

Report No. 48 on

The Roadless Brush Cutter

Origin

The problem of clearing land which has become derelict due to the encroachment of mixed vegetation is one for which machinery is being actively investigated. Much has already been done in the development of machines capable of cutting grasses and also of machines which can deal with the heavy types of growth found in derelict woodland. Between these two extremes there is a dearth of machines capable of taking on the type of vegetation containing heather gorse, saplings and other rough vegetation up to 2 inches in diameter. There are for example many acres of rides and firebreaks which, owing to the magnitude of the work involved, have been neglected until the state is reached where no machine of the mower type can compete with the situation. The Roadless Brush Cutter which is now being made under licence in this country by Roadless Traction Ltd. of Hounslow appeared to meet this need so a machine was obtained for trial.

Description

The Brush Cutter is designed as a mounted implement for the Fordson Major and a general view is seen at Photograph 1. The main feature is a twin armed rotor on a vertical axis driven, from the tractor P.T.O. The arms of the rotor extend 18 $\frac{1}{2}$ " from the centre point and at the extremity of each is a fulcrum pin to which a blade giving a further reach of 14 $\frac{3}{4}$ " is attached. See Photograph 2. The essential feature of the machine is that, as the rotor revolves at speed, the blades are flung out radially by centrifugal force so a swathe of 66" is cut as the machine moves along. (The machine tested was a prototype and did not conform exactly to the above dimensions).

The great advantage of using centrifugal force to keep the blades in their working position is that when they strike a solid obstacle such as an old tree stump concealed in the grass, they are able to swing back without suffering damage to themselves. As soon as the obstacle is passed the blades recover their position under the action of centrifugal force. Stationary blades located close to the revolving blades can be fitted when fine shredding is required. The drive to the rotor is taken by a Hardy Spicer propeller shaft driven from a special raised power take off on the tractor giving a rotor speed of 542 R.P.M. at 1600 engine R.P.M. The whole assembly is carried on the normal Fordson 3 point linkage so it is easily raised for travelling. When in use the height of the rotor and blades is controlled by adjustment of the height of skids.

Observations

1. Operating costs have been assessed as follows :-

Tractor	=	5/-d per hour
Brushcutter	=	2/4d " "
Operator's wages	=	3/6d " "
40% overhead on wages	=	1/5d " "

TOTAL = 12/3d " "

The charge for the Brushcutter is arrived at by writing off the purchase price of £242-16-0 and giving it a 3,000 hour life. This gives a depreciation rate of 1/7d per hour and to this is added 9d per hour to cover repairs. The life and repairs rate are only an assessment of what are regarded as fair figures for a machine of this type.

2. Field trials have been carried out as follows :-

- (a) On 4 acres of scrub consisting of rough grass, brambles, briars and blackthorn up to a maximum height of 6 ft and maximum stem diameter of 1 inch.

The machine had to cover this area twice in order to cut up the debris sufficiently to be subsequently ploughed in.

Total operating time was 24 hours so the cost, based on figures at Observation 1, was 73/6 per acre.

- (b) On 8 acres of rough grass and bracken which was cut down and shredded by the machine in a single operation in 16 operating hours.
Cost = 24/6 per acre.

- (c) 11 acres of heather, molinia and low coppice on fire rides that had last been cut 2 years previously were cut by the machine in 18 $\frac{3}{4}$ operating hours.

Cost = 20/10d per acre.

The conditions in this case could be described as comparatively easy.

3. On each of the trials it was clearly demonstrated that the machine was able to withstand a considerable amount of rough usage when striking stumps and, in some cases, stones concealed in the vegetation. It would increase the scope of the machine on the soft and rough ground of many forest plantations if it could be mounted on a fully tracked or half tracked tractor.

4. It was found that the stationary shredding blades were no advantage on very rough vegetation as better results were obtained by putting the machine over the area twice. An example of the result of two cuts through scrub gorse, broom, small oak and heather is seen at Photograph 3.

5. Users comments during the trial have been :-

- (a) A greater range of cutting height adjustment on the skids is required to increase the range to 3 - 12 inches instead of the present 3 - 6 inches.
- (b) The protective casing round the rotor should be bolted and not welded into position to simplify the repair of damage to this casing.

6. Mechanical defects occurring to the machine during the trial have been :-

- (a) Two cutter blades broken as a result of hitting a large number of stumps.
- (b) Protective casing damaged by stones.

7. The standard Fordson Major possessed ample power to operate the Brush cutter and no part of the tractor suffered any damage during the trial.

Conclusions

The Brush Cutter has proved itself to be a very effective machine for the removal of rough vegetation with stem diameters up to $1\frac{1}{2}$ inches.

Further Action

It is understood that on the production machines, now being produced by Roadless Traction Ltd., the modifications suggested at observation 5 are being incorporated.

R.G. SHAW

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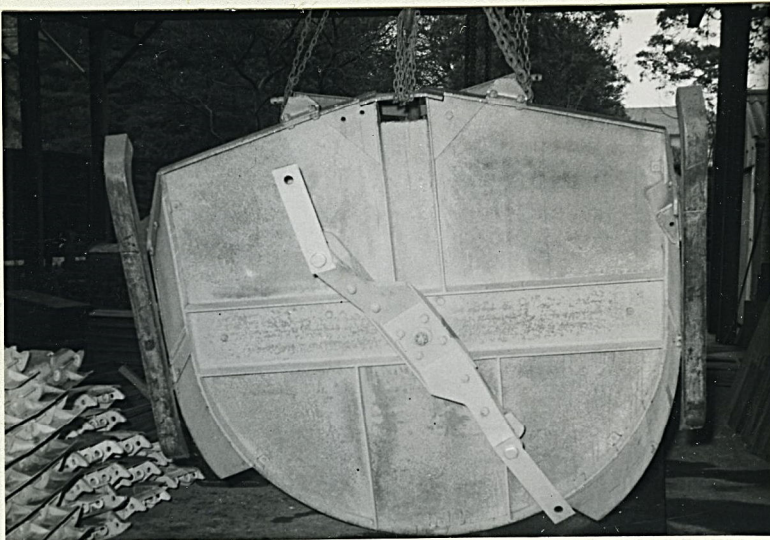
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PLUS

1. Giving a general view of the Brush Cutter operating on rough grass. The twin tractor wheels are not considered to be necessary under the conditions shown in the photograph.



2. Giving an underneath view of the Brush Cutter. The rotor is clearly seen with a swinging blade at each end of it. The skids on which the machine runs when in operation can be seen on each side of the outer casing.

3. Showing the passage cut by the Brush Cutter through a patch of gorse, broom and small oak. The machine had passed over this passage twice. The cut up vegetation is seen on the ground. Note how this vegetation has been shredded and the small space that it now occupies.

