What's in a date – Using the latest ryegrass breeding technology for profit.

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Summary

You can choose when your ryegrass pasture will flower and go to seed before you sow it. Latest plant breeding technology means there is an interval of more than six weeks between the earliest and latest flowering varieties.

Having paddocks with different flowering dates allows dairy farms to improve early spring growth, and late spring quality. It can also lead to easier spring pasture management and getting more pasture ME into your cows.

Introduction

Many different pasture varieties are currently on the market. There are two ways of coping with this. First, you can throw your hands up in confusion! Second, you can seek advice as to what this range of options can deliver for you, on your farm.

Several characteristics need to be considered with varieties, and flowering date is one of the key ones, because it plays such a large role in spring pasture growth and quality.

This paper is about using flowering date on dairy farms. Little formal research has been done in this area, and what follows is more a discussion about what farmers are doing.

What is flowering date?

Flowering date is used by plant breeders to describe when a grass variety starts showing flower or seed heads in spring.

It is also know as "ear emergence date", as can be seen in the photo to the right, with the seedhead starting to emerge from the ryegrass stem.

Different ryegrass flowering dates

What determines flowering date?

The flowering date of ryegrass is genetically controlled. It is triggered in spring when the day-length becomes long enough. Simply put, late flowering varieties are triggered by a longer day-length, which is reached later in spring.

When do ryegrasses flower?

In New Zealand we label ryegrass flowering as plus or minus days from Day 0. This is the date when we have seen seedheads first appear in traditional ryegrasses such as Nui, Ellett or Yatsyn 1. Day 0 is usually about 22 October, but this varies from year to year. For example, a cold early spring delays flowering, whereas a warm spring can bring it earlier.

A variety classified as +21 days will flower on average 21 days after a 0 day variety.

Table [1]**:** Flowering groups and dates of permanent pasture ryegrasses (days)

Very early	Standard	Late	Very late
Meridian = -17	Aries HD = +2 Bronsyn = 0 Cannon = -1 Commando = -3 Extreme = 0 Nui = 0 Samson = +3	Arrow = +10 Banquet = +21 Impact = +21 Revolution = +19	Bealey = +25 Matrix = +23 Quartet = +28

Effect of flowering date

Flowering date has two main effects: early spring growth and late spring quality. For simplicity this paper will from now on refer to using the two main options for sowing: A '<u>Standard flowering</u>' variety of 0 days versus a '<u>Late flowering</u>' variety of +21 to +25 days.

Early spring growth

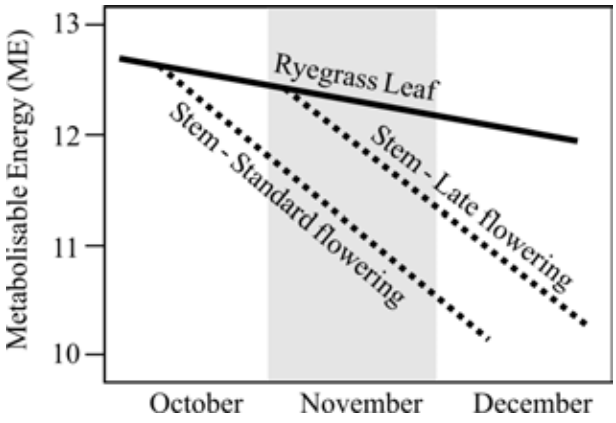
There is a strong correlation between earlier flowering and earlier spring growth. Standard flowering date varieties will continue to be used in South Island dairy systems for their excellent late August and September growth, which coincides with a critical feed pinch period.

Plant breeders continue to work on breaking the link between early flowering, and early yield. The new variety Arrow, for example, has excellent winter and early spring growth from a +10 day flowering date.

Late spring quality

Ryegrass is a wonderful plant, except in late spring when it starts to flower. As stems develop, fibre levels rise and metabolisable energy (ME) drops, as illustrated in Figure 1.

Figure [1]**:** Ryegrass feed value through spring



The presence of stems makes it harder to achieve consistent post grazing residuals, high utilisation and high pasture quality.

Late flowering varieties delay the drop off in quality over Standard flowering varieties (Figure 1), helping maintain cow intake and production through October. Late flowering ryegrasses also produce fewer seedheads, further improving spring pasture quality.

Using flowering dates on farm

What should you sow?

In most situations you need both Standard and Later flowering ryegrass, for each has its own advantages. The right balance between types can vary, but as a starting point we suggest 60% of the farm in standard flowering and 40% in late flowering ryegrass. Over time this ratio can be adjusted with further pasture renovation.

Paddocks of different flowering dates, or mix them?

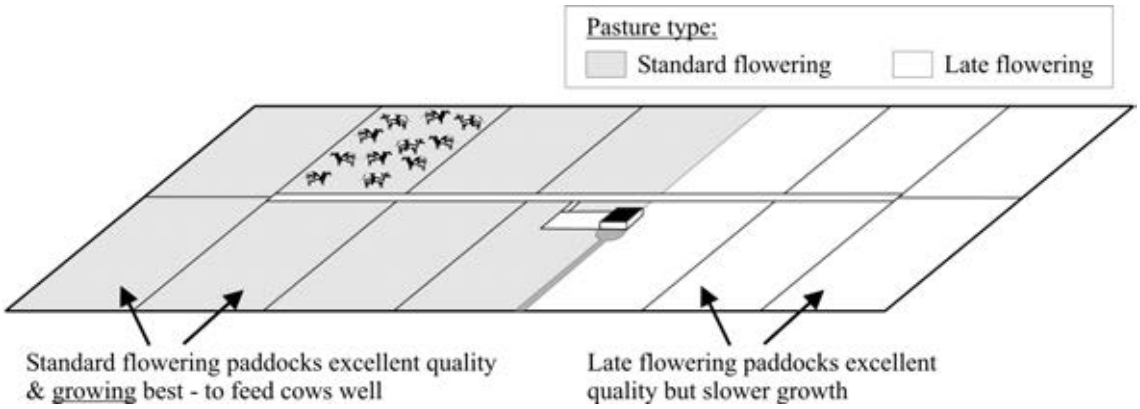
The biggest benefits will come from sowing paddocks into different flowering dates, which will be discussed in the rest of this paper.

Mixing ryegrasses of different flowering dates in the same paddock is a compromise – you have less of a rush to seed head (as different ryegrass plants will flower at different times) but you have seedhead over a longer period. So effectively, mixing varieties negates some of the advantages that different flowering dates offer.

Putting flowering dates into a farm system

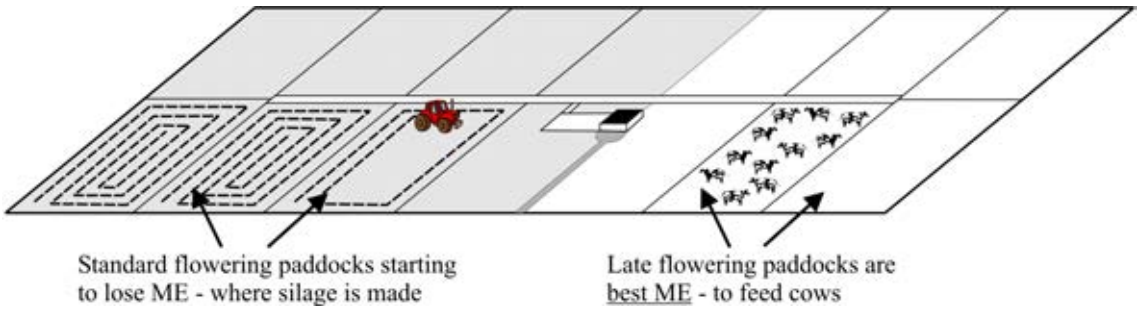
To help explain the principles of how they can be used, we've used a 'model farm', which is a nice rectangular property, with 14 paddocks, and 60% of its area sown in Standard flowering ryegrass, with 40% in Late flowering ryegrass (see Figure 2).

Figure [2]**:** Model farm - Late August and September



The 60% Standard flowering ryegrass is used for its superior late August-September growth. This is a critical feed pinch in dairy systems, typically in the second and third grazing rounds after calving.

Figure [3]**:** Model farm - 10 October to 1November



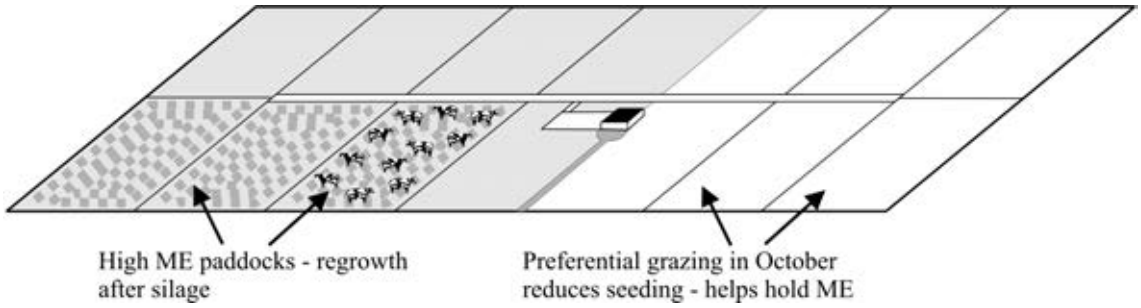
In October, the season changes to surplus pasture and, if we're not careful, deteriorating pasture quality. This is the most difficult period of pasture management, and it's also when the advantage of Late flowering ryegrass paddocks comes through. While the Standard flowering paddocks start to lose a little quality, the Late flowering paddocks are still high ME feed, with no sign of flowering – Figure 3.

NZ dairying systems are based on putting as much pasture ME as possible directly into cows. The Late flowering paddocks help achieve this, as they tend to be preferentially grazed through this period, giving higher cow feed intakes and more consistent post-grazing residual (which will in turn drive quality of regrowth).

Cows will still graze Standard flowering paddocks well if post-grazing residuals are well maintained through this period. Some managers feel this is easiest if you can alternate grazings between Late flowering paddocks (cows graze really well) and Standard flowering paddocks (where you may need to push cows a bit).

With the surplus pasture, October is typically a period of making silage. This is best done on the Standard flowering pastures, leaving the Late flowering paddocks for the cows. Standard flowering ryegrass will still make excellent silage (e.g. ME of 11.5+) if it is cut at a herbage mass below 3500kgDM/ha.

Figure [4]**:** Model farm - 1November to 22 November



The next grazing round in November (Figure 4) will have been set up (or not) in October. There is usually still an advantage from the Late flowering ryegrass paddocks. Although these are starting to flower, they have higher than anticipated ME, because they were preferentially grazed in the previous round.

On the Standard flowering ryegrass paddocks, if lighter quality silage crops were made, and cut to the right residual height, leafy high ME regrowth will also be becoming available for cows.

Conclusion

The availability of different flowering dates presents valuable options to set farms up for better pasture utilisation, by helping overcome our main pasture management hurdle – the quality of ryegrass in late spring. .