



ALGERIE: pâturage du colza grain.

Eleveurs, faites pâturer le colza à l'automne
et récoltez les graines en juin.



Colza associé à la vesce et à la lentille. (©Terre-net Média)

Le colza assure une abondante biomasse dès l'automne

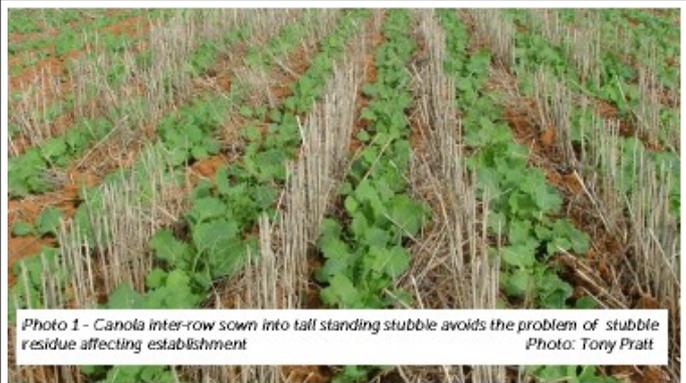


Photo 1 - Canola inter-row sown into tall standing stubble avoids the problem of stubble residue affecting establishment
Photo: Tony Pratt

Colza se semis direct après un blé.

Dual-purpose canola (grain and graze)



- Canola crops grazed without yield penalty
- Increase animal and crop production from mixed farms



Des essais en Australie

Sans pâturage (grain)

Rendement: 4.1 t/ha 898 \$

Avec pâturage (Fourrage + grain)
2.5 t/ha + 4.3 t/ha 1180 \$ (\$210 + \$970)

Une marge par hectare très intéressante.

En Australie, à l'automne, le colza peut être pâturé quelques semaines par les moutons avant de le laisser produire des graines. Une technique qui s'apparente au pâturage de l'orge en vert « g'ssil » chez nous.

Traduisez ce texte en français et en arabe avec google traduction et distribuez le autour de vous.

Djamel BELAID.

مهندس زراعي

Comment procéder?

Le pâturage n'a pas d'incidence sur le rendement final en grains.

16th Australian Research Assembly on Brassicas.
Ballarat Victoria 2009

Dual purpose canola – possibility or pipedream? (Extraits)

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Résumé

A field experiment at Wagga Wagga NSW comprising three spring canola (*Brassica napus*) cultivars sown at three sowing rates was grazed by sheep for a period of 7 days in mid-winter.

Increased sowing rate produced greater early biomass for grazing, while the TT cultivar produced less biomass than Conventional or Hybrid cultivars.

Grazing (196 dse d.ha) reduced dry matter by an average 50% and leaf area index by 63%.

At flowering, grazed plots had accumulated 12% less dry matter than the un-grazed plots.

Le pâturage retarde en moyenne la floraison de 4 jours mais sans entraîner de différences de rendement entre parcelles pâturées ou non-pâturées alors que l'augmentation de la dose de semis réduit le rendement en grain.

Le pâturage du colza est possible en conditions sèches sans pénaliser le rendement.

The results suggest grazing canola is possible in drier inland environments without yield penalty provided the timing and intensity of grazing are matched to available biomass and the anticipated seasonal water supply to support grain production.

INTRODUCTION

Dual purpose canola is the practice of grazing canola during the vegetative stage while producing an economic grain yield.

A small number of farmers have previously grazed canola crops without a noticeable effect on yield. Kirkegaard et al (2008a) demonstrated that with favourable spring conditions and timely grazing there was little effect of winter grazing on canola grain yield in studies near Canberra.

Both spring and winter varieties, generally crash grazed were used in the study. Grazing reduces biomass and delays development (Kirkegaard, et al., 2008a,b), both of which are important in determining grain yield.

Grazing a canola crop in a less favourable environment heightens the risk of delayed flowering and reduced biomass.

Le rendement du colza dépend essentiellement de sa date de floraison et de la biomasse accumulée.

The timing of flowering is critical as early flowers will be lost to frosts while later flowering will lead to the plant maturing under hot, dry conditions. Any changes in flowering date can have large consequences in yield especially in drier environments.

The aim of these studies was to quantify the impact of grazing on crop biomass accumulation and developmental delay (in flowering time) and to relate both to final grain yield in a drier inland environment than the studies reported by Kirkegaard et al (2008a).

The aim was to consider how feasible grazing may be as an option in these drier areas.

Commercially available cultivars differing in vigour and sown at different seeding rates were used to investigate effects on feed supply and crop recovery.

Dual-purpose canola (grain and graze)



- Canola crops grazed without yield penalty
- Increase animal and crop production from mixed farms



Suitable varieties



Grazing and animal nutrition



Computer simulation



On-farm adoption

<https://www.youtube.com/watch?v=wqx1T4V7L-o>

Dr John Kirkegaard - From dust bowls to food bowls Australian Academy of Science

Matériel, méthodes et résultats.

Des résultats positifs.

MATERIALS AND METHODS

(Ne pas oublier que l'Australie est dans l'hémisphère Sud et que donc les saisons sont inversées).

A grazing canola experiment was conducted at Wagga Wagga, NSW (35°03'S, 147°18'E) in 2008. The paddock history was an annual ryegrass pasture 2007, wheat in 2006 and a lucerne pasture phase that finished in 2005. The site was situated on alluvial flats with heavy clay 16th Australian Research Assembly on Brassicas. Ballarat Victoria 2009 subsoil and was pre-irrigated with 50 mm of water (9th April). The experiment was sown on the 29th April on 18 cm row spacings into 20 x 1.4 m plots. This split-split plot design consisted of grazing as a main plot, cultivar as a subplot and sowing rate as a sub-sub plot. Three different cultivar types (hybrid, conventional, triazine tolerant) varying in vigour, but matched for maturity times (mid-maturity) were selected. Each cultivar was sown at three sowing rates with plant emergence densities averaging 27, 48 and 67 plants/m². The grazing treatment consisted of grazed and un-grazed plots. Sheep grazed plots at 28 DSE/ha at the 6-8 leaf stage in a single mob from the 4th-11th July providing 196 dse.d.ha of grazing. Weeds and insects were controlled throughout the experiment. Plots were fertilised to achieve maximum yield potential. Further irrigations of 50 mm each were applied on the 3rd June and 18th September and together with growing season rainfall of 195 mm provided a total seasonal water supply of 345 mm (average for Wagga April – October is 350 mm). However spring temperatures were very hot (Sept-Oct mean maximum 3°C greater than LTM) and the crop experienced considerable stress during the grain-filling period.

RESULTS

Pre-grazing dry matter on 4th July ranged from 365-1820 kg/ha (Table 1). The level of available feed was dependent on cultivar ($p < 0.001$) and sowing rate ($p < 0.001$). The hybrid cultivar out yielded other cultivars at all sowing rates while dry matter yield of the TT cultivar was lowest.

Table 1. Dry matter pre-grazing (kg/ha)

Sowing Rate	Cultivar	Low	Mid	High
Hybrid	1061	1688	1820	
Conventional	1034	1452	1793	
TT	365	810	1073	

Hybrid, conventional and TT grazed plots contained 46, 45 and 62% dry matter compared to un-grazed plots immediately after grazing while leaf area index was reduced to 33, 28 and 49% of un-grazed plots. The conventional cultivar had 51% of stems removed during grazing while the hybrid and TT lost 33% and 17% of stems respectively.

Figure 1. Dry matter at flowering (LSD 779.9, $p = 0.006$) and maturity (LSD 1081.0, $p = 0.013$), final grain yield (not significant) 16th Australian Research Assembly on Brassicas. Ballarat Victoria 2009 Differences in dry matter due to cultivar and sowing rate persisted at flowering (data not shown). Grazing reduced dry matter at flowering by 12% (Figure 1). At flowering, no interaction was observed between sowing rate or cultivar to improve recovery rate.

Flowering was delayed by 4 days overall but there was significant variability within the data ($p = 0.076$).

ZOOM

Final dry matter was reduced by grazing but final yield was not affected (Figure 1).

Low sowing rates out-yielded higher sowing rates (Table 2) but there was no grazing. Grain yield response in relation to dry matter accumulation at flowering was different between grazed and un-grazed treatments (Figure 2).

Higher biomass at flowering in un-grazed treatments reduced grain yield significantly ($p = 0.008$), while this was not the case for grazed treatments. Grazing treatments improved harvest index from 13.9% to 15.8% ($p = 0.086$) when dead leaves were included.

Table 2. Grain yield for grazed and ungrazed crops (kg/ha). Average grain yield for sowing rate (kg/ha), LSD 229.9, $p < 0.001$

Figure 2. Dry matter at flowering and final yield. Closed circles control ($y = -0.1391x + 2598.7$, $R^2 = 0.2063$), open circles grazed ($y = 0.0338x + 1288.5$, $R^2 = 0.0148$)

CONSEILS Nous conseillons vivement aux éleveurs de moutons de se procurer des semences de colza et de tester cette méthode sur une petite parcelle.

DISCUSSION

Quel bilan tirer de cette étude?

Le pâturage du colza ne diminue pas le rendement en grains.

DISCUSSION

Cultivar choice and sowing rate determined the level of feed available at time of grazing. The hybrid cultivar produced the greatest level of early dry matter followed by conventional and TT cultivars. This relationship between early dry matter and type of cultivar has been previously demonstrated for a large number of cultivars (Kirkegaard, et al., 2008b). Sheep apparently preferred the hybrid and conventional cultivars over the TT cultivar leading to different grazing pressures being applied across the experiment (as seen by different proportions of biomass removal). Primarily this resulted from the smaller TT plants rather than any intrinsic difference in 16th Australian Research Assembly on Brassicas. Ballarat Victoria 2009 acceptability. This cultivar selection is unimportant commercially as sheep only have access to one cultivar in a field situation. The cultivar and sowing rate combinations that lead to low available feed would not support long grazing periods. The number of stems grazed generally related to the level of grazing on a particular plot although sheep often randomly selected particular main stems to graze while leaving lower leaves.

Grazed plants recovered quickly from low dry matter levels to 88% of the control plots at flowering. Using different sowing rates and cultivar types did not influence recovery. Low density stands produced larger individual plants that enabled recovery to occur more quickly on an individual plant basis. High density plots had smaller plants that recovered slowly at a single plant level but recovery on a canopy basis was the same due to higher plant numbers.

Previously it has been reported that removing the main stem leads to significant flowering delays (McCormick et al, 2008) but this was not apparent in this experiment. Individual plants function within a community where there is a variety of flowering times and defoliation levels between individual plants. Although some plants maybe severely defoliated, the delay in development at a canopy level is moderated as other plants are less affected.

ZOOM

The effect of grazing on dry matter was still evident at maturity in reduced plant height.

However, grazing did not reduce final grain yield, while increased sowing rate strongly reduced yield.

ZOOM

It appears that the increased canopy size generated by higher sowing rates used more water during the season, increasing water stress during the hot and dry finish, while grazing may have had the reverse effect.

Grazing did not reduce final grain yield

CONSEILS

These results suggest that canola can be grazed in winter with little impact on yield even in drier inland environments under average seasonal conditions. However there will need to be a balance between increasing the size of the canopy for increased winter feed production with the need to conserve water for grain-filling.

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ps: certains titres et sous-titres sont de la rédaction. Ndlr.

CONSEILS

Nous conseillons vivement à des étudiants en agronomie de choisir ce thème comme sujet de mémoire de fin d'étude ou de thèse.

COLZA DOUBLE EMPLOI

Double emploi du colza, mode d'emploi

Pâturer à l'automne et récolter en grain en juin.

Dual purpose (grazing) canola – a new opportunity?

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ABSTRACT

We conducted a pilot study near Canberra in 2004 to investigate the possibility of using winter canola (*B napus*) varieties with good blackleg resistance as dual purpose (grain/graze) crops in the higher rainfall zones of southern Australia.

Winter canola sown in late April produced 2.5 t/ha of high quality biomass and recovered from grazing in mid-August to produce a high grain yield (4.0 t/ha) with good oil content (47%).

Further work is required to test the feasibility of this concept across a wider range of environments and to identify varieties with suitable characteristics for use in this way. A dual purpose canola will provide an excellent break crop for winter cereals in the high rainfall zone, potentially increase the overall profitability of canola, and provide further flexibility in mixed farming operations.

INTRODUCTION

Winter types of *Brassica napus* are used as spring-sown forage crops in Australia (fodder rapes), and produce large amounts of high quality biomass for grazing. In Europe and North America, winter *B napus* is grown as an oilseed crop, both edible (canola) and industrial (rapeseed) and is adapted to long cold winters in which the reproductive phase is delayed until spring.

We were interested in the possibility of using these winter canola varieties as dual purpose (grain/graze) crops in the higher rainfall zones of Australia in much the same way as the dual purpose wheat is grown – sown early in autumn, allowed to grow during the warm autumn months to provide grazing in the winter, and after cessation of grazing prior to the reproductive phase, allowed to re-grow to produce an oilseed crop. A

dual purpose canola would provide all of the same break-crop benefits as spring canola to the disease prone winter wheat crops, and add another level of flexibility to mixed farming operations. The zones in which this could be feasible depend on varieties with suitable phenology and re-growth capacity, and on opportunities for early sowing.

A significant barrier to this opportunity has been the general susceptibility of most European and north American canola varieties to Australian isolates of blackleg (*Leptosphaeria maculans*) which is the most significant pathogen of canola in Australia. However recently, winter canola lines from Europe with good resistance to Australian blackleg have been identified (Steve Marcroft pers comm.), which provides an opportunity to investigate the feasibility of using winter canola as a dual purpose crop in higher rainfall areas, and to identify the key agronomic adaptations which will be necessary for such a concept to succeed.

We conducted a pilot study in the cool, high rainfall area near Canberra, ACT to investigate the acceptability of winter canola to sheep, the amount and quality of biomass which could be produced for grazing and the capacity for re-growth and grain yield following heavy grazing.



*Colza associé à la vesce et à la lentille. (©Terre-net Média)
Le colza a été testé à la station FDPS (ITGC) de Sétif.*

CONSEILS

En Algérie, nous conseillons vivement de mener ce type de pratique. On veillera à ne pas faire consommer le colza lorsque les boutons floraux de la tige principale commencent à se développer. Ndlr.

Quels enseignements?

Des différences variétales et sensibilité au pied noir.

MATERIALS AND METHODS

A pilot study was conducted at CSIRO Experiment Station near Canberra in 2004. Two European winter canola varieties previously shown to have high resistance to blackleg in Australia, and the Australian spring variety Hyola 60 were sown on 14th April 2004 at 5 kg/ha.

A common hybrid forage Brassica (cv Hunter) was sown around the experimental area. The experiment was arranged as a randomised block design with two blocks, and the three varieties randomised within blocks in plots 6m x 30m. In mid August the experimental area was fenced to provide grazed and un-grazed treatments.

Ten sheep were initially allowed access to the canola varieties, and to an adjacent 6m strip of fodder Brassica to determine if they showed any preference. Following this period the sheep were confined to the canola area only (6m x 30m) for a period of 48 hrs at which time the material had been heavily grazed.

The sheep were removed on 20 August and quadrats were immediately taken for biomass measurements on grazed and un-grazed areas to determine the biomass removed by sheep. The digestibility and protein content of the biomass was also measured. The biomass and yield of the canola in the grazed and un-grazed areas was measured from two 1.08m x 0.4m quadrats taken at physiological maturity in each plot. The incidence and severity of blackleg and sclerotinia stem rot infection was recorded on these plants and the seed was retained for oil content measurements.

RESULTS

The varieties selected for the experiment were at different phenological stages at the time of grazing. The Hyola60 was the earliest to flower and the main stem had bolted at the time of grazing in mid August. Winter1 also had visible buds beginning to elongate, while Winter2 was still vegetative when grazed and had much lower biomass when grazed.

ZOOM

The sheep showed no preference for the fodder

Brassica variety over the canola varieties when introduced to the brassicas and grazed contentedly on all varieties.

Biomass measurements following grazing reflected the differences in growth and the feed on offer for each of the varieties (Table 1).

Analysis of the dry mater indicated a protein content of 20% and digestibility of 80% and very little difference between the varieties.

Table 1. Biomass (t/ha) of three canola varieties 1-week after grazing and the estimated biomass removed by grazing at Ginninderra Experiment Station, 2004.

Variety	Ungrazed	Grazed	Biomass grazed
Hyola60	4.6	2.1	2.5
Winter1	4.7	2.1	2.6
Winter2	2.8	2.5	0.3

Les traitements avec pâturage ont vu leur floraison retardée de plusieurs jours, mais le colza a repoussé et reformé des branches à partir des bourgeons les plus bas après l'élimination de la tige principale.

Despite this delay, there was no significant impact of the heavy grazing on the yield or oil content of the canola varieties, although the earlier flowering and locally adapted spring variety Hyola60 performed better than the two winter types (Table 2). Both yield and oil content were favoured by earlier maturity in this relatively dry spring season.

Table 2. Impact of grazing on the yield and oil content of three canola varieties at GES in 2004

Variety	Yield (t/ha)	Oil (%)
Ungrazed		
Grazed		
Ungrazed		
Grazed		
Hyola60	4.84	4.61
Winter1	4.12	4.26
Winter2	4.09	3.95

Les moutons ne montrent pas de préférence selon les variétés.

CONSEILS Nous conseillons de réaliser des essais avec les variétés disponibles en Algérie. N'hésitez pas à contacter des sociétés étrangères pour des semences.

DUAL-PURPOSE

Quel intérêt?

Nouvelle opportunité en mixant fourrage et grains.

Dual-purpose canola - A new opportunity in mixed farming systems

Article in Australian Journal of Agricultural Research 59(4) · January 2008 with 22 Reads
DOI: 10.1071/AR07285

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Last J. M. Graham

Abstract

The term dual-purpose canola describes the use of a canola crop for forage before seed production. It could potentially provide a profitable and flexible break-crop option for mixed farms, but there have been no studies to test the concept in Australia.

Des variétés d'hiver et de printemps

We investigated the feasibility of using canola in this way in field experiments near Canberra, Australia, from 2004 to 2006, using European winter and mid-late maturing Australian spring canola varieties.

Des variétés d'hiver

Winter varieties sown from early March to mid-April produced 2.5-5.0 t/ha of biomass providing 0.3-3.5 t/ha of high-quality forage grazed by sheep in winter.

The spring varieties produced similar amounts of vegetative biomass from April sowing but were unsuited to the earlier March sowing as they flowered in early winter and did not recover from grazing.

The canola forage was readily eaten by sheep; alkane-based estimates of diet composition indicated that >85% of the organic matter intake consisted of canola.

Canola forage was also highly digestible (86-88%) and Merino hoggets grew at 210 g/day from a dry matter

intake of 1530 g DM/day.

Un fourrage apprécié des moutons

The canola generally recovered well when grazed in winter before bud elongation. Delays in flowering associated with heavy grazing ranged from 0 to 4 days when grazed before buds were visible, to 28 days if the crop had commenced flowering.

Significant delays in flowering (>14 days) associated with winter grazing did not reduce seed yield or oil content when favourable spring conditions allowed compensatory growth.

Causes possibles de pertes de rendement

Yield loss was observed when winter and spring conditions were unfavourable for compensatory growth, or if grazing continued too late into spring (late September) irrespective of seasonal conditions.

Une marge augmentée de 240 à 500\$/ha

The yield loss was more than offset by the value of the grazed forage and the mean gross margin for dual-purpose canola over the four experiments was \$240 to \$500 higher than for grain-only canola depending on the value assumed for the forage.

Plus value sans handicaper la récolte.

The study indicates there is considerable scope to capture value from grazing early-sown canola crops during winter without significant, uneconomic trade-offs with seed yield.

Further investigations in other medium to high rainfall environments in southern Australia are warranted.

DISCUSSION

Quel bilan tirer de cette étude?

Colza, d'extraordinaires capacités de récupération.

The incidence of blackleg was moderate at the site, although the severity of infection was very low (Table 3). There was some evidence that grazing increased both the incidence and severity of blackleg in all three varieties. The incidence of sclerotinia stem rot at the site was also relatively low however in the two varieties where infection was observed, grazing appeared to reduce disease incidence (Table 3).

Table 3. Impact of grazing on the incidence of blackleg and sclerotinia stem rot (% plants infected), and severity of blackleg (% of stem cross section affected) of blackleg at GES in 2004.

Blackleg Incidence (%)	Sclerotinia Incidence (%)	stem rot Incidence (%)	Severity (%)	Variety		
Ungraze	Graze	Ungraze	Graze	Ungraze	Graze	
Hyola60	23	35	1.5	4.1	6.0	1.5
Winter1	45	60	5.8	9.4	0.0	0.0
Winter2	35	75	8.9	25	6.5	3.5

DISCUSSION

This pilot study has confirmed that winter canola varieties can produce significant quantities of high quality feed which are readily eaten by sheep, and under the conditions of this experiment can recover from grazing to produce high yield and good oil content. The somewhat surprising result was the recovery of the spring variety (Hyola 60) **which was at an advanced stage of elongation when grazed and had the main stem completely removed by the grazing sheep.**

This indicates that canola may have a capacity for good recovery even from grazing early in the reproductive stages, provided the seasonal conditions provide sufficient time for recovery.

Le colza possède une grande capacité à produire des hampes florales malgré un pâturage tardif ayant éliminé la tige principale.

Although this requirement is likely to be more readily satisfied in the cooler, long-season areas of the high rainfall zone where dual-purpose wheat is currently grown, early sowing opportunities can occur in other areas and varieties adapted to these conditions may also

be identified.

The interactions of grazing with both of the diseases monitored indicate the need for vigilance in further evaluation of dual-purpose crops, in particular for blackleg where grazing appeared to increase disease incidence and severity.

ZOOM

Table 5. Gross margin estimates from grain only and dual-purpose Winter2 canola at GES in 2004.

Crop option	Fodder (%)	Grain (t/ha)	Oil (t/ha)	Gross margin (\$/ha)	(t/ha)
Winter1 (grain only)	0	4.1	48	\$898	
Winter1 (graze/grain)	2.5	4.3	46	\$1180	(\$210 + \$970)

The additional gross margin provided by the grazing of Winter1 in this experiment has been calculated based on current prices and likely feed conversion rates (Table 5).

The biomass production for grazing in this experiment was limited by the relatively late sowing (late April), and would be expected to be increased by sowing winter canola at an earlier stage.

However it is likely that in different seasons the delayed development caused by grazing may cause a yield penalty which would offset this additional income.

The interaction of the sowing date and the specific varietal phenology will dictate the ideal sowing time to achieve maximum biomass for grazing, but still leave sufficient time for regrowth and seed yield formation.

CONSEILS

In very poor seasons where this may look doubtful, the canola could be cut for hay, as it has been shown in recent drought years in southern NSW to make hay of good quality.

ZOOM

This pilot study suggests that development of dual-purpose canola is feasible although significant agronomic and grazing management research is required to fine-tune the system using a wider selection of suitable varieties in a range of potential target environments to maximise the potential benefits from the system..