



Pastures for recharge areas

Lisa Warn, Seymour and John Hunter, Benalla

May, 1996

AG0392

ISSN 1329-8062

Establishing deep rooted perennial pastures (phalaris or lucerne) on recharge areas is aimed at using more of the annual rainfall to produce feed and reducing the amount of water which escapes through the soil into the groundwater.

Recharge can only occur when the soil profile is saturated.

Perennial pastures can use more soil water than annual pastures because they have a longer growing season and their longer roots are able to dry out the soil to a greater depth.

Perennial pastures can also allow increases in stocking rates and provide feed at crucial times of the year when annual species are not active, thus making grazing enterprises more profitable.

High recharge areas are typically cleared hills with light shallow soils or exposed rock, or on the plains country. They are the well drained loamy soils.

High recharge areas (with unimproved or annual subclover based pastures) allow 50-100 mm of rain to enter the groundwater system each year.

Research carried out by the Department of Primary Industries at Bendigo, shows that high density trees (200 per hectare) could prevent this 50-100 mm of recharge from occurring. Lucerne could reduce recharge by 30 mm, and both low density trees (20 trees per hectare) and phalaris based pasture could reduce recharge by 20 mm.

Clearly strategic placement of trees and pastures in the landscape is the key to reducing recharge, controlling watertables and maintaining a viable grazing or cropping enterprise.

Phalaris based pasture can also reduce run-off by 50-90% (depending on rainfall event) compared to unimproved pasture, thus controlling water erosion problems.

Other benefits of perennial based pastures are reduced soil acidification and improved soil structure. In the case of lucerne (a legume), soil nitrogen levels are improved.

Pasture mixtures for low rainfall areas

(average annual rainfall 650 mm and below)

(a) Long term pasture

This comprises perennial grasses and clover suitable for grazing and extended pasture phase between cropping.

Species	Sowing rate kg/ha
Phalaris	
Sirosa, Sirolan or Holdfast	1 to 1½
Australian or Uneta	1 to 1½
Cocksfoot	
Porto	2
OR in areas below 550 mm	1
Porto	1
Currie	

For clay soils and those subject to waterlogging sow phalaris at a higher rate (3 to 4 kg/ha), and leave cocksfoot out of the sowing mix. Cocksfoot is suited to lighter open textured soils - including granite sands and the sedimentary gravelly hills.

Cocksfoot is more tolerant of acidic soils that contain high levels of toxic aluminium, than phalaris. If the soil cannot be improved by liming then sow mainly cocksfoot. Acid tolerant phalaris lines are being developed.

Perennial ryegrass is not recommended for high recharge areas as it does not have a deep root system like phalaris or cocksfoot. It is not drought tolerant and prefers medium to heavy textured soils (i.e. these are usually low recharge areas). Ryegrass also affects the establishment of phalaris in particular, and therefore should not be sown with phalaris at a rate higher than 2 kg/ha.

Sub clover - sow at least 6 kg/ha. Use one variety or a mixture of two or three of those listed below which suit your conditions. (**Note:** Larisa and Leura sub clovers are for higher rainfall areas).

Dalkeith, Daliak	Low producing hard seeded and tolerate driest areas, false breaks. Below 450-500 mm rainfall areas.
Seaton Park	Hard seeded and tolerates false breaks. More than 425 mm rainfall. Also useful on dry hills with up to 700 mm rainfall.
Trikkala	Widely grown, adapted to most soils and grows well in heavy, wet soils. More than 500 mm rainfall.
Trikkala	Widely grown, adapted to most soils and grows well in heavy, wet soils. More than 500 mm rainfall.
Woogenellup	Excellent autumn winter growth but susceptible to clover scorch disease in spring. 500 mm plus rainfall.
Goulburn	Good spring growth. Good resistance to root rot and clover scorch diseases. More than 600 mm rainfall.
Denmark	Similar to Goulburn.
Larisa	Longer growing season variety than Trikkala, otherwise the same. 700 mm and above.
Leura	Productive in winter and excellent late season growth. Good resistance to root rot and clover scorch diseases. 700 mm and above rainfall.
Balansa Clover	Sow 1 to 2 kg/ha in mixture. Annual clover, hard seeded also grows well in wet soils. Resistant to diseases. Good growth in late winter-spring. 450 mm and above.

b) Lucerne pasture

Lucerne is medium term pasture that will last for at least 6 years if soils and management are good. It is very effective in lowering water tables, and can increase production and carrying capacity. It is suitable for well drained deeper soils that are not too acidic and contain low levels of toxic aluminium in the top and sub-soils. Such soils occur on many of the creek and river flats, the Riverine plains, (e.g. Nagambie), the Dookie and Colbinabbin Hills and some gravelly hills, for example, in the Sheep Pen Creek Land Management Group area, near Violet Town. Sow at 2 to 8 kg/ha, depending on rainfall. See Agriculture Note; *Lucerne for recharge areas*.

Pasture mixtures for higher rainfall areas

(above 650 mm annual rainfall)

Species	Sowing rate kg/ha
Phalaris	3
Sirosa or Sirosa and Australian mix	3 total
Cocksfoot Porto	2

Balansa clover Paradana	1
White clover Haifa	1 Total of 6-8 kg/ha
Sub clovers - select 2 to 3 varieties from the list below that suit your conditions	
Trikkala	
Woogenellup	
Seaton Park (dry hills)	
Goulburn	
Denmark	
Larisa	
Leura	

Pasture establishment tips

Sowing pasture under a crop

Use a short strawed crop variety, reduce the sowing rate and consider blocking off every second drill row i.e. 250 mm (14") between crop rows.

Use a small seeds box to sow the pasture no deeper than 10 mm.

Control insects - spray germinated pasture/crop when necessary for red legged earth mite/lucerne flea.

Graze lightly and strategically for the first year. Sowing pasture in grazing areas

- Soil test to determine lime and fertiliser requirement before sowing.
- Control weeds the year before sowing, e.g., spray grazing, pasture topping.
- Graze paddock hard in spring/summer before autumn sowing.
- Use a herbicide to aid pre-sowing weed control.
- Direct drilling pasture establishment is good on gravelly, hilly and friable soils.
- Control insects - add insecticide to herbicide for control before sowing; treat legume seed, spray establishing pasture when necessary.
- Inoculate and lime coat legume seed.
- Sow seed with 250 kg/ha super-lime and 0.025% molybdenum (if pH in water less than 5.5). If pH above 5.5 sow with at least 125 kg/ha super and 0.05% molybdenum.
- Sow no deeper than 10 mm.

Aerial seeding.

In some districts the high recharge areas are too rocky or steep to sow down using conventional techniques. Aerial spraying and seeding has been a successful technique in areas with a rainfall greater than 650 mm (eg. Mansfield, Yea).

However in lower rainfall areas this technique is more risky as the season often cuts out before the seedlings have

a well established root system. Weed and rabbit control are also key factors that affect establishment. Aerial spraying and seeding are usually carried out from May to June.

Graze to trim only if necessary in early spring and then let flower and set seed. Graze only when foliage has dried off in summer but it is best not to graze perennial grass/clovers until autumn unless conditions are favourable.

Advice/assistance

For further information on perennial pasture establishment or management contact your local office of the Department of Primary Industries (DPI). Financial assistance is available from DPI for sowing perennial pastures on recharge country.

(Reprinted from Goulburn Dryland Salinity Program's Resource Kit)



This publication may be of assistance to you but the State of Victoria and its officers do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.