Holdfast

Phalaris

Phalaris aquatica

DOMESTIC

KEY FEATURES

- Bred as replacement for Sirosa
- Semi erect growth
- Low to moderate summer dormancy
- Acidic soil tolerance
- Medium seedling vigour for good establishment
- Excellent winter production
- Good persistence

HOLDFAST was bred by CSIRO and released in 1991. It was derived from selected plants of Australian which displayed excellent seed retention. It was then back-crossed with Sirosa and Sirolan material followed by out-crossings with selected lines from the Mediterranean. It has similar agronomic characteristics to Sirolan and Sirosa but has superior seed retention when fully mature.

HOLDFAST has a semi-erect growth habit; it is classed as a winter active variety with low to moderate summer dormancy.

It offers acidic soil tolerance, medium seedling vigour and excellent winter production with high total production. Ideally, HOLDFAST should be rotationally grazed and offers good persistence under drought

HOLDFAST can be sown in the main and drier phalaris growing districts. HOLDFAST is a suitable replacement for Sirosa.

Growing Conditions

Soil Type:
Grows best on deep, fertile, heavier textured soils, but adapted to a wide range of soil types from moderately shallow, sedimentary-derived soils to deep clay soils. Tolerates waterlogging and moderate salinity.

Rainfall:
500mm+

pH:
4.5 - 8.5 ($CaCl_2$)

Sowing Rate:
Mixes 1 - 3kg/ha
Pure 2 - 4kg/ha

Phalaris Agronomic Information

Scientific name(s) *Phalaris aquatica (Phalaris tuberosa)*

Strengths

- Excellent drought survival ability
- High cool season productivity of good quality
- Responsive to increased soil fertility
- Tolerates heavy grazing once established (particularly semi-winter dormant cultivars)
- Grows well on a wide range of soil types
- Tolerates waterlogging and moderate salinity
- Few pests and diseases
- Deep root system helps dry soil profile and reduces rate of soil acidification

Limitations

- Relatively slow to establish, similar to cocksfoot and tall fescue; winter-active cultivars have higher seedling vigour than semi-winter dormant cultivars
- Low production in the establishment year
- Seedlings are sensitive to competition from annual grasses
- More sensitive to soil acidity than alternative species such as cocksfoot
- Not suitable for low fertility soils
- Potential to cause phalaris poisoning
- Requires good management to enhance survival in marginal drier/hotter areas (e.g., northwest slopes of NSW)

Plant characteristics

Plant: Tufted, robust, deep-rooted temperate perennial grass, growing 1 to 2 m tall at maturity, and spreading by short underground stems (rhizomes). Main growth period autumn-winter-spring. Usually dormant in summer but can respond to summer rainfall particularly in cooler districts. Semi-winter dormant cultivars are slower growing in winter and less erect than winter-active cultivars.

Stems: Flowering stems are hollow and erect, with a waxy coating giving the plant a blue-green appearance. They may be over 1cm diameter at the base at maturity.

Leaves: Hairless, to 40 cm long and almost 2 cm wide, arising mainly from the base but also from higher nodes as the flowering stems elongate; the leaf sheaths often reddish in colour. Winter-active cultivars have larger leaves than semi-winter dormant cultivars.

Seedhead: Dense, oblong to cylindrical panicle 5 - 15 cm long and 1.5 cm wide, borne high above the leaves. New panicles are more or less compact and resemble spikes, but open and spread slightly as the plant matures.

Seeds: Cream to pale brown, smooth and shiny, flat, about 3mm long. 880,000 seeds/kg.

Pasture type and use

Used widely in the inland high rainfall zone and adjacent higher rainfall cropping areas of southern Australia for all types of grazing stock, but mainly sheep and beef cattle. Suitable also for hay and silage.

Where it grows

Rainfall

Minimum average annual rainfall 400 mm in South Australia, 400-450 mm in Victoria, 500-550 mm in southern NSW and 650 mm on the north west Slopes of NSW.

Soils

Grows best on deep, fertile, heavier textured soils, but adapted to a wide range of soil types from moderately shallow, sedimentary-derived soils to deep clay soils. Generally, survives well if there is clay subsoil and adequate fertility. Moderately sensitive to acid soils below pH 4.5 ($CaCl_2$) but many good phalaris stands grow on soils with surface pH below 4.5. Cultivars have been bred for improved acid soil tolerance. Lime application improves establishment on strongly acid soils. Poorly suited to soils where strong acidity extends deep into the subsoil. Tolerant of elevated Mn. Tolerates waterlogging and moderate salinity

Temperature

Grows best in the temperature range 15-25°C. Survives severe frosts well. Well adapted to tablelands and upper slopes in NSW and similar temperature zones in other states. Survives high summer temperatures in the dormant state but struggles when making new vegetative growth in summer rainfall areas where mean daily maximum temperatures exceed 30°C. Susceptible to damage from summer grazing in hotter northern NSW slopes areas.

Establishment

Companion species

Grasses: other slow-establishing grasses such as cocksfoot and tall fescue. Sowing with perennial ryegrass is not recommended.

Legumes: clover (subterranean, white), greater lotus, lucerne in appropriate regions.

Sowing/planting rates as single species

2-4 kg/ha, normally 3 kg/ha.

Sowing/planting rates in mixtures

1-3 kg/ha.

Sowing time

Can be sown in autumn (all areas) or late winter/early spring (Victoria, South Australia, Tasmania, tablelands of NSW).

Inoculation

Not applicable

Fertiliser

If soil is low in phosphorus (P), apply P fertiliser at sowing and maintain regular applications in later years. Use molybdenum (Mo) for clover component where recommended. Apply sulphur (S) in deficient soils. Starter type fertiliser can be used where nitrogen (N) levels are low.

Management

Maintenance fertiliser

A productive pasture requires good levels of P, N, S and K. Build up soil P to maintain a vigorous clover component since productivity will decline if clover disappears. Maintain S and K in deficient soils. N fertiliser can be effective in the absence of a companion legume or to boost seasonal production if required.

Grazing/cutting

Phalaris is sensitive to grazing/cutting in the year of sowing. Autumn-sown stands can often be grazed briefly during spring in higher rainfall areas, otherwise do not graze until after seed fall. Rotational grazing is recommended for production and persistence, particularly for winter-active cultivars. Semi-winter dormant cultivars are highly grazing tolerant and withstand long periods of set stocking.

Spelling during autumn/winter can be used to strengthen phalaris stands. Graze heavily enough in spring to maintain nutritive quality. Spelling to allow reproductive growth in spring/early summer can help strengthen stands if needed. In higher rainfall areas, maintain pastures in range 1500-3000 kg DM/ha. In drier districts, adjust grazing to allow at least some heading for persistence. Reducing stocking rate or destocking for 4-6 weeks in early stem elongation and after autumn break promotes persistence on northwest slopes of NSW.

Apply moderate grazing pressure during summer to remove dry residues by the end of March to promote clover regrowth.

In warmer summer rainfall areas, delay removal of stem residues until late summer to inhibit summer growth, protect any new growth that does occur and reduce soil erosion around crowns.

Seed production

Can produce up to several hundred kg of seed per hectare if locked up in spring. Older cultivars shed seed readily, but modern “seed-retaining” cultivars retain ripe seed in the head.

Ability to spread

Spread by seed is not rapid due to low levels of seedling recruitment. However, some spread from seed occurs in ungrazed areas where soil conditions are suitable. Semi-winter dormant cultivars have higher vegetative spread under grazing than winter-active cultivars. Allowing reproductive development increases the number and size of buds at the base and hence shoot numbers in the following season.

Weed potential

Some weed potential principally along roadsides and in drainage lines where moisture and deeper soil create suitable conditions and grazing is infrequent or absent. Weed potential derives mainly from the tall growth that smothers other plants. Weed threat unlikely in low fertility soils.

Major pests

Mature stands are generally unaffected by pests. Seedlings are susceptible to damage from red-legged earth mite, blue oat mite, aphids, field crickets, white curl grubs (scarab grubs) and slugs and snails. Seed-harvesting ants can be a problem in removing surface-sown seed.

Major diseases

There aren't any diseases of major importance to phalaris production in Australia. Stem rust is reasonably common in wet, mild seasons but the plants generally grow out of the infection without any long-term consequences for survival. Grazing will remove the infected leaves and encourage new growth.

Herbicide susceptibility

Sensitive to glyphosate and grass-specific herbicides but large plants may require higher rates to be killed.

Animal production

Feeding value

Phalaris is a high quality grass often considered intermediate between ryegrass and tall fescue in this regard. During vegetative growth, digestibility is typically in the range of 75-80% and metabolizable energy around 11-12 MJ/kg DM. Nutritive value declines as the flowering stems develop and mature.

Palatability

Vegetative growth is highly palatable but palatability declines as flowering stems mature and dry off during summer.

Production potential

Production potential is high provided soil fertility is adequate. Peak spring growth rates typically 50-80 kg/ha/day of dry matter. Winter growth rates are typically 10 kg/ha/day in cooler areas (e.g., NSW Tablelands), varying from 5-20 kg/ha/day depending on locality and cultivar. Phalaris-clover pastures good for liveweight gain and fattening. Under good conditions, dryland mixed pastures based on phalaris can carry an average of 1-2.5 steers/ha (300 kg liveweight or 10-15 DSE/ha) during April-November and produce liveweight gains of 0.9-1.2 kg/head/day.

Livestock disorders/toxicity

Phalaris can cause toxicity in sheep, and sometimes cattle, due to the presence of alkaloids, although problems are rare. There are two main conditions:

- Phalaris "staggers" can occur any time when green phalaris is predominant in the diet, classically a few weeks after the break of season. Stock that show staggers symptoms usually recover when removed from the pasture but may not recover where exposure is prolonged. The risk is highest in cobalt deficient soils or where conditions lead to low cobalt availability and is preventable with cobalt supplementation.
- "Sudden death" can result in losses within two days of introducing stock to a phalaris pasture. Losses typically have occurred on new shoots of phalaris after moderate rains in an otherwise dry period. The new growth is moisture-stressed and may be affected by frost. Most at risk are stock which are very hungry and unaccustomed to green phalaris, and which have been deprived of feed because of transport or shearing. This problem is more prevalent in rotational grazing systems. Potential for sudden death disappears after about 2 days on pasture.

Source : Pastures Australia

Australian Government
Rural Industries Research and Development Corporation
RIRDC www.rirdc.gov.au

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