Canola and Juncea Canola for Low Rainfall Areas in 2011

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RESEARCH

Location:
Minnipa Ag Centre

Rainfall
Av. Annual: 325 mm
Av. GSR: 242 mm
2010 Total: 410 mm
2010 GSR: 346 mm

Yield
Potential: 2.7 t/ha (C)
Actual: 2.3 t/ha 45Y77 Canola

Paddock History
2009: Wheat
2008: Wheat
2007: Wheat

Soil Type
Red calcareous sandy loam

Plot size
10 m x 1.48 m x 3 reps

Yield Limiting Factors
Nitrogen

What did fantastic yields in 2009, followed by a late break in 2010 do to canola? There was not much of a problem due to the good rainfall and extremely mild spring conditions, both conditions that give canola a great chance to perform.

Variety selection

The choice of the 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 for 2010-2011

A number of new early or early-mid maturity varieties will be marketed for 2011 sowings. Information about new varieties has been provided by the seed companies as in most cases, entries have only come into NVT trials in 2010.

Conventional varieties

Hyola 433 Mid-early maturing conventional hybrid. High yielding. High oil and good protein content. Medium height. Suited from low to medium rainfall regions including irrigation zones. Blackleg resistance rating is R-MR. Tested in NVT trials 2005 and 2009. Bred and marketed by Pacific Seeds.

CB Agamax New Release 2011. Early-mid maturing hybrid. Canola Breeders indicate excellent yield in low to medium rainfall, excellent early vigour and good oil content. Anticipated to have MR resistance rating (to be classified 2010). Tested in NVT trials in 2010 for the first time. Marketed by Canola Breeders. To be released in 2011.

SARDI515M A juncea variety for biodiesel feedstock production. It is a conventional type that is suited to areas with rainfall below 350 mm. Tested as SARDI515M, it is early flowering. Excellent pod shatter resistance allows for direct heading. Blackleg resistance rating is R (P). First tested in NVT 2010. Released in 2010. Bred by SARDI based on material bred by Vic DPI/Viterra in association with GRDC. Marketed in a closed loop by Smorgon Fuels.

Triazine tolerant (TT) varieties

CB™ Telfer Very early season for low rainfall areas. CBWA indicate high oil. Blackleg resistance rating is MS-S. Tested in SA NVT trials in 2008. Bred and marketed by Canola Breeders. An End Point Royalty (EPR) applies.

CB™ Scaddan Medium season for medium to high rainfall areas. Blackleg resistance rating is MR-MS. Tested in SA NVT trials in 2008. Bred and marketed by Canola Breeders. An End Point Royalty (EPR) applies.

CB™ Tanami Early maturing. Targeted for low rainfall areas. Moderate oil and protein content. Blackleg resistance rating MS-S. Released in NSW in 2007. Tested in NVT trials 2006-2009. Bred and marketed by Canola Breeders. An EPR applies.

CB Jardee HT™ Mid season TT hybrid canola. CBWA indicate excellent early vigour. Blackleg resistance rating is MR. Good early vigour and good oil content. Tested in SA NVT trials in 2008 at a few sites only, in trials in 2009 and 2010. Bred and marketed by Canola Breeders.

CB Mallee HT™ Early season TT hybrid canola. Blackleg resistance rating is MR (P). Good early vigour and good oil content. Tested in SA NVT trials in 2009 and 2010 as CHYB157. Bred and marketed by Canola Breeders.

CB Tumby HT™ Early-mid season TT hybrid canola. Blackleg resistance rating is MR (P). Good early vigour and good oil content. Tested in SA NVT trials in 2009 and 2010 as CHYB125. Bred and marketed by Canola Breeders.

CB Junee HT™ (Trialled as CHYB-127). New Release 2011. Early maturing TT hybrid. Canola Breeders indicate excellent yield, good early vigour and good oil content. Anticipated to have MR blackleg resistance rating (to be classified 2010). Tested in NVT trials in 2010 for the first time. Bred and marketed by Canola Breeders. To be released in 2011.

Hyola 555TT (tested as T2522) Mid-early maturing TT Hybrid. (TT version of Hyola 433) Pacific Seeds indicate excellent yield, excellent oil and high protein content. Ideally fits medium-low right through to high rainfall areas. This Hybrid exhibits good TT Hybrid vigour, medium plant height and excellent standability. Anticipated blackleg resistance rating R-MR. Tested in NVT trials in 2010. Bred and marketed by Pacific Seeds. To be released in 2011.

Hyola 444TT (tested as T98002) Early maturing TT Hybrid. Pacific Seeds indicate excellent yield, excellent oil and high protein content. Medium-short plant height. Ideally fits low to medium-high rainfall areas and exhibits good TT Hybrid vigour and good standability. Anticipated blackleg resistance rating R-MR. Tested in NVT trials in 2010. Bred and marketed by Pacific Seeds. To be released in 2011.

Fighter TT (tested as T2181) Early to mid-early maturing double haploid OP TT variety. Pacific Seeds indicate good yield with moderate oil and very high protein content. Medium-short height. Ideally fits medium-low to medium-high rainfall areas, exhibits reasonable vigour and excellent standability. Blackleg resistance rating MR. Currently being tested in NVT trials in 2010. Bred and marketed by Pacific Seeds. To be released in 2011.

ATR-Snapper (tested as NT0049) Early-mid maturing. Medium-short height. High oil and protein content. Anticipated to have good blackleg resistance. Bred by Canola Alliance. Marketed by Nuseed Pty Ltd. To be released in 2011.

ATR-Stingray (tested as NT0045) Early maturing. Short height. High oil and protein content. Anticipated blackleg resistance rating MR. Bred by AgSeed Research and DPI Victoria. Marketed by Nuseed Pty Ltd. To be released in 2011.

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.

Table 1 Oil content (%) of canola sown at 5 sites in 2009

Entry	Tooligie (%)	Keith (%)	Lameroo (%)	Minlaton (%)	Spalding (%)	Mean (%)
AV Garnet	48.5	46.7	38.6	45.5	48.1	45.5
Hyola 433	47.3	46.8	37.4	45.4	47.7	44.9
Tarcoola	48.8	45.1	37.6	45.1	47.9	44.9
Pioneer 44C79	48.1	43.0	40.3	44.5	48.2	44.8
Pioneer 43C80	49.1	44.5	36.9	44.9	47.9	44.7
Tawriffic TT	47.7	44.8	38.5	44.6	47.0	44.5
Hyola 50	45.0	45.3	37.9	45.4	47.4	44.2
Hurricane TT	47.1	44.4	38.2	44.3	46.3	44.1
CB Telfer	47.6	42.0	38.8	43.6	47.3	43.9
ATR Cobbler	46.6	42.8	37.3	43.2	47.5	43.5
Bravo TT	46.4	43.4	38.4	43.5	45.5	43.4
Rottnest TTC	45.7	41.7	37.7	42.4	45.4	42.6
CB Tanami	44.9	42.2	37.2	42.4	44.8	42.3
CB Jardee HT	45.2	41.2	37.6	42.2	45.1	42.2
CB Tumby HT	45.2	40.0	37.6	42.0	44.7	41.9
Lightening TT	45.2	41.1	35.0	44.1	43.3	41.8
CB Scaddan	44.6	40.6	36.3	42.5	44.0	41.6
Oasis CL	46.9	42.8	40.4		46.6	
Sahara CL	43.8	38.7	39.2		43.3	

Table 2 Grain yield of conventional canola at Tooligie 2010 NVT trials

Entry	Yield (t/ha)	% site mean
Sahara CL	1.05	70
Oasis CL	1.13	75
Tarcoola	1.42	95
CB Agamax	1.58	105
Hyola50	1.76	117
Hyola433	1.81	121
AVGarnet	1.88	125
Site Mean	1.5	
CV%	5.8	
LSD (P=0.05)	*0.14*	

45Y82 (tested as 06N785I). Pioneer Hi-Bred indicate provisional blackleg rating likely to be R-MR. 45Y82 is an early-mid hybrid Clearfield variety with shorter stem and good standability. Included in NVT trials in 2009.

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.

Hyola 575CL (tested as K9317). Mid-early season hybrid. Pacific Seeds indicate high grain yield and oil content about 1% more than Hyola571CL. Medium plant height. Blackleg rating suggested to be R (Pacific Seeds data). Tested in SA NVT trials in 2010. Bred and marketed by Pacific Seeds. To be released in 2011.

44Y84 (CL) Early/early-mid season hybrid. Pioneer Hi-Bred indicate provisional blackleg rating likely to be R-MR. Included in NVT trials in 2010. Bred and marketed by Pioneer Hi-Bred. To be released in 2011.

CLEARFIELD® *(imidazolinone tolerant) Juncea canola*

Oasis CL (tested as - J05Z-8920) First herbicide tolerant low-rainfall juncea canola variety in Australia. Suited to areas with rainfall below 350mm. Blackleg resistance rating is R. Excellent pod shatter resistance allows for direct heading. Seed quality as good as or slightly better than Dune. Bred by DPI Vic/Viterra in association with GRDC. Marketed by Viterra.

Grain quality

Grain quality data from trials conducted in 2009 are presented in Table 1. Many of the newer varieties have improved oil content over older varieties, but consider oil content amongst the other factors when choosing a new canola variety

Grain yield of canola and juncea canola varieties is shown in Tables 2 and 3. With the wet, mild conditions, the early mid varieties performed best at Tooligie. Juncea canola varieties performed poorer than canola in the conventional trial. Several new TT canola varieties to be released in 2011 performed very well. More data on these varieties in drier years will assist to determine how consistent these varieties are likely to be.

JUNCEA CANOLA FOR LOW RAINFALL ENVIRONMENTS

The only juncea canola variety to be available in south eastern Australia for 2011 will be OasisCL which has major changes to both the oil and meal quality from traditional table mustard. The variety was bred by DPI Victoria and Viterra, in Canada, and partly funded by the GRDC.

Juncea canola has a number of advantages over traditional canola in low rainfall areas, including faster ground covering ability, better heat and drought tolerance and shatter tolerance - thus it does not need windrowing (saving around $25/ha).

Future breeding priorities include further development of herbicide tolerant varieties with high yield, improved quality, good blackleg resistance and good adaptation. The first triazine tolerant advanced breeding lines were in multi-locations trials in 2009 and were tested on Eyre Peninsula, with first cultivars hopefully available in 2012. Hybrids and other herbicide tolerances are also currently being developed and will continue to be selected in low rainfall systems across Australia. One mustard of interest in these trials is SARDI515M which is being grown for biodiesel feedstock production. Good progress has been made with the development of the first TT juncea cultivars, with XCEED TT canola lines planned to be entered for the first time in 2011 NVT trials. More data will be available on XCEED TT canola's relative performance compared to napus canola in 2012.

Juncea canola lines tend to yield the same or more than traditional canola in situations where canola yields are equal to or less than 1.5 t/ha.

Table 3 Grain yield of TT canola at Tooligie 2010

Entry	Yield (t/ha)	% site mean
CB Mallee	1.23	83
CB Tanami	1.27	86
CB Telfer	1.29	87
CB Scaddan	1.38	93
ATR-Cobbler	1.48	100
FighterTT	1.52	103
TawrifficTT	1.55	105
ATR-Snapper	1.62	109
CB Junee	1.68	114
ATR-Stingray	1.76	119
Site Mean	1.48	
CV%	5.6	
LSD (P=0.05)	*0.13*	

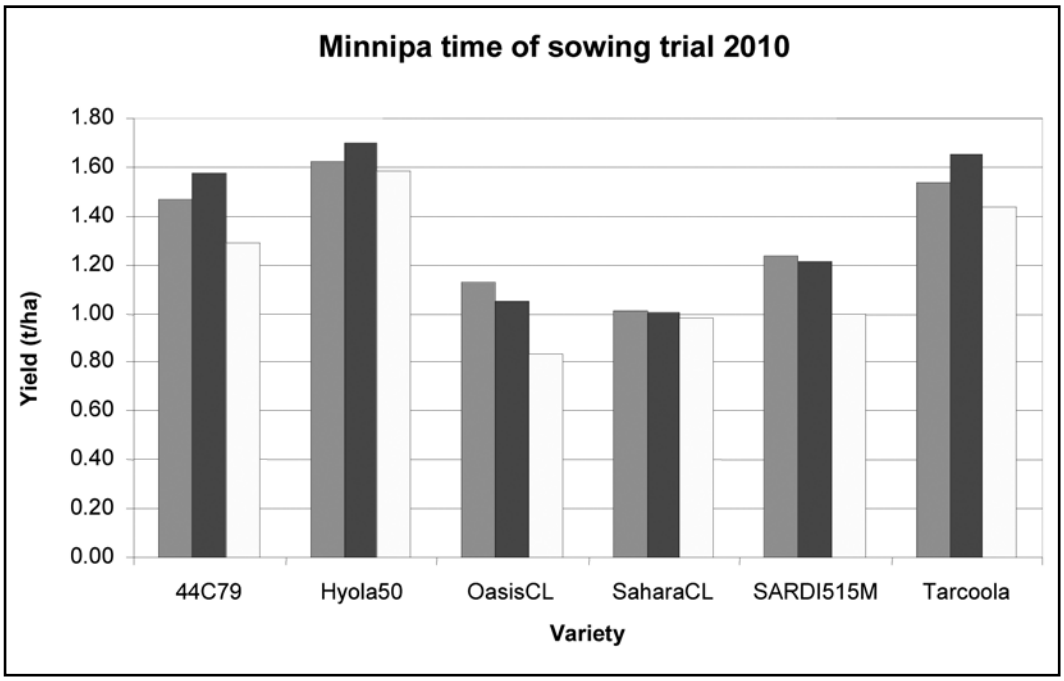

Figure 1 Effect of sowing date on canola and juncea at Minnipa in 2010, TOS1 - 27 May, TOS2 - 11 June, TOS3 - 24 June

Table 4 Yield of canola and Juncea canola with varying N rates, Minnipa and Lameroo 2010

	Minnipa		Lameroo	
Treatment	**t/ha**	**% site mean**	**t/ha**	**% site mean**
44C79 0 kg/ha N	0.57	61	1.03	124
44C79 30 kg/ha N	1.19	127	1.09	131
44C79 60 kg/ha N	1.47	156	1.09	131
44C79 90 kg/ha N	1.59	169	0.99	120
Oasis CL 0 kg/ha N	0.42	45	0.73	88
Oasis CL 30 kg/ha N	0.85	90	0.70	84
Oasis CL 60 kg/ha N	0.95	101	0.72	87
Oasis CL 90 kg/ha N	1.21	129	0.68	82
Sahara CL 0 kg/ha N	0.39	42	0.76	92
Sahara CL 30 kg/ha N	0.76	81	0.75	91
Sahara CL 60 kg/ha N	0.97	103	0.67	81
Sahara CL 90 kg/ha N	0.93	99	0.75	90
Site Mean	0.94		0.89	
CV %	9.35		13.85	
LSD (P=0.05)	*0.10*		*NS*	

Table 5 Yield of canola and Juncea canola with varying sowing rates, Minnipa and Lameroo 2010

Treatment	Minnipa		Lameroo	
	t/ha	% site mean	t/ha	% site mean
Oasis CL 1 kg/ha	0.64	94	0.74	91
Oasis CL 2 kg/ha	0.74	108	0.84	103
Oasis CL 4 kg/ha	0.67	99	0.88	108
Oasis CL 6 kg/ha	0.67	98	0.75	92
Oasis CL 8 kg/ha	0.74	108	0.81	99
Sahara CL 1 kg/ha	0.66	97	0.80	97
Sahara CL 2 kg/ha	0.65	96	0.87	106
Sahara CL 4 kg/ha	0.68	100	0.87	106
Sahara CL 6 kg/ha	0.66	97	0.82	101
Sahara CL 8 kg/ha	0.71	104	0.80	98
Site Mean	0.683		0.82	
CV %	12.14		13.35	
LSD (P=0.05)	*NS*		*0.13*	

With the mild spring in 2010, canola varieties tended to produce higher grain yields than juncea. Generally, grain yield reduced with later sowing but to a much lesser degree in 2010 compared to other years. As in 2009, SARDI515M produced higher yields than the juncea canola varieties OasisCL and SaharaCL.

Sowing rates and nitrogen rates have been tested for canola and juncea canola (Tables 4 and 5). Trials at Walpeup in Victoria, with older juncea lines, suggested that juncea had a lower need for nitrogen than canola. While the nitrogen rate trial at Lameroo showed no response to applied nitrogen in canola or juncea in 2010, the trial at Minnipa produced a yield increase for both species. However, the yield increase ranged from 1.02 t/ha for the canola variety 44C79 to 0.79 and 0.54 t/ha for OasisCL and SaharaCL respectively.

In 2010, sowing rate had little or no effect on grain yield at Minnipa or Lameroo. This may be due to the mild conditions as we have seen yield increases of up to 3 kg/ha for juncea in previous years. In general we recommend using a sowing rate of about 3-4 kg/ha for juncea canola due to the small seed size and the possible drying conditions of the seed bed in low rainfall areas.

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