

SECTION 4: KEY AGRICULTURAL MANAGEMENT PRACTICES

PASTURE MANAGEMENT

Pasture production for grazing and feed conservation is the major land use within the Ellen Brook Catchment.

Farmers frequently need to re-seed their pastures. Pastures deteriorate and new, more productive species and cultivars become available, and improved techniques are continually developed to tackle land management problems like salinity, waterlogging and acidity. All these situations lead to a re-seeding operation.

A successful re-seeding operation can be highly profitable, and failure expensive. The re-seeding operation itself may be faulty, being either poorly planned or poorly executed. Often a paddock is re-seeded because the pasture has deteriorated but the cause of the pasture deterioration has not been identified. Re-seeding, without tackling the underlying problem often leads to failure however competent and planned the re-seeding operation. Alternately a deteriorated pasture can often be restored to full production by changing paddock management.

So assessing the pasture, its botanical composition, health and productivity and the soil it is growing in are all important. This assessment helps you decide whether to re-seed the paddock or change paddock management practices. The following table lists some of the problems and some ways they can be identified.

PASTURE ESTABLISHMENT

Pastures are the backbone of any grazing enterprise. After identifying the underlying causes of why a pasture paddock has deteriorated, it is likely that the paddock will require re-seeding. Re-seeding is expensive, so it is important that any re-seeding operation be successful.

Beware that each paddock or LMU will differ, as will the seasonal conditions. Legume seeds not requiring inoculation should always be treated for redlegged earth mite and lucerne flea. Fertiliser type and rates should be dependent on soil test results.

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Table 4. Common problems associated with establishing good pastures

Problem	Indicators and causes
Low soil fertility	<ul style="list-style-type: none"> • Unproductive pasture. • Pasture low in clover, grassy, and weeds (flatweed, sorrel). • Clover patchy. • Clover has nutrient deficiency symptoms (usually potassium and/or sulphur). • Tissue or soil test for trace elements.
Soil acidity	<ul style="list-style-type: none"> • Soil test (chloride pH below 4.3). • Pasture low in clover. • Clover nitrogen deficient and poorly nodulated. • Roots stunted (chloride pH below 4.0). • Sorrel present.
Soil salinity	<ul style="list-style-type: none"> • Unproductive low-lying (poorly drained) land. • Bare ground, barley grass, button weed, beard grass, little subterranean clover, white clover or capeweed present. Often grows ryegrass, balansa clover or lotus. • Confirm by soil test and an EM 38 survey.
Overgrazing	<ul style="list-style-type: none"> • Clover, flat weed, winter grass and chickweed present, little ryegrass. • Much bare ground, even in winter • Grazed hard to the ground.
Undergrazing	<ul style="list-style-type: none"> • Low density, grassy pastures. • Old decaying leaves near pasture base. • Uneven grazing. • Dead grass carried over into new season.
Waterlogging	<ul style="list-style-type: none"> • Watertable 30 cm deep. Soggy wet ground, rushes, dock, pugging by stock.
Inundation	<ul style="list-style-type: none"> • Even worse than waterlogging - puddles everywhere.
Soil compaction	<ul style="list-style-type: none"> • Heavy loams and clays. Stock pugging, poor water infiltration, shallow rooting. Responds to ripping and draining. • Sandy loams. Traffic hard pan at depth. Cereal hay crops respond to ripping 30 cm deep.
Weeds	<ul style="list-style-type: none"> • Sorrel/Guildford grass: Unthrifty pasture, acidic and/or low in nutrients. • Rank weed growth: Undergrazing. • Flat weed growth: Low in nutrients (particularly potassium), overgrazing • Rushes: Waterlogging
Dock dominance	<ul style="list-style-type: none"> • High nitrogen status. • Needs a more productive grass. • Waterlogged, lax grazing, repeated hay cutting.
Capeweed dominance	<ul style="list-style-type: none"> • High nitrogen status. • Needs more productive, persistent grass. • False break or severe redlegged earth mite attack has killed clover. Sandy soils, disturbed or overgrazed in summer. Lax grazing in winter.
Couch/kikuyu dominance	<ul style="list-style-type: none"> • Undergrazing, high nitrogen use, salinity, waterlogging.
Loss of clover	<ul style="list-style-type: none"> • Low soil fertility levels (potassium, sulphur and trace elements), soil acidity, undergrazing. • Repeated hay cropping. • Insects (mite and flea) not controlled in hay crops. Toot rots and scorch in older clover varieties. • Viruses. • Non wetting. • Salt.

Source: *Productive pastures pay*, Agriculture Western Australia, 1995.

How to establish annual pastures

1. Summer - Soil test.
2. Autumn - Graze heavily to remove dry matter.
3. April - Burn if sufficient dry matter is present to carry a fire.
4. April - Topdress with grade one agricultural lime at 2.5 tonnes per hectare (subject to pH being less than 4.5 in CaCl).
5. April - Cultivate to 5 cm and harrow to prepare a final seedbed.
6. April/May - Wait for a complete germination of weeds.
7. Early May - Spray weeds with glyphosate at 2.5 litres per hectare. Add insecticide for control of redlegged earth mite and lucerne flea.
8. Early May - Mix seed and fertiliser in the fertiliser box of a combine and broadcast seed.
9. Harrow to cover the seed and roll to compact the soil around the seed on sandy soils.

The established pasture can be lightly grazed six weeks after germination.

How to introduce improved cultivars to existing annual pastures

1. Summer - Soil test.
2. Autumn - Graze heavily to remove excess dry matter.
3. April - Topdress with grade one agricultural lime at 2.5 tonnes per hectare (subject to pH being below 4.5 pH in CaCl).
4. April/May - Wait for a full pasture germination and clover to have four true leaves.
5. Early May - Spray with glyphosate (360 g/L) at one litre per hectare with added insecticide for redlegged earth mite and lucerne flea control - this spray will remove undesirable weeds but will only set back existing legumes.
6. Early May - Treat legume seed with insecticide for systemic control of redlegged earth mite and lucerne flea one day before seeding. Seed that requires inoculation and lime pelleting should not be treated.
7. Early May - Direct seed with drill two days after spraying with glyphosate.

Seed recommendations for annual pastures

The seed selected to be sown and the rate at which it is sown will vary according to soil type, species and cultivars already existing, species and cultivars potentially available and the current seed price. The lists below are a guide only.

Winter wet soils

Trikkala sub. clover

Paradana balansa clover

Prolific Persian clover

Palestine strawberry clover

Concorde annual ryegrass (one of many available)

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Medium soils

Trikkala sub. clover
Seaton Park sub. clover
Frontier balansa clover
Caprera crimson clover
Cefalu arrowleaf clover (sandy gravels)
Cadiz serradella
Santorini yellow serradella
Avila yellow serradella
Annual ryegrass

Dry soils

Dalkeith sub. clover
Hykon rose clover
Cadiz serradella
Santorini serradella
Charano serradella
Annual ryegrass

How to establish summer growing perennial grasses

Perennial grasses cost more to establish than annual pastures because of increased cost of seed and the need to reduce stocking in the year of establishment.

1. Early winter - Graze for winter feed.
2. Late winter - Heavily graze to remove the bulk of vegetated material.
3. Mid August - Spray with 2.5 litres of glyphosate (360 g/L), add insecticide for redlegged earth mite and lucerne flea control.
4. Late August - Harrow or cultivate to obtain enough loose soil to form a seedbed. Do not cultivate deeply (< 2.5 cm).
5. Late August/early September - Sow by mixing seed and fertiliser in the fertiliser box of a combine. Set the disc or cultivators to 2.5 cm depth. Remove the hoses and drop the seed and fertilisers onto the surface then lightly harrow to cover the seed. Roll to compact the soil around the seed.
6. Spring/summer - Delay grazing as long as possible. It is important not to graze in the first summer.

Seed recommendations for summer growing perennial grasses

Rhodes grass is the preferred perennial to sow in the Ellen Brook Catchment. Callide, katambora, finecut, top cut or namkat are suitable varieties. Green, gatton and bambatsi panics may have a place but are not recommended on horse properties. Rates can vary from 2 to 5 kg/ha.

How to establish sprinkler irrigated pastures

Sprinkler irrigated pastures can play an important role on small properties. To ensure success, close attention needs to be paid to the establishment of pasture and subsequent watering, fertiliser application and grazing management.

1. Winter - Graze for winter feed.
2. August/September - Heavily graze to remove the bulk of feed.
3. Early September - Prepare a fine seedbed with few large clods. This can be done with a disc cultivator, a scarifier or a rotary hoe. Then harrow with tyne harrows to break up the clods, firm the seedbed and level the surface.
4. September - Weed control is essential. After the final seedbed has been prepared, water the area to encourage a full germination of weeds, then spray with glyphosate (360 g/L 0 at two litres per hectare) to kill weeds. Add insecticide for redlegged earth mite and lucerne flea control.
5. September - Inoculate and lime pellet the clover seeds.
6. Late September/early October - Mix the seed with the fertiliser in the fertiliser box of a combine and sow by dropping the mixture onto the surface (hoses out). Cover the seed with a set of light harrows and roll to compact the soil around the seed.

Seed recommendations for sprinkler irrigated pastures

Kikuyu

Rhodes grass

Haifia white clover

Palestine strawberry clover

Paspalum dilatatum

(inoculate and lime pellet the clover seed)

FERTILISER APPLICATION

The Ellen Brook Catchment discharges approximately one third of the total phosphorus load that ends up in the Swan River estuary each year. The Ellen Brook contribution to total nitrogen load is approximately 7%. These high nutrient loads encourage rapid growth of algae and weeds that are not needed in our river systems. Apart from causing this pollution and unwanted algal growth, the loss of these nutrients from your farm costs you money.

Different fertiliser strategies have been tested and adopted over the last decade by Agriculture Western Australia to obtain the most profitable (optimum) production of pasture and to achieve the most efficient use of fertiliser with minimum export or loss off site. Fertiliser efficiency is achieved when most of the nutrients are used by plants and little or none is wasted by leaching.

The following strategies refer mainly to the annual fertiliser requirement of legume based annual pastures.