Chapter E2. Management strategies for key checks

PURPOSE OF THIS CHAPTER

To list some key checks for soil problems and some management principles for dealing with them

CHAPTER CONTENTS

- table of key checks and management problems

ASSOCIATED CHAPTERS

- A3 ‘Features of soil’
- Part B
- E1 ‘Key checks for productive irrigated soils’

MANAGEMENT STRATEGIES FOR KEY CHECKS

Table E2–1 lists the management strategies that can be used to deal with unsatisfactory results from key checks.

Table E2–1. Management strategies for various key checks

Key check	Management strategy to improve condition or status
Soil surface problems	**If crusted:** need to increase soil organic matter levels, protect the soil surface with a mulch, and use gypsum when soil is dispersive.
	General strategies:
	• use stubble on soil surface
	• use minimum tillage/direct drill
	• any cultivation should be non-inversion
	• use gypsum where dispersion index is greater than 8
	If hardset or compacted: need to break up the hard layer without damaging the soil structure or burying the soil surface.
	General strategies:
	• minimise cultivation
	• use non-inversion cultivation to break up the hardset layer. Deep banding fertiliser at sowing may achieve the same result.
	• try a gypsum test strip where the dispersion index is greater than 8
	• permanent beds reduce compaction
	• keep stock off wet paddocks if possible
Poor soil structure	**General strategies:**
	Loam soils: need to increase soil organic matter
	• reduce cultivation, and cultivate only at correct moisture content.
	• break up any plough pans or compaction layers with non-inversion cultivation
	• use less aggressive cultivation methods
	• rotate to a pasture phase
	• stubble retention may be of benefit
	Dispersive clays and clay loams: gypsum use is likely to be beneficial
	• gypsum or gypsum used with non- inversion cultivation will benefit these soils
	• minimising tillage will help stabilise the surface of these soils
	Non-dispersive clays and clay loams: compaction is the main structural problem
	• cultivate to break up any compacted layers or plough pans, or use a crop to dry and crack soil
	• permanent beds are likely to reduce compaction problems (especially if harvesting equipment runs in furrows)
Slaking score greater than 2	**Loam/clay loam soils:** slaking loam soils are likely to form crusts or set hard when dry
	• management as for crusted surface soils
	Clay soils: slaking does not present a major problem for clays, as they crack upon drying
Dispersion index	Gypsum application is likely to be the major form of management on dispersive soils
	Dispersion index greater than 4:
	• minimise cultivation
	Dispersion index greater than 8:
	• minimise cultivation
	• consider gypsum use
	• gypsum and deep cultivation may improve plant growth where subsoils are dispersive
	Dispersion index greater than 12:
	• check the exchangeable sodium percentage (see chapter D3) of the soil; if it is greater than 10, use gypsum
	• use minimum tillage
Soil pH	• apply lime to soils with pH ($CaCl_2$) < 5
Organic matter	**If the organic matter is below 2%:**
	• switch to direct drilling (using narrow points), or at least minimise tillage
	• retain stubble on the soil surface
	• rotate to a pasture phase
Soil phosphorus	If soil phosphorus is below ideal level, consult your local horticulturist or fertiliser representative for advice on the required application rates.