



Small Farm: Pasture establishment

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Planning a sowing program is necessary to achieve the best results. Paddocks need careful preparation in the year(s) preceding sowing and careful management in the establishment year. The quality of the resulting pasture will be a reflection of the time and preparation devoted to establishment. Questions that need to be considered before deciding to sow include:

- Is sowing the best way to increase the long-term productivity of this paddock?
- Is phalaris the best pasture species for the paddock?
- Can I prepare the paddock well enough?
- Can I afford to sow the paddock and have it out of production for one year?
- Do I have the time to do the job properly?

Weed control

Year before sowing:

The risk of pasture establishment failure doubles when there has been no preparation in spring prior to sowing. Many pastures fail due to competition from weeds, in particular annual grasses. Weed control prior to sowing pastures can double the number of perennial grass plants that establish. Weeds that pose the greatest threat such as annual grasses to establishing pastures need to be identified.

Firstly determine if the weeds are broadleaf or grass, perennial or annual, as these characteristics will affect planning and control strategies. Preparation will need to begin at least two years prior to sowing if perennial weeds are present. Various weed control techniques are available for different times of the year to control different weeds (Table 1).

Sowing a summer fodder crop such as millet in a paddock to be renovated is also a good form of weed control. The paddock should be worked up in spring and the crop sown with fertiliser. The fodder crop can provide extra feed over summer. The crop should be grazed heavily before the autumn break to remove any excess feed and then the new pasture can be either direct drilled or the paddock can be cultivated.

Year after sowing:

Existing vegetation must be controlled prior to sowing to remove competition. Generally, this is done by heavy grazing of the pasture before the autumn break, then

spelling to allow the weeds to germinate after the break. Apply a non-selective herbicide (weeds can be controlled by cultivation) about three to four weeks after germination when weeds are actively growing. The type of weeds present in the paddock will determine the most appropriate herbicides and rates to use.

Table 1. Weed control methods

Control techniques	Time of year (year prior to sowing)	Target weeds
Spray topping	Spring	Annual ryegrass, silver grass, brome grass, barley grass, capeweed, sorrel, bent grass, fog grass
Spray grazing	Winter	Paterson's curse, capeweed, thistles, dock, wild radish, wild turnip
Winter Cleaning	Winter	Annual ryegrass, silver grass, capeweed, sorrel
Spring fallow	Spring	All weeds present

Soils

A soil test is important to determine the nutrient status of the soil. More importantly for phalaris establishment, the results will indicate the soil pH and aluminium (Al) levels. Establishment and persistence of phalaris is generally poor on strongly acid soils. Soil tests should be taken as early as possible but at the latest the spring prior to sowing to allow time for improving soil fertility and acidity before sowing. Phalaris is sensitive to high aluminium levels that are associated with acid soils.

If aluminium levels are high in the topsoil (above 8-10 mg/kg CaCl₂), lime should be incorporated prior to sowing phalaris. Where subsoil (20-40cm) aluminium concentrations are high (above 5 mg/kg CaCl₂) phalaris should not be sown. Grasses such as cocksfoot, which are more tolerant to aluminium, can be sown.

The use of high-grade lime will restore soil pH to a suitable level provided the soil is not acid to depth. Lime moves through the soil relatively slowly and generally does not move much deeper than the top 15cm of soil. Therefore incorporating lime is generally more efficient than applying lime on the surface. Once the soil pH_(CaCl₂) falls below 4.9 aluminium maybe a problem. Aluminium restricts root growth, reduces plant growth and reduces the

plant's ability to survive dry summers. It is important to know the soil pH to depth (40+cm). If the depth of the very acid layer extends greater than 40 cm then phalaris should not be sown.

Seed and seedbed

Sowing the right amount of seed will ensure a dense pasture sward. Very high sowing rates can result in too much competition for light, nutrients and moisture.

Fertilisers

To assist with germination and encourage rapid growth, it is essential to apply nutrients at sowing. The essential nutrients for plant growth are phosphorus (P), sulphur (S), nitrogen (N) and potassium (K). Pasture seed should not be sown with potassium or large amounts of nitrogen as this can reduce germination. If potassium is needed it is best to apply potash prior to sowing to correct deficiencies. Nitrogen can be applied once the plants have established to increase growth rates.

Time of sowing

In most situations it is better to sow pasture in autumn, as the plants establish and are given the opportunity to set seed and form dormant buds before the hot summer, which increases the plants survival rate. Spring sowing is possible in cooler districts when summer rainfall is likely. Research has found there is no significant difference between spring and autumn sowing in terms of the number of plants germinating, as long as there is rainfall shortly after germination. Lucerne can also be sown in spring and autumn with many successful paddocks established in very early spring as soon as it is possible to get equipment on the paddock.

Seedbed

To ensure good germination, it is important to maximise the seed soil contact by sowing into a firm, moist, level seedbed. A weed free seedbed is also important,

especially with direct drilling where existing vegetation must be controlled prior to sowing. Ideally, the seed and fertiliser should be close together to allow seedlings easy access to nutrients in the critical early development stages. There are various techniques for sowing including, cultivation, direct drilling, aerial seeding, undersowing, over sowing, sod seeding and broadcasting. Cultivation and direct drilling are the most effective technique for establishing pasture

Direct drilling, cultivation and aerial sowing

More seedlings will germinate using the cultivation technique, as this creates the most suitable environment for the seed. However, cultivating will encourage more weeds to germinate, creating greater competition for seedlings. With direct drilling fewer seeds tend to germinate, but fewer weeds germinate to compete with the pasture. Direct drilling, cultivation and aerial sowing are the recommended techniques for establishing pasture due to good seed soil contact and the ability to place seed with fertiliser.

Monitoring

Monitoring a newly sown pasture is essential. In the first three months after sowing seedlings are susceptible to insect attack, in particular from redlegged earthmite (RLEM). Serious damage can be caused to the seedlings and future production, although it is important to note that grasses are more tolerant than clovers to RLEM attack. In clovers RLEM attack the growing point, which kills the plant, whereas in grasses RLEM attack the leaf blades. This is why grasses can tolerate higher densities of earthmites than clovers

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