

Replanting blueberries: things to consider to prevent erosion and sediment loss

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- Do not leave bare soil exposed for a long period of time
- Do ground works during the dry season period
- Re-establish fast growing grasses to protect soil
- Slopes greater than 31% are not recommended for orchard development

Soil is essentially a non-renewable resource because it erodes faster than it forms. In NSW, soil generally forms at 0.04 to 0.4 tonnes per hectare per year but losses from cultivated paddocks can be around 1 tonne per hectare per year. These rates of soil loss may not be obvious but a 1mm loss of topsoil per year represents a loss of around 14 tonnes per hectare per year.

Therefore, when soil disturbance (Figure 1) is necessary for developing a production area there are certain objectives that should be met to reduce the amount of soil eroded during the disturbance event. Where groundcover has been removed for development, the following steps should be completed.



Figure 1. Developed land ready for planting.

Photo credit: NSW DPI

1. Timing of works

Severe storms and heavy rainfall events can dump huge amounts of water in a short time, producing large volumes of fast flowing run-off that scour the soil and carry soil into waterways. Where there is intense rainfall over a long period, there is a much greater likelihood of erosion and mass movement (Figure 2). Average monthly rainfall figures are the most reliable guide for planning ground works that can disturb the soil or leave it devoid of groundcover for any length of time. Groundwork needs to be undertaken when the probability of high rainfall events is lowest. On the NSW north coast this is typically between June and October.



Figure 2. Erosion from large volumes of fast flowing water.

Photo credit: NSW DPI



Figure 3. Hay bales placed as an erosion control method. Photo credit: NSW DPI

2. Staged development

When development will expose soil to erosion, consider staging the work so smaller areas of soil are exposed at any given time. Once the work is completed in the area, re-establish ground cover on the site quickly before moving on to the next stage of the project. Erosion control methods that divert water around the work site and capture any sediment should be used where groundcover has been removed.

Examples of erosion control methods include:

1. Sediment traps located at the lowest part of the orchard help to trap sediment and stop it from moving off farm
2. Check structures such as straw or hay bales placed on their narrow side, dug 10cm into the channel surface to prevent water flowing underneath them and secured with two stakes per bale (Figure 3).

3. Stockpile topsoil

When earthworks are required (such as drain construction), the topsoil should be removed first and stockpiled separately. Once the works are completed the topsoil can be put back in place. The topsoil has the required consistency and nutrients to assist with quick growth of groundcover.

4. Improve soil

When developing blueberry mounds, topsoil can be scraped up into the mounds leaving little topsoil in between rows which can make establishing groundcover difficult. On the NSW north coast soil types often have acidic heavy clay subsoils with a compacted structure. These soils have poor aeration and a slow water infiltration rate, which increases run-off. Lime can be used to increase pH; Gypsum can be added to help break up heavy clay to improve aeration and assist water penetration; and compost will increase organic matter which helps maintain aeration and holds moisture.



Figure 4. Direct seeding with quick establishing ground covers helps to reduce soil loss. Photo credit: NSW DPI

Table 1: Ground cover required for varying degrees of slope

Slope range	Flat to gentle	Moderate	Steep	Too steep
Slope as %	0 – 13%	13 – 22%	22 – 31%	>31%
Minimum ground cover	80%	90%	95%	Not recommended for orchard development

5. Establish groundcover as soon as possible

On the NSW north coast 90-100% groundcover (Figure 4) is recommended because of the regions sloping country and intense rainfall events, especially in the storm risk period from October to May. Direct seeding with fast growing ground cover species should be carried out to re-establish groundcover as soon as possible.

The best way to maintain good ground cover is to select plants that are well adapted to the climate, the soil and the production system, so that they persist without a lot of attention. On moderate to steep slopes, jute mesh or matting is useful to hold loose soil and seeds in place.

Timing is important as there are minimum temperatures that are required for germination and establishment of certain grasses. Fast growing annuals include rye grass and millet; however these should be mixed with perennial summer and winter growing species to provide ongoing groundcover. When establishing grass from seed use up to 10 times the rate recommended for pasture establishment to achieve rapid surface cover.



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