

Næ-Moulder[®]

Ground Prep

Faster – Safer – Greener

How does the *Næ-Moulder* work ?

The *Næ-Moulder* operates across the contours incorporating a close coupled subsoiler and plough share which is drawn through the soil by an excavator or by a 4WD tractor or crawler. Working across the slope the subsoiler breaks up any pan and aerates the soil while simultaneously inverting a shallow furrow of topsoil through which the trees are planted

The Benefits of *Nae-Mounding*:

Silvicultural

The Nae-Moulder operates across the slope creating a raised planting position of topsoil with a subsoiled base. This encourages rapid establishment and growth. The *Nae-Moulder's* subsoiling reduces water accumulation under the root plate and the trees are able to develop a 360 degree root system which improves crop stability and nutrient uptake. On wet soils the likelihood of mounded pits being full of water inhibiting root development is avoided.

Environmental

The subsoiling significantly improves water absorption and slow release thereafter. Risk of flash floods with soil and carbon loss is much reduced and in dry years the conserved water benefits the trees.

Safety

The Nae-Moulder produces a shallow trench and an upturned layer of topsoil across the slope. The upturned furrow provides an easily followed guide for planting, beating up, weeding etc. No mounds to trip over and no associated pits to fall into. Fire control is not compromised by mounds preventing firefighting equipment gaining access to the scene of the fire.

Less Damage to Machinery and Standing trees

Conventional mounding has implications for the life of the crop. In thinning's small harvesting machinery will sway from side to side, damaging standing trees either side of the rack, causing more wear and tear to the machines. Likewise mounds make clear fell sites rougher on machines and operators alike.



Productivity and Cost Benefits

Woodland Creation – On sites permitting travel across the contours the *Nae-Moulder WCR* (Woodland Creation model) is attached to 4wd tractors/crawlers and will be up to 50% more productive than continuous mounding. There will be significant savings of time and fuel.

On steep slopes or sites otherwise inaccessible for tractors/crawlers the *Nae-Moulder MP* (Multi- Purpose model) is deployed using an excavator. It will be up to 25% more productive than conventional bucket mounding.

Re-Stock sites – The Nae-Moulder MP (multi-purpose) effectively ground preps where the trees were standing or windblown prior to harvest.

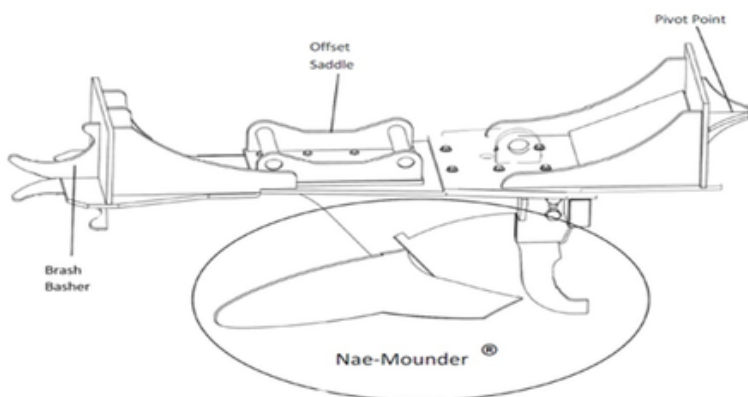
The Nae-Moulder's 'Brash basher' rakes brash into a tight brash mat leaving a clean site for Nae-Mounding and subsequent planting. Raking the brash leaves a cleaner and safer site for manual operators. Retaining the brash keeps the fertility on site. The Nae-Mounding will be up 10% more productive in terms of time required to cover a given area. Nae-Mounding uses less horsepower than conventional mounding/trench mounding resulting in a significant 15 – 21% fuel saving.

The *Nae-Moulder* has Silvicultural & Environmental benefits at lower cost :-

The *Nae-Moulder* prepares an optimum planting site for rapid establishment and growth.

- The *Nae-Moulder* creates a safer working environment – Brash is raked leaving a cleaner site with no mounds or brash to trip over or pits to fall into.
- The *Nae-Moulder* works across the contours improving water retention and mitigating the risk of flash flooding and loss of soil/carbon.
- The *Nae-Moulder* suppresses initial weed incursion and alleviates waterlogging.
- The *Nae-Moulder* is more productive - more hectares per day prepared for planting.
- The *Nae-Moulder* has a lower carbon footprint burning less fuel and minimising soil
- The *Nae-Moulder* reduces the risk of damage to machinery and standing trees in thinning and harvesting operations.
- The *Nae-Moulder* improves access for fire fighting
- The *Nae-Moulder* is good for the tree and good for the environment - **Faster** – **Safer** - **Greener**

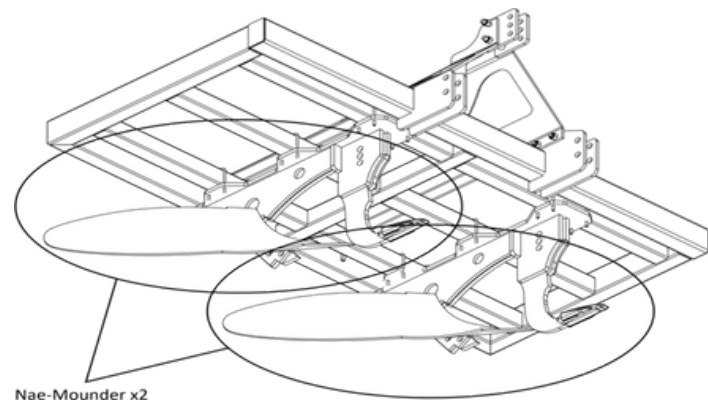
Nae-Moulder MP = 'Multi-Purpose' model



In the Multi-Purpose model (MP) the Nae-Moulder is centrally positioned in a robust chassis incorporating a 'Brash Brasher/Rake' and an excavator 'Pivot Point'.

The Nae-Moulder MP simultaneously subsoils and rips through roots and compaction inverting a shallow layer of topsoil through which the trees are planted. The 'Pivot-Point' is used like a bucket enabling the excavator to pivot, negotiate high stumps, cross over ditches and climb steep slopes. The Brash Basher/Rake handles the brash to compress the brash racks and clear the desired planting area.

Nae-Moulder WCR = 'Woodland Creation' model



The Woodland Creation (WCR) model, incorporates two Nae-Moulders in a robust frame with Cat.2/3 linkage.

The spacing between the Nae-Moulders is adjustable, 1.8 – 2.2m. The stocking rate is further adjusted by varying the distance between the plants.

The Nae-Moulder WCR is significantly more productive than continuous mounding. It reduces the cost of establishment and makes all subsequent operations less hazardous for operatives and machines.

Nae-Moulder - Operational Guidelines

Power Units:-

Nae-Moulder - WCR - Woodland Creation

Tractor/crawler hp 180/250

Nae-Moulder - MP – Multi-Purpose

Excavator wt. 14/20 tonne

Whether used for woodland creation or re-stocking the Nae-Moulder gives the planters the widest range of planting options. Stocking rates are easily varied across the site compared to the inflexibility of pre-determined stocking intervals dictated by the pattern of mechanical mounding.

Across a typical site the ground will vary from dry to wet with dry knolls and wet flushes. The Nae-Moulder working across the contour enables the planter to assess soil type and inherent moisture levels and plant the tree in the best position to match the conditions; EG planting on the inverted soil in the wetter areas and in the damper furrow for drier conditions.

Woodland creation

The Nae-Moulder WCR is operated across the slope and is specifically constructed for high output ground prep in woodland creation.

Select the towing vehicle to suit the ground conditions - wheeled or tracked. Decide stocking density and set lateral spacing of Nae-Moulders accordingly. Brief the planting gang on desired lateral spacing.

Excessive ground cover is likely to hinder efficacy so apply appropriate treatment in advance e.g. herbicide/mulching. Plan the pattern of travel across the site to optimise moisture management, adhering to water guidelines and Forestry Authority guidance - 'Cultivation for Upland Productive Woodland sites' On former 'improved' farmland identify the extent to which land drains are present and plan accordingly.

Depending on site conditions the Nae-Moulder will cover up to twice the number of ha. per day compared with mechanical continuous mounding.

Woodland creation on steep ground - Nae-Moulder MP

When woodland creation sites are inaccessible to 4WD tractors or crawlers the Nae-Moulder MP is deployed on an excavator which travels up/down the steepest of sites, working the Nae-Moulder from side to side across the slope.

Re-stock sites – Nae-Moulder MP

Involvement and co-operation with the harvesting team is essential from the outset. The felling pattern and brash management must be planned in advance. Felling should follow the lines of the trees. Stumps to be cut as low as possible and brash cut to 2m. The brash mats will normally be 14/16m apart but the spacing can be varied to suit the operating reach of the harvester and excavator.

The operator of the excavator should be familiar with and skilled at conventional mounding.

The Nae-Moulder MP is designed to operate parallel to the ground and a simple level indicator is fitted as standard.

On windblown sites the harvester is instructed to leave the stumps as near upright as is practicable. The Nae-Moulder's 'brash basher' rakes the brash into the brash mat. This leaves a 'clean' site making it easier for planting gangs and subsequent maintenance operations. Soil exposure and carbon loss is minimised.

Productivity and Fuel Saving

As with conventional mounding Nae-Moulder output per day will vary with site conditions and whether the compartment was windblown or standing when felled. Experience of Nae-Mounding on sites varying from blown to standing and up to 41% slopes indicates that Nae-Mounding will always be more productive than mounding with less fuel consumed. On restock sites savings of 10-20% can be expected.

The Production and fuels statistics Courtesy David A Shanks of Crieff using a CASE CX 180D. The stats derived from careful monitoring of several 35 -50 year old Sitka spruce re-stock sites; some of which were windblown.

The site conditions varied between brown earth over clay, pure clay and peaty to very steep, up to 41%