

HYOLA GARRISON XC

CANOLA



TruFlex
CANOLA with Roundup Ready[®] Technology

Clearfield
Production System

High yielding TruFlex[®] + Clearfield[®] hybrid
protecting growers' investment & returns



HYBRID ATTRIBUTES

XC stacked technology shows up to \$1550/ha* value in crop protection from group B IMI soil residue (*Summer application timing)

Excellent crop protection for group B IMI soil residue management as an enhanced risk mitigation tool after low rainfall summer dry profiles

Competitive grain yields across MRZ-HRZ rainfall zones across Australian environments vs hybrids Raptor TF, InVigor R 4022P, 43Y29, InVigor R 4520P, Hyola 410XX and DG408RR

High quantitative resistance with a blackleg rating of "R" with Tri-gene groups ADF, great for rotating effective combinations of major genes

Good lodging resistance, even flowering and manageable height for direct harvesting

Good early plant vigour and biomass similar to Hyola 410XX

Yield adaptability	1.5 - 3.5t/ha
Growing Zones	MRZ - HRZ
Blackleg Rating/Groups	R - ADF
Oil potential	High
Herbicide tolerance	XX + CL
Maturity	Mid
*Plant vigour	8.5
Plant height	Medium - High
#Lodging resistance	8.0
**Shatter tolerance	8.0
^Hectolitre weight	8.0
Growing regions	NSW, SA, Vic, WA
Irrigation/dryland	Both
Alternative to	Raptor TF, Condor TF, InVigor R 4022P, 44Y27, 43Y29, 45Y28, InVigor R 4520P, DG408RR, Hyola 410XX

Indicates observed visual rating from Pacific Seeds R&D internal replicated research trial evaluations

*Indicates observed visual rating from Pacific Seeds R&D internal replicated research trial evaluations

**Indicates observed visual rating from Pacific Seeds R&D replicated research trial evaluations comparing Hyola products

^ Indicates calculated weight rating from Pacific Seeds R&D internal replicated research trial evaluations

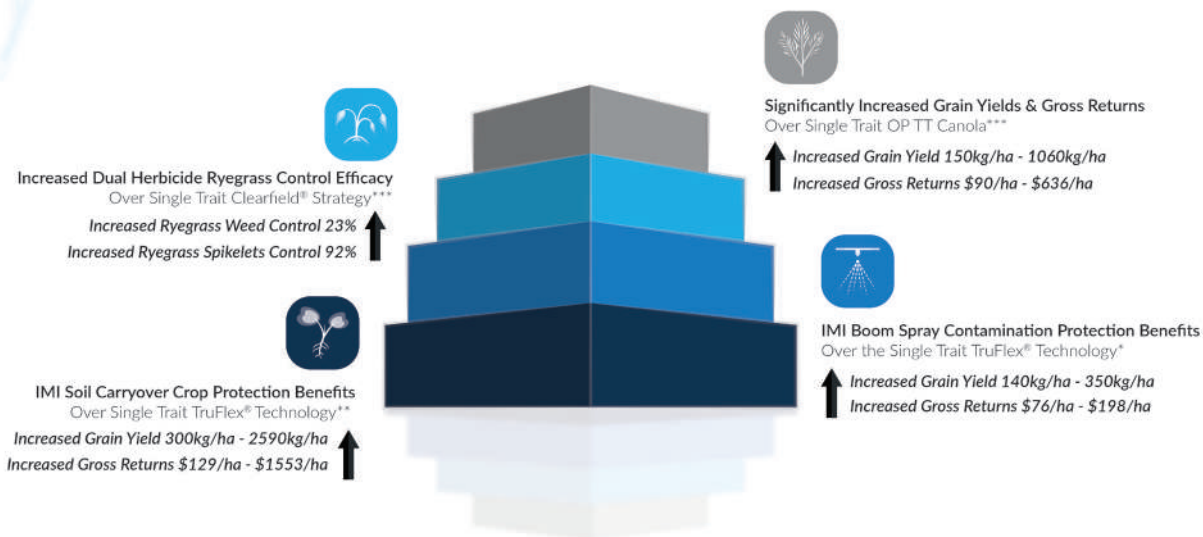
Scale: 1 = poor - 9 = best

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Roundup Ready[®] and TruFlex[®] are registered trademarks of the Bayer Group

Hyola XC Technology Stacked Value

Delivering Flexible Solution-Driven Profits to Growers



*Based on Pacific Seeds 2019 Replicated Technical Extension Research Trials using 30ml/ha Intervix® applied at 4-6 leaf Stage, conducted over four environments.
Based on Pacific Seeds 2020 Replicated Technical Extension Research Trials with five different IMI chemical treatments applied in Summer, conducted over four environments. *Based on Pacific Seeds 2020 Replicated Technical Extension Research IWM Trials using various XC vs XX vs CL vs CT vs TT chemical strategies, conducted over three environments.



2020 IMI Residue Research Trials showed up to \$1550 per Ha Crop Protection



**XX Single Trait Technology
Damaged by IMI Soil Carryover**

**XC Stacked Technology Protected
from Group B IMI Soil Carryover**

Compared to XC Technology	Summary of Treatment Results (XX Canola Losses)		
Herbicide Treatment Description	Yield kg/ha Loss Range	% Yield Loss Range	Gross Returns \$/ha Loss Range
Application Timing/IMI Rates	Loss Expressed from Lowest to Highest Yielding Trial Sites		
4MBS - High IMI Residue/XX spray - 375mL/ha Intervix®	300kg/ha to 840kg/ha	9% to 29%	\$129/ha to \$502/ha
4MBS - Very High IMI Residue/XX spray - 750mL/ha Intervix®	470kg/ha to 1250kg/ha	15% to 44%	\$228/ha to \$752/ha
4MBS - Mod-High IMI Residue/XX spray - 40g/ha OnDuty®	630kg/ha to 2490kg/ha	25% to 95%	\$378/ha to \$1491/ha
4MBS - Mod-High IMI Residue/XX spray - 45g/ha Raptor®	470kg/ha to 2590kg/ha	18% to 91%	\$285/ha to \$1553/ha
4MBS - Mod-High IMI Residue/XX spray - 70g/ha Spinnaker®	810kg/ha to 2360kg/ha	32% to 87%	\$488/ha to \$1418/ha

2020 Pacific Seeds Hyola XC Replicated IMI Residue Trials over four locations across Australia where Trial mean yields ranged from 1.93 – 2.78t/ha.

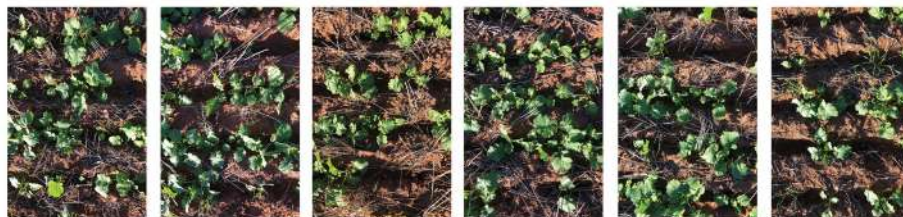
^Effects are greater in soil types where the herbicides were more mobile due to acid soils and higher rainfall after sowing and not always individual trial total rainfall. Hyola® XC Technology has been developed specifically for normal crop growth protection against Imidazolinone soil residues and is not promoted or recommended for use as having high levels of tolerance to levels of Group B - SU carryover. Refer to Pacific Seeds Hyola® XC Stewardship guide for specific growing guidelines www.pacificseeds.com.au/products/canola

Clearfield®, Intervix® and OnDuty® are registered trademarks of BASF.

Hyola XC versus XX IMI + SU Herbicide Carry Over Treatment Comparisons

XX

CL



Low IMI
Residue

Stage: Summer 4 MBS
Intervix® 375ml/ha
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High IMI
Residue

Stage: Summer 4 MBS
Intervix® 750ml/ha
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High OnDuty®
Residue

Stage: Summer 4 MBS
OnDuty® 40g/ha
Hasten® 500ml/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High Raptor®
Residue

Stage: Summer 4 MBS
Raptor® 45g/ha
Hasten® 500ml/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High Spinnaker®
Residue

Stage: Summer 4 MBS
Spinnaker® 70g/ha
Hasten® 500ml/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High Monza®
Residue

Stage: Summer 4 MBS
Monza® 20g/ha
DCTrate® 2L/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

XX



XX

CL



High Logran®
Residue

Stage: Summer 4 MBS
Logran B-Power® 50g/ha
Hasten® 500ml/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High Glean®
Residue

Stage: Summer 4 MBS
Glean® 15g/ha
Wetter 1000 100ml/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

High Ally®
Residue

Stage: 10 DBS
Ally® 5g/ha
Wetter 1000 100ml/100L
Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

Truflex® 3 Spray
Strategy

Stage: IBS
Rustler® 1L/ha
Stage: Early Post Em
(1-2Leaf)
RR 0.9Kg/ha
Stage: Post Em
(4-6Leaf)
RR 0.9Kg/ha
Stage: 1st Flower
RR 0.9Kg/ha

Truflex® 2 Spray
Strategy

Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(1-2Leaf)
RR 1.3Kg/ha
Stage: 1st Flower
RR 1.3Kg/ha

Standard Truflex®
Control

Stage: IBS
Rustler® 1L/ha
Stage: Post Em
(4-6Leaf)
RR 1.3Kg/ha
Select® 500ml/ha
Stage: 1st Flower
RR 1.3Kg/ha

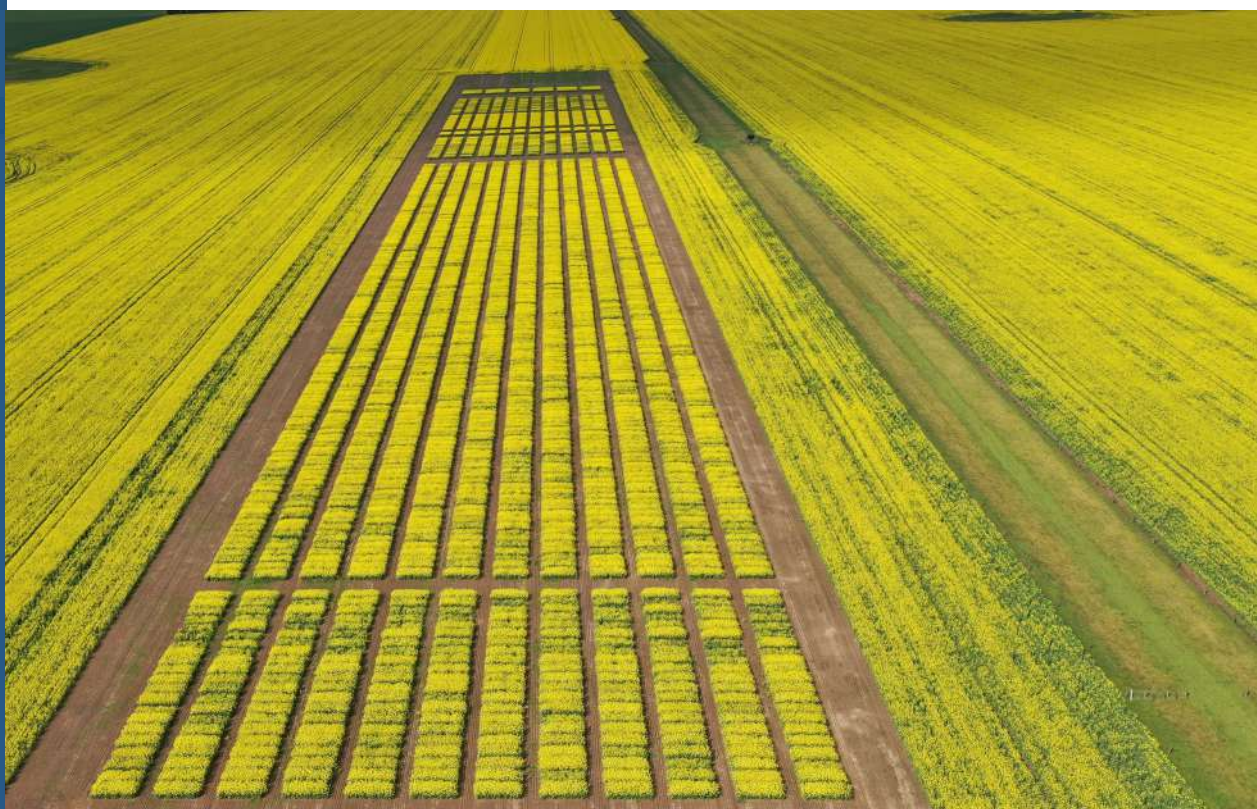
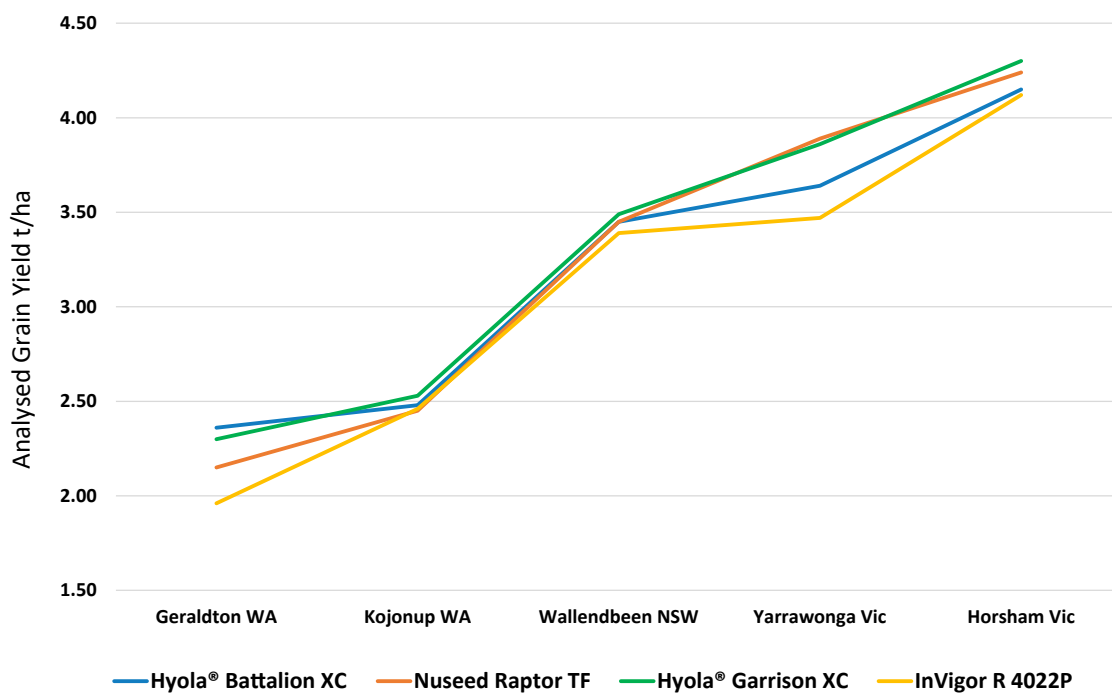
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2020 Pacific Seeds Internal Company Replicated GM Canola Trial Results



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2016-2020 GRDC NVT WA Long Term Analysed Mid Glyphosate Results expressed across Yield Groups

GRDC NVT MID 2016-2020 Variety	Yield Group Mean Yield # Trials	1.0 0.85 t/ha 2	1.5 1.37 t/ha 4	2.0 1.79 t/ha 3	2.5 2.25 t/ha 10	3.0 2.80 t/ha 12	3.5 3.21 t/ha 4	4.0 3.59 t/ha 2
InVigor R 4520P	18	106	112	118	115	114	113	111
Nuseed Condor TF	17	104	111	110	111	110	110	108
Pioneer 45Y28 RR	16	99	111		110	111	110	106
Nuseed Raptor TF	19	104	111	105	108	108	107	105
Pioneer 43Y29 RR	18	95	106	109	108	109	108	104
InVigor R 4022P	18	108	104	112	107	106	106	107
Hyola Garrison XC	18	101	104	101	103	103	102	102
Hyola 410XX	19	104	101	98	100	99	99	101
InVigor R 5520P	33	94	96	103	100	100	100	99
Hyola 540XC	18	87	92	89	92	93	93	91
VICTORY V5003RR	30	86	92	89	91	93	92	91

2016-2020 Long Term GRDC NVT WA (Mid Glyphosate) Long Term Analysis by Yield Group for regions: AgZone 1, AgZone 2, AgZone 3, AgZone 5 & AgZone 6

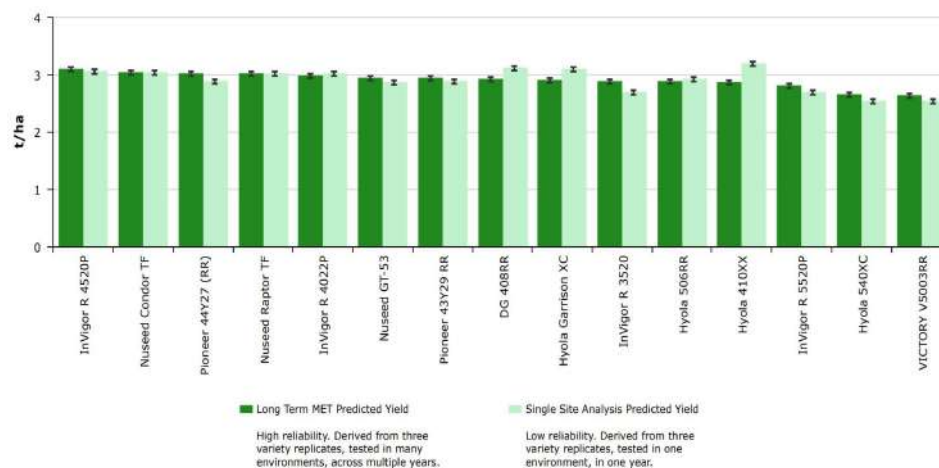




2019 GRDC NVT WA FEATURED INDIVIDUAL TRIAL RESULTS

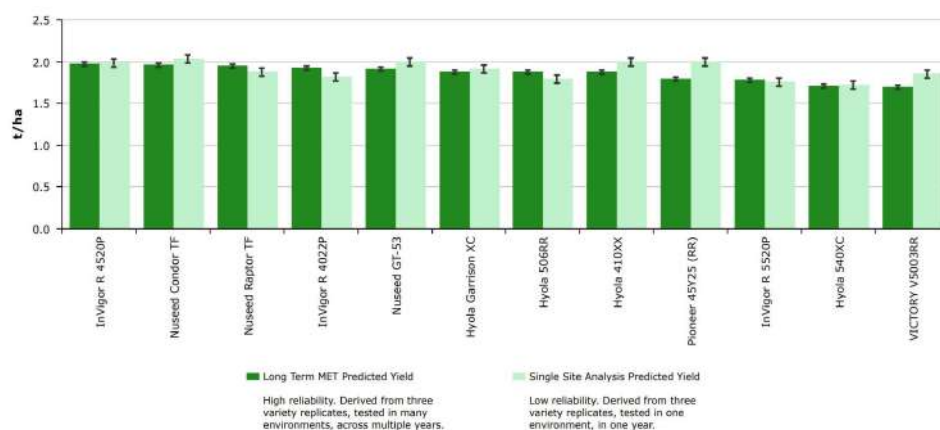
Dandaragan, WA - Canola - Mid Glyphosate Tolerant, 2019

Long Term MET Predicted Yield and Single Site Analysis



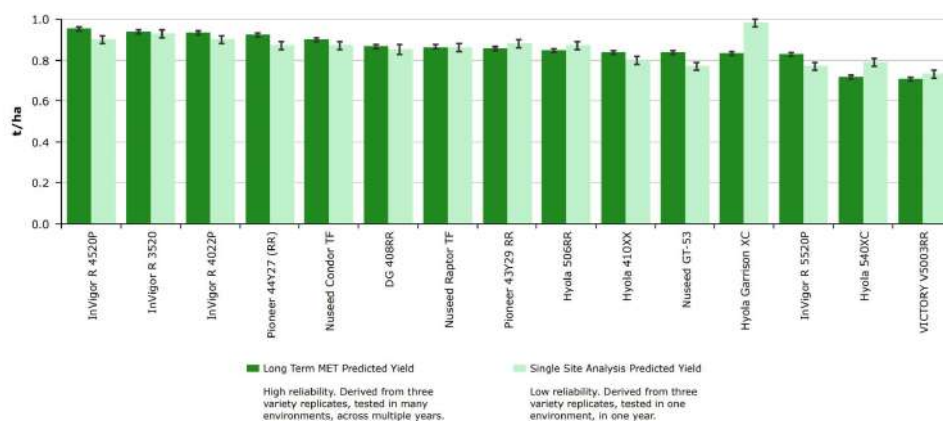
Munglinup, WA - Canola - Mid Glyphosate Tolerant, 2019

Long Term MET Predicted Yield and Single Site Analysis



Cunderdin, WA - Canola - Mid Glyphosate Tolerant, 2019

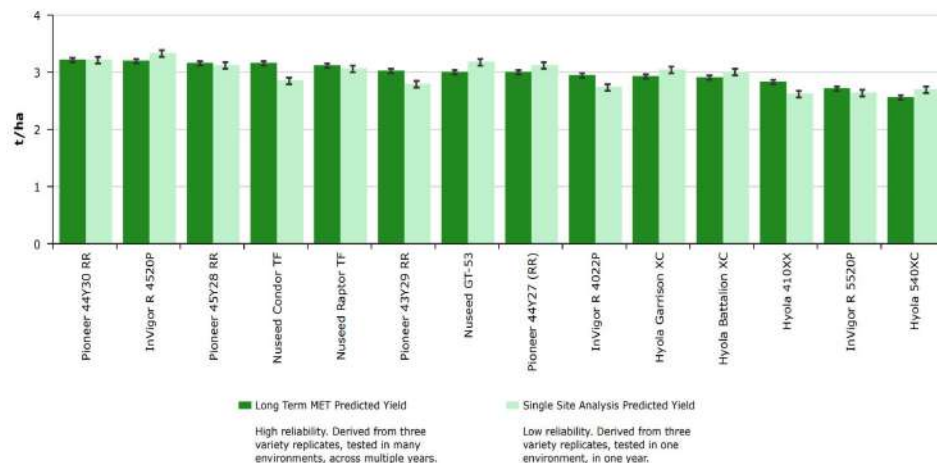
Long Term MET Predicted Yield and Single Site Analysis



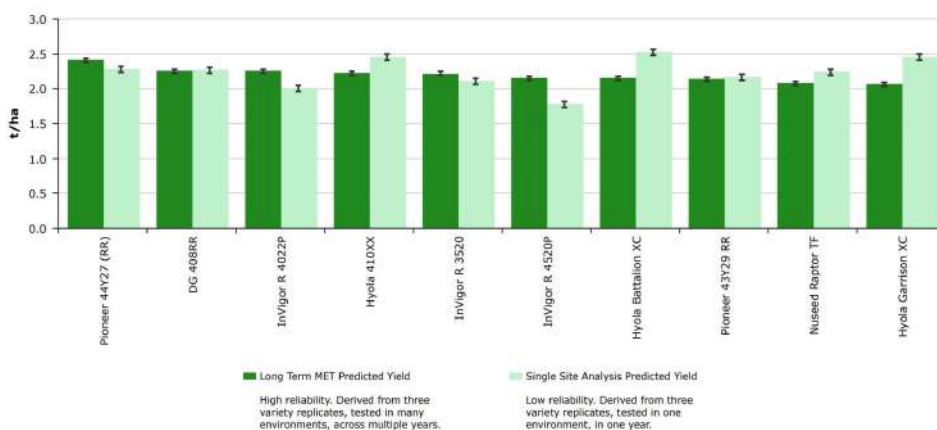


2020 GRDC NVT WA FEATURED INDIVIDUAL TRIAL RESULTS

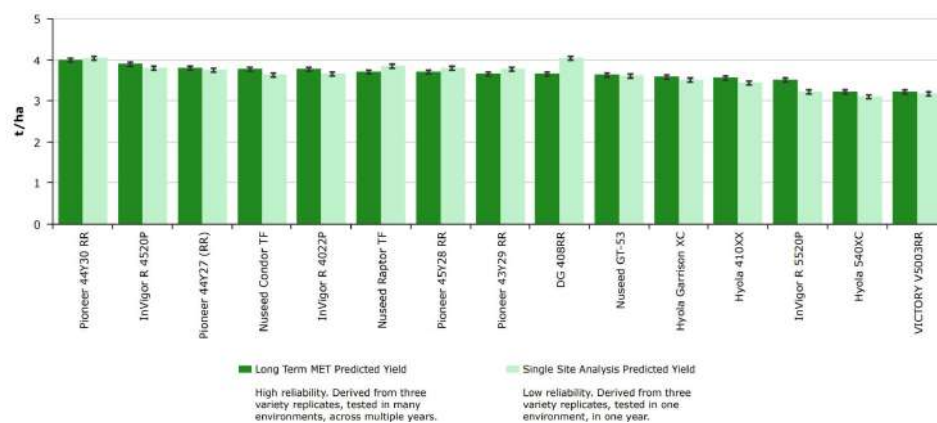
Gibson, WA - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



Buntine, WA - Canola - Early Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



Williams, WA - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



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2016-2020 GRDC NVT NSW Long Term Analysed Mid Glyphosate Results expressed across Yield Groups

GRDC NVT MID 2016-2020 Variety	Yield Group		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
	Mean Yield	# Trials	0.22 t/ha	0.72 t/ha	1.35 t/ha	1.76 t/ha	2.25 t/ha	2.74 t/ha	3.21 t/ha	3.76 t/ha
InVigor R 4520P	13	143	1	7	5	2	3	9	4	1
Nuseed Condor TF	13	130		116	113	114		113	112	110
Nuseed Raptor TF	12	122		113	110	104		108	111	
Pioneer 43Y29 RR	16			104	104		108	113	109	107
Pioneer 44Y27 (RR)	29	132		119	115	112	108	104	104	
Hyola Garrison XC	13	106		104	103	99		102	104	104
InVigor R 4022P	13	129		114	112	122		109	103	104
Hyola 410XX	14	104		104	102	97		97	100	100
InVigor R 5520P	30	94		94	96	107	98	104	98	98
Hyola 540XC	14	62		79	83	81		92	95	94
VICTORY V5003RR	31	60		79	82	79	89	92	95	94
Pioneer 45Y28 RR	12			111	109	109	112	113		111

2016-2020 Long Term GRDC NVT NSW (Mid Glyphosate) Long Term Analysis by Yield Group for regions: NW, SE, SW

CANOLA

2016-2020 GRDC NVT NSW Long Term Analysed Early Glyphosate Results expressed across Yield Groups

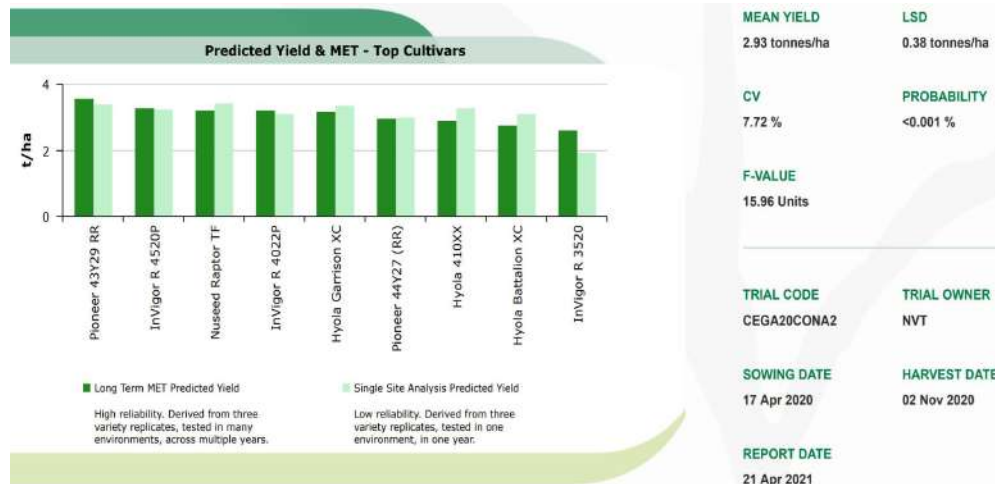
GRDC NVT EARLY 2016-2020 Variety	Yield Group Mean Yield # Trials	1.0 0.69 t/ha 2	1.5 1.30 t/ha 1	2.0 1.66 t/ha 1	2.5 2.24 t/ha 1	3.0 2.83 t/ha 1	3.5 3.03 t/ha 1
Pioneer 43Y29 RR	4	96	107	-	-	125	108
InVigor R 4520P	3	-	105	-	-	115	106
InVigor R 4022P	3	-	108	-	-	113	108
Nuseed Raptor TF	2	-	-	-	-	113	103
Hyola Garrison XC	3	-	101	-	-	112	102
Pioneer 44Y27 (RR)	6	116	112	112	104	104	110
Hyola 410XX	3	-	104	-	-	101	103
Hyola Battalion XC	2	-	-	-	-	97	100
InVigor R 3520	7	106	101	98	91	92	100
DG 408RR	4	108	104	102	-	-	-
Pioneer 43Y23 (RR)	4	106	-	96	87	-	-
Hyola 404RR	5	100	96	93	90	-	-

2016-2020 Long Term GRDC NVT NSW (Early Glyphosate) Long Term Analysis by Yield Group for regions: NW, SW

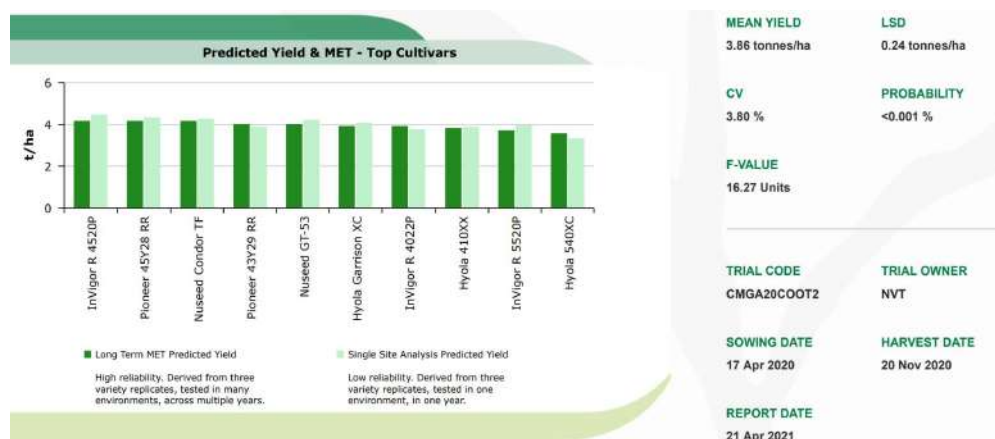


2020 GRDC NVT NSW FEATURED INDIVIDUAL TRIAL RESULTS

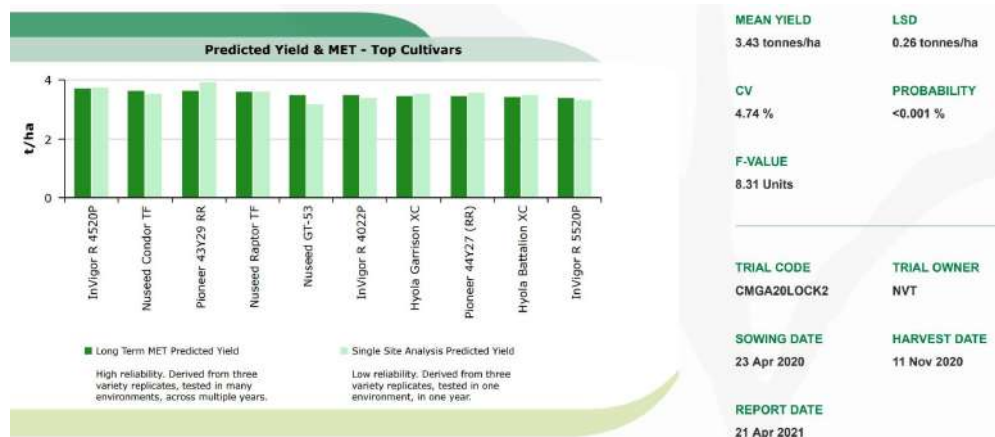
Condoblin, NSW - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



Cootamundra NSW - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



Lockhart, NSW - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



CANOLA

2016-2020 GRDC NVT VIC Long Term Analysed Mid Glyphosate Results expressed across Yield Groups

GRDC NVT MID 2016-2020 Variety	Yield Group		1.0	1.5	2.0	2.5	3.0	3.5	4.0
	Mean Yield	# Trials	0.96 t/ha	1.29 t/ha	1.84 t/ha	2.34 t/ha	2.71 t/ha	3.20 t/ha	3.69 t/ha
InVigor R 4520P	16		126	124	118	119	118	117	115
InVigor R 4022P	16		121	118	112	112	110	108	107
Pioneer 43Y29 RR	21		112	113	110	112	112	111	111
Nuseed Condor TF	14		110	109	109	109	110	111	110
Pioneer 45Y28 RR	19		105	105	107	108	110	112	110
Pioneer 44Y27 (RR)	28		108	106	105	103	102	104	102
Nuseed Raptor TF	14		99	99	102	103	104	108	106
Hyola Garrison XC	16		97	97	100	100	101	102	101
Hyola 410XX	16		96	95	97	97	97	98	98
Hyola 540XC	10		85	87	91		93	92	94
VICTORY V5003RR	38		83	86	90	91	92	92	94

2016-2020 Long Term GRDC NVT VIC Mid Glyphosate Long Term Analysis by Yield Group for regions: North Central, North East, South West, Wimmera

CANOLA

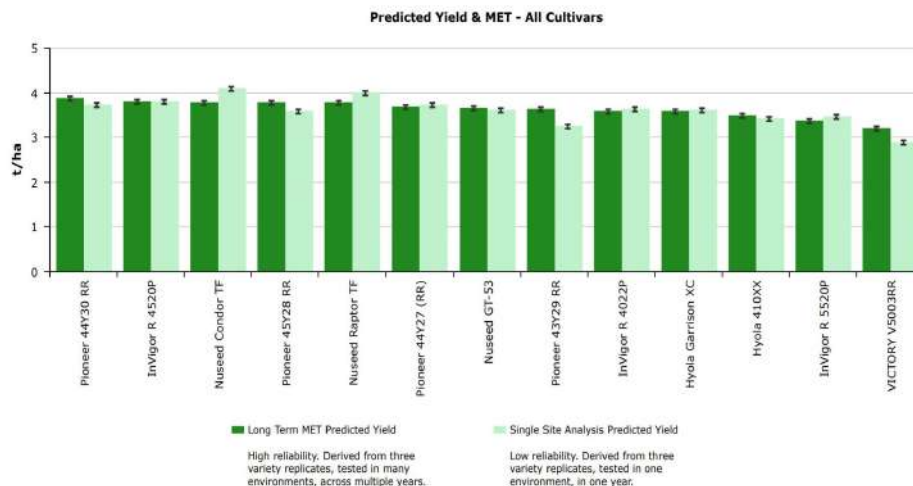
2016-2020 GRDC NVT VIC Long Term Analysed Early Glyphosate Results expressed across Yield Groups

GRDC NVT EARLY 2016-2020 Variety	Yield Group Mean Yield # Trials	1.0 0.89 t/ha 1	2.0 1.77 t/ha 3	2.5 2.06 t/ha 1	3.0 2.77 t/ha 4
Pioneer 44Y27 (RR)	9	110	107	107	108
Pioneer 43Y29 RR	4		107	106	115
InVigor R 4022P	2			105	110
InVigor R 4520P	2			104	110
Nuseed Raptor TF	2			102	107
Hyola Garrison XC	2			102	106
Hyola 410XX	2			102	102
Hyola Battalion XC	2			100	98
InVigor R 3520	9	97	99	100	96
Nuseed GT-53	1				102
DG 408RR	7	101	101		100
Pioneer 43Y23 (RR)	7	94	98		94
Hyola 404RR	7	93	96		93

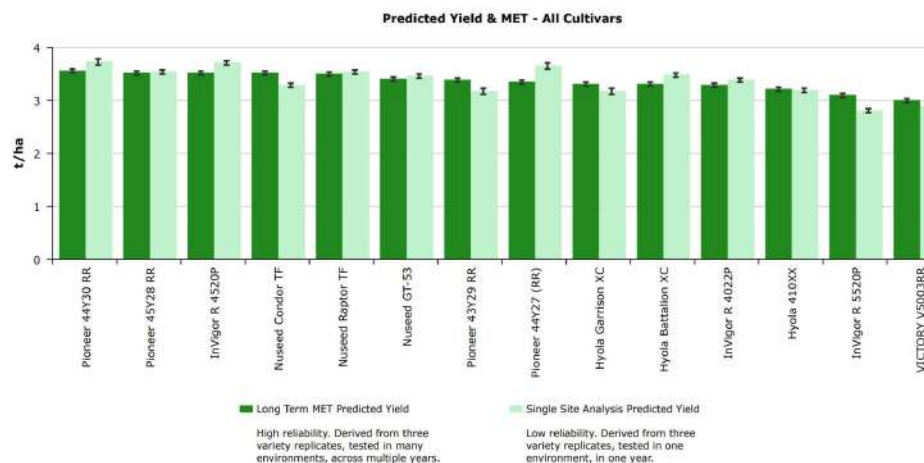
2016-2020 Long Term GRDC NVT VIC Early Glyphosate Long Term Analysis by Yield Group for regions: Mallee

2020 GRDC NVT VIC FEATURED INDIVIDUAL TRIAL RESULTS

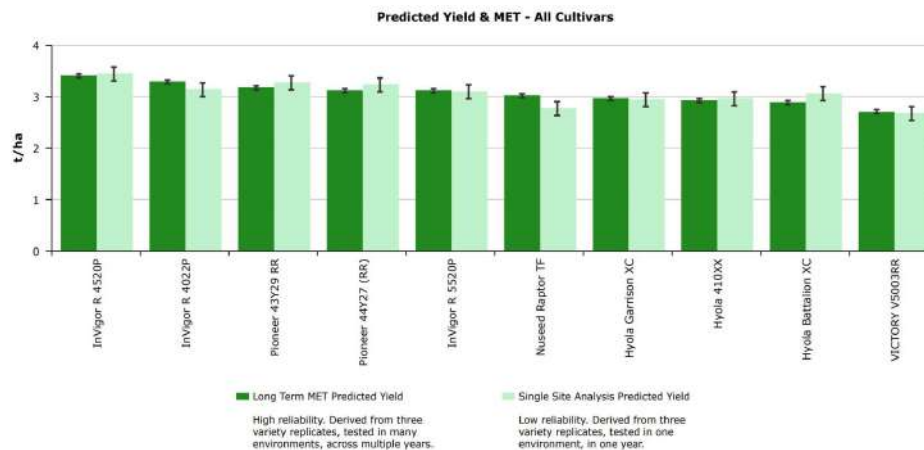
Yarrawonga, Vic - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



Kaniva, Vic - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



Diggora Vic - Canola - Mid Glyphosate Tolerant, 2020
Long Term MET Predicted Yield and Single Site Analysis



HYOLA XC - CROP PROTECTION BENEFITS TO GROWERS

Hyola® XC technology is the latest in flexibility of spray timing with both quick knock down and extended residual protection available using key chemical groups that growers need. Hyola® XC technology has become a vital part in IWM soil residual carryover canola toolboxes and provide growers with inbuilt crop and investment protection.

Mixing and rotating herbicide actives in crop is now the most valuable tool in resistance management when compared to rotating over successive seasons with individual chemistries.

Visit: www.crop.bayer.com.au/tools-and-services/mix-it-up for more details.



Above: Single Trait TruFlex® Hyola XX (L) vs Dual Herbicide Stacked Hyola XC Technology (R), both with 93ml/ha simulated IMI chemistry soil carryover in 2019 agronomy extension trials (PSPE Application timing).

SOIL RESIDUAL FACTORS

Hyola XC technology can be used to overcome plantback constraints often associated with the use of Imidazolinone herbicides, particularly in low rainfall environments and/or on soils of lower pH.

Sulfonylurea (SU), imidazolinone (IMI) or triazine herbicides are likely to cause the most concern, and residues, from the previous season may affect crop emergence or even kill sensitive crops or crop cultivars in the next season.

The soil pH will have an impact on which herbicides are more likely to persist. All other things being equal, imidazolinones will be more persistent on acid soils and sulphonyl ureas on alkaline soils.

Source: www.agric.wa.gov.au/crops/grains/canola

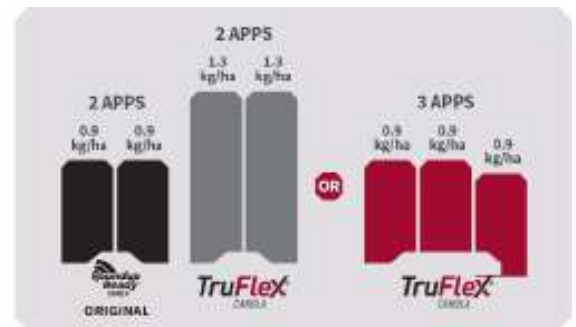
HYOLA XC - GROWER BENEFITS OF TRUFLEX TECHNOLOGY

EXTENDED SPRAY WINDOW EMERGENCE TO FIRST FLOWER



The window of application for Roundup Ready herbicide with PLANTSHIELD® by Monsanto will extend past the six-leaf stage all the way to first flower.

THE RATE FARMERS NEED FOR THEIR WEED CHALLENGES*



* Of Roundup Ready® herbicide with PLANTSHIELD® by Monsanto.

* Either apply three applications at 0.9 kg/ha or apply two applications of 1.3 kg/ha of Roundup Ready Herbicide with PLANTSHIELD® by Monsanto.

One of the smartest routes to high yield potential is through effective weed control. Here's how TruFlex® canola with Roundup Ready® Technology can help make it happen:

WEED CONTROL GROWERS CAN RELY ON

TruFlex® canola with Roundup Ready® Technology and Roundup Ready® Herbicide with PLANTSHIELD® by Monsanto were designed to work with each other. This combination provides you with the tools you need to effectively control weeds in your canola fields.

FLEXIBILITY IN SPRAY RATES AND TIMING

TruFlex canola gives you increased weed control flexibility. The window of application for Roundup Ready Herbicide with PLANTSHIELD® by Monsanto will extend past the six-leaf stage to first flower. From emergence to first flower either apply three applications at the current rate of 0.9 kg/ha or apply two higher rates of 1.3 kg/ha.

SUPERIOR YIELD POTENTIAL

New advances in trait technology will help enable better weed control and crop safety compared to Roundup Ready® canola. It's a combination that could give you the opportunity to see a lot more yield potential at harvest time.

Roundup Ready® and Truflex® are registered trademarks of the Bayer Group

TruFlex®
CANOLA with Roundup Ready® Technology

HYOLA XC - CLEARFIELD HERBICIDE CHEMISTRY MANAGEMENT

When utilising the XC technology, a sound IWM strategy utilising alternative modes of action across pre-emergent, post emergent and fallow application in different crops should be adopted.

Also, the ongoing strategy should consider non-herbicide control measures such as harvest weed seed control (chaff carts, seed destructors, narrow windrow burn, chaff lining, Chaff baling etc.).

Clearfield canola

Apply to canola crop at the 2 to 6 leaf stage. Apply to actively growing weeds in 3-leaf to 2-tiller stage and broadleaf weeds in the 2 to 6 leaf stage. DO NOT apply **Clearfield** canola after 6 leaf stage.



To preserve the effectiveness of any herbicide a good resistance management approach is recommended. Intervix herbicide is a Group B herbicide. Other group B (ALS inhibitors) include sulfonylureas, and triazolopyrimidines (sulphonamides).

To assist with resistance management, rotate Clearfield winter crops with spring crops to break the cycle of winter annual weeds and allow the use of alternate site of action herbicides.

If winter cropping is rotated with a fallow season, control weeds before they set seed and use alternate mode of action herbicides. ALS-inhibiting herbicides should not be used more than 2 out of 4 years.

This aligns well with the industry WEEDSMART's "The Big 6" basis for an IWM program (www.weedsmart.org.au/big-6/), which can be summarised as followed:

1. ROTATE CROPS AND PASTURES
2. DOUBLE KNOCK – TO PRESERVE GLYPHOSATE
3. MIX AND ROTATE HERBICIDES
4. STOP WEED SEED SET
5. CROP COMPETITION
6. HARVEST WEED SEED CONTROL

Clearfield® is a registered trademark of BASF.



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