NSW GOVERNMENT Department of Primary Industries

primefact

Drought-affected canola and wheat – feed quantity and quality decline in standing crops

September 2018, Primefact 1659, First edition

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Key points

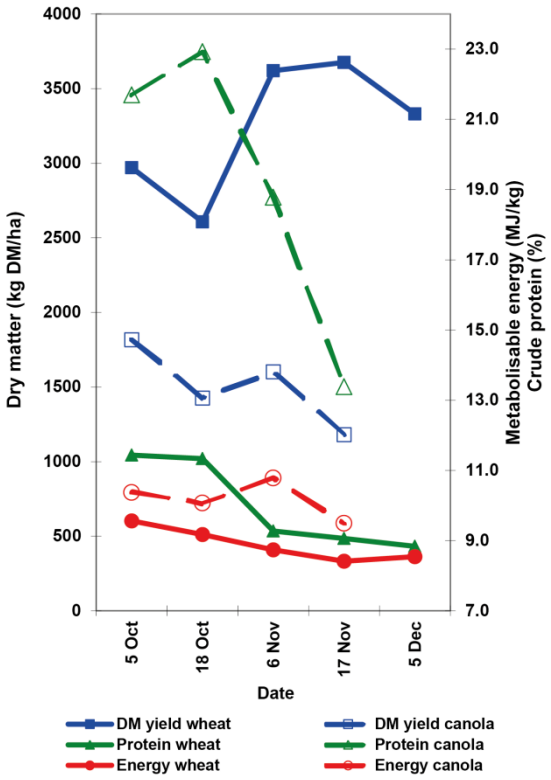
1. Baling drought-affected crops for hay or silage at flowering will capture the highest quality feed, optimise the cost per MJ and deliver the best animal performance when fed.
2. Leaf and head/pod material is significantly higher in feed value than the stem. Grazing a standing crop will allow animals to select a diet higher than the whole crop average and this will be reflected as higher animal performance.
3. Leaf and pod loss in canola is more rapid than with wheat. Grazing canola crops first to capture this material could be one strategy to maximise use.
4. Allow growing livestock to graze crops first while high quality feed is available.

Background

Baling drought-affected canola and wheat crops for silage or hay can often provide the greatest economic return. However, it is not always possible or desirable to bale these crops and in many instances crops are left standing as a feed source for livestock. Standing crops are subjected to environmental conditions that will not affect stored fodder, resulting in greater change in both quantity and quality over time. But unlike hay or silage, standing crops might be selectively grazed to deliver a diet higher than the average nutrient value of the crop. Understanding the changes in quantity and quality can help producers better manage grazing from these crops.

Trial plots of canola and wheat were left standing at Ganmain and Eurongilly to measure changes in feed quantity and quality from early October to December 2006. Plots were cut to ground level and divided into leaf, stem and head/pod. Each component was tested for feed quality. Rainfall during this period was quite low (Ganmain 38.2 mm, Eurongilly 40.6 mm) and it can be expected that with greater rainfall after crop death losses in both quantity and quality would be higher. The results presented here have been averaged over both sites.

Figure 1. Whole plant yield and quality of 2006 drought-affected crops.



Whole crop quantity and quality

Figure 1 shows dry matter (DM) yield, metabolisable energy (ME) and crude protein (CP) for canola and wheat. For both crops there is a general decline in ME and CP after flowering, with canola showing a small increase in ME during pod fill. At all stages canola exhibits better feed quality than wheat.

Dry matter yields for wheat are greater than canola at all stages. The wheat also produced a substantial increase in yield after flowering as grain formed in the head. This reflects the greater ability of cereals to handle drought conditions compared with canola.

Energy and protein levels are initially quite high, particularly with canola, and experience shows that animal performance on silage or hay made from this material is good. Relative animal performance modelled using Grazfeed® predicts that hay or silage made from cutting the crop on 5 October would produce weight gains in a 33 kg lamb of 124 g/day for canola and 82 g/day for wheat. By cutting hay or silage on 17 November, weight gains when fed out would only be 79 g/day for canola and 26 g/day for the wheat. The take home message is that to maximise animal performance and minimise cost per unit of energy from baled drought-affected crops, they should be cut early, ideally around flowering.

Table 1. Effect of stage of cutting on quantity and quality of leaf, stem and pods for canola in 2006.

Date	Dry matter (kg/ha)		
	Leaf	**Stem**	**Pod**
5 Oct 06	505	1178	135
18 Oct 06	376	861	189
6 Nov 06	292	1100	209
17 Nov 06	126	934	121
Crude protein (%)			
	Leaf	**Stem**	**Pod**
5 Oct 06	31.4	17.4	22.8
18 Oct 06	32.2	17.5	28.6
6 Nov 06	32.2	15.2	17.3
17 Nov 06	33.4	11.9	12.6
Metabolisable energy (MJ/kg DM)			
	Leaf	**Stem**	**Pod**
5 Oct 06	11.1	9.2	10.8
18 Oct 06	11.1	8.5	10.6
6 Nov 06	10.7	8.1	13.6
17 Nov 06	11.5	7.2	11.7

Plant part quantity and quality

Table 1 shows the changes in plant part quantity and quality for canola. Notably, the stem makes up 60–80% of available feed. The high nutrient value leaf material retains its energy and protein well over the period compared with wheat (Table 2), but quantity declines rapidly, and while the pod quantity and energy values increase

during seed fill, it represents less than 14% of the available feed.

Table 2. Effect of stage of cutting on quantity and quality of leaf, stem and head for wheat in 2006.

Date	Dry matter (kg/ha)		
	Leaf	**Stem**	**Head**
5 Oct 06	883	1282	805
18 Oct 06	517	920	1170
6 Nov 06	720	1051	1848
17 Nov 06	657	1188	1831
5 Dec 06	626	1074	1629
Crude protein (%)			
	Leaf	**Stem**	**Head**
5 Oct 06	16.9	7.0	12.2
18 Oct 06	12.4	6.3	14.7
6 Nov 06	8.6	3.6	12.8
17 Nov 06	6.7	4.1	13.0
5 Dec 06	7.1	3.6	13.1
Metabolisable energy (MJ/kg DM)			
	Leaf	**Stem**	**Head**
5 Oct 06	9.3	9.6	9.8
18 Oct 06	8.6	8.7	10.2
6 Nov 06	8.0	6.7	11.3
17 Nov 06	7.5	7.0	11.2
5 Dec 06	7.5	6.9	11.2

In 2006 it was observed that livestock would readily eat canola stem. This was not a universal experience, with stock rejecting older, tougher stems in some instances. The best value from canola will likely come from grazing the leaf and pod while they are still available and grazing stem when relatively soft and palatable.

The leaf component of wheat was greater than canola in both total amount (up to 500 kg/ha more) and percentage of available fodder (19–30%). Leaf retention was much higher than canola, with over 70% remaining by early December. However, the feed quality was consistently lower and declined more rapidly than canola. Head material accounted for around 50% of dry matter and over 60% of the available MJ/ha after flowering.

The best grazing response from failed canola or wheat crops will come from early grazing where animals can select a high quality diet before the leaf content or quality declines.

PUB18/625

ISSN 1832 6668