Department of Primary Industries

primefact

Introduction to selecting pastures in NSW

Primefact 1539, First edition, April 2017, replaces Agnote DPI-263
Pastures Unit

Introduction

This guide has been produced to help in the selection of suitable pasture species and varieties. Each pasture species listed at http://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/species-varieties has in its Primefact information on some or all of the following:

- Brief description
- Required rainfall
- Area of adaptation
- Advantages
- Disadvantages
- Soil requirements
- Varieties
- Sowing rates
- Sowing times
- Companion species
- Legume inoculation
- Main pests
- Main diseases
- Management
- Livestock disorders of particular note
- Additional tips
- Further information.

Required rainfall and area of adaptation

The selection of pasture species appropriate to a particular district is, in large part, determined by the minimum annual rainfall and rainfall distribution. The minimum average annual rainfall required normally refers to the limit for the earliest maturing variety. It does not refer to all varieties listed.

Other important factors which influence growing conditions include:

- The soil's capacity to hold moisture
- Elevation and temperature
- Slope and aspect (that is, the direction that a paddock faces, e.g. south-west)
- Livestock management.

Soil requirements

Attributes such as soil water holding capacity, waterlogging, salinity and acidity at depth tend to be very expensive to modify. In contrast, soil fertility is relatively easy to improve. Therefore, a species' requirement for "medium to high fertility soils" may not be an obstacle to its selection.

Varieties

Suitable varieties should be selected on the basis of attributes such as:

- Performance: Seek local trial results (if available) for seasonal yields and persistence
- Maturity: Choose an earlier-maturing variety if in the drier part of a species' zone of adaptation
- Dormancy: Many pasture species exhibit a dormancy mechanism that enables them to survive during periods of extreme conditions, e.g. winter dormancy to avoid severe cold, and summer dormancy to survive periods of heat and drought stress.
- Plant habit: Prostrate or erect
- Grazing tolerance
- Seedling vigour
- Tolerance or resistance to pests and disease.

Varieties or brands?

A variety or cultivar is an assemblage of cultivated individuals that is distinguished by any character significant to the purpose of agriculture which, when reproduced (sexually or asexually), retains its distinguishing features. Where seed is sold under a brand name, it might or might not be a distinct variety. The Australian Seed Federation maintains an extensive list of pasture species varieties and brands at http://www.asf.asn.au/seeds/pasture-seed-database/.

Plant Breeders' Rights (PBR)

PBR is a type of copyright which protects the breeder's "invention" of a new, unique plant variety. It provides the right of commercialisation of this registered variety. Protection under PBR is normally valid for up to 20 years. Seed from lines protected by PBR may be held on farm for own use. However, the current seed or the produce of subsequent harvests cannot be sold as seed for sowing, without permission from the breeder or his agent. Information on PBR and listings of registered varieties and their distinguishing characteristics are available at Intellectual Property Australia, see https://www.ipaustralia.gov.au/plant-breeders-rights.

Seeds and sowing rates

- Wherever possible, **use certified seed**. It is guaranteed to be true-to-type and meets strict standards, including those for purity and germination rate.
- The sowing rates given are for dryland areas, unless otherwise stated
- The sowing rates cover a wide range of circumstances. Use the lower rates in lower rainfall situations, and the higher rates for higher rainfall areas or if under irrigation.
- When sowing mixtures, take care to avoid too high seeding rates. This can result in competition between establishing pasture seedlings, especially when more than one grass is being sown.
- If the seed is coated, for example some legumes and tropical grasses, increase the sowing rate to allow for the weight of the seed coat.

Sowing times

In the right conditions, temperate (or cool season) perennial species can be sown over most of the year but tropical (or warm season) species require a minimum soil temperature for good germination. This minimum temperature varies with species. Sowing time is influenced by seasonal conditions.

Companion species and mixtures

Temperate (cool season) pasture species produce most feed during winter and spring. They tolerate cold and frost, and are widely adapted. Temperate grasses tend to produce higher quality feed than do tropical grasses, especially where pastures are not actively managed.

Tropical (warm season) species are most productive during the warmer months. In New South Wales, their profitable use is limited by low effective rainfall in summer, low temperatures, and frost. Tropical pastures are therefore more commonly grown in coastal districts, the northern and central inland areas of the lower slopes and plains, and (with irrigation) the plains of the southern districts.

A mixture of temperate and tropical varieties may improve the overall quality of the mixture and provide a spread of feed across seasons. For example, tropical grasses on the north-west plains are usually grown with barrel medic, which is temperate.

Another strategy to spread risk and broaden feed availability is to sow two or three suitable varieties of a single species – still totalling the same recommended seeding rate.

A mix of species and varieties in different paddocks can spread risk and broaden feed availability.

If species in a mixture have different optimum sowing times, they are often **sown separately**. For example, a temperate legume may be sown with a crop one season, and a tropical grass sown the following season.

Legume inoculation

Legumes require “inoculation” (i.e. infection) with *Rhizobium* bacteria in order to ‘fix’ atmospheric nitrogen. Different legume species require inoculation with specific strains of commercially-available *Rhizobia*. The correct *Rhizobium* may already be present in the soil in sufficient numbers. For example, if the same legume species was growing in the paddock in recent years and nodulation was seen to be adequate, the addition of inoculant when resowing may not be necessary. However, in most cases, the additional step of inoculating legumes at sowing is strongly advised.

Animal health

An increase in the incidence of certain livestock health disorders may be associated with pasture improvement. Livestock and production losses can result from some of these disorders. Management may need to be modified to minimise risk to livestock health. These risks need to be balanced with the consequences of a minimalist approach, which may include low and declining plant productivity.

The following livestock disorders are common across many pasture species:

- **Enterotoxaemia** (pulpy kidney) is a constant risk when ‘improved’ or ‘introduced’ pasture species are grazed
- Sporadic cases of **polioencephalomalacia** (PE) may occur when livestock are grazed under a rotational or cell grazing management system
- **Hypomagnesaemia** (grass tetany) can be a seasonal risk for stock on many grass pastures
- Significant **oxalate, nitrate or cyanogenetic glycoside accumulations** may occur in many pasture species in some seasons. Grazing ruminants usually adapt successfully to such feed, provided they are not suddenly placed upon such pastures when hungry.
- Bloat is a constant risk in cattle that are grazing lush pastures with a large component of legume (e.g. greater than 30% of total herbage dry matter).

Livestock health disorders that are of importance in relation to a particular pasture species are listed in the Primefact for that species. Fortunately, appropriate management can reduce the risk associated with most of these problems. Consult your veterinarian or adviser when planning pasture improvement.

Further information

For more information contact Local Land Services, seed suppliers or your preferred agricultural advisor. For relevant publications by NSW DPI go to www.dpi.nsw.gov.au/agriculture

Acknowledgments

Written by Ashley Senn, Development Officer (Pastures), with input from current staff of the Pastures Unit. Based on Agnote DPI-263 *Introduction to selecting and using pastures in NSW*, by former Technical Specialist Warren McDonald and other staff of the Pastures Unit.

Pasture improvement cautions

Pasture improvement may be associated with an increase in the incidence of certain livestock health disorders. Livestock and production losses from some disorders are possible. Management may need to be modified to minimise risk. Consult your veterinarian or adviser when planning pasture improvement.

The *Native Vegetation Act 2003* restricts some pasture improvement practices where existing pasture contains native species. Enquire through the NSW Office of Environment and Heritage for further details.

ISSN 1832 6668