Feed Planning

Winter cereals or annual ryegrass

Sowing options for autumn

Winter cereals are being more widely used on dairy farms as an alternative to ryegrass to help clean paddocks up, as a break crop or to allow earlier sowing of summer crops. Cereals can also be grazed over the winter before being cut for silage in early spring.

The most commonly used winter cereals on dairy farms in southern Australia are oats and barley. Oats are typically sown in early autumn (moisture permitting), where they can establish at a higher soil temperature (of 25°C) compared to barley that is sown later in autumn or early winter at a cooler soil temperature. Due to the earlier sowing of oats, it may be possible to obtain two grazing's before silage lock-up, provided grazing occurs prior to stem elongation (GS 30). For barley it is often possible to get one or two grazing's and a silage crop in spring.

Some varieties of winter wheat can also be suitable if sown in very early autumn as they remain vegetative throughout late autumn/winter. In some regions, sowing a blend of ryecorn and annual ryegrass has been successful. The ryecorn provides quick early feed in autumn and throughout winter before the annual ryegrass component starts to dominate the sward from spring onwards, producing a high quality silage crop in mid to late spring when the ryecorn has faded away.

Key messages

- ☑ Nutritive value of cereal silage is generally not as good as annual ryegrass
- ☑ Can graze a cereal 1–2 times in early winter before lockup for silage
- ☑ Cereals are more water efficient than ryegrass – often suitable for lower rainfall areas
- ☑ Cut cereal silage at boot stage to maximise quality

Table 1 Comparison of winter cereals vs. annual ryegrass

	Cereals	Annual ryegrass
Moisture	Higher tolerance to moisture stress – a larger seed, sown deeper (2–4cm) therefore less impacted by false break	Less tolerant to moisture stress and false breaks – small seed and shallow sowing.
Silage	Higher yield as can be locked up earlier over a wet winter – more upright crop	Needs more grazings before ensiled – challenging in wetter winters
Nutritive value	Less energy value if cut late.	Higher energy value for cow
Dry matter losses	Greater losses as more of the crop is ensiled versus grazed	If grazed well, less losses as more is direct grazed versus ensiling

Winter cereals are often easier to obtain a silage crop from in spring, compared to annual ryegrass. Annual ryegrass needs to be grazed a few times before lock-up for silage in order to be efficiently utilised, whereas cereal crops can remain standing for long periods without lodging. Annual ryegrass also requires multiple grazing's in winter and spring to maximise yields, which can be a challenge in a wet winter where pugging often occurs while grazing. In contrast, cereals can be grazed 1–2 times in late autumn to early winter before stem elongation (GS 30) and detection of the first node. After this, the crop can be locked up for a few months during the wettest part of the year before being harvested for silage in spring.

Winter cereals tend to be more water efficient than annual ryegrass swards. The project 3030* monitored on-farm yields in Yarram (South East Gippsland) where cereals yielded 7–8 t DM of silage with only 400mm of rainfall. Even under irrigation, water use efficiency has been shown to be higher for cereals than ryegrass.

Research at Terang in south west Victoria for the project 3030 showed how cereals provided more early feed (May/June) in the drier year when autumn rainfall was low.

The nutritive value of cereals tends to decrease as the season progresses, while annual ryegrass has the ability to provide excellent quality feed right throughout winter and into late spring.

The table below shows the large difference between annual ryegrass silage and cereal silage, particularly in terms of energy and crude protein.

Losses in the silage-making process and feeding out will be greater for winter cereals than annual ryegrass, as most of the DM harvested in a cereal crop is ensiled compared to annual ryegrass that is grazed directly. Annual ryegrass holds an advantage in this regard as it is possible to directly graze all of the DM produced and not make silage, whereas a winter cereal must be harvested as silage to maximise yields.

*Project 3030 was a project co funded by Dairy Australia, Gardiner Foundation, and Melbourne University that aimed to help farmers achieve a 30% improvement in farm profit by consuming 30% more home-grown forage (pasture plus crop). Research topics included pasture management as well as alternative forage crops. The project ran from 2005–2012.

Table 2 Yields at first grazing (tillering stage, mid-June) of oats and annual ryegrass in 2005 and 2006, and autumn rainfall for each year

	2005	2006
Rainfall mm (Mar–May)	70.5	149.6
Oats (t DM/ha)	0.79	1.13
Annual ryegrass (t DM/ha)	0.53	1.22

Table 3 Average metabolisable energy (ME), crude protein (CP), neutral detergent fibre (NDF) and water soluble carbohydrate (WSC) content of silage made at the 'soft dough' stage from two studies in south-west Victoria.

	ME (MJ/kg DM)	CP (%DM)	NDF (%DM)	WSC (%DM)
Triticale	8.2	8	55.5	17.8
Wheat	8.7	10.3	54.5	16.3
Oats	7.6	8.3	61.9	11.2
Barley	6.6	9.2	67.8	3.4
Annual ryegrass	10.2	13.1	55.5	12.4

Grazing winter cereals

Grazing cereals once at the early to mid-tillering stage (GS 22–29) does not affect final silage dry matter (DM) yield. Depending on the crop and the timing of sowing, it should be possible to get 1–3 grazings. In most cases however, anything more than one grazing should be considered a bonus.

It is essential to ensure the crop is grazed prior to GS 30 (stem elongation), keeping the first node below the grazing height. Grazing after stem elongation will reduce silage yields by 50%. Manage allocations carefully to ensure grazing heights do not go below 5cm. For more information see Forage cereals – a management guide for dairy farmers.

Graze at the tillering stage where utilisable yields of 1600–2300kg DM/ha are achievable. However beware of high nitrate levels, especially if N fertiliser has been applied and avoid grazing very hungry stock. The nutritive value of grazed cereals is similar to ryegrass.

Cereal silage

Be mindful of the trade-off between yield and quality when cutting cereals for silage. It is recommended to cut silage at the boot stage if aiming to maximise silage quality. If cut at this stage, an ME content of 8-10MJ/kg DM should be achievable for all cereal silage types. Quality of silage will decline sharply once the crop moves to the milk and soft dough stage (see Table 2), though yields will be significantly higher at this stage than the boot stage. Seasonal conditions at the time of cutting in spring may inform your decision of whether to target yield or quality; but bear in mind that feeding low ME cereal silage to lactating cows in the following summer will significantly reduce milk yields.

A further benefit of cutting silage at the boot stage is the potential for an extra 'bonus' crop of hay. During the project 3030, cereal silage was harvested at Yarram in Gippsland at the boot stage, and a rainfall event after the crop was cut resulted in it re-striking and giving a further crop of hay, yielding up to 4 t DM/ha. Some tillers did not have an elongated stem at the time of silage cutting and stayed below the cutting height. This would not have happened if silage was harvested at a later stage of growth such as soft dough.

Sowing blends/mixes

Sowing blends may be a good option on farms with a high autumn/winter feed demand. Options such as oats, ryecorn or hybrid brassicas sown in combination with annual ryegrass have been shown to produce higher yields than annual ryegrass alone in late autumn/early winter. However the project 3030 showed in north east Victoria that if an oats/annual ryegrass mix is sown before March, oats will totally dominate the sward so later sowing is advised for mixes including oats.

Seek agronomic advice

In all cases, it is recommended to seek advice from a trusted agronomist or advisor on what is the best option for your farm, and also what is best practice management in terms of seeding rates and methods, fertiliser applications and weed and pest control.

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