Headquarters Mechanical Development Committee
Report No. 56
The Danish Tolne Plough

Origin

This plough was seen by members of the staff of the Forestry Commission during a tour of Denmark by the Society of Foresters in September, 1955. It was noted as being able to cultivate land for forest planting which was similar to several areas in East England. One of these ploughs was, therefore, imported for trial.

Description

(see Photograph 1)

The plough fits onto any tractor with three point linkage and is primarily designed to cut a shallow furrow throwing the inverted turf to left and right over a wide area. A subsoiler follows in the centre of the furrow and the result is very similar to that achieved with the mounted two throw plough covered by H.Q.M.D.C. Report No. 22. The advantages claimed for the Tolne plough are:-

(a) A rigidly mounted roller which runs ahead of the point of the mouldboards and disc coulter lifting the plough over any obstruction, such as a stump, which may appear in the path of the plough. This roller is adjustable for height and controls the depth of the ploughing. (There are no depth control wheels).

(b) The subsoiler which is mounted on a free parallelogram allowing it to rise and fall independently, as it passes over stumps and other obstructions. The subsoiler is held down by the weight of the plough operator who sits on a seat on an extended arm of the parallelogram.

(c) The resulting shallow ploughing and subsoiling are considered to give good planting conditions on some types of ground.

The plough was supplied by:-

Plovfabrikken,
Bovland,
Pr Branderup,
Denmark.

The price was £154. 6.11. including import duty of £19. 6. 8. and agents charges of £12.12.5.

Trial

The plough was seen working in Hevingham forest in Norfolk in September, 1956. The ground was flat carrying, on one site, a crop of low scrub Birch up to about 18 inches high and, on the other site,

Observations

1. A considerable area of the birch covered ground had already been ploughed and the results provided good planting conditions with vegetation suppressed over a width of 40 inches and a subsoiled path in the centre 5-6 inches deep. See photograph 2.

The results in bracken were similar. The plough was able to pass through the bracken without any signs of choking.

2. The front roller was most effective in raising the coulter and plough points over stumps. The plough came out of the ground and within a few feet had gone down again to the pre-set depth.

3. The plough was being used on the standard three point linkage of a Ferguson tractor fitted with Opperman wheel strakes. Wheel slip occurred on a number of occasions showing that the Ferguson drawbar pull gave very little margin. It is understood that the Danes normally use a Bristol tractor giving a higher drawbar pull.

4. Dynamometer tests showed that the steady pull required to pull the plough when operating correctly was 1,500 lbs.

5. It was noted that the plough operator has to work very hard in keeping the plough vertical by putting his foot down on one side or the other. When going over stumps he has an extremely rough ride and it would need a very fit man to keep going throughout an eight hour day. The need for a plough operator in addition to the tractor driver substantially increases the operating cost per hour compared with other similarly mounted implements.

6. The output rate which has been achieved at Hevingham is 4-5 acres per day. Costs can therefore be calculated as follows:-

Ferguson tractor at 5s. per hour	= £2. 0s. 0d.	per day
Tractor operator and ploughman at 7s. 6d. per hour	= £3. 0s. 0d.	" "
40% on-cost on labour	= £1. 4s. 0d.	" "
Plough depreciation and repairs approx. 1s. per hour	= 8s. 0d.	" "
TOTAL	£6.12s. 0d.	" "

Taking an output of 5 acres per day the cost on this basis works out at £1. 6s. 5d. per acre.

Conclusions

1. The Tolne plough is very effective for ploughing areas containing a large number of stumps owing to its ability to ride over the stumps without suffering damage.

Conclusions (contd.) 2. The need to have a man riding on the plough is some disadvantage in view of the physical endurance demanded of him and the extra labour cost.

R. G. Shaw

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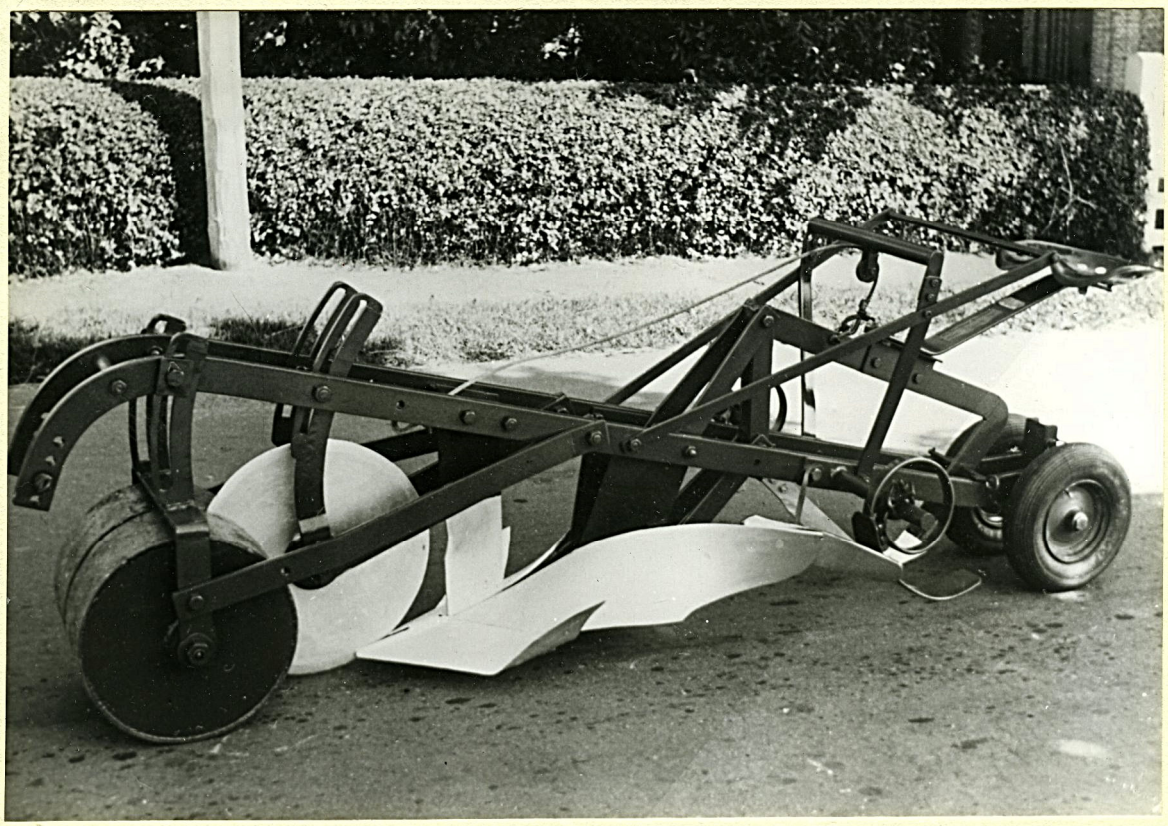
November, 1956



Photograph 1. A general view of the Tolne plough. Note the roller in front which lifts the coulter and share over stumps and other obstacles.

Photograph 2. A view of the results of Tolne ploughing on ground free from obstructions.