

# Grazing spring-sown canola for lamb and canola production

*Sowing winter-type canola (*Brassica napus* L.) in spring (September to November) in Australia's temperate high rainfall zone exploits the winter vernalisation requirements of the crop. The canola remains vegetative and can be grazed as a forage crop during its first summer/autumn. After vernalisation, the canola sets seed and is harvested as a seed/oil crop in the second spring/summer.*

## INTRODUCTION

Spring sowing of winter-type canola varieties can be used as direct replacement for the spring sowing of a brassica/forage rape crop for sheep production. Spring-sown canola produces similar levels of dry matter (DM) to traditional brassica forages such as Winfred forage rape. It can produce 3 to 4 t DM/ha of feed with high nutritive value (~12MJ/kg DM and 14% crude protein) over summer and autumn and into winter at time when other feed is either poor in quality or restricted in availability. If adequate growth occurs the crop can be grazed a number of times until the following winter, and can then be locked up for seed/oil production.

This system should be considered in regions with longer growing seasons suitable for spring sowing and where there is a reasonable incidence of summer rainfall events. Short dry springs provide a risk for establishment and dry summers can reduce dry matter production for grazing.

Use of spring-sown canola should be considered where brassica forage crops or canola is already used in the production system and there are facilities and contractors available to harvest the crop and sell the seed.

## CULTIVAR SELECTION

All winter-type canola varieties can be used for spring sowing where they have a vernalisation requirement and a longer flowering date. Winter canola varieties will not flower until they over-winter because they need to experience low temperatures to initiate flowering. Spring-type canola

varieties are not suitable for spring sowing, as they will try to flower early and reach maturity too soon.

## ESTABLISHMENT

Preparation for the sowing of canola in spring is identical to that required for autumn and winter sowing. The time of sowing should be carefully considered and should occur as soon as paddocks are dry enough to accept traffic for paddock preparation. Delaying spring sowing increases establishment risks if the season closes out early and there is insufficient rain to promote germination, establishment and early growth.

An agronomist and chemical labels should be consulted with regard to chemical use in establishing canola crops for grazing, as grazing withholding periods may delay or restrict grazing.

Like many forage brassicas, canola has a small seed and performs best when sown at a depth of 1.0-1.5 cm into a cultivated, well-prepared seed bed that allows good soil-to-seed contact. Rolling of the seed bed can assist soil-seed contact.

Use of nitrogen fertiliser is important for good growth but rates of application should be conservative to reduce the risk of nitrate poisoning in livestock. Carefully consider topdressing requirements and allow time after applications before grazing. Consider testing the forage for nitrate content before grazing.



Spring-sown canola at Hamilton on 27 March 2014.

A typical fertiliser program for a spring-sown canola crop that is used for grazing would involve the application of mono-ammonium phosphate or di-ammonium phosphate at sowing, and top dressing with ammonium sulphate or urea after grazing has ceased and at stem elongation.

Soil tests should be taken to determine P, K and S requirements and fertilizer applications tailored to ensure soil fertility is above critical levels.

### MANAGEMENT OF WEEDS AND PESTS

Canola is susceptible to black leg and other typical diseases of canola crops. All chemical treatment applications should be discussed with an agronomist, and the grazing withholding periods for livestock production considered. This also applies to the spraying of weeds.

Like other brassica crops in summer and autumn, spring-sown canola can also be attacked by cabbage and diamond back moth, reducing dry matter yield. Grazing to utilise dry matter will reduce the problem, but chemical control could also be considered provided withholding periods are observed.

Spring-sown canola crops that are used for grazing may have increased summer weeds and strategies for weed control using either chemicals and/or grazing may be needed.

Depending on conditions at sowing slug control may be required.

### MANAGEMENT FOR HARVEST

The last grazing of canola should occur prior to flower bud development and elongation. Grazing after this time will reduce the yield of canola and delay the harvest date.

Typically, grazing can occur up until the end of June in the Hamilton, Victoria environment without incurring a yield penalty, but grazing in July and August can substantially reduce the yield.

Where spring conditions are expected to be shorter (e.g. El Nino) and there is reduced soil moisture, consider ceasing grazing earlier to allow the canola sufficient time for re-growth and the formation of biomass to support flowering and pod development.

### GRAZING MANAGEMENT

Canola has similar habits and properties to forage brassicas and crops should be allowed to mature and grow for a minimum of 6-8 weeks prior to their first grazing.

Research in south western Victoria on Winfred under grazing by dairy cattle has shown that, in summers where crop growth is not likely to be seriously restricted by moisture availability, dry matter production is maximized under grazing regimes which remove the majority of leaf and petiole but little of the stem (Ward and Jacobs 2013). Grazing too intensely, where axillary buds are grazed off, can reduce the regrowth potential of brassica crops by drawing on and

eventually depleting water soluble carbohydrate reserves. Whereas lax grazing fails to utilize the available forage. Earlier research conducted on Winfred under grazing by lambs in New Zealand has also shown that maximum live weight gain per hectare was achieved at a daily allowance of 2.5 kg DM/head/day, where lambs ate 60% of the crop and left a grazing residual of 1350 kg DM/ha (Judson 2010). The canola should then be rested until it produces sufficient leaf for re-grazing.

### Dry matter production

Subject to sufficient rainfall the canola will produce between 2 and 4 t DM/ha by the first grazing at about 8-10 weeks after sowing. The canola will also respond well to summer and autumn rainfall events and will re-grow following grazing.

### Nutritive value

Canola has a high digestibility, good crude protein concentration and low neutral detergent fibre concentration. It will provide approximately 12MJ/kg DM and 14% crude protein. The neutral detergent fibre concentration of canola forage varies from 16.5 to 25% in experiments conducted at Agriculture Victoria, Hamilton. .

### Animal health

All sheep should be given booster vaccination of a vaccine protecting against pulpy kidney (e.g. 5 in1), if sheep have not been vaccinated within three months of the grazing period. If this three month period of protection will run out during the grazing of the canola crop, all sheep will require a booster vaccination two weeks prior to the end of the protection period.

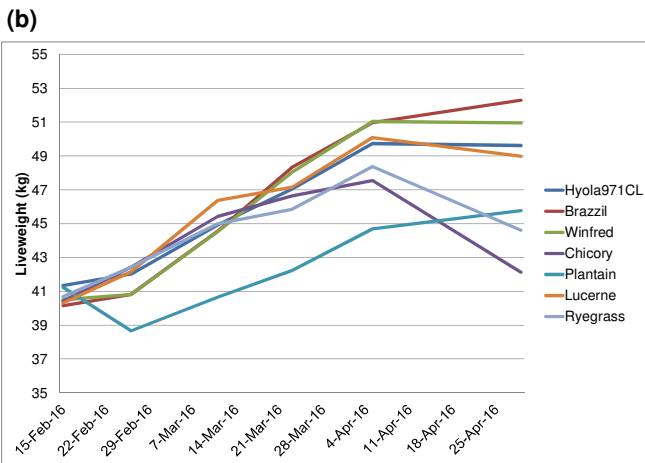
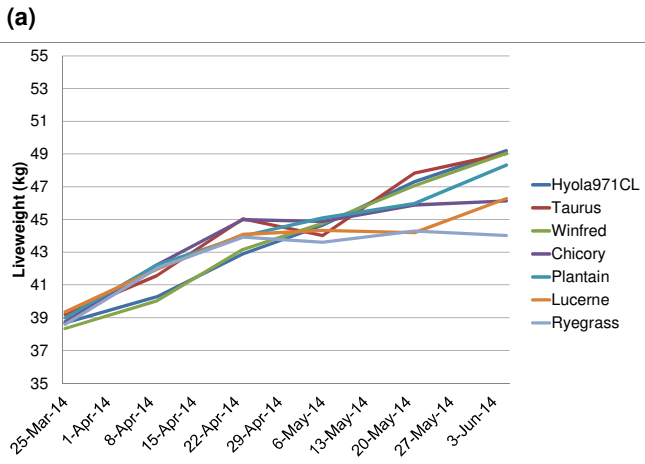
Standard protocols for the use of N-based fertilisers should be followed. Nitrogen is a key driver of growth in brassica crops and may be needed to boost growth. However, where nitrogen applications have been recent or large or the crop has been established into a former legume pasture, consider testing for nitrate content to avoid nitrate poisoning in livestock.

Do not put hungry livestock straight onto a canola forage crop. Like all changes in diet, sheep should be introduced slowly to the crops and be allowed to adapt with access to other feed sources. Adaptation may take 2-3 weeks, after which feed consumption and growth rates will increase. The use of a fibre source such as hay during this period may assist the process. Once adapted, animals will be able to consume the crop as the sole diet.

### EFFECTS ON LIVEWEIGHT GROWTH AND REPRODUCTION IN SHEEP

Studies at Agriculture Victoria Hamilton have shown growth rates in the range of 100 to 240 g/day once the lambs have adapted to canola. Lamb growth rate varied due to seasonal conditions, feed available and nutritive value. Higher lamb growth rates may be possible where more lenient grazing is practised and the crop has had fresh growth prior to grazing. Figure 1 shows the liveweight of ewe lambs on spring-sown canola in comparison to other forages during grazing in summer and autumn 2014 and 2016. In both years, after a

two-week period of adaptation to grazing, lamb growth rates on canola were similar or better than other forages in the study.

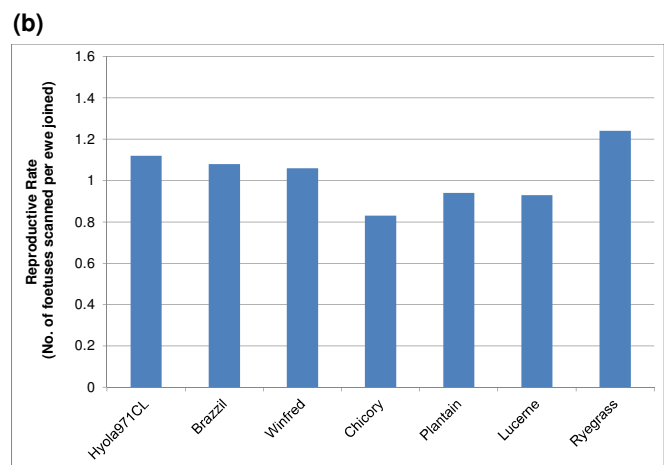
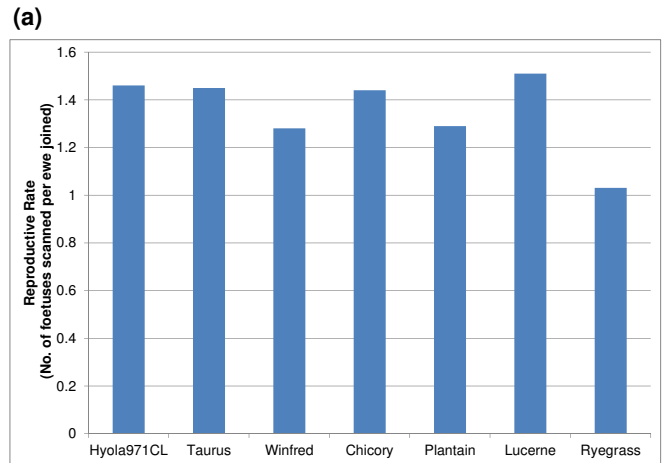


**Figure 1.** The liveweight of ewe lambs (6-8 months old) grazing spring-sown canola (Hyola, Taurus and Brazzil) during summer and autumn of 2014 (a) and 2016 (b) compared to other forages (Winfred, lucerne, chicory, plantain and perennial ryegrass pasture).

### Effects on ewe lamb reproduction

These studies have also shown no detrimental effects on ewe lamb reproduction while grazing ewe lambs on canola either prior to and during joining (Figure 2). Ewe lamb reproduction is largely governed by ewe lamb liveweight at the time of joining and the high nutritive value of canola crops allows lambs to gain weight quickly for joining. This may actually allow increased reproductive performance in some years compared to other forages (Figure 2 (a)).

Ewe lamb reproductive performance is generally poor if they are mated at less than 35 kg liveweight. Reproductive rate improves as liveweight increases above 40 kg. Ewes should therefore be at least 35-40 kg liveweight when mated and at condition score 3.0.



**Figure 2.** The reproductive rate (number of foetuses scanned per ewe joined) of ewe lambs (6-8 months old) grazing spring-sown canola (Hyola, Taurus and Brazzil) during summer and autumn of 2014 (a) and 2016 (b) compared with other forages (Winfred, lucerne, chicory, plantain and perennial ryegrass pasture).

Mated ewe lambs require careful follow-up management during pregnancy so that they reach CS 2.7 or better for singles and CS3.3 for twins at lambing. Good feed availability at lambing and during lactation is also important for optimising lamb growth and survival. Extra supervision of ewe lambs at lambing to assist ewes with lambing difficulty is also recommended. Research at Agriculture Victoria has shown that lamb survival for maiden ewes is lower than adult ewes but can still be very good, and gains in reproductive rate from joining on canola forage can be translated to good lamb marking percentages.

### ECONOMIC BENEFITS

Canola seed is significantly more expensive than typical forage brassica varieties used for grazing. It is therefore important to consider the harvest of the canola as an integral part of the returns rather than an added benefit. The opportunity costs of forgone grazing during the establishment



phase in spring should also be considered as a cost and in feed budgeting.

Estimates on the gains from animal production could include the weight gain achieved, improvements in reproduction and/or additional grazing achieved compared with supplement that may have been used instead.

Like all cropping, canola should be considered as part of a rotation on cropping farms and as part of a program of pasture improvement program on livestock farms.

Economic modelling of a case study farm has shown that mating ewe lambs to lamb at one year old improves farm profits over conventional two-year-old ewe lambing. The use of spring-sown canola as the feed source to achieve the target weight of these ewe lambs for joining reduces risk partly through income diversification when compared to supplementation on perennial ryegrass pasture to achieve the same production targets.

### Key messages

Spring-sown canola can be used as a summer/autumn forage for grazing ewe lambs prior to and during joining. This practice can be used as a direct replacement for the sowing of typical forage brassica for summer/autumn grazing and will give similar performance in terms dry matter production, nutritive value and liveweight growth and reproductive performance.

There appear to be no negative effects of grazing brassica forages on ewe reproductive performance prior to and during joining. Gains in liveweight during this period will improve reproduction and forage brassicas are able to produce good liveweight gains at a time of year when perennial grass pastures are usually dormant.

Grazing of spring-sown canola during summer and autumn will not affect canola yield at harvest providing grazing ceases before the plants start producing flower buds.

Use of spring-sown canola within a farm system will require careful consideration of the sowing risks, costs, increased management complexity, additional animal health management requirements and the availability of equipment or contractors to harvest the mature canola.

### FURTHER INFORMATION

Ward, G. N. and Jacobs, J. L. (2013) Effects of defoliation intensity at the first grazing of forage rape (*Brassica napus* L.) by dairy cattle on subsequent regrowth potential, total DM consumed, nutritive characteristics and nutrient selection. *Animal Production Science*, **53**, 226-233.

Judson, H.G. (2010) Maximising productivity from brassica crops. *Proceedings of the 25th Annual Conference of the Grassland Society of NSW*

<http://www.dairynz.co.nz/publications/feed/management-practices-for-forage-brassic/>

[http://www.dpi.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/146730/forage-brassic-quality-crops-for-livestock-production.pdf](http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/146730/forage-brassic-quality-crops-for-livestock-production.pdf)

<https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2010/09/BESTBET-MANAGEMENT-FOR-DUALPURPOSE-CANOLA>

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