

Paddock protection and stock management during dry times

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The management of paddocks and stock during dry times requires considerable care to avoid degradation of soil and water, damage to plants or seeds and long term financial losses. Paddocks should remain in such a condition that soil structure and fertility are protected and ready to respond to the return of wet weather.

In dry periods, soils become more susceptible to wind erosion as a result of the removal of the protective vegetative soil cover. This is caused by stock grazing and the trampling of the soil surface degrading the soil structure. As a consequence, strong winds are able to erode soil particles, depositing them either as drifts along fence lines or at locations up to thousands of kilometers away. Eroded soils and animal manure can foul both domestic and stock water supplies decreasing the potability of the water. Sandy soils are renowned for blowing during dry periods, however all soil types are susceptible.

Erosion of topsoils by wind takes with it nutrients such as nitrogen, phosphorous and organic carbon all of which are vital for the health of the soil and production. With every 1 mm of topsoil eroded, approximately 13 t/ha of topsoil, 130 kg/ha of organic carbon, 20 kg/ha of nitrogen equivalent to 40 kg of urea and 8 kg/ha of phosphorous equivalent to 100 kg of superphosphate are lost. Phosphorous and some nitrogen can be replaced through fertilizer however organic carbon and nitrogen take years of appropriate management to build up in soils.

Although the consequences of soil erosion may not be seen until a number of years after the drought, removal of soil through erosion will decrease the productivity of the paddock for many years to come.

Grazing stock not only create the potential for soil erosion but may cause irreparable damage to perennial pastures if the grazing pressure is too hard. Perennial pastures if managed properly through dry periods will be the first to respond following breaking rains to provide feed. In addition the cost of repairing or resowing perennial pastures will be high. Stock, under low feed conditions will also strip a majority of the stored annual pasture seed supply in the soil. Annual pastures may therefore need to be resown with a subsequent lag in providing feed following breaking rain.



Figure 1. Timely management can help avoid degradation

The problems of degrading paddocks and long term decreases in productivity during drought are considerable, however a number of strategic management options can be put in place to minimize potential damage and give the paddock the greatest potential to recover rapidly and fully after rain. Essentially, the strategy aims to maintain a protective vegetative cover of the soil surface or groundcover. The vegetative cover can be living plant material, failed crops, crop stubbles or pasture residues. The amount of groundcover required depends upon the region, soil type and the expected length of the drought. Groundcover recommendations given in this document are general and highlight levels that should be on the paddock at the end of the drought. Pasture and stubble will deteriorate over time due to stock trampling, wind and rain damage. Therefore, be conservative with your groundcover level and take into account local variations suggested by DSE officers.

Pastures

Overgrazing will deteriorate both annual and perennial pastures. To protect the soil and either pasture seed or living perennial pastures, sufficient pasture residue should remain to cover 80% of the soil surface with a minimum of 12 mm or ½" height above the soil surface. On sloping light textured soils (Mallee and granite country) it is preferable to retain 100% soil surface cover. Newer cultivars of phalaris may need more lenient grazing in spring to set dormant buds particularly on lighter soils.

Crops

It is important to maintain cover on all cropping paddocks. Crops that have failed this season should not be grazed due to the limited quantity of vegetative cover they will offer the soil. Valuable nutrients will also be removed from cropping paddocks by grazing of failed crops. In addition, standing anchored crops or stubble provide more protection than flat crops. This year, it is important that grain legumes remain standing due to the smaller crops in particular. Field pea and lupin crops will offer very little protection unless they remain standing and therefore should not be grazed.

Crops that have been stripped need to have the quantity of stubble remaining assessed to determine the extent of grazing before the risk of unacceptable damage will become too great. This will depend upon soil type, location and whether the stubble is standing or flat. It is difficult to provide general levels of protective vegetative cover for all soil types and regions however the minimum quantities of stubble thought to afford adequate protection of the soil at the end of the drought of the soil are given in Table 1.

Table 1. Minimum crop stubble cover required for cropped paddocks at the end of the drought

Soil Type	Locations	Stubble Cover Required
Clays, clay loam, silts and loams	Wimmera North and north-central North east Western district Central	30 % flat* or standing
Sands and sandy loams	Mallee Northern Wimmera Northern Central	50% flat or standing*

* To maintain adequate cover throughout the drought, extra stubble should be maintained now. Your local DSE officer will assist with recommendations.

These are the minimum quantities thought to be required and need to be maintained through the drought period. Some breakdown of the cover will occur through the dry period so retaining more cover will be needed. This may vary from an extra 10% on heavy soils to an extra 20% on lighter soils.

The burning of stubble should be avoided and cultivation of soils, particularly light textured soils (sandy), should be avoided unless no cover remains. If no soil cover remains, emergency measures such as ripping may work on heavier soils however, ridging on lighter soils has limited success in preventing erosion. Soils whether light or heavy have a much greater ability to resist erosive forces by wind or water if vegetative cover remains with minimal trampling by stock.

Dam surrounds

To prevent the movement of soil and animal manure into dams or water courses, vegetative buffer strips need to be maintained in the catchment of dams and immediately around the perimeter. When the soil cover reaches the critical levels described for pastures and crops, stock should be isolated from dams and troughs utilized.

Stock management

To maintain vegetative cover required, stock will need to be managed differently than during normal seasons.

Management strategies need to take into account the quantity of feed available (in the paddock and in the shed), the cost of purchasing fodder, water requirements of stock and the exclusion of stock from paddocks. Stock rationalization should be considered sooner rather than later and the numbers to be retained assessed in the light of the above factors.

Stock should remain on paddocks until the vegetative cover conditions described above are reached. A stock containment area then needs to be established to enclose the stock. Stock containment areas will avoid the depletion of the surface cover and topsoil disturbance on the majority of paddocks. The policy of 'opening the gates' should be avoided. Stock containment areas should have the following attributes;

- Heavier soil type where possible (clay, clay loam)
- Flat relief
- Situated lower in the landscape
- Shade
- Water supplied to a trough and not by dam
- Reasonable access for feeding and inspection

Your local DSE officer can assist with the appropriate location of stock containment areas. It is advisable to consider the location and establishment of stock

containment areas before paddock conditions get to critical levels.

Stock should remain in the containment area until such a time that pasture growth on paddocks has established sufficiently to be safely grazed.

Paddock and stock management during drought must be considered with a long term view and options set in place to enable rapid recovery of pastures and crops following the breaking rains. The management options above are aimed to provide timely strategies to protect your most valuable resources, that is soil and pasture potential and

remove the need for expensive management options such as ridging and ripping at later stages.

Further information

Please contact your local office of the Department of Sustainability and Environment.

Compiled by John Williamson, Bendigo, from information supplied by many Departmental Officers

The following pictures are a useful ready reckoner to assess the approximate quantities of stubble remaining. Estimating flat stubbles compared to standing stubble can be difficult so two pictures are presented to assist. Be conservative, where possible maintain a further 10-20% cover.



Figure 2. 30% Stubble Cover Flat

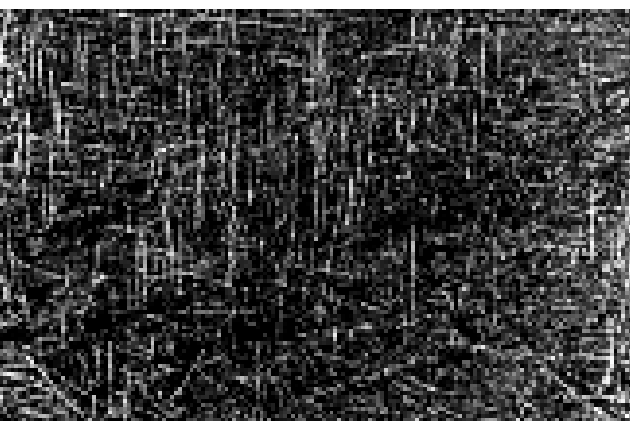


Figure 3. 30% Stubble Cover Standing

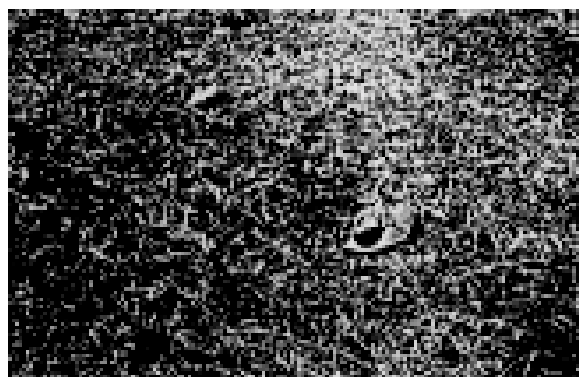


Figure 4. 50% Stubble Cover Flat

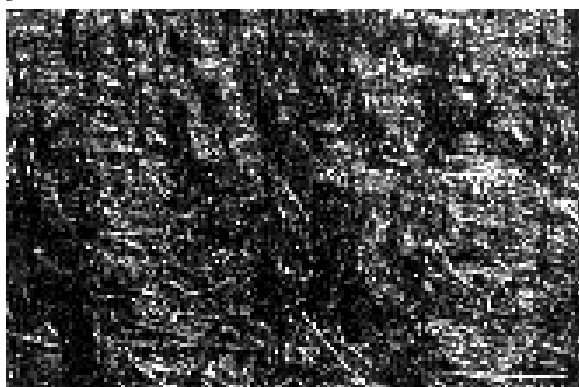


Figure 5. 50% Stubble Cover Standing

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