

# NYNGAN CANOLA VARIETY TRIAL

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## Introduction

This variety trial was sown on 23 April 2008. The trial comprised of 10 early and mid maturing canola varieties with clearfield, TT and conventional backgrounds. Plant establishment was low and variable. Fertiliser was applied (6.6kg/haN, 14.5kg/haP & 1kg/haS) with the seed and weed control involving Haloxyfop-R was good. A well managed long fallow period provided good subsoil moisture. Treatments were applied to plots (12m\*1.5m) and replicated three times.

## Results

Variety	Yield (t/ha)	No	Protein (%)	No	Oil (%)	No
AG-MUSTER	1.25	1	25.6	9	38.0	7
HYOLA50	1.23	2	26.2	6	39.5	3
ATR-COBBLER	1.18	3	25.4	10	39.1	4
TARCOOLA	1.14	4	26.1	7	40.2	2
CBWA-TANAMI	1.11	5	25.8	8	37.0	9
ROTTNEST_TTC	0.97	6	28.2	3	37.4	8
TAWRIFFICTT	0.90	7	26.6	5	40.4	1
45Y77	0.89	8	28.8	1	36.7	10
44C79	0.85	9	27.4	4	38.5	5
TORNADOTT	0.80	10	28.2	2	38.1	6
					LSD = 2.41	
	P = 0.076		P = 0.189		P = 0.045	
	NSS		NSS		Significant	

NSS = Not statistically significant

Significant = statistically significant

\*Varieties that vary by less than the LSD are not statistically different.

\*Many factors affect the relative performance of varieties in a trial. Varietal decisions should therefore not be based solely on a varieties performance in a limited number of trials.

## Comments

This trial was a bit of a mixed bag with conventional, clearfield and TT varieties of varying maturities evaluated. The small number of varieties (10) meant that collation of all types into the one trial was the most feasible option. Grain yield and protein were not statistically significant whereas oil percentage was. Although sowing time was adequate an earlier sowing may have given the trial more time to compensate for the low and irregular establishment.

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# 2009 BRASSICA JUNCEA TIME OF SOWING TRIAL

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## Key Messages:

- sow both canola and Brassica juncea early to maximize both yield and oil potential
- short season canola will out-yield Brassica juncea when sown early in a dry season
- juncea canola can out-yield conventional canola when sown late, but alternate crop options for late sowing may be more profitable
- check market options for biodiesel and condiment types prior to sowing.

**Aim:** to compare the yield and grain quality of *Brassica juncea* and canola at three different sowing times for the Western Plains region of NSW.

**Background:** *Brassica juncea* (Indian mustard) is a relatively new oilseed crop in NSW. There are three different types of *B. juncea* available to growers: the canola quality mustards, referred to as juncea canola, industrial (or biodiesel) mustard and condiment mustard. Juncea canola was only commercialised in 2007, but has drought and stress tolerant attributes considered superior to conventional canola (*B. napus*). It should therefore be better adapted than canola to the low rainfall cropping zones of western NSW, with anecdotal evidence suggesting that *B. juncea* would be competitive where canola yields average 1.2 t/ha or less (McCaffery *et al*, 2009b).

Current research is focusing on agronomy issues such as time of sowing, row spacing, plant population and nutritional aspects. This research is being supported by agronomist and grower experience to develop improved management guidelines and agronomic recommendations for growers.

## 2009 Trial details

Five varieties of *Brassica juncea* and three varieties of conventional canola were sown at three sowing dates.

**Brassica juncea:**

- Dune** – first juncea variety released in 2007. Early to mid maturing, open pollinated, juncea canola.
- Oasis CL** – first herbicide tolerant Clearfield®

juncea canola, released in 2008. Early to mid maturing, open pollinated.

- Sahara CL** – released in 2009. Early maturing, 5-7 days quicker than Oasis CL. Clearfield® tolerant, open pollinated.
- SARDI 515M** – early maturity, open pollinated, conventional herbicide status, biodiesel grade *B. juncea* (now referred to as dryland juncea by licensee).

**Canola:**

- 44C79** – early-mid maturity canola, open pollinated, Clearfield® variety
- Tarcoola** – early maturity canola, open pollinated, conventional herbicide variety
- Hyola 50** – early-mid maturity canola, hybrid, conventional herbicide variety.

**Sowing dates:**

- 21 April; 18 May; 7 July 2009**

Standard fertiliser rates (Granulock 12Z @ 100 kg/ha) and herbicides (glyphosate, Stomp®, Verdict® and Lontrel®) were used but no insecticides were applied to this trial. The irrigation bay was pre-watered in early April prior to sowing, but not irrigated in-crop.

## Results

Sowing time 3 (7 July) was delayed due to wet conditions in early June and planted late. Due to poor establishment and lack of follow-up rainfall during July and August, the plots were severely stressed by September and consequently decimated by aphids. These plots failed to flower and so were not harvested.

Field observations during the season included scoring plots for flowering, aphid incidence and level of sclerotinia disease.

In terms of aphids, observations through the season suggested that *B. juncea* may have been more attractive to turnip aphid (*Lipaphis erysimi*), whereas cabbage aphid (*Brevicoryne brassicae*), seemed to have a preference for the nearby canola management trials. This will be re-assessed in future trials. Despite the presence of aphids, no virus symptoms were observed in 2009.

Levels of sclerotinia were slightly higher in sowing time 1 (21/04) than sowing time 2 (18/05) but there was no great difference between canola and *B. juncea* varieties within each sowing time. Overall sclerotinia disease caused no significant impact on yield.

Yield and quality results are presented for sowing time 1 and sowing time 2. The yield data showed a highly significant effect for both sowing time ( $p < 0.001$ ) and variety ( $p < 0.001$ ), whilst the interaction between sow time x variety was significant ( $p < 0.01$ ) but less than the independent variables. Quality data (oil content and protein) has not yet been statistically analysed.

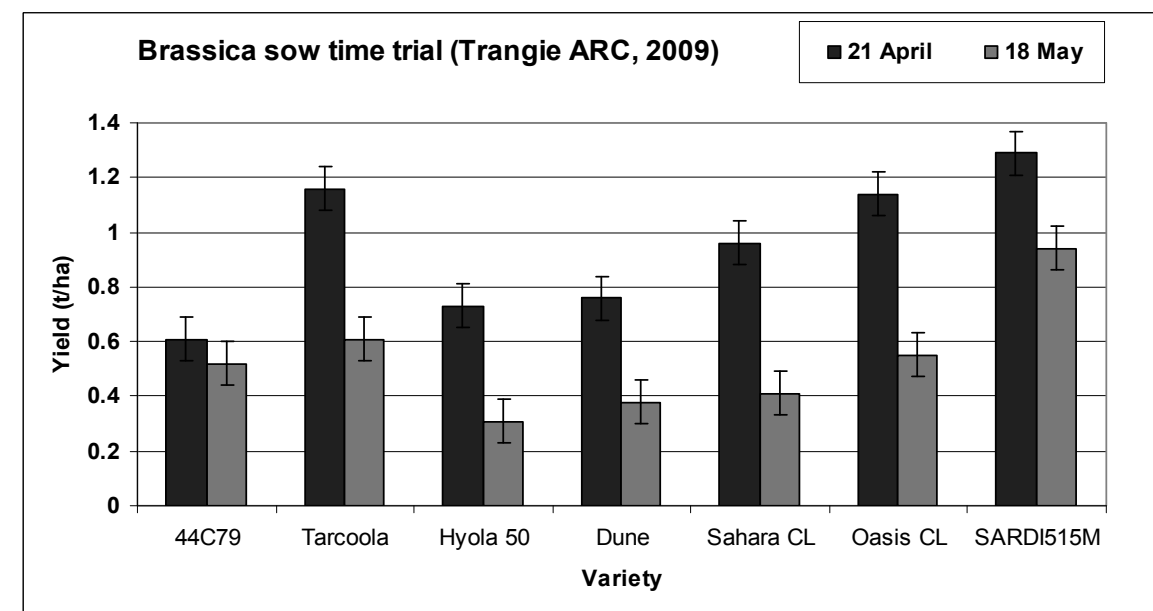
**Table 1: Yield results for *Brassica juncea* trial 2009**

VARIETY	sow time 1 21 Apr 09 yield (t/ha)	sow time 2 18 May 09 yield (t/ha)	average for variety across sow time yield (t/ha)
44C79	0.61	0.52	0.57
Tarcoola	1.16	0.61	0.89
Hyola 50	0.73	0.31	0.52
Dune	0.76	0.38	0.57
Oasis CL	1.14	0.55	0.85
Sahara CL	0.96	0.41	0.69
SARDI 515M	1.29	0.94	1.11
<b>mean yield (t/ha)</b>	<b>0.95</b>	<b>0.53</b>	<b>0.74</b>
<b>LSD (t/ha) sow time</b>	0.07 ( $p < 0.001$ )		
<b>LSD (t/ha) variety</b>	0.134 ( $p < 0.001$ )		
<b>LSD (t/ha) variety x sow time</b>	0.192 ( $p < 0.01$ )		

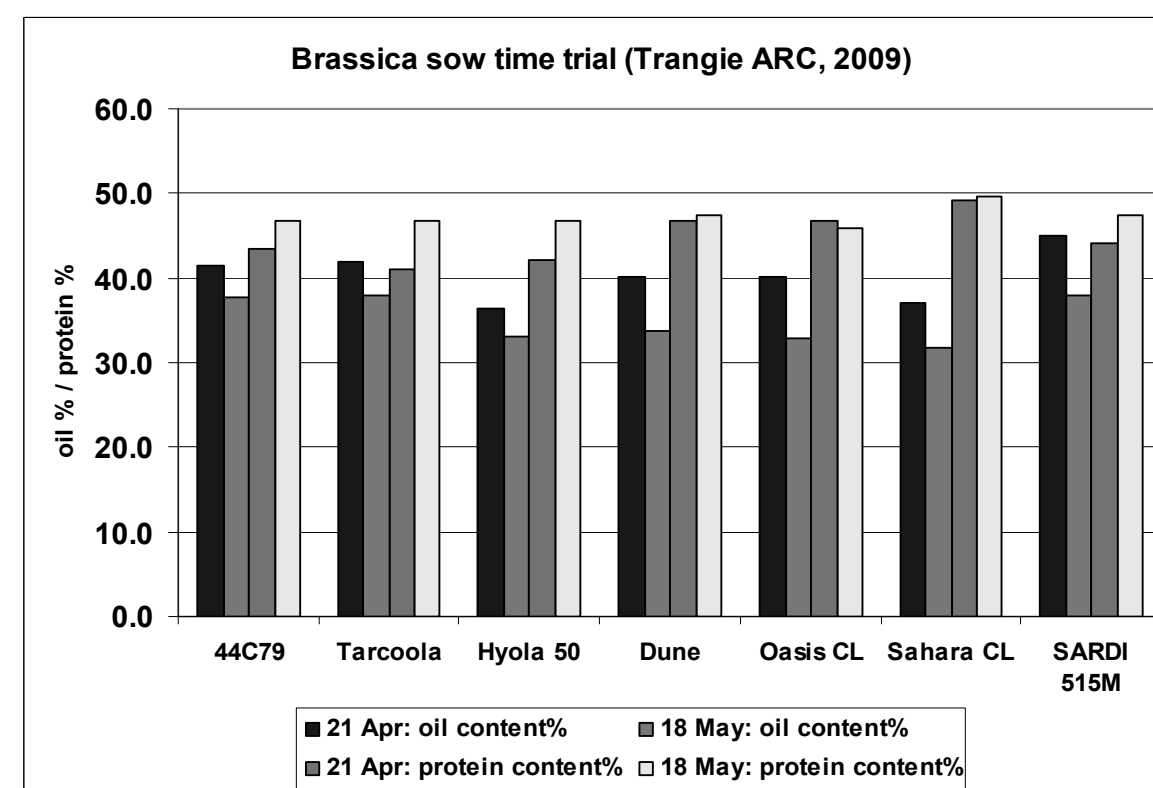
**Table 2: Quality data for *Brassica juncea* trial 2009**

VARIETY	oil content %		protein content %	
	sow time 1 21 Apr 09	sow time 2 18 May 09	sow time 1 21 Apr 09	sow time 2 18 May 09
44C79	41.4	37.6	43.4	46.8
Tarcoola	41.9	38.0	41.0	46.9
Hyola 50	36.5	33.2	42.2	46.8
Dune	40.1	33.8	46.8	47.5
Oasis CL	40.1	32.9	46.9	45.8
Sahara CL	37.0	31.7	49.1	49.7
SARDI 515M	45.0	37.9	44.0	47.4

**Figure 1: Yield results for *Brassica juncea* trial 2009**



**Figure 2: Quality data for *Brassica juncea* trial 2009**





## Discussion

Until recently it was generally considered that mustards, as a collective term, were best suited to late planting, generally towards or at the end of the sowing window for canola. This trial shows in a season such as 2009 with a dry winter and dry spring, yields of both canola and juncea canola are maximised when sown early.

The yield penalty associated with the four week delay in planting averaged 0.35 t/ha across all canola varieties, and 0.47 t/ha across all juncea canola varieties. Of the canola varieties, Tarcoola yielded highest, but also showed the greatest yield penalty as sowing was delayed. With the exception of the variety SARDI 515M (biodiesel type), none of the commercial *B. juncea*s out-yielded Tarcoola for either sowing time.

Tarcoola performed well in this trial due to the short season. However in trials such as Coonamble NVT (2009), the yields of Tarcoola were much lower than longer season canola varieties, as the longer season varieties were able to make better use of the full soil moisture profile and good early-September rain. For this region though, it is likely that short seasons are going to be more common than seasons with ample moisture, so Tarcoola would likely come out in front when averaged over several years.

The quality analysis of oil and protein contents has also produced interesting results. Oil and protein content in canola are known to be inversely related so that when one is high the other is low, and this relationship can now also be applied to the *Brassica juncea* varieties. Time of sowing has had a significant impact on oil content, with the canola varieties showing an average penalty of 3.7%, and the *Brassica juncea* varieties an even greater penalty of 6.5% in oil content. However the protein contents increased only slightly for the *Brassica juncea*s (0.9% average), compared to a greater increase (4.6% average) for the canola varieties.

These results reinforce the already well-known anecdotal evidence that a delayed sowing (by four weeks in this trial) can have a significant negative impact on both yield and oil content for both canola and juncea canola varieties.

## Conclusions

- Sow both conventional canola and canola juncea varieties as early as practical within the sowing window to avoid yield and oil penalties.
- It is hard to see a place for juncea canola (yet) in this region given the current variety choice available: short season canola varieties (such

as Tarcoola) will out-yield juncea canola when sown in dry seasons. Juncea canola will out-yield canola when sown very late (e.g. late June - Coonamble 2008 and 2009), but yield has already been lost for the juncea compared to sowing early, and in this case chickpeas are likely to be a more profitable option.

- Check market options for industrial (biodiesel) and condiment types, and evaluate whether the premiums paid will counter-balance reduced yield and oil potential in this region.

## References & Further Reading

- Haskins, B., McCaffery, D. & Bambach, R. (2009). "*Juncea canola in the low rainfall zone of south-western NSW*". Primefact 783, NSW DPI.
- Hertel, K., Roberts, K. & Bowden, P. (2009). "*Insect and mite control in field crops 2009*". NSW DPI Management Guide, NSW DPI.
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# CANOLA AND JUNCEA CANOLA FOR LOW RAINFALL AREAS IN 2009

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## Variety selection

The choice of most suitable canola variety for any situation will often follow a consideration of maturity, herbicide tolerance, blackleg resistance and early vigour together with relative yield and oil content. In relation to some of these issues the following points can be made:

- The weed species expected may dictate the need for a herbicide tolerant production system (e.g., triazine tolerant or Clearfield). Remember that a triazine tolerant variety will incur a yield and oil penalty when grown in situations where they are not warranted.
- Varietal blackleg resistance and/or fungicide use should be considered, particularly when rotations are close, although blackleg is less of a factor in low rainfall systems.

The following are early or early-mid flowering varieties that may be suitable for lower rainfall areas.

## New varieties released in 2008

### Triazine tolerant (TT) varieties

**Hurricane TT** New release (coded PacT2202). Early-mid maturing variety. Pacific Seeds indicate good yield, oil and protein content. Ideally fits low to medium rainfall areas, exhibits good vigour. Blackleg rating MR provisional. First year of testing in NVT in 2007. Bred and marketed by Pacific Seeds.

**Tawriffic TT** (coded BLN3697TT) is an Early-Mid, Triazine Tolerant Canola variety developed by the Canola Alliance. Tawriffic TT has a blackleg rating of MR-MS (provisional) and is medium in height. The Canola Alliance have indicated that Tawriffic TT has high yield and oil potential. Marketed by PlantTech Pty Ltd.

### CLEARFIELD® (imidazolinone tolerant) varieties

**44C79** New release (coded NS6082BI). Early maturing, similar to 44C73. Pioneer indicate good vigour, high yield and oil content. Blackleg rating is MR-MS (provisional). Targeted to replace 44C73. Limited seed quantities in 2008. Bred and marketed by Pioneer Hi-Bred Australia.

## New varieties for 2009

A number of new varieties will be marketed for 2009 sowings. Information about new varieties has been provided by the seed companies as in most cases, entries have only come into NVT trials in 2008.

### CLEARFIELD® (imidazolinone tolerant) varieties

**43C80** (coded NS6108BI). Early maturing variety. Pioneer indicate good early vigour, good yield and moderate oil content. Blackleg rating MS (provisional). Suited to low rainfall areas and potentially as a late sowing option in medium-high rainfall areas. Tested in SA NVT trials in 2008. Limited seed quantities in 2009. Bred and marketed by Pioneer Hi-Bred.

**Hyola 571CL** (tested as K9209). Early-mid maturing hybrid with similar maturity to 45Y77. Pacific Seeds indicate excellent early vigour, with good oil and yield potential. Blackleg resistance R (provisional). Tested in SA NVT trials in 2008. Bred and marketed by Pacific Seeds.

### CLEARFIELD® (imidazolinone tolerant) *Juncea canola*

**Oasis CL** New release (coded J05Z-08920). First herbicide tolerant Clearfield Juncea canola. Blackleg rating R (provisional). Seed quality as good as, or slightly better than Dune. Limited seed quantities for 2009. Bred by DPI-Victoria and Viterra (Canada). Marketed by Pacific Seeds. An EPR applies.

**SaharaCL** (tested as J05Z-08960). Early maturing juncea canola, earlier than Oasis CL. Pacific Seeds indicate exceptional vigour. Blackleg resistance R (provisional). An End Point Royalty (EPR) applies. Tested in SA NVT trials in 2008. Bred by DPI Victoria and Viterra (Canada). Marketed by Pacific Seeds.

### The following varieties are being outclassed with limited seed available in 2009

- Monola™ 75TT, Rivette, Skipton and WarriorCL