SECTION 6

6.1 SITE PREPARATION – RIPPING

6.1.1 Discussion and Application to Oil Mallees

Ripping will assist with the absorption and retention of soil moisture and create an environment where tree roots have easier access to this resource. It may also release some nutrients.

All oil mallee sites are on farmland, and it is highly likely that all farmland will have some degree of compaction pan that will need relieving for maximum performance in tree growth. Therefore, ripping is essential on all sites.

It is essential to investigate each site to understand the nature and depth of the hardpans to be dealt with. A prescription for the depth of ripping and the type of machine required can then be written.

Most wheatbelt farmers have tractors of sufficient horsepower to deep rip tree lines. While three point linkage equipment has the advantage of being able to use the weight of the tractor for better penetration, configuration of the machinery may make it necessary to use trailing equipment. This equipment is available for use/hire in most areas.

Use of single pass planting machines is common, particularly in lighter soil types. This technique has the potential to provide good cost effective results but must be monitored to ensure that the ripper is set deep enough to break through hard pans. The hardpan depth should be checked regularly and a separate ripping operation used where needed. This will speed up the scalping/planting pass, and ensure that roots and rocks are cleared.

Maximum shatter of the ground and consequently maximum soil aeration will be achieved by ripping in summer and autumn when the subsoils are at their driest. Little is achieved by ripping clay soils when wet.

Clods, roots and rocks bought up while ripping must be cleaned up before planting. This is to facilitate an efficient harvest and is much easier done before trees are in. Clods may be squashed by running a tractor wheel over the riplines but (particularly in clay soils) this will cause surface compaction that may make hand planting more difficult. Tractor wheels will not eliminate deep gaps and air pockets and this needs to be considered in heavy soils at planting time. Other options for cleaning up cloddy soils are ploughing or use of a heavy towed scraper, such as those constructed of railway line.

Sound land management practices for erosion prevention must be followed. Enlist the assistance of a Community Landcare Technician if unsure.

6.1.2 Key Points

- Depth of ripping should be determined by site inspection (backhole, probe, shovel). Little benefit will be gained by ripping below 500mm unless there is a ripable hardpan within reach of affordable equipment.
- All soils benefit from ripping, including deep sands.
- The main function of ripping is to relieve traffic pans, normally at 2-400mm.
- To eliminate erosion problems ripping should be on or close to the contour.
- Do not rip across waterways.
- Mound rip lines if there is a risk of waterlogging.

Note: Use of winged tines.

Once actively promoted, the benefit of winged tines is now being questioned. Winged tines increase the efficiency of ripping by increasing the area of shatter per unit of drawbar pull, however there is no evidence from existing research trials to suggest this increases growth or survival. Trials have not been performed specifically for oil mallees or in the low rainfall regions where the oil mallee program operates. While it would be unwise to discourage anyone from fitting, using or trialing this equipment, it can't be promoted as advantageous on existing trial data. A reasonable compromise is to use narrow tine rippers (less resistance), with a broad boot for greater lift and shatter.

The angles of life and rake are important in the design of wings for tines, for maximising their efficiency.

Having two lesser tines ahead of and to either side of the main tine lessens the drawbar pull considerably.

6.1.3 Disadvantages

Waterlogging and fungal infection may increase with ripping on shallow duplex soils. In the low rainfall areas the risk is minimal. Where waterlogging is suspected to be a significant risk consider mounding, which will overcome these problems.

Ripping (any ground disturbance) may change the type and/or status of weeds on the site. This will need to be monitored.

PAPERS ATTACHED

1. Improving the efficiency of ripping.
   Reprinted from Forest Industries Review August 1977.
2. Graph of results of ripping trial work.

6.2 SITE PREPARATION – MOUNDING

6.2.1 Discussion and Application to Oil Mallees

This technique is only essential on those sites where losses are to be expected from seasonal waterlogging. Mounds may also be necessary on sandplain seep locations to get trees established. Sites permanently waterlogged or badly salt affected are not suited to oil mallees.

Generally trees respond well to mounding, as there is a stockpiling of topsoil and nutrients as well as good aeration of the soil. However, there is some uncertainty as to how the harvester will deal with mounded sites so it is wise to keep them to a minimum at this stage.

Mounding can be done with a grader but this is not recommended, as it is difficult to control the shape, width and compaction of the mound. Avoid trailing mounders, which do not have a press wheel. The function of the press wheel is critical to mound construction, providing the profile and compacting the soil. For the limited use that the oil mallee program has for mounders there are sufficient machines available for hire from Land Conservation District Committees and CALM district offices in the Wheatbelt.

6.2.2 Key Points

- Mounding reduces waterlogging stress.
- Mounding is not a substitute for proper drainage work.
- Caution is needed to ensure that mounds do not interfere with surface water movement. This can cause erosion or increase waterlogging.
- Mounds should be constructed in the year of planting, but with sufficient time to settle and for any weeds to germinate.
- Mounds will prevent herbicides being concentrated in the riplines.
- Weed control may be more difficult over mounds.
- Growth responses have been attributed to mounds on all soil types.
- Shape of mound and compaction with press wheel are important.
- Heavy soils may require cultivating first to prevent cloddy mounds.

6.2.3 Disadvantages

Mounds will limit access across paddocks to some degree. Leave breaks through mounds at regular intervals for stock mustering.

Light soils may cause problems with increased exposure to wind erosion and increased likelihood of drought death.

Mounding (any ground disturbance) may change the type and/or status of weeds on the site. This will need to be monitored.

PAPERS ATTACHED

Mounding for tree establishment in saline seeps. Reprinted from Land & Water Research News.

6.3 SITE PREPARATION - CULTIVATION

6.3.1 Discussion and Application to Oil Mallees

Cultivation may be useful as a grooming technique after ripping to ensure that the site is suitable for harvest machine access. It may also be used to break up clods of clay bought to the surface in ripping, and to fill in cavernous rip lines in heavy soils.

Some nutrient response can be expected after cultivation, as it is with mounding.

Some weed control may be achieved with timely cultivation, and the well-prepared bed will be ideal for spraying.

6.3.2 Key points

- Much of the positive response of mounding (except for the amelioration of waterlogging) may be attributable to cultivation.
- Cultivation may help with control of some perennial weeds.
- Cultivation may help fill in open riplines in heavy soils.

6.3.3 Disadvantages

As with cultivation of cropping land there is a risk of erosion by wind and water, particularly on light soil types. This risk must be weighed against any benefits when writing a prescription for a particular site.

6.4 SITE PREPARATION - FURROWLINING and SCALPING

6.4.1 Discussion and Application to Oil Mallees

The preference for getting oil mallees away from the valley floor and onto the slopes means that a lot of planting's are on lighter country. These locations are often exposed and can dry out quickly in the spring. The furrowing technique may be appropriate for machine planting this light country where there is no risk of waterlogging. The dish created by the scalp or forrowline collects additional moisture in the sandy soils and provides some shelter to the young seedlings.

Although initial weed control is usually good, close attention needs to be paid to spring weed control. The furrow can trap wind blown weed seeds and turn good weed control into a concentrated area of dense weed growth.

There is some uncertainty as to how the harvester will deal with furrowlined plants. The ridges pushed to the sides may have to be swept aside or partially back into the trench at a later stage. Much of the concern is not the depth of the trench, but the combination of this trench with the ridge of spoil where the harvester will probably travel.

Aim to minimise the spoil by limiting the depth to the minimum need to remove the weed seed bank and/or non-wetting soil. Consider flattening ridges if excessive - there may be an opportunity to plough this as weed control in spring or the second year.

6.4.2 Key Points

- Used in deep and/or non-wetting sands.
- May be useful for initial weed control, but weeds may blow into the furrowed area.
- Deeper planting will provide some wind protection.
- Furrows will collect and run water, so it is essential that they be on or near to the contour.
- Ripping to the appropriate depth beneath the furrow is still essential.

6.4.3 Disadvantages

Removal of topsoil and its nutrients may slow the initial growth of the trees. To determine if compensatory fertilising is warranted, review fertiliser history with the farmer and assess the position of the planting in the paddock. With integrated planting's in particular, the trees will usually benefit from any paddock top dressing.

PAPERS ATTACHED
Effects of different site preparation treatments on P. pinaster on sandy soils (Fremlin, 1993)