What is a good pasture?

Before beginning to design pasture mixtures it is important to consider why pastures are grown, and therefore what makes a 'good pasture'.

Pastures are not the end product for the farmer. The ultimate output from a pasture system is the animal product it yields. This is what the farmer is paid for. Therefore the main objective of growing pasture is to feed animals.

However, **pasture must also be an efficient feed source for animals.** For this purpose, *efficient* means meeting the nutritional requirements of the animals for as much of the year as possible, in a way that is cost-effective for the farmer. The pasture must return similar levels of animal production for lower cost compared to other sources of feed such as bought in supplements or a forage crop grown on the farm. To achieve this, there are three primary requirements:

1. The pasture must be **productive**. It must grow at rates that are close to the potential growth rate, *within the constraints imposed by the environment of the growth site.* Both the total amount of pasture grown in a year, and the time of year when the pasture grows are important.

2. The pasture herbage produced must be of adequate ***nutritional value*** for livestock to perform to expected levels. The main nutritional factors to consider are the energy density of the pasture and the protein concentration. Animals should be able to sustain a high rate of intake from the pasture, so that they can grow or produce as needed.

3. The pasture must be **'fit for the purpose'** for which it is intended. For example, if the intention is to use the pasture as a permanent source of feed for milking cows, then it must be persistent (that is, survive for many years) and produce high quality feed for all, or most of, the time when cows are lactating. These features combined will lead to relatively high efficiency in both a biological and economic sense.

A good quality ryegrass / white clover pasture for milk production

If these three primary descriptors of a good pasture are met, then it is likely that some secondary requirements will also be met. These include:

4. The pasture must contain a high proportion of species that perform best in the environment where the pasture is growing, and suit the purpose for which it will be used. This generally means it will have a high content of sown or desirable species and a low content of 'weed' species. Weed species generally restrict the biological efficiency of the pasture, and create additional costs which also reduce the pasture's economic efficiency.

White clover is renowned for its high digestibility and protein content.

Weeds such as thistles reduce the biological and economic efficiency of pasture.

5. The pasture will consist of a ***mixture*** of sown or desirable species, each of which contributes to the overall objective of providing high quality feed at a time when it is required by the animals.

The principles of combining species in a pasture mixture will be considered in another tutorial.

A good pasture needs to suit the environment and the needs of the animals. Consequently, a pasture that is effective in one situation may not be suitable in another. This is why the same pasture type is not used in all regions and grazing enterprises in Australia, or even Victoria. To identify a 'good' pasture to fulfil a specific purpose, we must consider:

1. Interactions between pasture plants and their environment, particularly the climatic and soil environments in which the plants are growing;

2. Interactions between pasture plants and their management, including the species of animal being used to graze the pasture; and

3. Interactions between pasture plants and other pasture plants (competition both within and between species).

By analysing these factors, you can use your knowledge of the agronomic and adaptive features of pasture species and cultivars to design a pasture mixture that will meet the objectives of the farmer.

A fence-line comparison between well-fertilised (left) and poorly fertilised (right) pastures in the long-term phosphate experiment at PVI Hamilton in western Victoria. The difference in soil fertility leads to large differences in pasture composition across the fence line, as plants respond to their soil environment.