Management guidelines for dune use

5

Leaflet No.
V–03.6

Surface stabilising agents: plant materials

Introduction

The processes involved in designing, constructing and shaping a dune in a particular location are outlined in Leaflets No. V-03.2, V-03.3, and V-03.4. The next step is to quickly stabilise the sand surface against wind erosion so that vegetation can be established. A common technique is to stabilise the dune surface with plant material using brush matting or spreading mulch. This will stabilise the dune if time is required for sand moisture and salinity conditions to become more favourable for the establishment of dune vegetation. Sand spinifex grass can be planted in conjunction with the use of plant material stabilisers, but should only be done if the moisture and salinity conditions are favourable.

Another method of providing initial surface stability to a newly formed dune is to plant a cover crop on the dune as well as planting seed of sand spinifex grass (*see* Leaflet V-04.1). For this method to be effective there must be:

- adequate moisture in the sand profile and the expectation of useful rainfall
- planting machinery that can handle the slopes of the dune profile
- a dune surface profile sufficiently leached of excess salinity (if the dune was formed from marine sands).

Brush matting being used to stabilise the sand surface and to initiate the dune building process by trapping wind blown sand.

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Brush matting

Applying brush matting involves placing a layer of leafy branches over the bare sand surface. If a tractor and planting machinery are available, the area can be planted and fertilised before brushing, or otherwise, seed and fertiliser can be broadcast over the area after the laying of the brush. The seed will then be buried as the brush matting traps the windblown sand. Brush matting is most effective if laid evenly over the area with some overlap, and where strong winds are likely to be encountered, the brush will be more stable if placed with the butt facing into the wind. An application rate of about 10 tonnes of fresh brush per hectare will stabilise a dune surface in exposed situations. Lower rates are sufficient at more sheltered sites.

The following features of brush matting make it a useful technique in dune stabilisation.

1. Dune vegetation, especially sand spinifex grass, establishes well and grows easily through brush matting. The sand-trapping qualities of brush matting are useful for burying spinifex seed that can be broadcast over the brushed area. It is incorporated into the soil profile as windblown sand is trapped and deposited on top of it.
2. Brush matting withstands strong winds while keeping the sand surface stable.
3. The original dune shapes are retained as the brush traps a uniform layer of windblown sand and it gradually buries itself.
4. With competent supervision, the brush can be obtained and spread by relatively unskilled staff.
5. Seed or seedlings can be planted and fertiliser applied either before or after the brush is laid.
6. As the brush eventually decays it adds organic matter to the sand, improving its nutrient status and moisture-holding capacity.

Cutting, transporting and spreading brush matting is labour intensive and restricted to areas where brush is available and free from weed seeds. Extensive cutting of coastal vegetation for use as brush is not an environmentally acceptable activity, but brush may be obtained from firebreaks, under power lines or from areas where vegetation clearing is needed.

Mulches

In less exposed dunal areas where the susceptibility to wind erosion is lower, a satisfactory level of surface stability can be obtained by using mulch. Suitable materials for mulch include maize or sorghum stubble and cane tops. They provide a coarse, fibrous mulch that will not easily blow away. Other sources of mulch such as chipped waste from tree pruning and clearing operations can be considered if they are not a source of weed seeds. Seed, cuttings or potted stock of sand spinifex grass or other dune-stabilising plants can be planted prior to spreading the mulch.

Mulches have the advantage of being commercially available and are easier to handle and transport than brush. However, unlike brush, mulches are not effective on exposed areas with strong winds and large amounts of windblown sand.