How to establish a cover of soft weeds

Application of phosphate fertilisers

If there are many noxious weeds in the plantation (alang-alang, _melastoma_, _dicranopteris_) the soil is likely to be phosphorus-deficient. Beneficial weeds such as ferns and legumes grow better in phosphorus-rich soils.

To help the good weeds grow and reduce the growth of noxious weeds it is useful to apply phosphate fertilisers as follows:

- 500 kg/ha soluble P fertilisers (TSP, SP-36)
- 500–1000 kg/ha reactive rock phosphate

Spread the P fertiliser evenly throughout the plantation, mostly in the inter-row and over the frond stack.

Establishing legume cover plants or other soft weeds

<table>
<thead>
<tr>
<th>Name</th>
<th>Shade tolerance</th>
<th>Sowing practices</th>
<th>Other properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Calopogonium caeruleum</em></td>
<td>Very tolerant</td>
<td>Needs scarification</td>
<td>Very productive; tolerant of heavy shade</td>
</tr>
<tr>
<td><em>Mucuna bracteata</em></td>
<td>Tolerant</td>
<td>Needs to be sown in a seedbed and then</td>
<td>Good N fixation; good soil cover; prevents soil erosion</td>
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<tr>
<td></td>
<td></td>
<td>planted; benefits from inoculation</td>
<td></td>
</tr>
<tr>
<td><em>Calopogonium mucunoides</em></td>
<td>Somewhat tolerant</td>
<td>Needs scarification</td>
<td>Pioneer species; short life span</td>
</tr>
<tr>
<td><em>Pueraria phaseoloides</em></td>
<td>Somewhat tolerant</td>
<td>Needs scarification</td>
<td>Grows quickly; very palatable for livestock</td>
</tr>
</tbody>
</table>

Legume cover crops are best sown at the time of land preparation, when all the other weeds have been cleared. If there are many weeds, then the legumes may still grow, but selective weeding will become very difficult. In plantations where clear-weeding was a normal practice, legume cover crops can be sown directly after spraying. For sowing or planting legume cover crops, follow the steps below:

**Step 1.** Select the appropriate legume cover crop. They can also be mixed to increase the chances of successful establishment.

**Step 2.** Scarify the seeds, if necessary. Scarification is required to remove the hard outside of the seeds, so that the seeds can germinate faster and simultaneously. Scarification can be done mechanically (with sandpaper), by using 70% sulphuric acid or by using hot water [13]. The sulphuric acid method is the most common and the most effective one, but the acid may not be widely available and is a dangerous chemical, which is also difficult to dispose of after use. Therefore, the mechanical scarification or the hot water treatment are recommended.

For mechanical scarification, use the following approach:

- Place the seeds on a table between two pieces of sandpaper
- Make small rounds with the sandpaper, first one way and then the other
There is no need to rub off the complete outside of the seeds; there just need to be some deep scratches for the water to enter.

For scarification with hot water, try the following with a small batch of seeds:

- Heat water to boiling in a pan.
- Take the pan from the fire and let the water cool down to 75°C (check the temperature using a cooking thermometer).
- Add the seeds to the water and stir for 3 minutes.
- Remove the seeds and rinse them with cold water, or leave them in the hot water to cool overnight.
- Sow the seeds on the next day, or sun-dry them immediately to prevent rotting or germination.
- The optimum temperature and soaking time vary from species to species; if the germination is not good, then it is recommended to try different temperatures and find out what works best.

**Step 3.** Broadcast the seeds in the plantation, on bare soil or in an area that was recently weeded. Start with a small area to see if the legumes are able to establish effectively.

Apart from sowing legume cover crops, the population of *Nephrolepis* ferns can also be increased. To achieve this, pull the ferns from the trunks of the palms (roots and all) and throw them in the inter-row. Some of them may establish and start growing. The application of empty fruit bunches promotes the growth of *Nephrolepis* ferns.

**Slashing inter-row vegetation at knee height**

- Every six months slash all inter-row vegetation at knee height using a bush knife.
- Note: in some plantations it is considered a good practice to let the ferns in the frond stack area grow over 1 meter tall.