

Hyola® ICS canola performance & agronomy trials

Steve Lamb, Territory Manager – Central and Northern WA, Advanta Seeds
Co-operators - Eurofins Agrisearch, Monsanto, Sinochem, Syngenta, Bayer, BASF

Purpose: To evaluate the performance and agronomic attributes of a range of Hybrid and OP canola varieties across different herbicide tolerant technologies over two time of sowing events.

Location: WMG Main Trial site - Dandaragan WA

Soil Type: TBA by Eurofins Agrisearch

Soil Test Results: Available upon request from Eurofins Agrisearch

Rotation: TBA by Eurofins Agrisearch

Growing Season Rainfall (April- October 2015): TBA by Eurofins Agrisearch

BACKGROUND SUMMARY

Advanta Seeds has collaborative laboratory and field research studies to investigate a range of canola agronomic and extension concepts from 2015 to 2020 with key Universities, grower organisations, industry bodies and weed scientists across Australia focusing on Integrated Weed Management (IWM) solutions with varying herbicide cost application strategies.

The research will be determining the value in \$/ha for each weed control component in the canola crop within specific herbicide technology systems and then developing a software model to calculate the individual and cumulative value to growers of each of these elements for weed control in a “Integrated Weed Control Package”.

The Dandaragan Hyola® ICS trial is part of the Pacific Seeds National Innovative Cropping Solutions initiative combining a range of multi-treatment agronomic trials for canola and wheat growers to view and gain further knowledge from the applied research and extension results. These trials include:

1. Time of Sowing (TOS) Trials with 3 different herbicide technologies, RT®, RR and TT to investigate the effects of TOS on varietal maturities, adaptability and yield/oil performance.
2. Plant population trials comparing 25 plants/m² vs 40 plants/m² within RT®, RR and TT herbicide technology systems across two separate TOS.
3. Clearfield Technology evaluations of Winter dual purpose Graze n Grain Hybrids vs Winter*Spring Hybrids vs Spring Hybrids for biomass appraisal and yield/oil performance compared against RR, RT® and TT technologies.
4. Simulated grazing vs un-grazed RR and RT® herbicide technologies, using the S Series hi-biomass longer season Spring Hyola® hybrids at 25 plants/m² and 40 plants/m²
5. Best Practice Management spray applications for the RR, RT® and TT herbicide technologies to demonstrate mode of action sequences in conjunction with Monsanto and Sinochem.
6. New and pre-commercial canola seed treatment enhancement combination evaluations conducted in conjunction with Syngenta, Bayer and BASF.
7. TT Hybrid yield/oil performance evaluations vs OP TT canola varieties across two separate TOS.

2015 Hyola® ICS Technology Trial Layout

TOS1	TOS1	TOS2	TOS1	TOS2	TOS1	TOS2
Clearfield® Technology	RR Technology	RR Technology	RT® Technology	RT® Technology	TT Technology	TT Technology
CL Winter Hybrid vs Spring Types - Grazing vs non-Grazing DM and Yield Trial	Hyola® RR - S Series vs Spring Types TOS, Graze vs Ungrazed and Plant Population Research Trial	Hyola® RR - S Series vs Spring Types TOS, Plant Population, Herbicide Pre & Post Emergent, Spray Treatment Trial - Monsanto, Adelaide University	Hyola® RT® - S Series vs Spring Types TOS, Graze vs Ungrazed and Plant Population Research Trial	Hyola® RT® - S Series vs Spring Types TOS, Plant Population Performance Trial, Herbicide Pre & Post Emergent Spray Treatment Trial New Innovative Seed Treatment Evaluation Trial - Syngenta, Bayer, BASF	Standard Hyola® TT Spring Hybrids - TOS, Plant Population Performance Research Trial	Standard Hyola® TT Spring Hybrids - TOS, Plant Population and Optimum Herbicide Spray Performance Trial



Advanta Seeds Personnel inspecting the 2015 Dandaragan Hyola ICS Performance Trial

TRIAL DESIGN

Plot size: 10 x 1.5m plots

Repetitions: 3 - Randomised Complete Block

Crop type and varieties used: Hybrid and OP canola with herbicide tolerances; RR = Roundup Ready, RT® = Roundup Triazine, CL = Clearfield and TT = Triazine Tolerant

Seeding rates and dates: Plots were sown for targets of 25 and 40 plants per m² across different varieties, technologies and two times of sowing. TOS1 was 15th April 2016 and TOS2 was the 5th May 2016.

Fertilizer rates and dates: TBA by Eurofins Agrisearch.

Herbicide rates and dates: Many applications for 6 different trials due to the nature of the trials and varying evaluations including BMP and standard industry applications. Further details are available from Eurofins Agrisearch.

Other applications/ treatment rates and dates: Further details are available from Eurofins Agrisearch.

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RESULTS

Table 1: Winter types s Winter*Spring types by Spring types - Clearfield Canola Evaluation

Hyola ICS Trial Variety/Treatment Clearfield Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Analysis Stats Sign
Hyola 575CL TS1 40p/m2	CL - Spring	1	2567	a
Hyola 577CL TS1 40p/m2	CL - Spring	1	2662	a
K50055 TS1 40p/m2	CL - W * S	1	1328	b
K50056 TS1 40p/m2	CL - W * S	1	1325	b
K50057 TS1 40p/m2	CL - W * S	1	1285	bc
K50058 TS1 40p/m2	CL - W * S	1	1042	bc
Hyola 970CL TS1 40p/m2	CL - Winter	1	930	c
Edimax CL TS1 40p/m2	CL - Winter	1	916	c
K50054 TS1 40p/m2	CL - W * S	1	919	c
F probability				0.005
LSD 5 %				387
CV %				8.0

Means within the same cell with a letter in common are not significantly different ($P>0.05$)

Discussion: Both the Winter types and Spring * Winter types were found to be sown too late to take advantage of the Winter hardiness and vernalisation which took too long so yields were significantly lower than the Spring types.

Recommendation: Winter hybrid types sown in Mid Jan to early March and the Winter*Spring hybrid types could be sown in early to end of March to gain extra grazing biomass and yield potential whilst meeting vernalisation day requirements

Table 2: TOS * Simulated Grazing Hi-Biomass S Series RR - RT Technology Evaluation

Hyola ICS Trial Variety/Treatment S Series - RR and RT Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Analysis Stats Sign
Hyola 600RR 25p/m2	RR	1	2977	a
Hyola 600RR 40p/m2	RR	1	2723	ab
Hyola 600RR TS1 Graze X 1 - 40p/m2	RR	1	2318	defg
Hyola 725RT 25p/m2	RT	1	2484	bcde
Hyola 600RR TS1 Graze X 1 - 25p/m2	RR	1	2426	cdef
Hyola 725RT 40p/m2	RT	1	2381	cdefg
Hyola 725RT TS1 Graze X 1 - 40p/m2	RT	1	2111	g
Hyola 725RT TS1 Graze X 1 - 25p/m2	RT	1	2226	efg
Hyola 600RR 40p/m2	RR	2	2547	bcd
Hyola 600RR 25p/m2	RR	2	2653	bc
Hyola 725RT 25p/m2	RT	2	2277	defg
Hyola 725RT 40p/m2	RT	2	2111	g
F probability				0.0001
LSD 5 %				287

CV %	7.0	
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Means within the same cell with a letter in common are not significantly different (P>0.05)

Discussion:

As expected overall the RR Hi-Biomass Hybrid out-yielded the RT Hi-Biomass Hybrid due to the TT inherent component. With mid-April sowings a single grazing event will reduce yields significantly in both RR and RT technologies especially in hot spring finishes. 25 or 40 plants per m² did not seem to have a significant effect on the final grazed and ungrazed yields achieved. The RR Hi-Biomass simulated grazed plots yielded as well as the RT ungrazed plots over all 3 locations.

Recommendation:

If you are wanting a grazing event and grain yield from high biomass Spring types then sow in late March to early April to capture the benefits. Both technologies provide the opportunity for early sowing, grazing, excellent weed control and high yields/oils from Hi-Biomass types.

Table 3: TOS * Plant Population Performance RR Technology Evaluation

Hyola ICS Trial Variety/Treatment Roundup Ready Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Analysis Stats Sign
Hyola 600RR 25p/m ²	RR	1	2977	a
GT50 40p/m ²	RR	1	2903	a
45Y25 40p/m ²	RR	1	2808	a
Hyola 600RR 40p/m ²	RR	1	2723	a
Hyola 404RR 40p/m ²	RR	1	2856	a
Hyola 504RR 40p/m ²	RR	1	2408	a
GT50 40p/m ²	RR	2	2842	a
Hyola 404RR 40p/m ²	RR	2	2786	a
45Y25 40p/m ²	RR	2	2754	a
Hyola 600RR 40p/m ²	RR	2	2547	a
Hyola 600RR 25p/m ²	RR	2	2653	a
Hyola 504RR 40p/m ²	RR	2	2543	a
F probability			0.080	
LSD 5 %			ns	
CV %			7.2	

Means within the same cell with a letter in common are not significantly different (P>0.05)

Discussion:

No significant differences found for S Series Hi-Biomass Hyola 600RR when comparing 25 to 40 plants per m². Growers are able to reduce sowing costs and achieve high yields with the Hi-Biomass S Series types with early sowing in April. Hyola 600RR shows equal or higher yields than 45Y25 and GT50 when sown in TOS 1 - early to mid-April. With TOS2 Hyola 404RR shows its adaptability to match the mid-season types for yield (early to mid-May sowings)

Recommendation:

Sow Hyola 600RR in early to mid-April to capture the Hi-Biomass weed suppression and high yield with very high oil benefits. Sow Hyola 404RR from late April through to end of May due to its ongoing yield adaptability and high oil content.

Table 4: TOS * Plant Population Performance RT - TT Technology Evaluation

Hyola ICS Trial Variety/Treatment RT and TT Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Analysis Stats Sign
Hyola 559TT 40p/m2	TT	1	2340	ab
Hyola 650TT 25p/m2	TT	1	2250	b
Hyola 650TT 40p/m2	TT	1	2214	b
Hyola 559TT 25p/m2	TT	1	2268	b
Hyola 525RT 40p/m2	RT	1	2506	a
Hyola 725RT 25p/m2	RT	1	2484	a
Hyola 725RT 40p/m2	RT	1	2381	a
ATR Wahoo 40p/m2	TT	1	2241	b
Hyola 559TT 40p/m2	TT	2	2372	a
Hyola 559TT 25p/m2	TT	2	2304	ab
Hyola 650TT 25p/m2	TT	2	2428	a
Hyola 525RT 40p/m2	RT	2	2435	a
Hyola 525RT 25p/m2	RT	2	2457	a
Hyola 650TT 40p/m2	TT	2	2345	ab
Hyola 725RT 25p/m2	RT	2	2277	b
ATR Bonito 40p/m2	TT	2	2191	b
Hyola 725RT 40p/m2	RT	2	2151	b
F probability			0.843	
LSD 5 %			215	
CV %			9.3	

Means within the same cell with a letter in common are not significantly different (P>0.05)

Discussion:

Some of the Hybrid TT and RT varieties showed significantly higher yield than 2 popular OP TT varieties. Depending on variety, comparing plant populations from 25 to 40 plants per m2 showed some significant differences. However 25 plants per m2 showed excellent results for hybrids and this will assist growers in reducing there seeding rates and costs. With TOS2 Hyola 559TT shows its adaptability across multiple times of sowing for yield and oil performance.

Recommendation:

Sow Hyola 559TT from Mid-April to Mid-May in medium to high rainfall zones. The RT Hybrids are very competitive for yield and oil with the best TT hybrids and offer the extra weed control for all IWM systems. Sow Hyola 725RT in early April and Hyola 525RT from Mid-April to end of May for best performance results.

Table 5: Best Practice Management Comparisons - RT Technology Evaluation

Hyola ICS Trial Variety/Treatment RT Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Analysis Stats Sign
Hyola 525RT - Trifluralin 2.5L/ha -Pre fb (900g RRH + 1.1kg ATR @ 2lf) + (900g RRH + 1.1kg ATR @ 6lf)	RT	2	2463	a
Hyola 525RT - Trifluralin 2.5L/ha -Pre fb (900g RRH @ 2lf) + (900g RRH + 1.1kg ATR @ 6lf)	RT	2	2362	a
Hyola 525RT - Propyzamide 1kg/ha - IBS fb (900g RRH + 1.1kg ATR @ 2lf) + (900g RRH + 1.1kg ATR @ 6lf)	RT	2	2399	a
Hyola 525RT - Trifluralin 2.5L/ha - Pre fb (900g RRH @ 2lf) + (900g RRH @ 6lf)	RT	2	2313	a
Hyola 525RT - Propyzamide 1kg/ha - IBS fb (900g RRH @ 2lf) + (900g RRH + 1.1kg ATR @ 6lf)	RT	2	2336	a
Hyola 525RT - 2.2kg ATR Pre fb (900g RRH @ 2lf) + (900gRRH @ 6lf)	RT	2	2246	a
Hyola 525RT - 1.1kg SIM Pre fb (900g RRH @ 2lf) + (900g RRH + 1.1kg ATR @ 6lf)	RT	2	2340	a
Hyola 525RT Unsprayed	RT	2	2178	a
F probability			0.87	
LSD 5 %			ns	
CV %			10.0	

Means within the same cell with a letter in common are not significantly different
($P>0.05$)

Discussion:

No significant differences as expected due to this being a relatively clean site and these treatments being BMP treatments. No High weed pressure to demonstrate the weed control value because BMP was the purpose of the trial.

Recommendation:

The combinations of TT and RR chemistry on the RT technology show the highest yield results.

There are many combinations of TT and RR that will work for Hybrid RT growers. Weed species, weed levels and herbicide resistance are the key drivers behind which combinations to use.

Table 6: Seed Treatment Comparisons - RT Technology Evaluation

Hyola ICS Trial Variety/Seed Treatment RT Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Analysis Stats Sign
Hyola 525RT - COM	RT	2	2435	a
Hyola 525RT - COGPPM	RT	2	2219	a
Hyola 525RT - PPM	RT	2	2309	a
Hyola 525RT - COJ	RT	2	2260	a
Hyola 525RT - COCPPM	RT	2	2241	a
Hyola 525RT - PPJ	RT	2	2192	a
Hyola 525RT - PPM + Awaken 5L/MT	RT	2	2228	a
Hyola 525RT - COM + Awaken 5L/MT	RT	2	2226	a
Hyola 525RT Bare Seed	RT	2	2147	a
F probability			0.9233	
LSD 5 %			ns	
CV %			7.51	

ns = not significant

Discussion:

No significant differences shown due to the low disease pressures and only moderate insect pressure. The blackleg and damping off diseases were only at low levels which effectively showed no real benefit of any one treatment over another. However, the all treated seed samples commonly showed higher yields than the bare seed.

Recommendation:

Many of the seed treatments offer good protection and added insurance against common pests and diseases. Seed treatments are vital enhancements to use when moderate to high disease or insect pressure is expected.

FINANCIAL ANALYSIS OF RESULTS

Table 7: TOS * Plant Population Performance RR Technology – Gross Returns

Hyola ICS Trial Variety/Treatment Roundup Ready Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Mean Oil %	Gross Return \$/ha \$/ha
Hyola 600RR 25p/m2	RR	1	2977	52.6	\$1,646
Hyola 600RR 40p/m2	RR	1	2723	51.9	\$1,496
45Y25 40p/m2	RR	1	2808	49.0	\$1,502
GT50 40p/m2	RR	1	2903	48.7	\$1,549
Hyola 404RR 40p/m2	RR	1	2856	50.5	\$1,549
Hyola 504RR 40p/m2	RR	1	2408	49.3	\$1,292
GT50 40p/m2	RR	2	2842	48.1	\$1,508
Hyola 404RR 40p/m2	RR	2	2786	50.1	\$1,506
45Y25 40p/m2	RR	2	2754	48.5	\$1,467
Hyola 600RR 40p/m2	RR	2	2547	49.3	\$1,367
Hyola 600RR 25p/m2	RR	2	2653	49.6	\$1,427
Hyola 504RR 40p/m2	RR	2	2543	48.2	\$1,350

Discussion:

Hyola 600RR shows equal or higher yields, higher oils and higher gross returns than 45Y25 and GT50 when sown in TOS1. Sowing earlier by mid-April can lift gross returns in \$/ha by \$200/ha depending on spring rainfall, heat periods and frost events. With TOS2 Hyola 404RR shows its adaptability to match the mid-season hybrid types for yield, oil and gross returns (early to mid-May sowings). Gross returns based on \$500 per MT, yield as MT per Ha, Oil bonus calculated at +/- 42% only.

Recommendations:

Sow Hyola 600RR in early to mid-April to capture the Hi-Biomass weed suppression and high yield with very high oil and gross return benefits. Hyola 404RR can be sown from late April through to end of May due to its ongoing adaptability, high oil content and high overall \$ returns.

Table 8: TOS * Plant Population Performance RT - TT Technology Gross Returns

Hyola ICS Trial Variety/Treatment RT and TT Technology	Herbicide Technology Group	Time of Sowing	Dandaragan WA Yield kg/ha 10-Nov-15	Mean Oil %	Gross Return \$/ha \$/ha
Hyola 559TT 40p/m2	TT	1	2340	49.0	\$1,252
Hyola 559TT 25p/m2	TT	1	2268	50.0	\$1,225
Hyola 650TT 25p/m2	TT	1	2250	49.6	\$1,211
Hyola 650TT 40p/m2	TT	1	2214	49.1	\$1,186
Hyola 725RT 25p/m2	RT	1	2484	52.6	\$1,374
Hyola 525RT 40p/m2	RT	1	2506	50.6	\$1,361
Hyola 725RT 40p/m2	RT	1	2381	51.5	\$1,304
ATR Wahoo 40p/m2	TT	1	2241	50.5	\$1,216
Hyola 559TT 40p/m2	TT	2	2372	50.0	\$1,281
Hyola 559TT 25p/m2	TT	2	2304	50.6	\$1,251
Hyola 525RT 25p/m2	RT	2	2457	50.0	\$1,327
Hyola 525RT 40p/m2	RT	2	2435	49.8	\$1,312
Hyola 650TT 25p/m2	TT	2	2428	48.4	\$1,292
Hyola 650TT 40p/m2	TT	2	2345	48.0	\$1,243
ATR Bonito 40p/m2	TT	2	2191	51.0	\$1,194
Hyola 725RT 25p/m2	RT	2	2277	48.5	\$1,213
Hyola 725RT 40p/m2	RT	2	2151	47.1	\$1,131

Discussion:

Hybrid TT and RT varieties showed some significantly higher yield and gross returns than 2 popular OP TT varieties. With TOS2 Hyola 559TT and Hyola 525RT showed adaptability across multiple times of sowing for yield, oil and gross returns performance. Gross returns based on \$500 per MT, yield as MT per Ha, Oil bonus calculated at +/- 42% only.

Recommendation:

Sow Hyola 559TT from Mid-April to Mid-May in medium-low to high rainfall zones. The RT Hybrids are very competitive for yield, oil and gross returns with the best TT hybrids and offer the extra weed control for all IWM systems. Sow Hyola 725RT in early April and Hyola 525RT from Mid-April to end of May for best performance results and gross returns.

OBSERVATION/ DISCUSSION/ MEASUREMENTS

Overall the site experienced low starting rainfall with staggered plant emergence and then with further rainfall plot populations were within 75 to 85% of targeted plants/m². All pests and diseases were controlled to an acceptably high level.

PEER REVIEW/REVIEW

Justin Kudnig, Canola Business Manager, Advanta Seeds

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