

Grazing phalaris for production & persistence



Phalaris

Phalaris – the plant

Phalaris is a winter-active perennial that has erect stems and short rhizomes. It is deeper-rooted than perennial ryegrass and cocksfoot. Therefore it is suited to drier and more drought prone areas.

There are two types of phalaris;

- Prostrate, semi-winter dormant, summer dormant cultivars (eg Australian) slower to establish, less winter growth but more tolerant of set stocking than winter active cultivars.
- More erect, winter-active, medium summer dormancy cultivars (eg Sirosa) easier to establish, higher winter production but require rotational grazing management for optimal persistence and production.

Phalaris changes from vegetative to reproductive growth after a period of 5-10°C and/or short days and then increasing day length. Once reproduction has been triggered, the plant diverts energy from leaf production to stem and seed production. Prior to seeding, the tillers undergo stem elongation, head emergence and flowering. While this is occurring, tillers also develop dormant buds.

Phalaris buds are full of carbohydrates. The key to phalaris production and persistence is managing these buds.

Buds develop when phalaris is in the reproductive phase – the further the plant goes through this phase the bigger and stronger buds will be.

The dormant buds allow phalaris to survive the summer. Each bud is supplied with a trickle of moisture through summer by deep roots. Factors that restrict root development, such as sub-soil acidity, will reduce the persistence of phalaris.

Actions summary

- ▶ **Strategic rotational grazing can greatly improve the persistence and productivity of phalaris pastures especially in challenging conditions.**
- ▶ **Low soil pH and high available aluminium in the topsoil and/or subsoil will reduce production and persistence of phalaris.**
- ▶ **Prostrate, semi winter dormant cultivars are less productive but more tolerant of set stocking.**
- ▶ **Winter active cultivars require rotational grazing for good survival and production.**



*Phalaris leaf stage.
Each new leaf is bigger than
the last, so maximum growth
potential is reached at four
leaves.*

Establishing Phalaris on farm

Phalaris is a relatively small and weak seedling so there needs to be good weed and insect control ahead of seeding. This is especially important if upgrading pastures dominated by onion grass, silver grass, bent grass etc that will strongly compete with establishing phalaris. Phalaris cannot be thickened up by over-sowing phalaris into existing pastures as can be done with ryegrass.

Sow phalaris as the only perennial grass. Ryegrass, cocksfoot or cereals will seriously compete with the phalaris in the establishment year. Surveys of paddocks in southern NSW have found that where mixtures of perennial ryegrass and phalaris were sown, the paddocks often contained few perennials after three to four years. The ryegrass dominated the phalaris in the establishment year but then only lasted for two to three years leaving no perennials present by year four. If other perennials must be added to the pasture, these should be oversown after the phalaris is established.

The ability of phalaris to regenerate quickly in autumn depends on the number and health of the dormant buds. Rapid autumn growth is important to suppress weeds and boost production.

Tillering of phalaris thickens up the pasture. If tillering occurs late in spring, or there is an early finish to the season, tillers may not develop buds. These tillers then rely on the main plant for energy. If there is not enough energy to support the extra tillers over the summer the entire plant can die.

Getting the conditions right

Before establishing phalaris, test soil for pH and aluminum in a 20-30cm sample in addition to a 0-10cm soil fertility test. Get advice on lime requirements as it will need to be applied one to two years before sowing to allow time for it to get into the soil. In northern Victoria, lime can greatly improve the establishment and persistence of phalaris pastures.

Select cultivars that suit your management style and enterprise requirements. Winter dormant cultivars are

more tolerant of set stocking, but harder to establish and have lower winter production. Winter active cultivars are easier to establish and more productive but require more careful management.

Leaf Stage

Phalaris growth rate and persistence is highly reliant on the level of stored water soluble carbohydrates (WSC) in the roots and stem of the plant.

WSC are required to produce the first leaf after grazing, and are replenished by photosynthesis when new leaves grow.

The maximum level of stored WSC is not reached until there are four fully expanded leaves on each tiller. This is the optimum time to graze the plant.

The rest period required for a phalaris plant to reach four leaves depends on soil moisture and temperature.

Longer rest periods are required during summer when moisture is limiting, and in winter when soil temperature is limiting.

Research at Broadford, Victoria, showed that rest periods of approximately 70 days in summer, 30-50 days in autumn, 40-60 days in winter and 20 days in spring were required for phalaris to reach the four leaf stage prior to grazing.

Animal Health Issues

Livestock disorders (sudden death, acute nervous disorder, phalaris staggers) are more prevalent during autumn.

Phalaris contains alkaloids which interfere with the heart, spinal cord and brain. The alkaloid content varies with the stage of growth of the pasture.

Young rapidly growing phalaris can be toxic, especially in conjunction with high soil nitrogen, low light intensities within the sward and high temperatures – all of which are common in autumn.

Sheep tend to be more prone to the effects of the alkaloids than cattle. Shifting stock late in the day can reduce livestock problems.



A four paddock rotation can be used to allow feed to get away during autumn and winter

Grazing management

The requirement for managed grazing depends on the conditions where the phalaris is grown.

On heavy clay in western Victoria with good water-holding soils and low available aluminum, phalaris can completely dominate the pasture, excluding clover and requires heavy continuous grazing.

In contrast, in northern Victoria with more acid soils and lower soil water capacity, rotational grazing is required to give the phalaris a competitive advantage over weed species.

Summer-autumn

Careful management in summer - autumn will set up phalaris pasture for the rest of the year, in particular for winter growth.

During summer, aim to graze each paddock twice, with a rest period of about 70 days.

By the autumn break, dry standing phalaris should be reduced to 800-1000 kg DM/ha to encourage sub clover establishment. Sub clover must germinate and establish a root system while competing with phalaris for moisture and light.

If sacrifice paddocks or stubbles are available, phalaris grazing should be deferred after the opening rains until pastures get to the 4-leaf stage.

Alternatively, rotationally graze through summer and autumn to avoid continually grazing the new growing points.

The time of the autumn break determines rate of leaf emergence and therefore the length of the autumn rotation.

With an early break, leaf emergence rate will be high, and stock can be grazed on a faster rotation (30-40 days), which will encourage clover germination.

For a late break, leaf emergence will be slow, and stock should be rotated slowly (40-60 days) or use a sacrifice paddock to allow phalaris to get away. The key is to respond to seasonal conditions.

Autumn-winter

To improve persistence of phalaris, it should be rotationally grazed through autumn and winter.

- Pre-grazing: Aim for pastures to reach the 4-leaf stage, or about 30-40 days before grazing to optimize growth of winter active cultivars.

- Post-grazing: Graze to food on offer (FOO) of 6-800 kg DM/ha (1-2 cm) or half a leaf stage. If grazed below this level, the low leaf area will restrict future growth. Persistence will be reduced by continually removing growing points.

- Spells from grazing: Rest periods of 40-60 days will be required for phalaris to reach the 4-leaf stage during winter. Two weeks grazing and six weeks rest works well with a four-paddock system and balances management input, paddock numbers and pasture production. Where paddocks range in size and production level, grazing time should be increased or decreased accordingly. Shorter grazing times (one to four days) can increase phalaris production as regrowth is not grazed.

Spring

Management of phalaris in spring is often a choice between pasture quality and persistence.

Where phalaris persists well, (high rainfall areas, heavy soils, low aluminum, high fertility), manage phalaris for higher quality.

Aim to keep the phalaris vegetative and reduce head emergence. This will require increased stocking rates and shorter grazing rotations (one week grazing, three weeks spell) or continuous grazing. Optimum FOO is 1200-2000 kg/ha.

Phalaris pastures can be cut for silage or hay. Graze to just before stem elongation (mid-September) and then cut just before head emergence (Mid November). This will achieve a good balance between pasture growth and quality.



Rotational grazing allows phalaris to dominate over broadleaf weeds

Spring management continued...

When phalaris persistence is a problem, graze the pasture so that it is kept between 1,500 - 2,500 kg DM/ha.

This will allow some phalaris plants to reach head emergence, while others are kept short enough to maintain reasonable quality.

The aim is to have the majority of tillers with well developed buds before summer.

For newly established phalaris pastures it is vital to allow seed set before grazing.

This may also be considered in a spring when the season is likely to finish quickly and an extended dry summer is predicted.

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Further information

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Research results

Research has shown that:

- Compared to one day of grazing, continuous grazing resulted in up to 60% less pasture being consumed, while seven days of grazing resulted in 40% less pasture consumed.
- Research at the Broadford Grazing Experiment, Victoria, compared three different grazing methods; set stocking, simple rotational grazing (four paddocks two weeks on/six weeks off) and intensive rotation (phalaris grazed at the 4-leaf stage in up to 20 paddocks, sheep moved every four days). Stocking rate was 1DSE/ha higher with the simple rotation, and 3 DSE/ha higher on the intensive rotation. Wool production was 10% and 20% greater on the simple and intensive systems respectively.

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