Herbicide tolerance of canola and oat varieties

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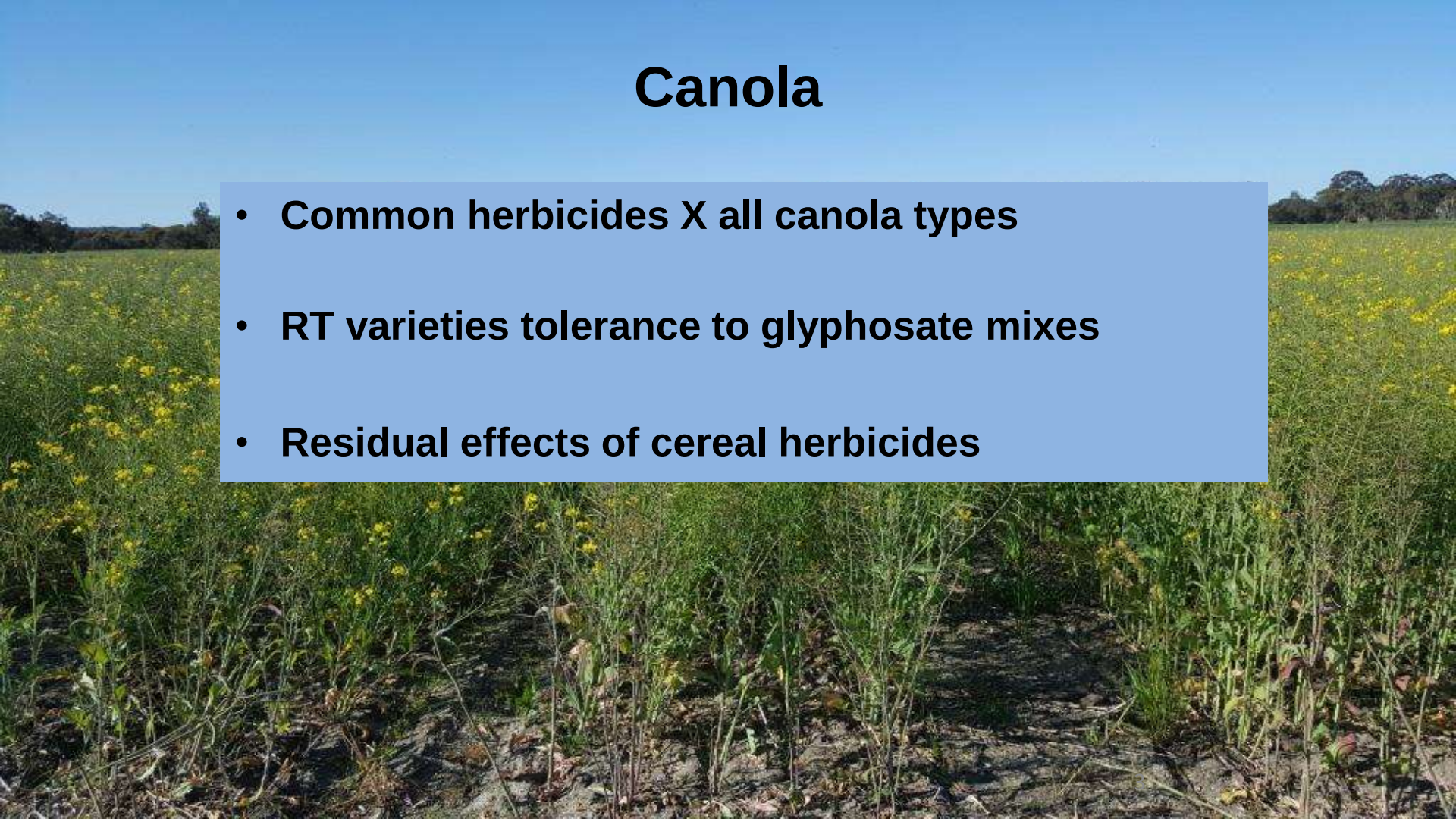
GRDC UPDATES

Disclaimer

- Trials under weed free conditions
- Crop safety margin was determined
  - Higher than the label rates were used
- Good crop safety margin
- Narrow crop safety margin
  - Under less than optimal conditions, yield loss may occer even at label rate
  - Overlapping herbicide
- Don’t promote any herbicide product or company
- Always follow label recommendations

Canola



- Common herbicides X all canola types
- RT varieties tolerance to glyphosate mixes
- Residual effects of cereal herbicides

Grain yield loss at label rates

112 variety x herbicide combinations, 3 trials, 95% OK

On sandy soils at Mingenew applied IBS, 2014-15

- Napropamide + clomazone (Altiplano® at 3kg/ha) - Hyola® 404RR and Pioneer® 43Y23RR (25-30%)
- S-metolachlor (Dual Gold® at 0.25L/ha) - ATR Snapper TT (24%)
- Propyzamide (Edge®/Rustler® at 1L/ha) - ATR Bonito TT (12%)

On sandy loam soil at Katanning, 2017

- Clopyralid (Lontrel® at 120 mL/ha) + haloxyfop (Verdict® at 100 mL/ha) at 2 leaf - ATR Mako TT (12%)

Grain yield loss at higher than label rates

On sandy soils at Mingenew applied IBS, 2014-15

- S-metolachlor (Dual Gold®) - ATR Bonito TT (13%)
- Propyzamide (Edge®/Rustler®) - Pioneer Sturt TT (28%)

On sandy loam soil at Katanning, 2017

- Metazachlor (Butisan®) IBS - ATR Mako TT (10%)
- Butroxydim (Factor®) at 4 leaf - Hyola® 404RR and Pioneer 45Y88CL (11-13%)

Clethodim at 2- and 8-leaf stage (2014)

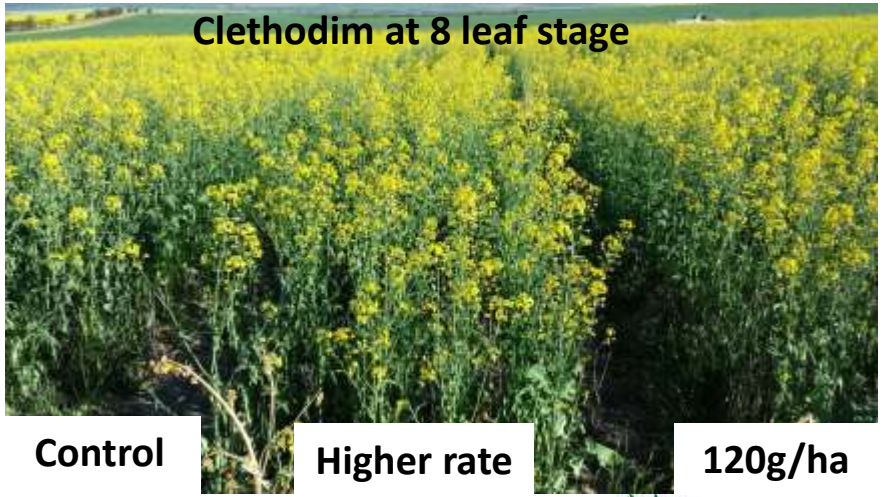
Label says, don't apply after flower bud becomes visible

Clethodim at label rate (120g ai/ha) and at higher rate

Applied at 2 and 8 leaf stage

6 varieties (4 TT + 2 RR)

Tolerated well



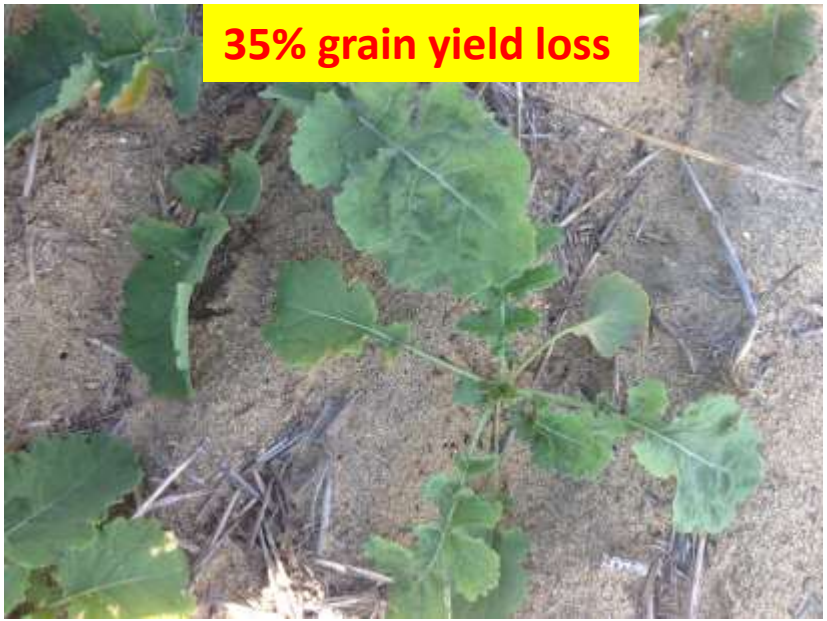
Clethodim timings, Yeelanna, SA 2013

Application Timing	Clethodim Rate	ATR Gem	AV Garnet	Hyola 474 CL
Untreated		1.74 t/ha	2.12 t/ha	1.75 t/ha
		————grain yield % of control————		
4 leaf	120g/ha	98	94	100
	240g/ha	94	94	100
8 leaf	120g/ha	95	95	95
	240g/ha	**90**	**90**	**75**
4 leaf and 8 leaf split	60g/ha + 60g/ha	90	96	99
	60g/ha + 60g/ha	97	92	98
Bud initiation	120g/ha	**76**	**86**	**70**
	240g/ha	**65**	**87**	**48**

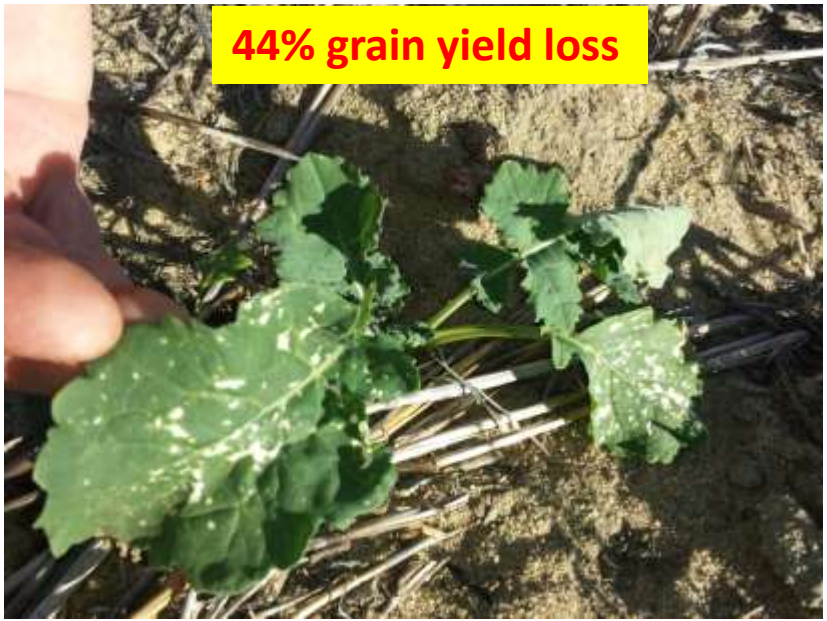
Glyphosate mixes with other herbicides

- Three trials, 2015 at Mingenew 2016 and 2017 at Katanning
- Two application of glyphosate at 621g/ha, emergence to 6 leaf stage
- Glyphosate alone at 621g/ha and in mixture with
  - Atrazine
  - Clethodim
  - Clopyralid
  - Haloxyfop
  - Terbuthylazine
  - Atrazine + terbuthylazine
- 1-2, 3-4 and 4-5 leaf on Hyola® 525RT® and at Bayer 3000TR– **ALL OK**

Don’t use off label mixes

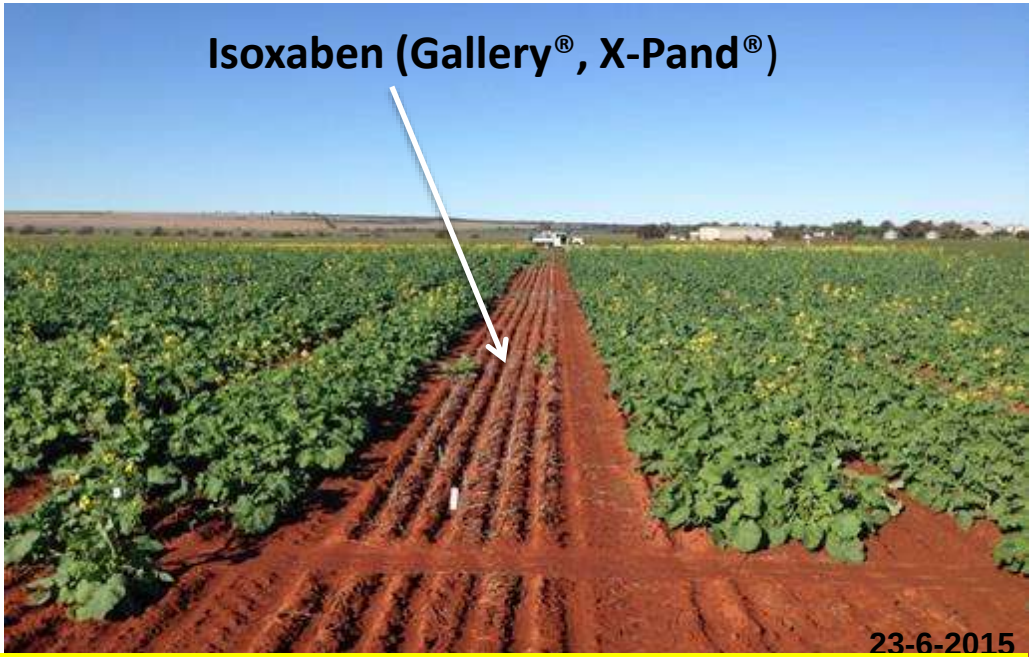


Glyphosate 621g + s-metolachlor 960g/ha at 3-4 leaf stage, Hyola® 525RT®



Glyphosate 621g + oxyfluorfen 48g/ha at 3-4 leaf stage, Hyola® 525RT®

Residual effect of cereal herbicides on canola

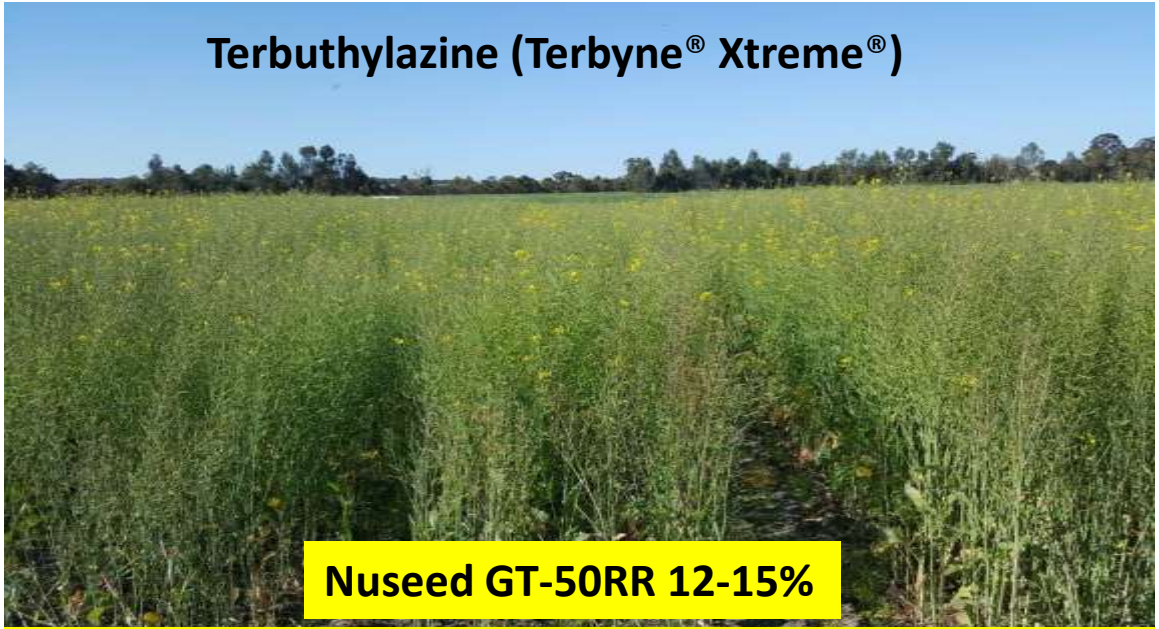


Label: Pre-em and early post-em Isoxaben @53-105g/ha, plant back period 22 months, >300mm rainfall.

Mullewa

- **22 May 2014 6 wheat varieties on red loam soil, 20 herbicide treatments**
- **15 April 2015 6 canola varieties sown 11 months later,**
- **Close to last years furrows**
- **Total rainfall after isoxaben application 215mm**

Residual effect of terbuthylazine on canola



Label: Pre-em terbuthylazine 1050g/ha, plant back period 6 months, 175mm rainfall.

Katanning

- **16 June 2015 6 wheat varieties on sandy loam soil, 20 herbicide treatments**
- **27 May 2016 6 canola varieties sown 11.5 months later,**
- **Total rainfall after terbuthylazine application 435mm**

Canola Key Messages

- Majority of the canola varieties showed good tolerance to registered herbicides.
- Some canola varieties showed sensitivity to napropamide + clomazone, propyzamide and s-metolachlor on sandy soils.
- Glyphosate mixes with herbicides registered on canola were tolerated well by Hyola® 525RT® and Bayer 3000TR.
- Follow plant back period of isoxaben to avoid crop damage in canola.

Oats

- Trifluralin and its mixtures
- Trifluralin x Seeding speed
- Tolerance to post-em herbicides

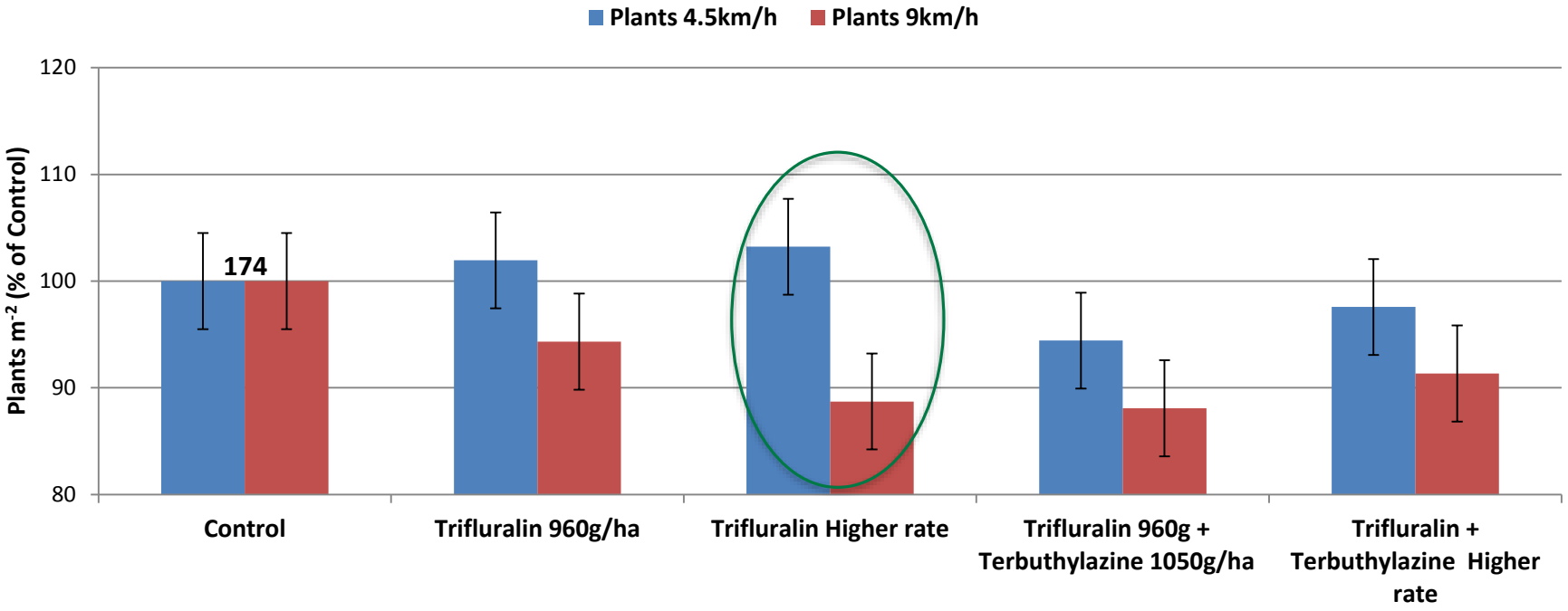
Oats tolerance to Trifluralin

- DPIRD and the industry identified potential use of trifluralin as IBS
- 5 trials, 2006-2008, 2015 and 2017, Katanning
  - Loamy sand to sandy loam soils
- Trifluralin at 720g - 960g/ha and higher rates
- Trifluralin 960g + terbuthylazine 1050g/ha and higher rate
- Sown with superseeder and knife points and press wheels
  - 21 - 25cm row spacing, 4 – 9km/hr
- All current and new oat varieties tolerated well
- During 2017, all varieties had lower crop establishment (8 - 30%)
  - No effect on yield

Trifluralin permit for oats (PER84040)

- **GIWA oats council secured a permit for triflurain use in oats in April 2017**
  - Trifluralin up to 960g/ha (any 480 formulation up to 2L/ha)
  - knife/blade points and press wheels seeding system only
  - Do not use disc openers/planting equipment
  - Optimum seeding depth of 3 - 4cm
  - Avoid sites that waterlog or where furrow walls may collapse
  - Treated soil movement into furrows may cause crop damage.
  - Maintain slow to moderate seeding speed

Trifluralin X Seeding Speed in Williams



2017: Loamy sand, Bourgault 8810 Airseeder, 25 cm

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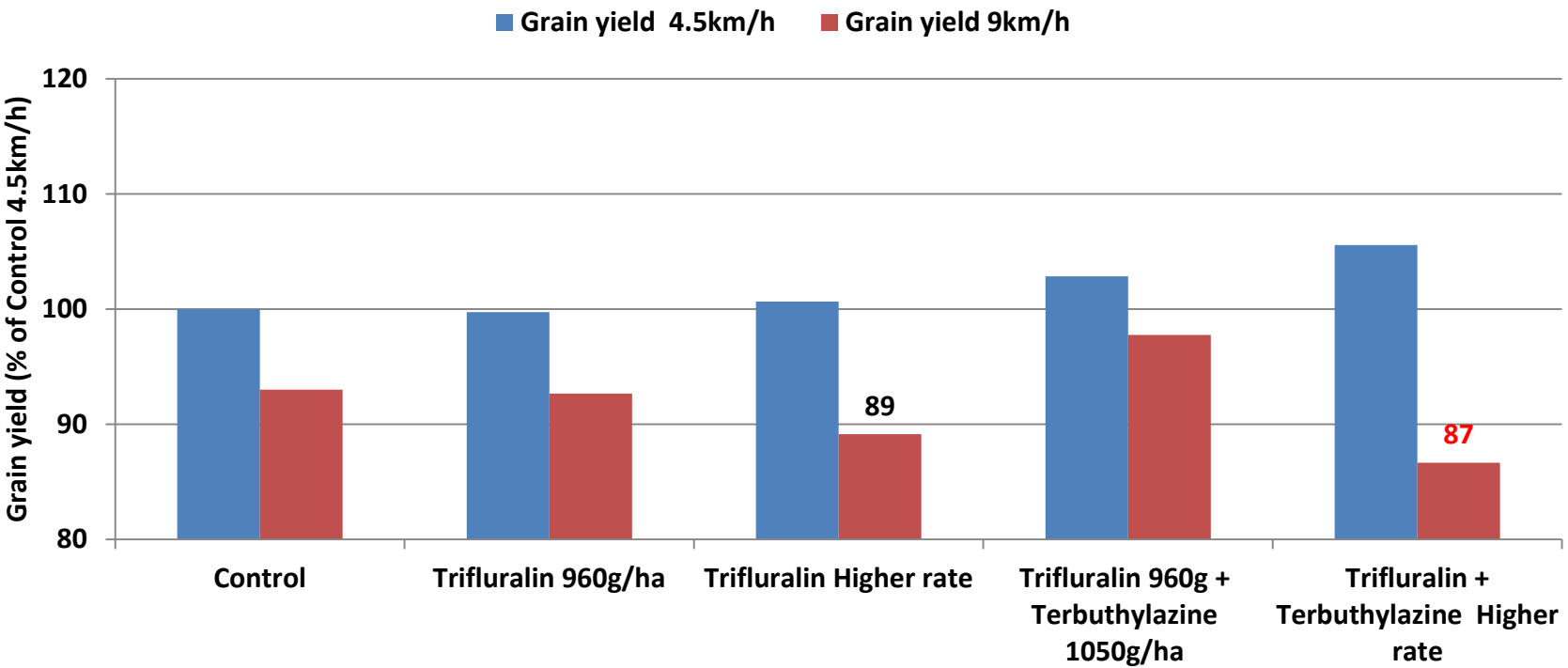

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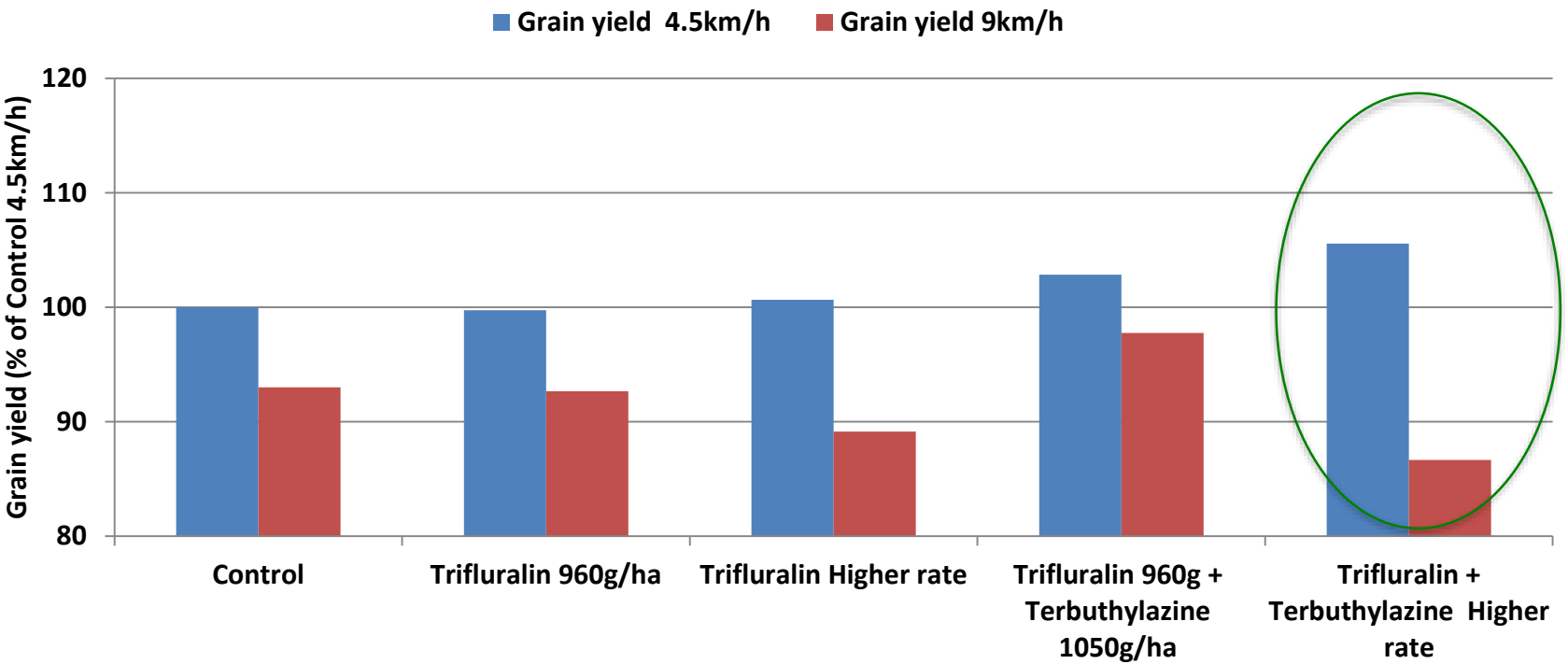

2017: Loamy sand, Bourgault 8810 Airseeder, 25cm

New oat varieties X post-em herbicides (2011-17)

Statistically significant yield loss in at least 2 trials

Chlorsulfuron (Glean® 20g/ha) at Z12-Z13

- Durack (9 -15%)
- Williams (8 – 20%)
- Carolup (10 – 23%)

Bromoxynil + MCPA ester + dicamba (Broadside® 1L/ha) and
Picolinafen + bromoxynil + MCPA ester (Flight® 720mL/ha) at Z13-Z14

- Williams (8 – 9% and 11 – 12%)

New oat varieties X post-em herbicides (2011-17)

Statistically significant yield loss in at least 2 trials

Diuron 500 0.5 L + MCPA amine 500 0.5L and

Pyrasulfotole + MCPA ester (Precept® 2L/ha) at Z13-Z14

- Bannister (11 -15% and 6 -12%)

2,4-D amine dual salt (Amicide® Advance 700 1.15L/ha) at Z15-Z16

- Durack (23 - 35%)
- Williams (9 - 10%)

Oats Key Messages

- Trifluralin up to 960g/ha was tolerated well by all the oat varieties sown with knife point and press wheel seeding system at 4 to 9km/h.
- Bannister sensitivity to diuron + MCPA amine and pyrosulfotole + MCPA ester at label rates.
- Durack sensitivity to chlorsulfuron and 2,4-D amine dual salt at label rates.
- Williams sensitivity to Broadside®, Flight®, chlorsulfuron and 2,4-D amine dual salt at label rates.

Canola Key Messages

- Majority of the canola varieties showed good tolerance to registered herbicides.
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- Glyphosate mixes with herbicides registered on canola were tolerated well by Hyola® 525RT® and Bayer 3000TR.
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