

### Key Messages

- Seed size did not have a significant effect on Canola yield when planted 15-20mm deep
- Cost differential of establishing a Canola plant stand can be substantial

### Aim

To confirm if seed size has any significant effect on yield in shallow seeding (15-20mm) situations that are common in Western Australia's sandy soils.

Determine the economic implications on seed size assuming yield is the same.

### Background

Canola varieties have progressed considerably in the last 5 years in relation to early vigour. Previous studies such as Riethmuller, Carmody & Walton (2002) have shown larger seed is the preferred option, however, new hybrid varieties and pedigree open pollinated varieties with smaller seed size have been observed to perform well in the field under shallow seeding conditions.

Trial sites selected were located in Binnu and Goomalling. The Binnu trial had only the Bonito treatments while the Goomalling trial tested both Bonito and Wahoo treatments. The treatments were procured using the same method from a selected seed lot of each variety.

**Table 1:** Treatment seed size and method of procurement

Seed Classification	Seed Size (seeds per kg)	Method of separation
<i>Small</i>	360,000	<i>Passed through 1.5 mm slotted sieve</i>
<i>Medium</i>	290,000	<i>Passed through 1.8 mm slotted sieve but not the 1.5mm</i>
<i>Large</i>	235,000	<i>Didn't pass through 1.8 mm slotted sieve</i>

(Pedigree seed typically ranges between 150,000 and 350,000 seeds per kg each year)

The trial was designed as a randomised complete block statistical design allowing an ANOVA test to be carried out to determine if any treatment was significantly different (greater than 95% confidence). The three seed classes had seeding rates adjusted to account for seed size. A plant population of 35-45 plants per m<sup>2</sup> was targeted assuming a paddock establishment of 60-70%.

### Trial Details

Location	NAG Main Trial Site Binnu	Goomalling, Berring Rd.
<b>Plot size &amp; replication</b>	10m x 1.55m x 3 replicates	8m x 1.75m x 3 replicates
<b>Soil type</b>	Deep Sand	Sand over clay
<b>Sowing date</b>	15/04/2015	30/04/2015
<b>Seeding rate</b>	Small seed 1.6 kg/ha, Medium Seed 2 kg/ha & Large Seed 2.4 kg/ha	
<b>Growing Season Rainfall</b>	220mm	230mm

### Results

Plant establishment (PE) counts were taken at the 6 -8 leaf stage of development. PE % ranged between 34% and 78% between locations and varieties. The Wahoo seed lot was observed to have lower vigour than the Bonito initially but recovered to create comparable plot plant stand by spring.

**Table 2:** Plant establishment counts

Seed Lot	Plants Metre Square	Establishment (%)
<i>Small Bonito Goomalling</i>	45	78
<i>Small Wahoo Goomalling</i>	19.5	34
<i>Small Bonito Binnu</i>	23	40
<i>Medium Bonito Goomalling</i>	44.5	77
<i>Medium Wahoo Goomalling</i>	29	50
<i>Medium Bonito Binnu</i>	20	34
<i>Large Bonito Goomalling</i>	42.5	75
<i>Large Wahoo Goomalling</i>	32	57
<i>Large Bonito Binnu</i>	27	48

**Yield Results**

Analysis determined that there was a significant difference between the yield result of the two varieties at Goomalling but there was no significant difference in yield due to seed size at either site.

**Table3:** Yield results t/ha

Treatment & Location	Small Seed	Medium Seed	Large Seed
<i>Bonito Goomalling</i>	1.508	1.494	1.536
<i>Wahoo Goomalling</i>	1.179	1.222	1.113
<i>Bonito Binnu</i>	0.912	1.088	0.98

**Cost Analysis**

The cost of seed in the canola market varies widely so a range of seed costs have been included to show the cost implications of the differing canola types.

**Table 4:** Cost of seed \$/ha

Seed Cost per kg	Seeding Rate kg/ha		
	1.6	2	2.4
\$5	\$8	\$10	\$12
\$15	\$24	\$30	\$36
\$25	\$40	\$50	\$60
\$35	\$56	\$70	\$84

**Comments**

Consistent with field observations there was not found to be a significant effect on yield in shallow seeding conditions between small, medium and large seed. The cost implications become more noticeable the higher the cost of seed per kg. The management implications for farmers planting retained open pollinated seed vs Hybrid pedigree seed may be different due to this.

**Paper reviewed by:** Andrew Suverijn, Nuseed

**References:**

Improved canola establishment, yield and oil with large seed on sandplain soil in Western Australia, GP Riethmuller, PC Carmody and GH Walton found 15/12/2015 from [http://www.australianoilseeds.com/data/assets/pdf\\_file/0014/4550/Improved\\_canola\\_establishment\\_yield\\_and\\_oil\\_with\\_large\\_seed\\_in\\_WA.pdf](http://www.australianoilseeds.com/data/assets/pdf_file/0014/4550/Improved_canola_establishment_yield_and_oil_with_large_seed_in_WA.pdf)

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