

*Canola Breeders ceased operating as a company in July 2013. The marketing for CB Sturt has been taken over by Dupont Pioneer. The future marketing arrangements of all other Canola Breeders released varieties is unclear at the time of writing this article.

Notes

(P) = provisional rating – the variety has only been in our blackleg nurseries for one year – it needs two years before it gets a full rating.

⌢ = plant breeders rights (PBR) varieties where an end point royalty is collected.

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Maximising canola yield by getting establishment right – upper EP experience in 2013

RESEARCH

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Location:
Minnipa Ag Centre, South 4

Rainfall
Av. Annual: 324 mm
Av. GSR: 241 mm
2013 Total: 334 mm
2013 GSR: 237 mm

Yield
Potential: 1.4 t/ha Canola
Actual: 1.4 t/ha

Paddock History
2013: Canola and Field pea trials
2012: Wheat
2011: Barley
2010: Barley

Plot Size
1.5 m x 10 m x 4 reps

Yield Limiting Factors
Wind, Diamond back moth

Location:
Piednippie
Rainfall
Av. Annual: 324 mm
Av. GSR: 220 mm
2013 Total: 314 mm
2013 GSR: 246 mm

Yield
Potential: 2.0 t/ha Canola
Actual: 1.1 t/ha

Paddock History
2012: Wheat
2011: Barley
2010: Pasture

Plot Size
1.5 m x 10 m x 4 reps
Yield Limiting Factors
Low spring rainfall, Diamond back moth

Key messages

- Early sowing had the largest positive impact on canola yield when comparing a range of treatments trialed in 2013.
- Good seeding depth and the correct seed rate were also important in maximising canola yields, but not to the same extent as time of sowing.

Why do the trial?

This is part of a new South Australian Grains Industry Trust (SAGIT) funded project. It aims to maximise canola productivity through creating soil specific management strategies that improve canola yields, profitability and establishment in field trials on lower and upper Eyre Peninsula.

In 2013, seven separate trials were conducted at Minnipa Agricultural Centre (MAC), Poochera, and Piednippie on upper Eyre Peninsula. Five will be reported on here. Further trials were conducted on lower Eyre Peninsula and will be reported in the LEADA results booklet.

How was it done?

Trial 1 – Time of Sowing (Minnipa Agricultural Centre)

Aim: To evaluate the effect of four different sowing times, in combination with two different seeding depths and two different seeding rates has on canola emergence and yield of two

Clearfield tolerant varieties on Minnipa Agricultural Centre.

Treatments:

- Sowing dates: Time of Sowing (TOS) 1: 23 April 2013, TOS2: 7 May 2013, TOS3: 17 May 2013, TOS4: 27 May 2013.
- Two varieties were sown each time: Pioneer 43C80 and Pioneer 43Y85.
- Sowing depths: 2 cm (shallow) and 4 cm (deep).
- Sowing Rates: 40 plants/m² (equivalent to 2.5 kg/ha 43C80 and 2.9 kg/ha 43Y85) and 60 plants/m² (equivalent to 3.7 kg/ha 43C80 and 4.3 kg/ha 43Y85).
- Seed size: 43C80 = 0.43 g/100 seeds and 43Y85 = 0.62 g/100 seeds.

Management: The trial received a total of 63 kg/ha 19:13:0 S9% + 64 kg/ha urea fertiliser, applied at seeding and 100 kg/ha sulphate of ammonia (SOA) broadcast during the season. 500 ml/ha Intervix, 300 ml/ha Select, 100 ml/ha Lontrel and 0.5% Supercharge was applied to control weeds. Multiple products were used during the season to control insects, but there was still some damage from Diamond back moth and aphids in all trials discussed in this article.

What does this mean?

- Time of sowing had a large impact on yield, where the earliest sowing time produced the highest yield with each subsequent time of sowing producing significantly lower yields.
- The time of sowing did have an effect on establishment, but this did not correlate to the differences in yield achieved.
- Other treatments such as sowing depth and seeding rate (results not shown), while significantly affecting establishment did not significantly affect grain yield within the same time of sowing (i.e. all treatments sown on the same day, regardless of sowing rate and sowing depth did not yield significantly different to each other.)

- A similar trial was established in the high rainfall zone of lower Eyre Peninsula, near Vanilla, and similar results were achieved.

Trial 2 & 3 – Triazine Tolerant Canola Emergence Trials

Aim: To evaluate the effect that one triazine tolerant variety, sown at three different seeding rates and three different depths has on emergence and yield at Minnipa Agricultural Centre and Piednippie.

Treatments: The trials were sown on the 14 May 2013 (Piednippie) and 16 May 2013 (Minnipa). The variety ATR Stingray (seed size 0.3 g/100 seeds) was used in all treatments. The trial was planted at three depths (1 cm, 2 cm, and 4 cm) and at three rates (1.5 kg/ha, 3 kg/ha and 4.5 kg/ha).

Management: The Piednippie trial received a total of 71 kg/ha 19:13:0 S9% + 41 kg/ha urea fertiliser, applied at seeding and 125 kg/ha SOA broadcast during the season. The MAC trial received a total of 63 kg/ha 19:13:0 S9% and 39 kg/ha urea fertiliser, applied at seeding and 100 kg/ha and 125 kg/ha SOA broadcast during the season. Both trials received a knockdown of Roundup, Carfentrazone-Ethyl and a bare earth insecticide of 1 L/ha Chlorpyrifos. At Minnipa 1.2 L/ha Gesaprim 600SC, 300 ml/ha Select, 200 ml/ha Targa, 1 L/100L Kwicken and 1 kg/100 L SOA was applied to control weeds. At Piednippie 1.2 L/ha Gesaprim600SC, 400 ml/ha Select, 30 ml/ha Karate Zeon, 1 L/100L Kwicken and 500 g SOA was applied to control weeds and insects.

Table 1 The effect of time of sowing (TOS), on grain yield and emergence of canola at Minnipa, 2013

Time of sowing	Yield (t/ha)	Emergence (plants/m ²)
TOS1	1.42	30
TOS2	1.13	41
TOS3	0.95	36
TOS4	0.69	38
LSD (P=0.05)	0.07	4

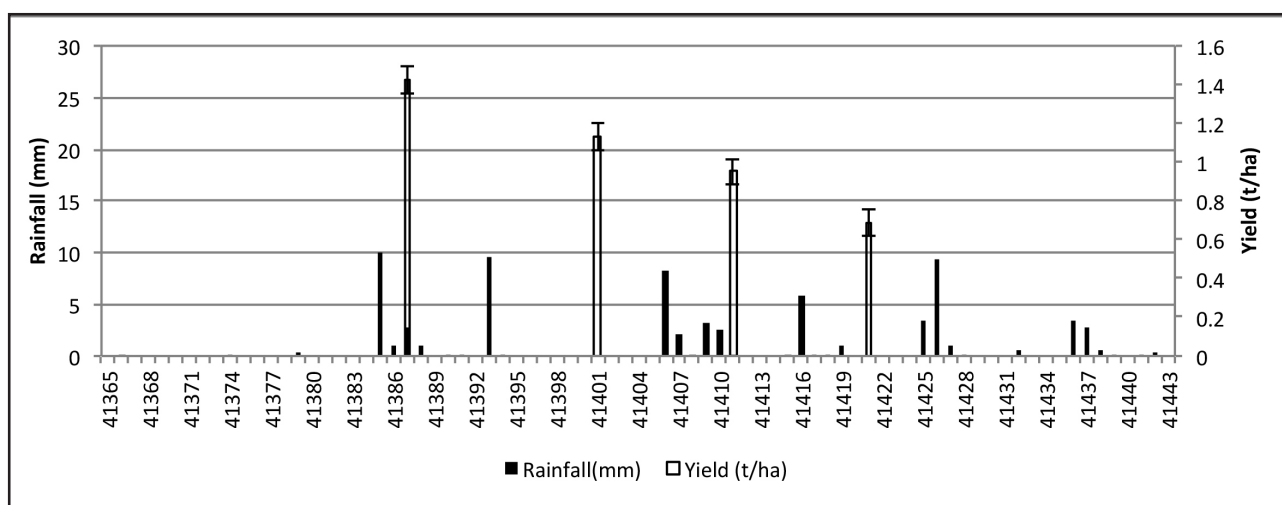


Figure 1 Daily rainfall (mm) at MAC (1 April – 18 June 2013) and canola yield (t/ha) of the four times of sowing (plotted on the day of sowing)

Table 2 The effect of sowing rate on grain yield and emergence of Stingray TT canola at Minnipa and Piednippie, 2013

	Minnipa		Piednippie	
Sowing Rate (kg/ha)	Yield (t/ha)	Emergence (plants/m ²)	Yield (t/ha)	Emergence (plants/m ²)
1.5	0.95	26	0.87	30
3	1.06	42	0.98	49
4.5	1.11	65	0.97	63
LSD ($P=0.05$)	0.04	9	ns	8

Table 3 The effect of sowing depth on grain yield and emergence of Stingray TT canola at Minnipa and Piednippie, 2013

	Minnipa		Piednippie	
Sowing Rate (kg/ha)	Yield (t/ha)	Emergence (plants/m ²)	Yield (t/ha)	Emergence (plants/m ²)
1	1.10	48	1.03	57
2	1.06	47	0.94	49
4	0.96	38	0.85	37
LSD ($P=0.05$)	0.04	9	0.12	8

What does this mean?

- At Minnipa the highest yielding treatments were sown at 4.5 kg/ha, this gave significantly better yields than treatments sown at 3.0 kg/ha and better again than treatments sown at 1.5 kg/ha. At Piednippie sowing rate did not significantly affect yield.
- Sowing depth had a significant effect on yield at both Minnipa and Piednippie, with yield decreasing the deeper the seed was placed.
- Results from both of these trials indicate that sowing canola too thin and too deep can have a significant detrimental effect on yield and also suggests that growers should target an establishment rate of at least 50 plants/m² to maximise yield.

Trial 4 & 5 – Clearfield Tolerant Canola Emergence Trials

Aim: To evaluate the effects of seed source, sowing depth and seeding rate on Clearfield canola emergence and yield at Minnipa Agricultural Centre and Piednippie.

Treatments: The trials were sown on the 14 May 2013 (Piednippie) and 16 May 2013 (Minnipa). The seed used in these trials consisted of: commercial seed (store purchased) of the varieties Pioneer 43C80 (seed size 0.43 g/100 seeds) and Pioneer 43Y85 (0.62 g/100 seeds) and farmer retained seed of Pioneer 43C80 graded into two sizes, larger than 2.0 mm (seed size 0.5 g/100 seeds) and smaller than 2.0 mm (seed size 0.31 g/100 seeds). The trial was planted at three depths (1 cm, 2 cm, and 4 cm) and at three rates (1.5 kg/ha, 3 kg/ha and 4.5 kg/ha).

Management: The Minnipa trial received a total of 63 kg/ha 19:13:0 S9% and 39 kg/ha urea fertiliser, applied at seeding and 100 kg/ha and 125 kg/ha SOA broadcast during the season. The Piednippie trial received 71 kg/ha 19:13:0 S9% and 41 kg/ha urea at seeding and 100 kg/ha SOA broadcast during the season. Both trials received a knockdown of Roundup, Carfentrazone-Ethyl and a bare earth insecticide of 1 L/ha Chlorpyrifos. The Minnipa trial had 500 ml/ha Intervix, 350 ml/ha Select, 60 ml/ha Lontrel and 0.5% Supercharge applied to control weeds. The Piednippie trial had 300 ml/ha Select, 150 ml/ha Targa, 300 ml/ha Astound Duo, 1 L/100 L Water Kwicken and 700 ml/ha Intervix, 30 ml/ha Lontrel, 15 ml/ha Karate Zeon and 500 ml/100 L SuperCharge applied to control weeds and insects.

Table 4 The effect of seeding rate on grain yield and emergence of Pioneer 43C80 and 43Y85 canola at Minnipa and Piednippie, 2013

Sowing Rate (kg/ha)	Minnipa		Piednippie	
	Yield (t/ha)	Emergence (plants/m ²)	Yield (t/ha)	Emergence (plants/m ²)
1.5	0.88	15	0.91	19
3	0.97	27	1.02	34
4.5	1.02	38	1.07	45
LSD (P=0.05)	0.04	3	0.04	3

Table 5 The effect of seed source on grain yield and emergence of Pioneer 43C80 and 43Y85 canola at Minnipa and Piednippie 2013

Seed Source	Minnipa		Piednippie	
	Yield (t/ha)	Emergence (plants/m ²)	Yield (t/ha)	Emergence (plants/m ²)
43C80 Large	0.98	24	0.96	31
43C80 Small	0.94	26	0.94	34
43C80 Store	1.04	32	1.04	37
43Y85 Store	0.86	23	1.05	28
LSD (P=0.05)	0.05	5	0.05	6

What does this mean?

- The trials at Minnipa and Piednippie both showed that using higher seeding rates improved establishment and yield.
- In both trials using commercial seed or store purchased seed of 43C80 produced a higher rate of establishment and a higher yield than the farmer retained seed. Grading the farmer retained seed to larger than 2.0 mm gave a higher but not significant yield to the seed that was smaller than 2.0 mm.
- Results from both of these trials indicate that sowing canola too thin and using retained seed can have a detrimental effect on yield.

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ATR Stingray - registered variety of Nuseed Pty Ltd. Pioneer 43C80. Pioneer 43Y85 - registered varieties of Dupont Pioneer. Intervix - registered trademark of BASF. Select - registered trademark of Arysta Life Sciences and Sumitomo Chemical Co. Japan. Lontrel - registered trademark of Dow AroSciences. Supercharge - registered trademark of Syngenta Group Company. Gesaprim 600Sc - registered trademark of Syngenta Group Company. Karate

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