

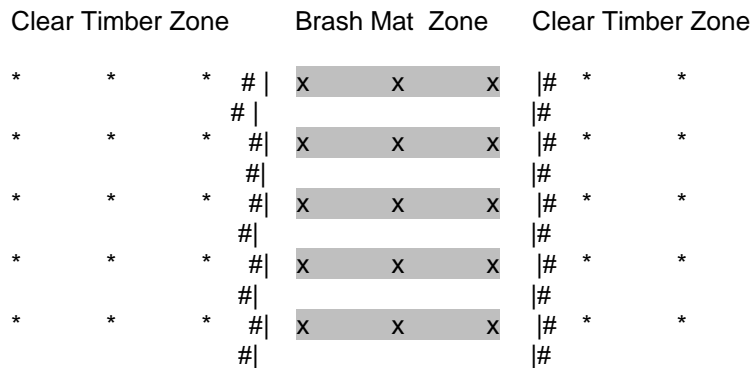
The “Cawdor Technique” A Brush Handling Method for the Bräcke Planter.

Logistics:

An excavator fitted with a ditching bucket travels each brush mat. Three holes are punched through the brush, one in the centre of the excavator’s tracks and one on the outer edge of each track. The operator pushes the bucket backwards and forwards until the teeth of the bucket have reached the underlying ground surface. The bucket is then turned and emptied of soil (collected from next to the brush) into the hole to provide sufficient soil to provide a planting spot in continuous contact with the ground. Brush on the edge of the mat can be pushed into pits created from mining the spoil for the brush mounds.

Where the brush mat is more extensive than 3 rows the excavator operator can provide additional mounds as required.

An excavator fitted with the Bräcke planter then passes along the prepared brush mat following the first excavator. The operator uses the mounding head to create hinge mounds in the timber zone and plants directly into the prepared spots in the brush. The latter planting spots require minimal preparation, usually just firming up, and are quickly planted. 3 planting spots are laid out to one side with 2 being laid out on the other side. This gives 8 planting spots per pass.



- * Bräcke mounds
- x Excavator “brush pits”
- # Soil mining pits

Outputs:

The planter is capable of planting a carousel (70 plants) in 15 minutes. This would give around 250 plants per hour or about 2250 plants per day over a 9 hour working day. The brush handling machine can cover almost twice the area a planter can cover in a day, as it does not have to mound the entire site.

For maximum job quality it is suggested that a 3rd man to be available in the field filling the carousel when it is empty and checking the planted trees to ensure they are planted correctly. (The 3rd man can be of assistance in loading trees onto the excavator at roadside, maintaining a supply of fuel and trees from roadside, assisting with daily servicing/greasing, filling with water and also with any tree shelters that may require fitting. It may also be possible to use the field man as a backup driver during break periods in order to maintain productivity.)

The technique is considered to be applicable to the vast majority of excavator accessible sites with even heavy brush sites being possible to handle in this manner. On light brush sites it is probably more economic to use the Bräcke alone – although even here a field man would be beneficial.

(Note: It should be possible to design an alternative bucket – with a point on the digging edge – capable of holding soil and punching through the brush at the same time.)

Ten Advantages For the Contractor

1. Each machine is doing the job it is best suited to – the Bräcke can handle incidental brush but is not called upon to handle heavy brush that would slow it down and could cause damage to the machine. The brush handling excavator is not being called upon to carry out the heavy digging work associated with spoil drain mounding (less fuel used and less wear and tear) and the dangers from “flying brush” are minimised.
2. The brush excavator can dig out any stumps that are in the way of the tracks for both machines. This would allow a standard clearance excavator to be used to mount the Bräcke planter allowing it to travel easily without having to handle stumps.
3. Bräcke output rates are significantly higher than when handling heavy brush.
4. Where other site works (drainage, road repairs etc) are required the brush excavator can get ahead of the Bräcke for a period. Once the supplementary work is completed or the planter has completed the prepared mounds the brush excavator can resume handling the brush.
5. With a 3rd man in the field, the perceived problem of operators having to leave the cab every 15-20 minutes is avoided.
6. A cycle time of 15 minutes with a 1.5 minute refilling time (assumes 3rd man) provides the planting operator with a good balance of work and break time.
7. The operator on the brush excavator can regulate the relative speed of the two excavators by putting out more mounds in the timber zone. This will slow down the brush excavator whilst speeding up the planting excavator. The two machines can therefore be kept “in balance”.
8. If the two operators are used interchangeably on the machines this will provide a degree of variety and each operator will get to know the requirements of the Bräcke. This will enable them to present better mounds for the Bräcke.
9. Two machines working on the same site provides improved health & safety conditions as well as mutual encouragement when compared to lone working.
10. As both machines travel on the brush at all times there should be little chance of machines becoming bogged in soft ground. If one machine gets into trouble on soft ground the second machine can assist immediately rather incurring the cost of having to bring in a second machine.

Ten Advantages for the Forest Manager

1. The planting spots created in the brush mat provide a mound in contact with the underlying soil. This will ensure even root development.
2. The presence of a 3rd man on the ground ensures a high standard of planting, and provides the possibility of carrying out small-scale tree shelter fitting where required.
3. The passage of the Bräcke excavator over the brush mat results in the mat being flattened again. This improves visibility for vermin control & accessibility for any subsequent operations.
4. Minimal brush disturbance means nutrients from the brush mat are available to the topsoil and young tree roots in the surface layer rather than being buried in spoil trenches.
5. Potentially soft ground associated with spoil ditches backfilled with branches are not going to be a problem in future harvesting operations.
6. The lack of brush filled ditches reduces potential rabbit warrens. Compacted brush is not attractive to rabbits.
7. Both machines travel the brush mats. This provides better ground bearing capacity for the both excavators and less ground damage.
8. Environmental impact is minimised as the lower level of soil disturbance reduces the potential for erosion and oxidation of carbon in peat soils.
9. Trees are more evenly spaced than with brush raking or windrowing of brush.
10. The technique described is broadly applicable across a range of sites including those with heavy Sitka brush. It should be possible to use this method on **freshly felled** sites as the green brush is heavy and will hold together. Depending upon the timing of the work this should provide one-year weevil-free growth for the young plants.

B Sutton, Development Manager, Alba Trees Plc

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Planted Mounds in Heavy Sitka "Brash Pits"

