

Mr. M.C. Richardson,

H.Q. M.D.C. Report no 66

and Report on Demonstration 12.7.57

The attached papers reached me this morning.

Although a search was made for Report no 66 prior to the ~~last~~ M.D.C. meeting last Monday, there is nothing to indicate where it has been since you initialled it on 25/9.

I cannot recall having seen your report before, presumably it was attached to Report no 66 by you.

no action appears to have
been taken on the Directors
minute of 29/7 and the

Report has been sent direct
to Conservators by H.Q.

Have you the matter in
favor please?

AB
21/10/57.

Stroke M Richardson

1. Have copies of his report, + Perceval's report typed +
sent to Cons. bearing note to be added that
Brampton "agrees all are willing to give what he
thinks is worth the money." When reports sent
let Director leave H.O.C. no 66 ~~responsible~~
then ~~copy~~ + copy of what is sent to Cons.

AB 25/10

Miss O'Shea *MS*

memo sent 21/10

Director

Independent report in the Scotch
clearance trials in the New Forest, as
requested. I have not discussed my
assessments with Col Shaw, and have no
idea as to what his report will be.

MR 27/5/57.

Thanks you. Just what I wanted.
We must circulate this to Coms but
should not do so without a 'Reconciliation
Statement' vis-a-vis what Col. Shaw may
be issuing.

Pl. find out what Col. Shaw is doing and
analyse with him (subject to any 'reconciliation')
that his reports are circulated to England
Coms. Also this office together with a
copy to you.

Col. Richardson

29?

P.S. In future it would be useful to
check whether Whitford, Crawford, Perreval
agree with you.

OTC

P.T.O

Crawford

Agrees all same

Wolsey Sides swide

He thinks it is worth

the extra money.

Perceval

Report attached.

W.D. 27

Ch. Richardson

9.10

P. 10

1) H.Q. M.D.C. Report No. 66
 Compared the relative
 merits of the Roadless
 Bruchenther, Wilder Raintorpe
 Chopper, Arthur Glashier
 and Wolsley Super Swipe.

2) D.S. New Forest is the only
 area where there is a
 Wolsley Super Swipe
 operating. The Deputy
 Surveyor has been requested
 to submit a report prior
 to the M.D.C (E) meeting.

W. S. Hughes.
 18.3.1958.

D.F. (Wales)

A/750/ASP/MH
 Copy on A/718/1

file

MACHINERY DEVELOPMENT COMMITTEE
SCRUB CUTTER TESTS
YOUR W80/65/1 OF 8.7.57 REFERS

As instructed, Mr. Percival attended
 the Trial of Scrubcutters at Lynhurst on
 12.7.57. His report and prints of
 photographs taken are attached.

The poor quality of some of the
 photographs is regretted and is due to a
 very amateur photographer and poor weather
 conditions.

LBV
 for C.F. S.Wales
 7. 8. 57.

For circulation within
the Forestry Commission only.

Headquarters Mechanical Development Committee

Report No. 66

A Comparative trial of the following Scrub Cutting Machines:-

The Roadless Brush Cutter
The Wilder Rainthorpe Chopper
The Arthur Slasher
The Wolseley Super Swipe

- (i) Director
(ii) Mr. Baring 17/9
(iii) Mr. Packwood 18/9
(iv) Mr. Sloane 19/9
(v) Mr. M.C. Richardson
(vi) Mr. Brumby 21/10
(vii) Miss O'Shaughnessy
Origin

A number of machines are now available for the clearance of unwanted vegetation. They range from the small power driven machines operated by a man on foot to the large dozing, grubbing and cutting machines mounted on powerful tracked tractors. There is however an important middle weight class consisting of machines mounted on (or trailed by) standard wheeled tractors and driven by the rear power take-off. This is an important class because several of the machines in it are very effective and they have the great advantage of being able to travel on roads under their own power.

It was decided to test all the machines in this class together under identical conditions to establish comparable information on the performance of each of them. A trial took place at Lyndhurst on the 12th of July 1957 of the following:-

The Roadless Brush Cutter on a standard Fordson with 4 wheel drive.
The Wilder-Rainthorpe Chopper on a standard Fordson.
The "Arthur" Slasher on a standard Fordson.
The Wolseley Super Swipe on a Ferguson 35 with live P.T.O.

Description The Roadless Brush Cutter carries swinging knives and has already been described in H.Q.M.D.C. Report No. 48. The price is £206.

The Arthur Slasher is a new machine imported from Australia. See Photograph 1. It is mounted on the hydraulic linkage and consists of a vertical shaft carrying chains at the bottom which are flung out by centrifugal force clearing a path 8 ft. wide. It is, in fact, a larger edition of the Wolseley Swipe described in H.Q.M.D.C. Report No. 63. The price in England is not yet certain but is likely to be about £160.

The Wilder Rainthorpe Chopper consists of a trailer carrying a P.T.O. driven rotor fitted with two rows of swinging tines covering a path 4 ft. 6 ins. A description was given in H.Q.M.D.C. Report No. 58. The price is £350.

The Wolseley Super Swipe is new and it is an improved version of the Swipe described in H.Q.M.D.C. Report No. 63. The main difference is that it is driven by shaft from the power take-off instead of by belt. The price is £90.

Conditions

All the machines were tested on three different types of vegetation:-

- (a) Thick brambles
 - (b) A heavy growth of old heather up to 2 ft. high
 - (c) Thick gorse several years old and having stem diameters up to 4".
- Height was up to 10 feet.

Heavy rain had fallen overnight and all this vegetation was wet.

It was intended to time each machine on measured plots but the density of the growth was so inconsistent that a fair comparison could not be made. The following observations are based on visual judgment.

Observations 1. The results obtained on areas of thick bramble showed that this was no obstacle to any of the machines, in fact, they found it so easy that it was difficult to say that any one machine was better than the others. In every case all the growth was cut at ground level. A mass of cut vegetation was left on the floor but in each case a second passage of the machine shredded it into small pieces and it would have rotted away very quickly.

The Wilder Rainthorpe left the debris evenly spread over the ground. The other machines were inclined to leave it in ridges.

2. Heather proved a far more formidable problem as it has done on all previous scrub clearing operations. A thick mat of old heather about two feet high, in spite of looking easy is, in fact, one of the greatest absorbers of power that we have tackled. It was not surprising that any of these machines trying to travel fast when cutting this heather immediately found themselves stalling.

The live power take-off (which was fitted only to the Ferguson 35 on this occasion) gave a tremendous advantage to the Wolseley Super Swipe and

enabled it to very nearly compete on equal terms with the much larger competitors.

The live P.T.O. enables the operator to halt his tractor on the engine clutch as soon as he feels his engine revs falling. Full power can then go to the cutting machine which can overcome the resistance and recover its revolutions before the tractor is allowed to go forward again.

Good though the Super Swipe was on this heather it could not quite equal the Roadless Brush Cutter, Wilder Rainthorpe and Arthur since the latter three machines could also remove and break up the occasional small self regenerated Scots pine growing amongst the heather.

The Wilder Rainthorpe and Roadless Brush Cutter were the outstanding machines in this test as they were able to deal very effectively with the heather by first taking a high cut and then a second cut at ground level.

Actually the Wilder Rainthorpe succeeded in demolishing a Scots pine with a 5" butt diameter. By passing over it four times it removed the tree by the roots and sliced it up into a form in which it would offer little opposition to ploughs in the tine plough class.

The Arthur performed well but it was clearly asking too much to expect to get an 8 ft. sweep from a 40 H.P. tractor under the conditions provided for this trial without a live power take-off.

3. The trial on gorse again confirmed previous experience that gorse, though looking so formidable, is unexpectedly easy to clear. In this case the growth was up to 10 ft. high as can be seen in photographs 2 and 3 of the Roadless Brush Cutter and Wolseley Super Swipe. Some of the old stem diameters were as much as 3 - 4 inches, a typical example after a single attack by the Wilder Rainthorpe Chopper is seen in photograph 4.

All the machines were able to deal with this gorse to some extent, even the little Wolseley Super Swipe made a very good showing and was only limited by the extent to which the Ferguson tractor could push it's way into the dense crop.

The Wilder Rainthorpe again excelled on this site being able to virtually eliminate everything above ground level except for a few

/splintered

splintered stumps in two runs over the ground. It must however be mentioned that there were no old hardwood or softwood stumps in this ground as these might have caused trouble due to the small ground clearance on the frame of the Wilder. The Roadless Brush Cutter and the Arthur were noticeably less effective than the Wilder mainly because their revolutions dropped so quickly under load. It was again shown that both these machines would be far more effective if given a live power take-off. This is now available on all new Fergusons and on new Fordsons at a price of £30 but it costs over £100 to fit it to a Fordson already built without it.

4. Although the ground on all the tests was clear of stumps the usual collection of bottles and tin cans was found and in one case the frame of a bedstead was exposed. None of these hazards caused the machines any trouble but they were a source of danger to anyone standing within 25 yards.
5. All these machines using centrifugal force whether applied to knives or chains, are a potential danger to anyone standing within 25 yards of them. Debris (and also a possible broken knife or chain) is liable to fly out at any time. The machine operator is, however, safe as he is above the trajectory of flying pieces.
6. No accurate assessment of rate of output by any of the machines can be given based on this one day trial but it appeared that the Wilder Rainthorpe would be able to clear about an acre per day on the worst of the gorse and substantially more on the brambles and heather.

Conclusions

The two outstanding machines in this trial were the Wilder Rainthorpe Chopper and the Wolseley Super Swipe. The Wilder gave the best all round performance and the Wolseley showed how much could be done by a machine costing under £100.

The Roadless Brush Cutter and the Arthur were overshadowed mainly through their inability to maintain speed under load.

The value of a live power take-off on a tractor was very clearly shown.

R. G. SHAW

Machinery Research Officer

September, 1957

DEMONSTRATION of SCRUB, HEATHER & GORSE CLEARANCE.

NEW FOREST. 12.7.57.

Present:

Messrs. Shaw	Crawford
Winterflood	Percival
Blane	Richardson

together with representatives of the firms supplying the machines.

General.

A well laid on demonstration for comparing the merits of five different machines.

Four of these employed the principle of flails revolving in an horizontal plane :-

The Roadless Brush Cutter	powered by	Fordson
" 'Arthur' "	"	"
" Wolsey Swipe "	"	Ferguson
" Wolsey Super-Swipe "	"	"

The fifth had solid flails revolving in a vertical plane:-
The Wilder-Rainthorpe - powered by a Fordson.

Sites.

Three sites were selected:-

- No. 1 Thick bramble with Birch saplings up to 1½" diameter at base.
- No. 2 Dense old heather about 2' high with a few stunted S.P. up to 3" diameter.
- No. 3 Old gorse. Very dense with stems up to 4" thick in centre of clumps.

Tests.

All machines were given one or two runs at each site. After they had performed, opportunity was given for anyone to ask for another run, with or without further adjustment to the machine.

CONCLUSIONS.

For Scrub Clearance in general the best machines were the Roadless Brush Cutter and the Wilder-Rainthorpe Chopper with little to choose between them.

However, taking prime cost into consideration the Wilder at £340 was not £100 better than the Roadless at £235.

Although both machines cope equally well with light overgrowth there is undoubtedly a place for lighter, cheaper and more economical running machines for this work.

The Wolsey machines score on the cheap running basis, but again the 'Super' at £90 does not appear to oust the 'Standard' at £40 despite its slightly superior performance.

The 'Arthur', apart from being a dangerous machine to use, was obviously underpowered.

M. Richardson
25.7.57

Five machines were tested under identical conditions and a comparison of their capabilities was made on 3 sites. The sites chosen permitted the machines to work in:-

1. Bramble containing some small Silver Birch (up to approx. 1½ - 2" butt diam.).
2. Heather - both new close growth and old wiry growth.
3. Gorse - up to approx. 8' in height and with stem diam. varying up to 4".

The machines tested were:-

A. The Wolsley Swipe. Mounted on the 3 point linkage of a Ferguson tractor. The main features are a vertically mounted shaft driven by V belt from the tractor p.t.o. At the bottom of the shaft is a disc to which are attached 3 chains - each 20" long. The shaft rotates at 550 r.p.m. and the chains are flung out radially - cutting a swathe almost 48" wide.

The machine is very light and extremely simple in operation. It costs approx. £45.

B. Wolsley Super Swipe. This machine was mounted on the 3 point linkage of a Ferguson "35" tractor having "Live" p.t.o. It is very similar to the Swipe but is of somewhat heavier construction and the V belt drive has been replaced by shaft drive to a level box. Adequate guards have been fitted to the top and sides and a trailing castor wheel has been fitted to control the height of cut. The price is approximately £90.

C. The Arthur Slasher. An Australian machine not yet in production in this country. The model tested was mounted on a Fordson Major and in construction was similar to the Super Swipe. The drive was through p.t.o. shaft and bevel box to a vertical shaft. On the bottom of the vertical shaft is a large dished disc to which are attached 4 chains, each approx. 30 inches long. A guard was provided but was found to be totally inadequate and was not used during the test.

To operate, the linkage is lowered until the dished plate rests on the ground. It is not, therefore, possible to alter the height of cut with any accuracy.

D. Roadless Brushcutter. Mounted on 3 point linkage of Fordson Major. The main features again are a vertically mounted shaft, shaft driven through a bevel box from the tractor p.t.o. At the lower end of the vertical shaft is a carrier to which are flung out radially by the turning movement of the shaft. An adequate guard is fitted to the top and sides and the height of cut is governed by adjustable skids. The cutter and gears are protected by a shear pin incorporated in the p.t.o. shaft.

E. The Wilder Chopper. A trailed machine mounted on two wheels, carrying a rotor driven from the tractor p.t.o. The rotor carries two rows of tines each hinged to a bar running across the width of the machine. As the rotor revolves, the tines are flung out radially under the action of centrifugal force. The tines swing back on their hinge when they strike a stump or other obstacle and then swing back into the operating position.

The machine may be adjusted for height and is protected by a friction clutch incorporated in the p.t.o. drive shaft.

The price is £376 for a machine cutting a 6' swathe.

Observations

1. The Wolsley Swipe cleared Bramble and gorse with surprising ease, considering its small size but was not tested on gorse as this was considered to be beyond its capabilities.

Two runs were necessary on the older, more wiry bracken but one run was sufficient in the more open bramble patches.

2. The Wolsley Super Swipe gave excellent results under all conditions. One run through bramble and heather was sufficient to chop the vegetation into small pieces while 2 runs were needed in gorse. Here the performance was most satisfactory, stems

up to 2 1/2" being cut with ease. The "live" p.t.o. of the Ferguson Tractor was most useful and was of the greatest assistance when tackling the tougher areas.

On uneven ground the machine was apt to leave the ground if the front wheels of the tractor entered a depression but it is possible that an experienced operator could prevent this by use of the Hydraulic Lift.

3. The Arthur Slasher would have put up a far better performance if fitted to a more powerful tractor than to one fitted with "Live" p.t.o. It was most noticeable that the Tractor Engine revs dropped - almost to stalling point - when the machine encountered tough stems and thick gorse.

The machine was reversed into very dense gorse with excellent results due largely to the fact that the vegetation was upright and not crushed by the tractor wheels.

Two runs were necessary on Heather and gorse to produce a clean finish but this was largely due to the falling off of revs. and consequent reduction in cutting power.

4. The Roadless Brushcutter had no difficulty in chopping bramble and heather, leaving a clean finish after one run. Two runs were necessary in gorse and it was found that the shear pin broke when tackling the thicker stems (over 2 1/2").

It was apparent that in heavy going such as this, at least 2 cuts should be made - the first with the blades lifted as high as possible.

5. The Wilder Chopper gave a most convincing demonstration on all the sites, leaving a clear path of finely chopped vegetation. Gorse stems up to 4" diameter were cut with no difficulty and no damage to the machine.

Conclusions

Two machines were particularly successful - the Wolsley Super Swipe and the Wilder Chopper. Apart from price considerations, the Wilder had the advantage of being a trailed machine - requiring only a tractor fitted with p.t.o. while all other machines required hydraulic lift linkage.

The Arthur Slasher is understood to have done very good work in Scotland but was not seen to the best advantage during this demonstration.

The great advantages of the live p.t.o. were fully demonstrated and it is felt that their inclusion in future orders for tractors intended for this type of work, should be considered.

"A. S. Percival"
6. 8. 57.

The price is £275 for a machine cutting a 6' machine.

General

The Wolsley Super Swipe cleared bramble and gorse with surprising ease, considering its small size but was not tested on gorse as this was considered to be beyond its capabilities.

Two runs were necessary on the other, more with broken but one run was sufficient in the more open bramble sections.

1. The Arthur Scrub Cutter.
Note the shaft drive to the bevel box driving the vertical shaft carrying the horizontal disc.
The four chains attached to the periphery of the disc fly out to cover an 8 ft. swathe under the action of centrifugal force.



- 2, The Roadless Brush-cutter in gorse.

3. The Wolseley Super Swipe in gorse.





4. One of the large gorse stumps after one run by the Wilder Rainthorpe. A cigarette packet is included to give some idea of size.



5. The Wilder Rainthorpe cutting gorse. Note the finely shredded debris coming out of the back of the machine.