

THE LINCOL DITCH CLEANER

Origin

A long term investigation is being made into all machines designed for the cleaning of drains which appear to be likely to succeed under forest conditions. The Lincoln is the first side mounted machine to be included in these tests.

Description

The Lincoln ditch cleaner consists of an endless chain with cutters carried on a frame on the side of a David Brown 30 I.T.D. tractor and driven from the power take off. The makers are Barford (Agricultural) Ltd. Belton, Grantham, Lincs. The machine is seen at work at Photograph 1. The complete ditch cleaning attachment is raised and lowered by hydraulic power under finger tip control by the tractor operator. Ditches can be cleaned to a depth of 3 ft. 6 inches and the section of the drain can be altered by the adjustable setting of the rollers on which the chain runs. The spoil is dug out of the drain and deposited well away from the edge on the side on which the tractor is operating. On wet clay there is however a tendency for some of the spoil to be dropped too near the drain as mentioned later in this report.

Conditions

A trial was carried out on very wet clay at Alice Holt in March using drains which were in urgent need of cleaning and deepening. These drains had originally been about 2 feet deep but they had filled in to a depth of 1 ft. or less with a great deal of vegetation impeding the flow of water. The crop on this very flat area was small oak with some of the trees planted close up to the existing drains.

Observations

1. A typical example of the drains before cleaning is seen at Photograph 2. and the result after two cuts by the machine at Photograph 1.

No difficulty was experienced in operating the machine in these conditions except that any standing tree within

On this showing this is a most valuable machine with great possibilities over a wide range of circumstances and soils. Consideration & DPs attention should be drawn to this Report and we should pursue & develop use of this machine as rapidly as experience justifies.
C.S. 9.5.57

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two feet of the drain centre was an obstruction as it was fouled by the chain cutters. In several cases about 2 feet of drain had to be left to be cleaned by hand opposite these close standing trees.

To give adequate room for the machine to work the ride must be at least 12 ft. wide.

2. The speed of the machine when cleaning is 0.4 M.P.H. but the working speed allowing for the minor difficulties that were met was about 20 chains per hour.

It was found that in most cases it was necessary to give three separate cuts to restore drains under these conditions to their original depth of 2 feet. The hourly output of finished drain was, therefore, 6 - 8 chains per hour. Each cut deepened the drain by 3 - 5 inches but the first cut always appeared to do far more than this as it was this first cut that cleared the vegetation from both bottom and sides. The shape of the drain was entirely reformed.

There was a tendency for the wet clay to cling to the cutters of the chain. Under drier conditions the output rate would probably be faster. This clinging also caused a certain amount of the spoil to be dropped too close to the edge of the drain.

The machine is remarkably immune to damage by obstacles such as roots which it cuts effectively up to a diameter of 3 ins. Rocks and loose stumps can not be cleared and these must be removed by hand. No actual breakages of any parts took place during the $1\frac{1}{2}$ days trial but it appears that about one hour per day is needed on maintenance of the Lincoln attachment (apart from the tractor) for such services as replacing hinge pin, split pins, tightening the chain etc.

3. Operating Cost. The hourly operating cost of the Lincoln machine is calculated as follows:-

/Tractor

*Working Plough at 2 1/2 m.p.h.
= 200 chains per hour
= 25 x 30
chains as per*

Tractor (Forestry Commission rate)	=	18/3d per hour		
Operators wages at 4/4d + 40% overheads	=	6/1d	"	"
Lincol machine (£750 based on 3,000 hours life) Depreciation	=	5/-	"	"
Maintenance of Lincol machine (estimated)	=	2/-	"	"
	TOTAL	31/4	"	"

Taking an output rate of 6 chains per hour the cost per chain would be 5/3d. The cost of doing the same work by hand is over £1 per chain.

Conclusions

Under the conditions met on this trial, the Barford Lincol ditch cleaner has shown that it is a very effective implement for the cleaning of roadside drains. The results indicate that a substantial saving in costs over hand labour can be obtained.

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Photograph 1. The machine is here seen doing a third cut to complete the restoration of a drain in a clay soil.



Photograph 2. The same drain before restoration.