

Factors affecting the quality and quantity of forage harvested for silage

SILAGE NOTE NO. 5

Forage quality and quantity are both important in determining the profitability of animal production from silage.

The quality of the forage cut and the management of the forage, from cutting through to feedout, affects the quality of the silage consumed. It puts a limit on the potential animal production per tonne of silage dry matter (DM) produced.

Managing the growing crop or pasture

The growing parent crop or pasture must be well managed to produce high yields of high quality forage.

Species and variety selection

The choice of crop and pasture species for silage production is governed by your climatic and management considerations.

Silage Note 4 includes a range of crops and pastures commonly used for silage production, with emphasis on their forage production potential and management for silage production. Remember, the quality of the silage produced is limited by the quality of the parent forage harvested.

Soil fertility

Soil fertility can influence potential yield, quality, growth rates and capacity for forage crops and pastures to recover after grazing or cutting. Fertiliser requirements vary with crop and soil type and soil test analyses. Seek local advice for fertiliser application rates.

Large amounts of nutrients are removed when high yielding crops and/or pastures are harvested, and must be replaced to sustain long-term production.

Weeds, pests and diseases

Infestations of some weeds, pests and diseases can reduce the yield of the parent forage and the quality of silage produced. Either select paddocks that are free of problem weeds, pests and diseases or control them before they impact on yield and/or quality.

Some weeds can be poisonous or unpalatable, cause milk tainting or affect the silage fermentation process. However, grass weeds cut early are not likely to affect the silage quality.

GOALS FOR SUCCESSFUL SILAGE

Optimise forage yield and quality with good agronomic management

Harvest at the recommended growth stage for optimum quality and quantity

Wilt to the target dry matter range as quickly as possible.



Caution with chemicals

When using pesticides and/or other chemicals on crops and pastures intended for silage:

- Always read the label.
- Keep up-to-date with withholding periods (WHPs) and export slaughter intervals (ESIs) for chemicals used in forage production systems.
- Avoid chemical residues in silage by minimising chemical use, spray early in the growing season and ensure all WHPs have been satisfied.
- Be aware that chemicals used on crops that were intended for grain harvest may have a long WHP and may make crops unsuitable for silage production.
- If purchasing forage ask for a signed Vendor Declaration which lists all chemical treatments used before and during the forage growing period, which could compromise silage use.

Managing the forage from cutting to harvest

Growth stage at harvest

Digestibility, ME content and protein levels of plants are highest when the plants are in the early vegetative growth stage. Late cut forage is usually of low quality and unsuitable for enterprises with high production targets.

The graph in figure 2 clearly shows how this applies for lucerne.

Although DM yield is likely to be highest when the parent forage is in the seed formation stage, forage quality drops quickly once maturity progresses from the vegetative stage to the reproductive stage, particularly after flowering. The rate of decline of forage quality is slower for legumes.

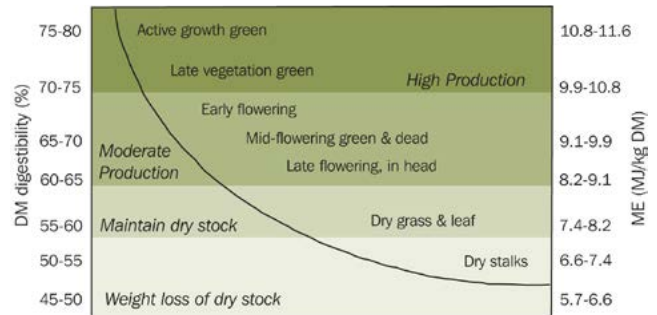
The optimum stage for harvest is often a compromise between quality and quantity, with the recommended growth stage targeting a time when forage quality is acceptable and DM yields are sufficiently high to produce economic silage yields.

Additional benefits from harvesting early include:

- Faster wilting rate - lower yielding crops will dry more quickly.
- Pastures and forage crops have greater regrowth potential following an early harvest.
- The recommended growth stage to harvest varies between species (see Silage Note 4).

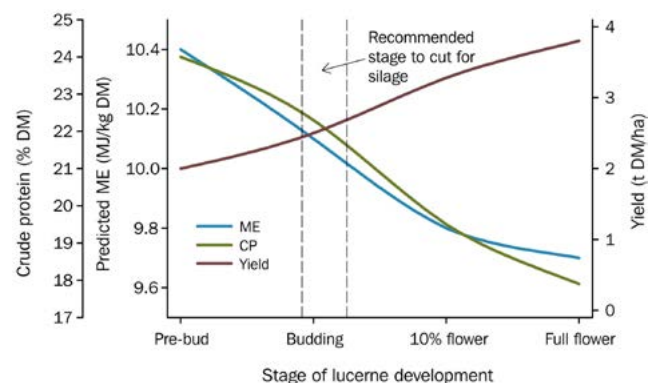
The graph in figure 1 relates specifically to temperate grasses, but the trend can be used as a guide for most plants.

Figure 1 Forage quality (digestibility and ME content) of the parent forage declines as it matures.



Source: Adapted from Bell (2000)

Figure 2 The effect of the growth stage on yield, ME content and crude protein level of lucerne harvested at Kyabram, Victoria.



Source: Adapted from Clarke and Mason (1987)

Dry matter content and wilting

The DM content of the stored forage affects how well it is preserved.

The focus must be on wilting to the target DM content as quickly as possible after cutting to minimise quality and DM losses in the field.

The target DM range for specific forages at harvest is included in Silage Note 4. The importance of wilting to the recommended DM contents is covered in Silage Note 6.

FOR FURTHER INFORMATION

The information in this silage note is taken from the Successful Silage manual.

This Silage Note is No. 5 in a series prepared as part of TopFodder Silage - a joint initiative of Dairy Australia and NSW Department of Primary Industries, which aims to improve the quality of silage produced on Australian farms.

For comprehensive information ask about:

- Successful Silage - a technical manual (including the TopFodder Silage DVD).
- Short courses in your area.