. The machine requires a headland of 10 ft. at each end of the bed for turning so the advantage of long beds is as great with this machine as it is with the Holland transplanter. ✓

5. The development trial was carried out at Branshill but, to obtain experience on different types of ground, brief tests were also made at:-

It was considered that we should buy two of these machines for use in D(R) in F.Y. 56. G.M. M.D.C. Minutes.

- (i) Mr. H. C. Lister
- (ii) Mr. Mackenzie
- (iii) Mr. S. S. S. S.
- (iv) Mr. S. S. S. S.
- (v) Miss O'Shaughnessy

I.A.

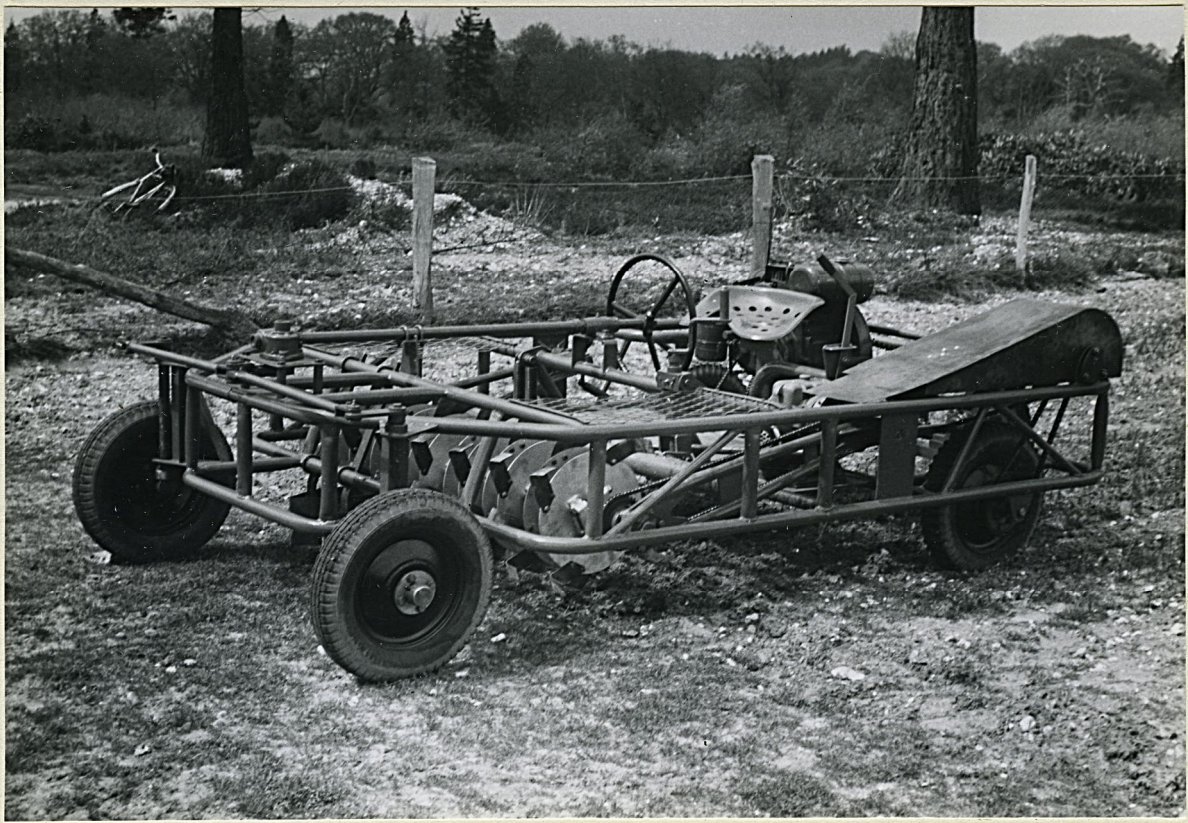
- (a) Tair Onen in South Wales where inter row cultivation was satisfactory but the use of the machine was restricted by the absence of headlands.
- (b) Ledmore in Scotland where the results were inconclusive because the beds were already weed free owing to recent cultivation.
6. Experience with this prototype machine showed the need for a reverse gear and a handbrake on any later machines.

Conclusions This prototype machine has shown that it can substantially reduce the cost of inter row cultivation if the lining out has been done at accurate spacing. As in the case of all mechanisation long uninterrupted runs are essential.

R. G. SHAW
Machinery Research Officer
October, 1955.

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Photograph 1. General view of the machine. Note the rotor carrying multiple cultivators immediately behind the front wheels.



Photograph 2. Rear view of the machine in operation. The revolving blades can be seen below the machine with the rows of plants passing safely between them.



Photograph 3. Showing the cultivated bed after the machine has passed over it. Note the accuracy with which the machine has been able to cultivate close up to the lines of plants.