



# Renovating Irrigated Perennial Pastures

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Pastures can be the cheapest source of feed on dairy farms in northern Victoria, provided that they are grown and utilised well. One of the best ways of minimising the cost of milk production is to grow and consume as much pasture as possible. This requires effective management and a desirable species composition.

**Effective management** involves the use of best management practices in the areas of water, soils and fertilisers, and grazing.

**A desirable species composition** requires effective pasture management and may require pasture renovation. The two main methods of pasture renovation are resowing and oversowing.

## Is pasture renovation required?

**Oversowing** is the appropriate renovation option in a well managed pasture with a low content of ryegrass and a low content of “difficult weeds”\* (such as couch grass). Oversowing involves sowing seed into an established pasture to thicken up ryegrass.

Oversowing will not remove weeds but a higher ryegrass content will limit their impact on pasture performance.

(\* “difficult weeds” are weeds that are difficult to control and generally required herbicides to remove).

**Resowing** is the appropriate renovation option for a well managed perennial pasture when a high content of “difficult weeds” exist. The best approach is to remove the weeds using herbicides and to rectify the underlying cause of their invasion before resowing. Resowing is also necessary after landgrading.

## Steps in renovating pastures

1. assess the current pasture situation
2. choose the most appropriate option (this includes weighing up the costs and benefits of each option)
3. plan and implement the chosen option
4. manage the renovated pasture well.

These steps are outlined in this brochure.

## 1. Assessing the pasture

To determine the performance of a pasture the indicators to look at are:

- species composition
- management
- pasture consumption.

These indicators are explained below.

### 1.1. Species composition

Productive pastures contain a high content of sown / desirable species.

Unproductive and low quality species take up valuable space in pasture and contribute little to the herd’s diet. These species are commonly known as “weeds”.

Managing the desirable species well and controlling weeds will lead to high pasture consumption.

### 1.2. Pasture management

The key areas of pasture management are:

- water
- soils and fertilisers
- grazing.

The best management practice (BMPs) in each of these areas apply to both newly renovated and to established pastures. Monitor newly renovated pastures a little more closely than established pastures.

#### BMPs – water

The aims of water management are to irrigate the pasture before it is moisture stressed and to minimise waterlogging. This involves attention to:

- **irrigation frequency.** Irrigate at a cumulative evaporation less rainfall interval (E-R) of 50 mm. In practice, this is every 7 days during summer.
- **speed of irrigation.** Water should flow onto bays for a maximum of 4 to 6 hours.
- **quick drainage.** Surface water needs to drain off the bays quickly to minimise the period of water logging (ie. no standing water within 18 hours of starting to irrigate).
- **water quality.** Use water with a low salt content.

## BMPs – soils and fertilisers

A program to ensure adequate soil fertility includes:

- **soil testing** representative areas of the farm.
- **setting nutrient targets**, especially for phosphorus (P), potassium and sulfur. Phosphorus targets for perennial pastures used for dairy production are in the range of 18–22 ppm of Olsen P.
- **developing a fertiliser plan**. This should take into account nutrient imports and exports.
- **implementing BMPs** for fertiliser applications.

## BMPs – grazing

The keys to the grazing management of perennial ryegrass based pastures are:

- **Grazing frequency**. Ryegrass plants should be grazed at the 2½–3 leaf stage – this will require changes in the rotation length during the year.
- **Grazing intensity**. Graze pastures to a residual height of 4–5 cm between clumps.
- **Grazing duration**. Do not graze new regrowth i.e. a maximum of 3 days on the one area.

Grazing management should target the most dominant species. During summer, paspalum-dominant pastures should have a different rotation length than ryegrass-dominant pastures.

## 1.3. Pasture consumption

Pasture consumption is the amount of pasture consumed on a farm estimated over a year in tonnes of dry matter per hectare (t DM/ha).

High pasture consumption results from high pasture growth and efficient use. Low pasture consumption results from poor pasture growth and/or poor use.

Calculating pasture consumption allows you to monitor pasture performance annually. In a recent survey of farms in northern Victoria, the range in pasture consumption was 3.4–14.7 t DM/ha. This suggests that there is potential on many farms for substantial increases in pasture consumption.

For details on calculating pasture consumption refer to the listed contact details.

## 2. Choosing the right option

The opportunities to improve a pasture's performance are:

- improve pasture management (Option A).
- improve species composition through renovation (Options B or C).
- improve pasture management and renovate at the same time.

### Question 1:

#### Can management be improved?

Yes => address **Management** issues (Option A).

No => **Renovation** may be an option, go to question 2.

### Question 2:

#### Is the content of “difficult weeds” high?

Yes => consider **Resowing** (Option C).

No => **Oversowing** is the best course of action if the ryegrass content is low (Option B).

Oversowing is an option when ryegrass is lacking and you only want to thicken up ryegrass in the current pasture.

Resowing is an option when there is a high content of “difficult weeds”.

## 2.1. Cost of renovating

It is worth considering the costs involved in renovating pasture. Estimate your costs in Table 1.

Resown pastures often have low production in the first year due to the establishment stage. This may necessitate increased supplement use and has not been allowed for in Table 1.

For improvements in management, the costs need to be estimated for individual situations.

**Table 1. Typical costs (\$ / ha) associated with pasture renovation.**

Item	Oversowing costs		Resowing costs	
	Typical range	Your estimate	Typical range	Your estimate
Topping	0-35	-----	-	-
Herbicide and spraying				
Herbicide <sup>A</sup>	-	-	40-50	-----
Spray <sup>B</sup>	-	-	10-20	-----
Cultivate / Sow				
Disc <sup>B</sup>	-	-	35-45	-----
Power harrow <sup>B</sup>	-	-	70-85	-----
Sow <sup>B</sup>	-	-----	35-45	-----
Seed				
Ryegrass	50-140 <sup>C</sup>	-----	75-105 <sup>D</sup>	-----
White clover	-	-	20-35 <sup>E</sup>	-----
<b>Total cost (\$ / ha)</b>	<b>85-225</b>	<b>-----</b>	<b>285-390</b>	<b>-----</b>

A Typical cost of a herbicide□

B These costs are often lower for larger areas. Aim to minimise the number of cultivations.

C Assumes a sowing□

D Assumes a sowing rate of 15 kg/ha and a price of \$5 to \$7/kg of seed.

E Assumes a sowing rate of 3 kg/ha and a price of \$6 to \$11/kg of seed.

## 2.2. Benefits of oversowing

The benefits of oversowing are increases in:

- pasture consumption
- ryegrass content / tiller density
- pasture digestibility (energy content).

The advantages of oversowing are its low cost, ease of operation, potentially high returns and minimal interference with the normal grazing rotation.

### Oversowing with perennial ryegrass

Research at Kyabram found that a single oversowing with perennial ryegrass can increase DM production by 1.0 t DM/ha per year.

Cost over 4 years (single oversowing with perennial ryegrass):	
Extra pasture	= 3.9 t DM/ha
Cost of oversowing	= 180 \$/ha
Cost of extra pasture	= 180 / 3.9 \$/t DM
	= 46 \$/t DM

### Oversowing with short-lived ryegrass

Research at Kyabram found that oversowing annually with short-lived ryegrass can increase DM production by 1.6 t DM/ha per year.

Cost over 4 years (annual oversowing with short-lived ryegrass):	
Extra pasture	= 6.4 t DM/ha
Cost of oversowing	= 4 x 150 \$/ha
	= 600 \$/ha
Cost of extra pasture	= 600 / 6.4 \$/t DM
	= 94 \$/t DM

The keys to an economic response from oversowing are:

- oversowing pastures that are responsive (low ryegrass content)
- use of BMP's for oversowing
- use of BMP's for pasture management.

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## 2.3. Benefits of resowing

Research at Kyabram showed that resowing can:

- reduce pasture consumption in year 1.
- increase pasture consumption in subsequent years.
- increase content of sown grasses.
- increase pasture digestibility (energy content).

When the increase in pasture consumption following resowing is:

- small, resowing may not be viable
- large, the benefits are likely to be large.

The keys to a good response from resowing are:

- resowing pastures that are responsive (high weed content).
- use of BMPs for resowing.
- use of BMPs for pasture management.

## 3. Implementing options

### Option A - Pasture management

Use of BMPs is important (see section 1.2).

### Option B - Oversowing

Oversowing involves sowing seed into an existing pasture to increase the density of the desirable species.

The keys to successful oversowing are:

- timing to optimise temperature. The best conditions for oversowing are in early autumn when daily maximum air temperatures have averaged less than 25 °C for a week (generally between mid March and mid April).
- minimise competition. Graze (and top if required) the pasture to a residual height of 3–4 cm prior to oversowing.
- adequate soil moisture for seedbed preparation and germination.
- good seed-soil contact to assist rapid germination.
- placement of seed at a suitable depth (this is 5–10 mm for ryegrass).

It is easiest to get all of these right in autumn.

When oversowing:

- use perennial ryegrass at 20 kg seed/ha comprising a mix of 3 cultivars
- do not use white clover.
- do not use tall fescue.

Caring for oversown pastures involves:

- use of BMPs for water.
- use of BMPs for soils and fertilisers.
- use of BMPs for grazing
  - ◆ keep the paddock in the normal rotation.
  - ◆ pluck a new seedling, if it pulls out it is not ready to graze, if it breaks it can handle grazing.
- monitoring pests. Common pests are red-legged earth mite and lucerne flea.

The keys to successful oversowing are:

- timing to optimise temperature
- graze to 3–4 cm before sowing
- adequate soil moisture
- good seed-soil contact
- placement of seed at 5–10 mm.

### Option C - Resowing

Resowing involves sowing a new pasture into a prepared, weed-free seedbed.

The keys to successful resowing are:

- timing to optimise temperature. The best conditions for sowing ryegrass and white clover are in early autumn when daily maximum air temperatures have averaged less than 25 °C for a week (generally between mid March and mid April).
- good weed control to minimise competition.
- adequate soil moisture for seedbed preparation and germination.
- good seed-soil contact to assist rapid germination.
- shallow placement of seed (2 mm depth is ideal for mixtures containing white clover). Place seed on or near the surface and lightly cover or roll.

It is easiest to get all of these right in autumn.

### Tip – Weed control

- Identify the problem weeds in the existing pasture.
- Seek advice (check herbicide labels).
- Herbicides are most effective when the target weeds are actively growing.
- Allow an appropriate interval between herbicide use and cultivation (check labels).

### Tip – Seedbed preparation

- Seedbed preparation can begin once weeds have died (there may be a need for trash removal).
- Cultivation should be shallow.
- Cultivation should be kept to a minimum while achieving a fine seedbed and avoiding pulverisation of the soil.

### When resowing:

- use perennial ryegrass at 15 kg seed/ha comprising a mix of 3 cultivars.
- use white clover at 2–4 kg seed/ha comprising a mix of 2 cultivars.

### Caring for newly sown pastures involves:

- use BMPs for water
- use BMPs for soils and fertilisers
- use BMPs for grazing
  - ◆ the first few grazings should be at a height of 10–12 cm (or at least at the 2 leaf stage) leaving a residual height of 5–6 cm. Aim to graze new pastures at least once before winter
  - ◆ Pluck a new seedling. If it pulls out it is not ready to graze, if it breaks it can handle grazing.
- monitoring pests. Common pests are red-legged earth mite and lucerne flea.

### The keys to successful resowing are:

- timing to optimise temperature
- good weed control
- adequate soil moisture
- good seed-soil contact
- shallow placement of seed (2 mm).

## 4. Followup management

Use of BMPs is important (see section 1.2).

### Further reading

Lawson A and Hildebrand K (2003). *Renovating irrigated perennial pastures: A handbook for northern Victoria* (DPI, Kyabram).

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