

MICROSITE PLANTING MECHANICAL SITE PREPARATION

Sometimes, growth limiting factors are so severe that even the best planting spots do not provide the conditions for good seedling growth. In that case, foresters may decide to create better microsites with mechanical site preparation (MSP). MSP is done after logging but before planting, with machines that dig, plow, scrape, or mix the soil. Depending on the machine used, mounds and depressions can be created, or characteristics of the material at the soil surface can be changed.

MSP techniques are tailored to create microsites that offset the growth limiting factors. For example, on cold sites, the objective would be to create high spots to improve drainage and soil temperature. On hot, dry sites, the objective would be to create depressions, so that seedlings could have more access to soil water.

Some examples of MSP equipment and the soil profiles they create

Powered disc trencher



Mounding



Soil profile



Soil profile



Disc trenchers create continuous furrow with a raised berm that is topped with mineral soil. Disc trenching can produce 3 distinct planting positions:

- Trench position for dry sites.
- Hinge position for medium sites.
- Berm position for moist sites.

Mounders create small or large individual mounds that are capped by mineral soil. Mounds vary in size depending upon their composition and the objective of the mound treatment. On heavy, clay soils mounds require only 10–15 cm of mineral soil capping, while on wet organic soils mounds can be as large as required to elevate the seedling root system above restrictive high water tables. In most cases, mounds should not exceed 20–30 cm in total height after settling. Mounds must be wide enough to control competing vegetation. Seedlings are usually planted on the top or side of the mounds.

Some more MSP examples

Ripping



Mixing



Soil profile



Soil profile



Ripper plows create continuous trenches with a side cast on both sides. They are used on either dry sites to create microsites that conserve moisture or wet sites (when frozen) with thick organic layers or deep organic soils. Seedlings are usually planted just above the trench towards the hinge position (see slide 4).

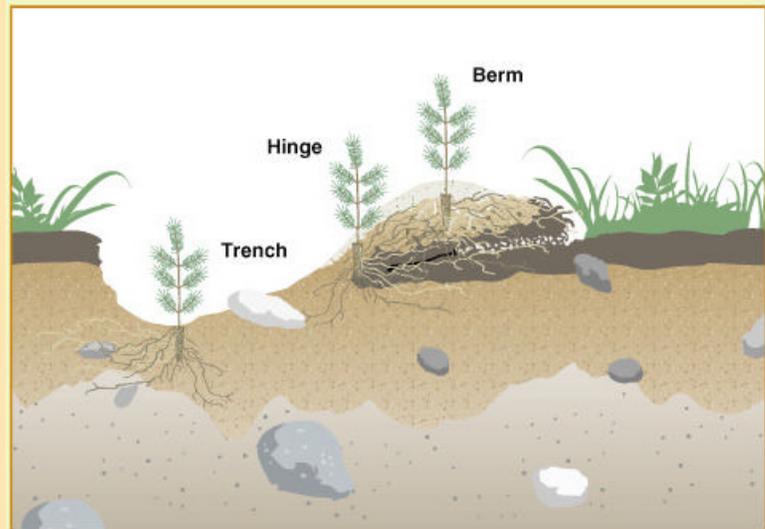
Mixers mix mineral soil and the forest floor. The result is looser, warmer rooting conditions and some relief from vegetation competition. Seedlings are usually planted in the middle of the mulched spot.

The best microsite to plant on prepared sites varies from site to site, depending on the growth limiting factors. This illustration shows seedlings planted in three different microsities.

What would be best?

Based on the information presented in this slide show, we know that on cold, wet sites, the best microsite would be the top of the berm, on cold, but not so wet sites, the best spot would be the hinge, and on hot, dry sites, the best spot would be just above the trench towards the hinge position. However on hot dry sites with deep loamy soils the trench may be a suitable position as long as grazing cattle cannot access the site.

What's the best microsite to plant on a prepared site?



- **Varies with site**
- **Varies across British Columbia**

Your supervisor should instruct you about where to plant on each prepared site. If you have any questions – don't hesitate to ask! Its very important to take advantage of the microsities created by MSP.

Trampling Damage



Photo: Brian Wikeem, Research Branch, MoF

This photo shows a grazing cow trampling a seedling. When cattle graze in new plantations, significant damage to seedlings can occur from trampling. Trampling damage is highest in the first two to three years following planting. On site prepared sites cattle walk along the bottom of the rows. Trampling damage can be reduced by planting seedlings up off the bottom of the trench into the hinge position.

MSP is expensive - its important to take advantage of the microsities

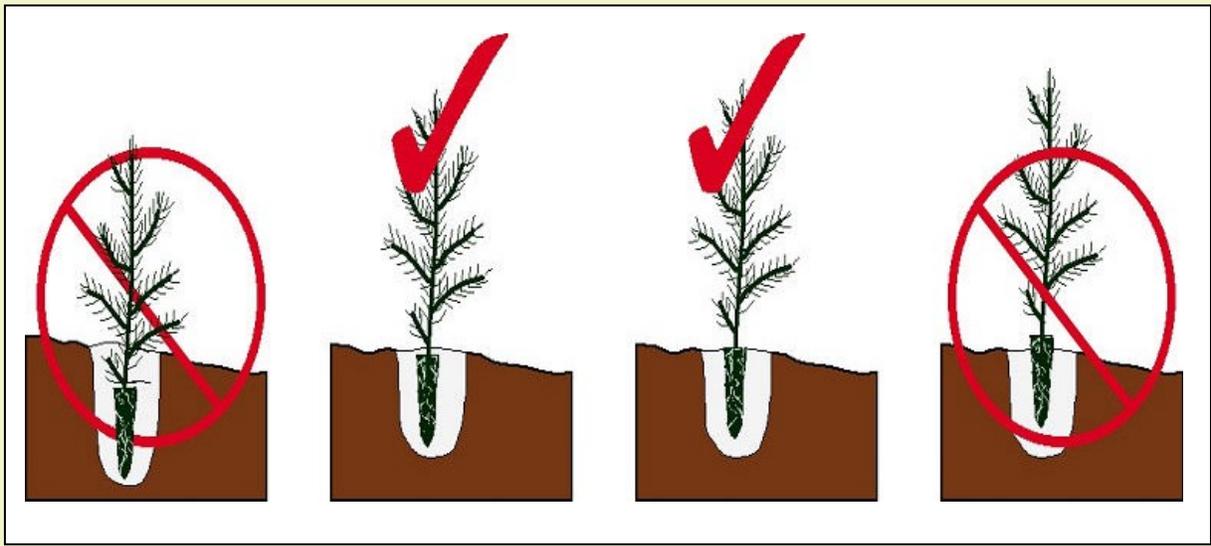


Here is a photo showing a seedling planted in a mound, with the side cut away to show you the rooting profile. You can see that the spot is raised and free of vegetation, and that there is rich organic material for roots to grow in.

MSP is expensive, and it is important that seedlings are planted to take the best advantage of it. In this case, the seedling has been planted in the very centre of the mound, which is the microsite that is warmest, driest, and furthest away from vegetation.

- It is important to plant there prepared areas properly.

How deep should seedlings be planted?



Seedlings should be planted neither too deep nor too shallow. Where conditions are dry, planting a little deep, to the bottom of the foliage, will put the roots into slightly moister soil. However, planting too deep covers up the needles and reduces the ability of the seedling to photosynthesize. Where conditions are cold and wet, plant so that the root plug is just barely covered.

This will put the roots in the warmest, driest spot. Do not leave part of the root plug sticking out of the soil - roots that are exposed to air dry out and die and the seedling will have less root area to absorb water and nutrients. Sometimes you may be told to plant all or part of the root plug in the forest floor. It's a good substrate for root growth on moist sites.

Not too deep and not too shallow!

THE BOTTOM LINE

- Microsite planting is **very important**.
- If you're not sure where to plant... ask your Supervisor
- The results of planting correctly will provide benefits for a long time.