



Department of
Primary Industries and
Regional Development

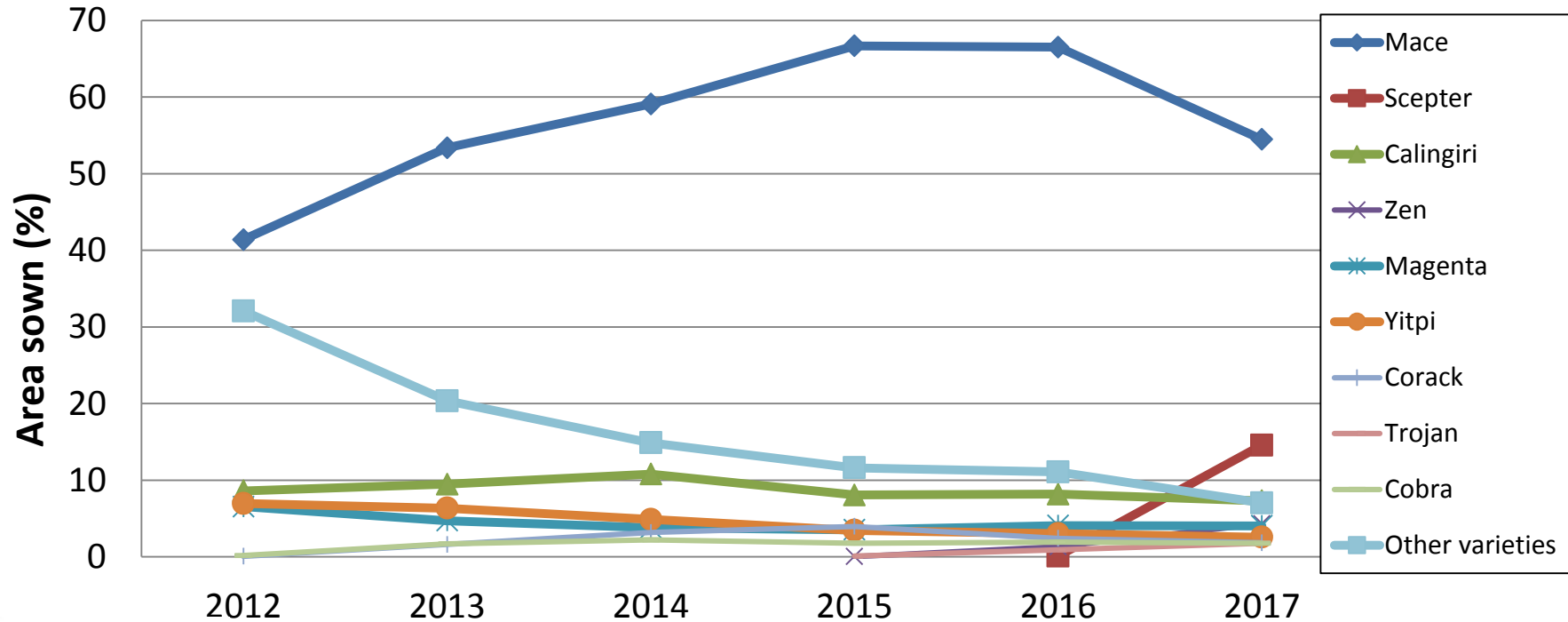
Wheat variety update and agronomy

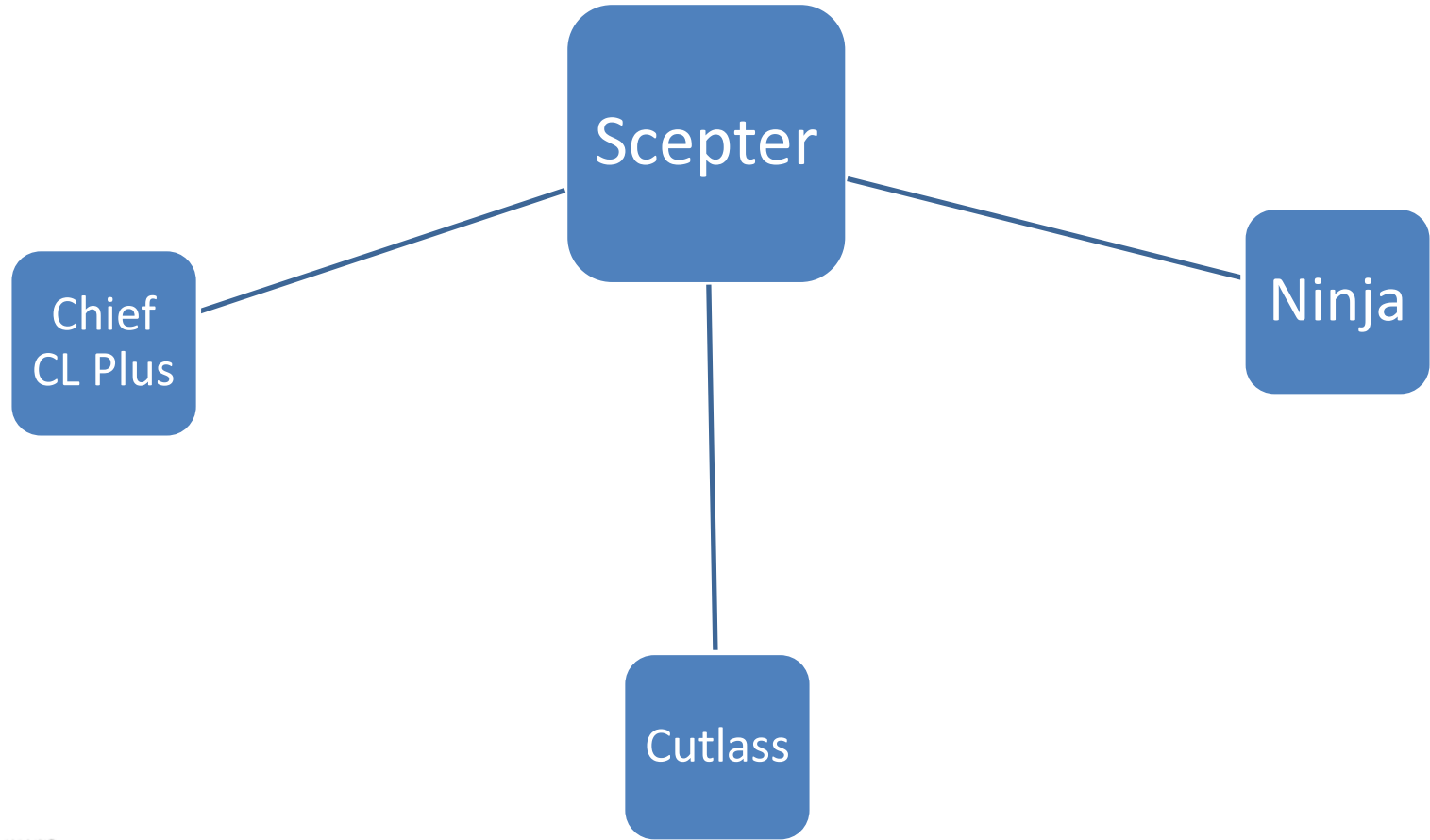
Dion Nicol, DPIRD

Co-authors: J Curry, B Shackley, C Zaicou DPIRD



Scepter on track to replace Mace





New releases

2015

- Bremer
- Cutlass
- DS Pascal
- Hydra
- Impress CL Plus
- Scepter
- Supreme
- Zen

2016

- Chief CL Plus
- Ninja
- Tungsten

2017

- Longsword
(only in early NVT)
- LRPB Havoc

New releases for 2017

- LRPB Havoc (Longreach)
 - AH classification
 - Similar to quicker maturity to Mace
 - Behind Scepter in yield, only trait better was PM-MS rating. S_p for stem rust
- Longsword (AGT)
 - Fast winter wheat (Mace background with vernalisation = stable flowering time with early sowing)
 - Limited data thus far and no classification as milling wheat (yet?)
 - See Shackley et al. 2018 Updates paper on Early sowing wheat

MET table – NVT long term yield

		Group	2013	2014	2015	2016	2017
		Mean Yield t/ha	3.17	2.54	2.73	3.55	3.17
Variety	All Trials	<i>Trials</i>	44	43	44	25	39
Scepter	108				110	111	113
Ninja	105				108	109	110
Cobalt	154		108	101	108	107	103
Hydra	194		105	104	105	104	103
Tenfour	195		103	102	107	107	102
LRPB Havoc	64					102	106
LRPB Arrow	108				103	102	106
Mace	195		102	105	102	101	105
Corack	195		101	107	101	100	105
Cutlass	108				101	105	102
Zen	192		102	99	103	102	105
Chief CL Plus	107			103		98	105

Mean of 2015-17 MET results

Variety	Statewide	Agzone 1	Agzone 2	Agzone 3	Agzone 4	Agzone 5	Agzone 6
Scepter	100	100	100	100	100	100	100
Ninja	98	100	98	97	97	96	97
Cobalt	95	101	96	95	95	90	95
Tenfour	95	95	95	96	95	91	95
Hydra	93	97	93	93	93	90	93
LRPB Havoc	93	96	95	91	97	88	88
LRPB Arrow	93	95	93	93	93	91	92
Zen	93	98	93	92	93	88	91
Mace	92	92	92	92	93	90	90
Cutlass	92	96	92	91	92	91	94
Corack	92	89	91	91	92	92	90
LRPB Cobra	91	93	91	91	91	89	92
Chief CL Plus	91	95	91	89	93	86	87
Magenta	91	97	91	89	90	87	92
LRPB Scout	90	92	90	91	90	89	93
Wyalkatchem	90	93	90	90	90	88	88

Mean of 2015-17 MET results

Variety	Statewide	Agzone 1	Agzone 2	Agzone 3	Agzone 4	Agzone 5	Agzone 6
Scepter	100	100	100	100	100	100	100
Ninja	98	100	98	97	97	96	97
Hydra	93	97	93	93	93	90	93
LRPB Havoc	93	96	95	91	97	88	88
Zen	93	98	93	92	93	88	91
Mace	92	92	92	92	93	90	90
Cutlass	92	96	92	91	92	91	94
Corack	92	89	91	91	92	92	90
LRPB Cobra	91	93	91	91	91	89	92
Chief CL Plus	91	95	91	89	93	86	87
Magenta	91	97	91	89	90	87	92

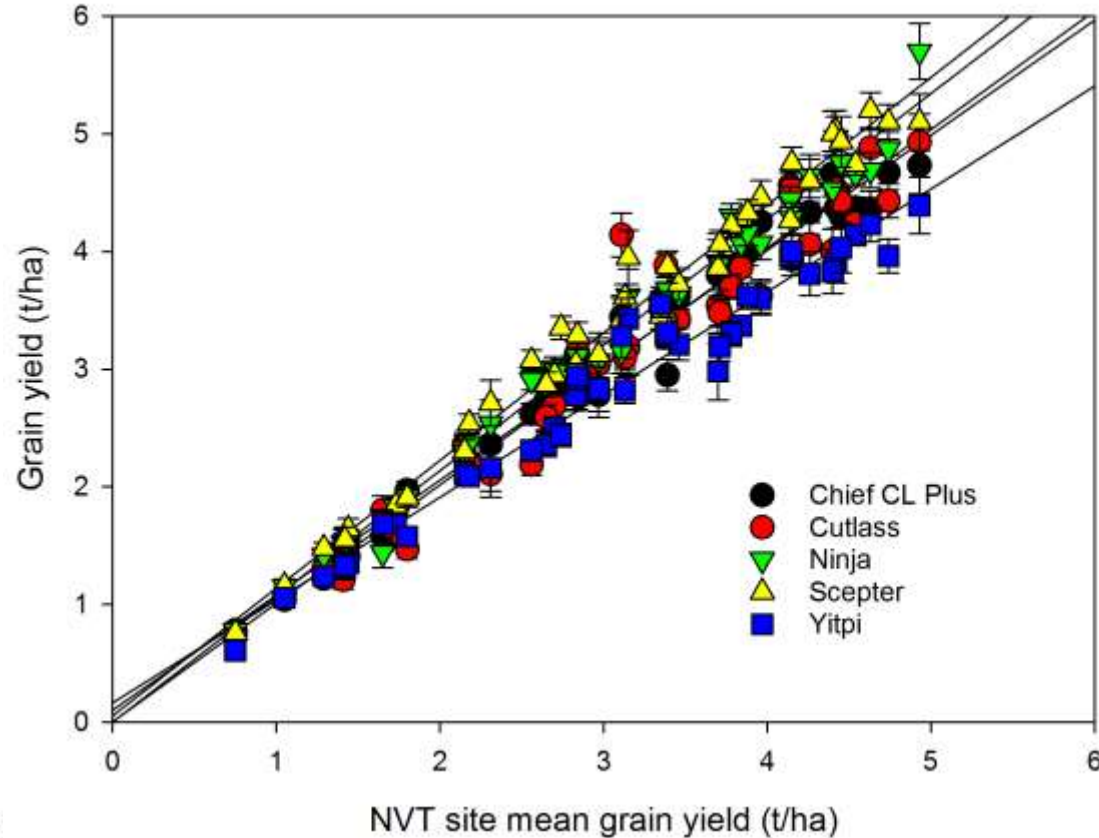
Mean of 2015-17 MET results

Variety	Statewide	Agzone 1	Agzone 2	Agzone 3	Agzone 4	Agzone 5	Agzone 6
Scepter	100	100	100	100	100	100	100
Ninja	98	100	98	97	97	96	97
Hydra	93	97	93	93	93	90	93
LRPB Havoc	93	96	95	91	97	88	88
Zen	93	98	93	92	93	88	91
Mace	92	92	92	92	93	90	90
Cutlass	92	96	92	91	92	91	94
Corack	92	89	91	91	92	92	90
LRPB Cobra	91	93	91	91	91	89	92
Chief CL Plus	91	95	91	89	93	86	87
Magenta	91	97	91	89	90	87	92

Mean of 2015-17 MET results

Variety	Statewide	Agzone 1	Agzone 2	Agzone 3	Agzone 4	Agzone 5	Agzone 6
Scepter	100	100	100	100	100	100	100
Ninja	98	100	98	97	97	96	97
Hydra	93	97	93	93	93	90	93
LRPB Havoc	93	96	95	91	97	88	88
Zen	93	98	93	92	93	88	91
Mace	92	92	92	92	93	90	90
Cutlass	92	96	92	91	92	91	94
Corack	92	89	91	91	92	92	90
LRPB Cobra	91	93	91	91	91	89	92
Chief CL Plus	91	95	91	89	93	86	87
Magenta	91	97	91	89	90	87	92

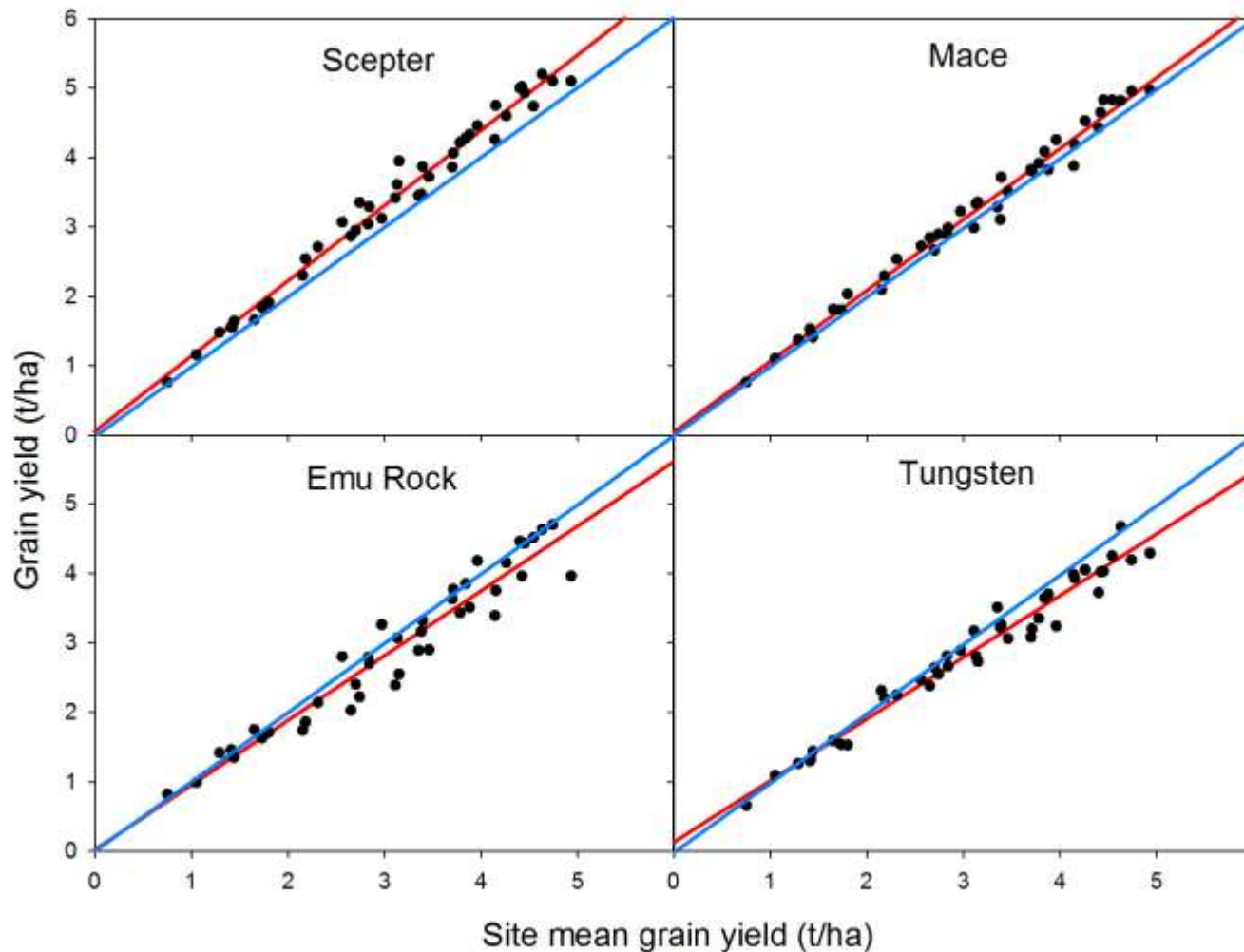
Yield x site mean



Grain yield

1:1 (mean)

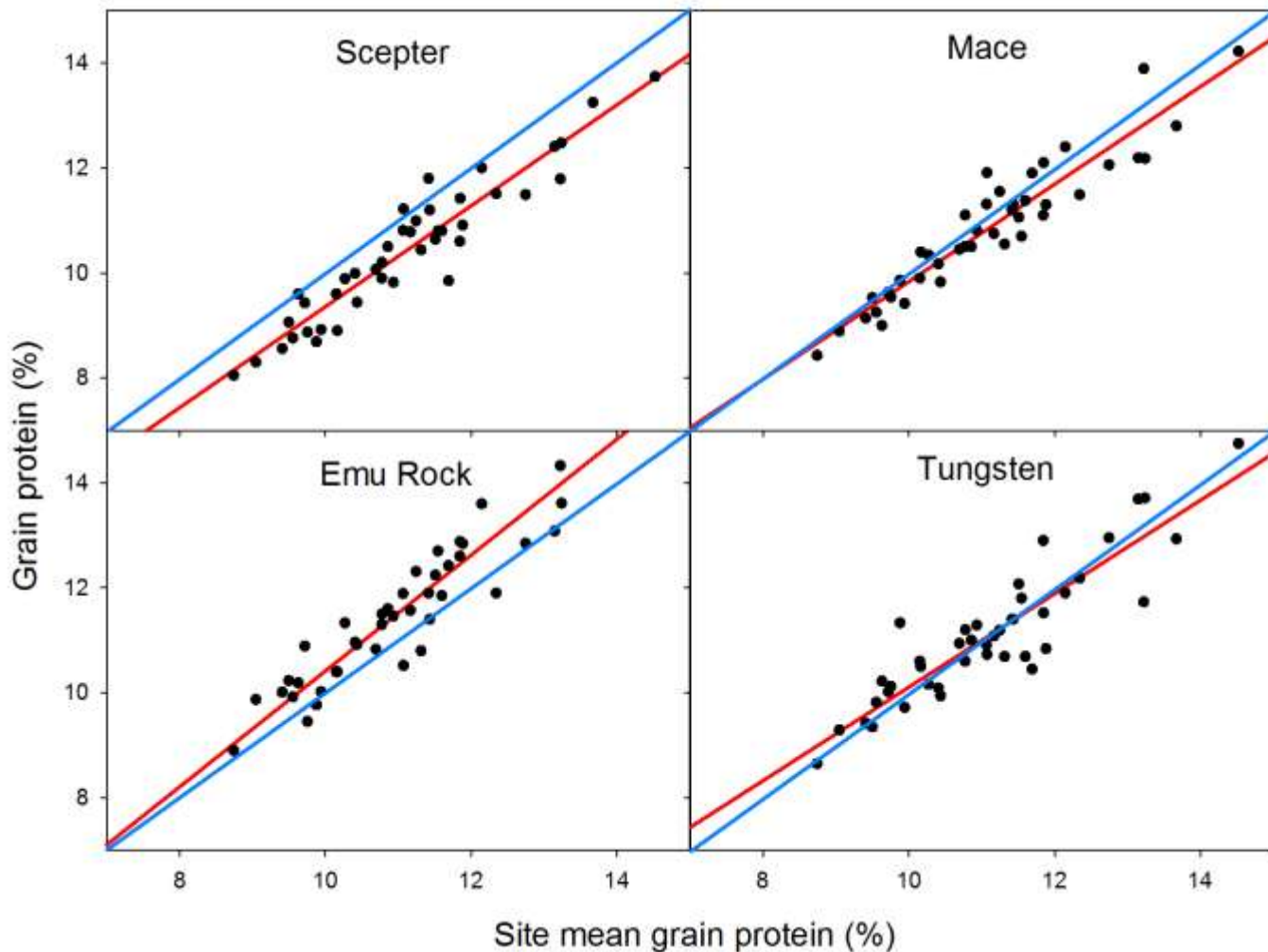
Variety trendline



Grain Protein

1:1 (mean)

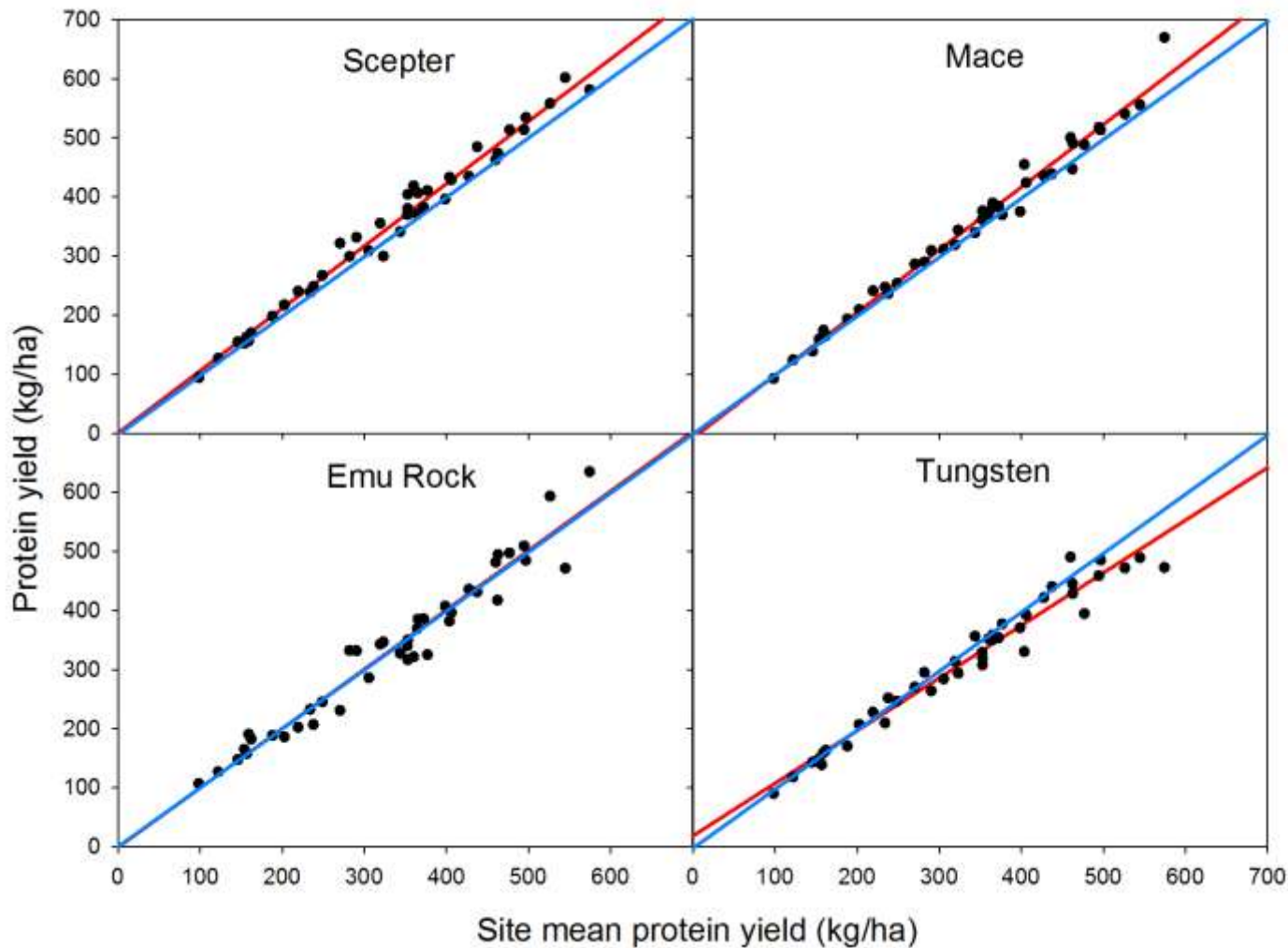
Variety trendline



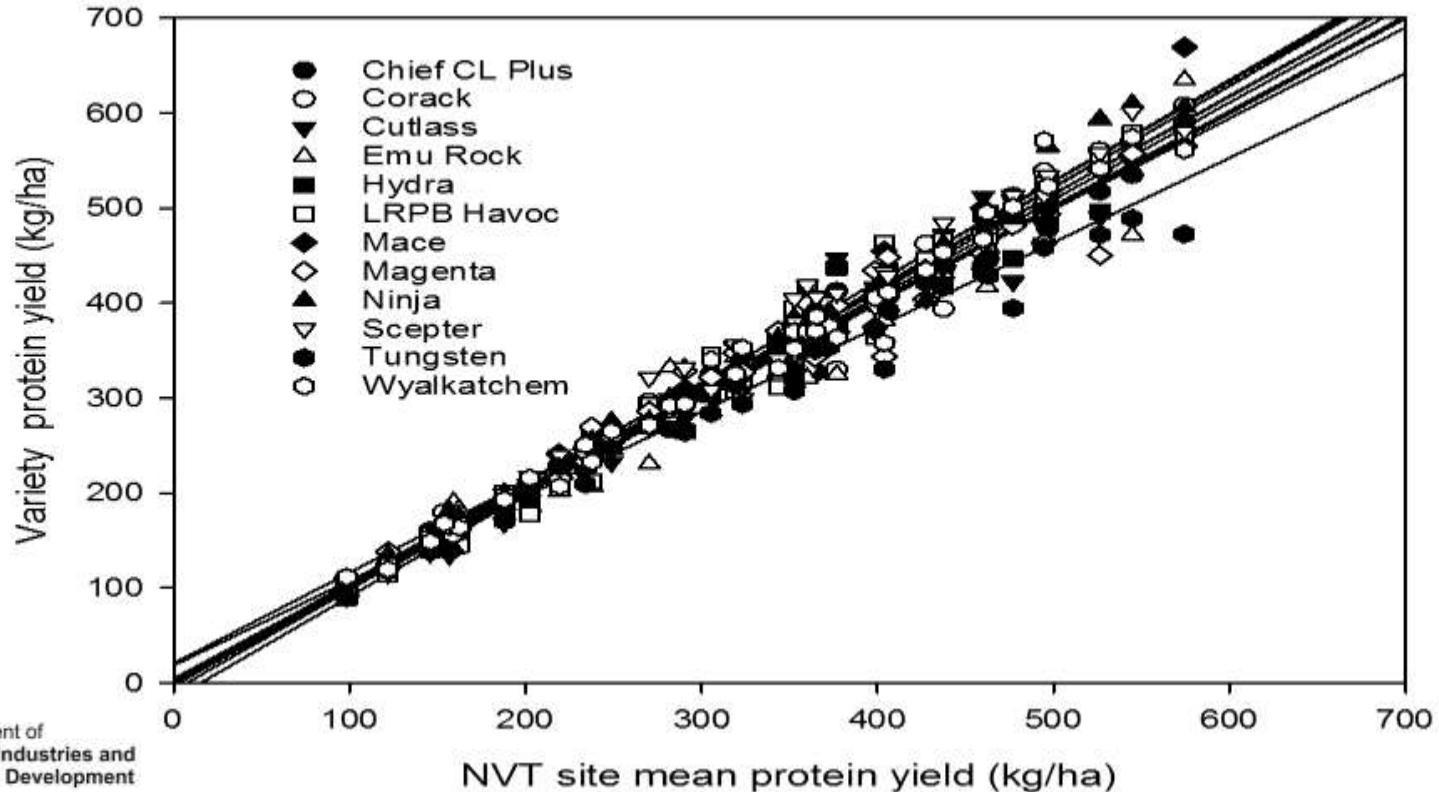
Protein yield

1:1 (mean)

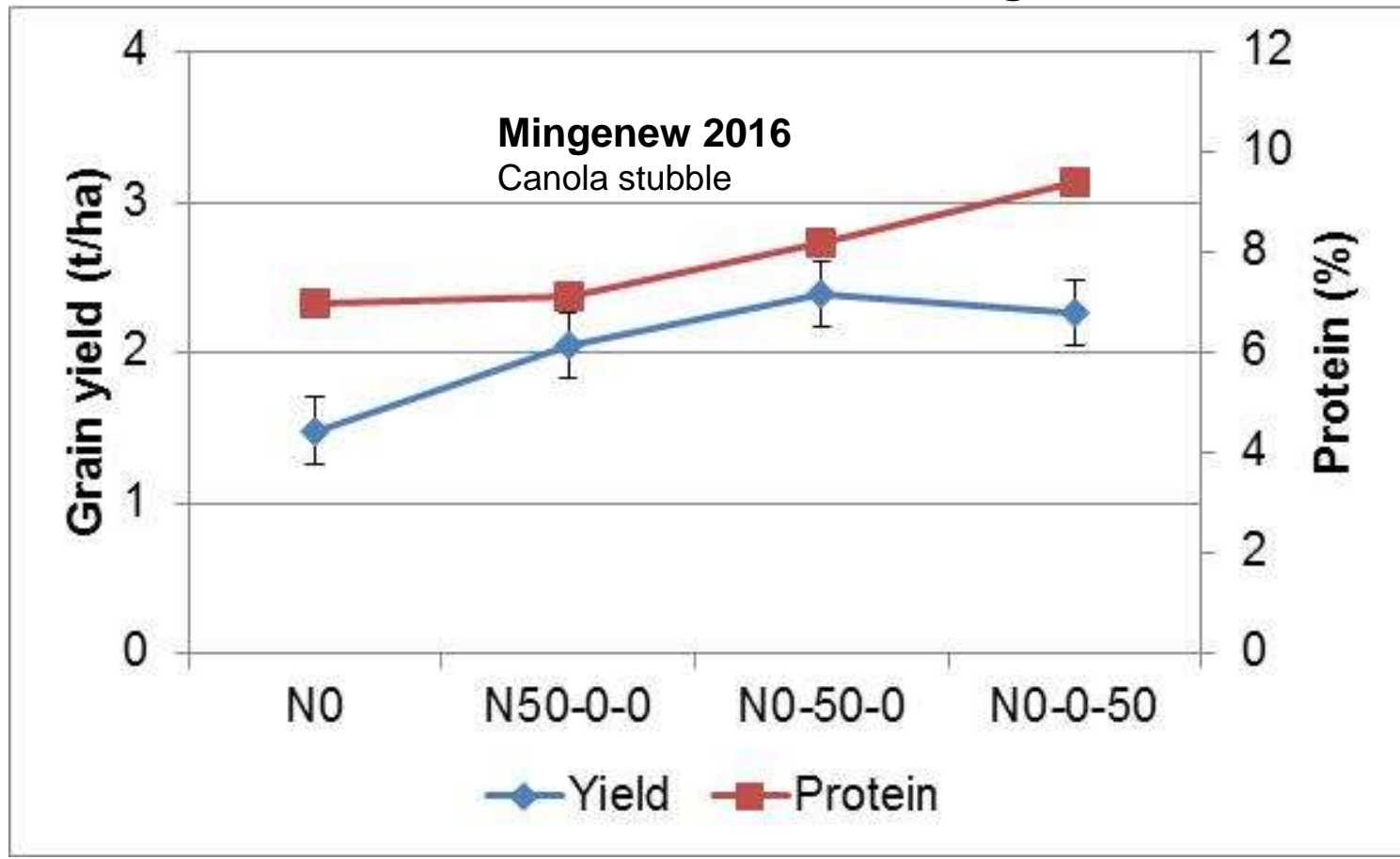
Variety trendline



Protein yield of 2017 NVT



Protein and N timing



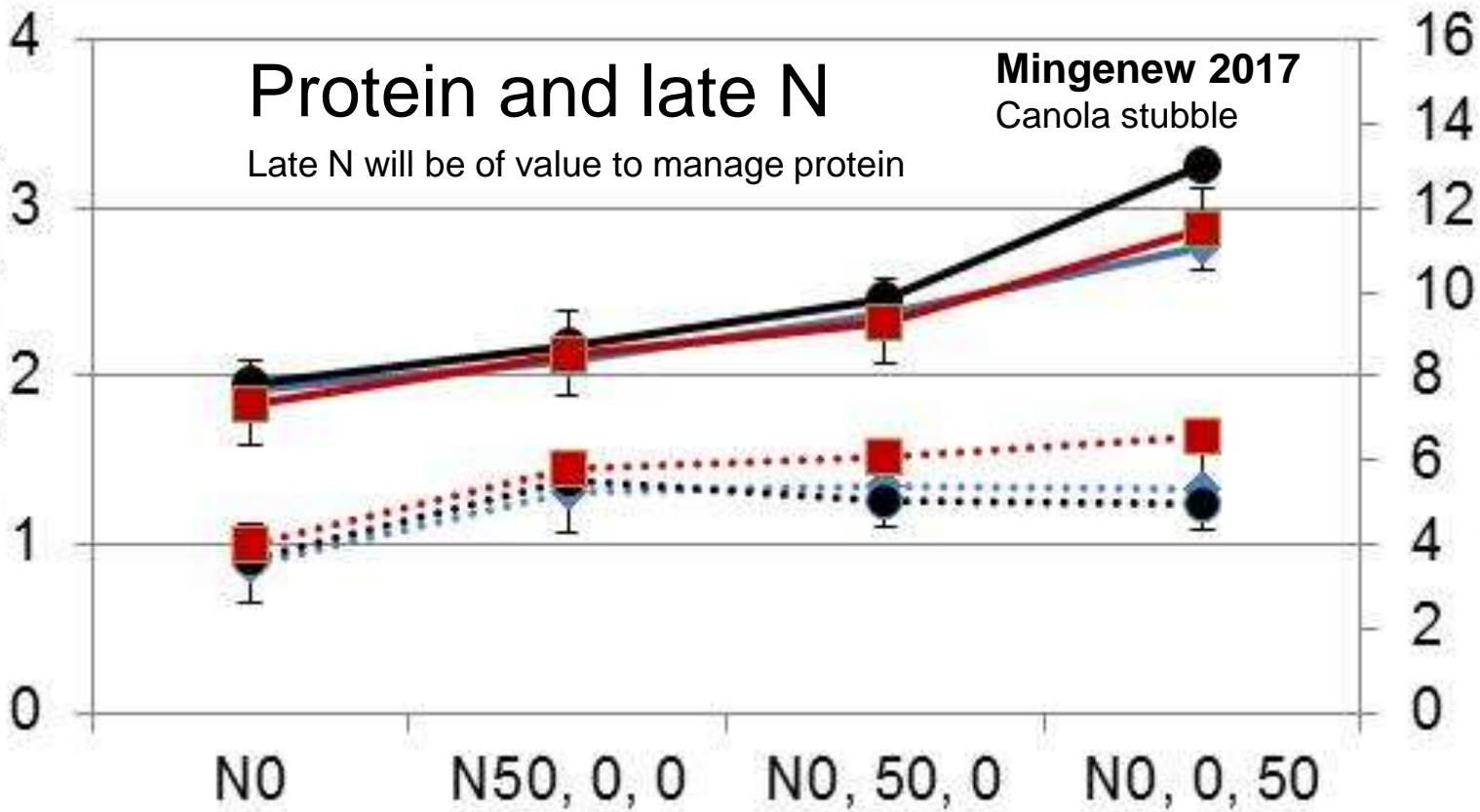
Protein and late N

Mingenew 2017
Canola stubble

Late N will be of value to manage protein

Grain yield (t/ha)

Protein (%)

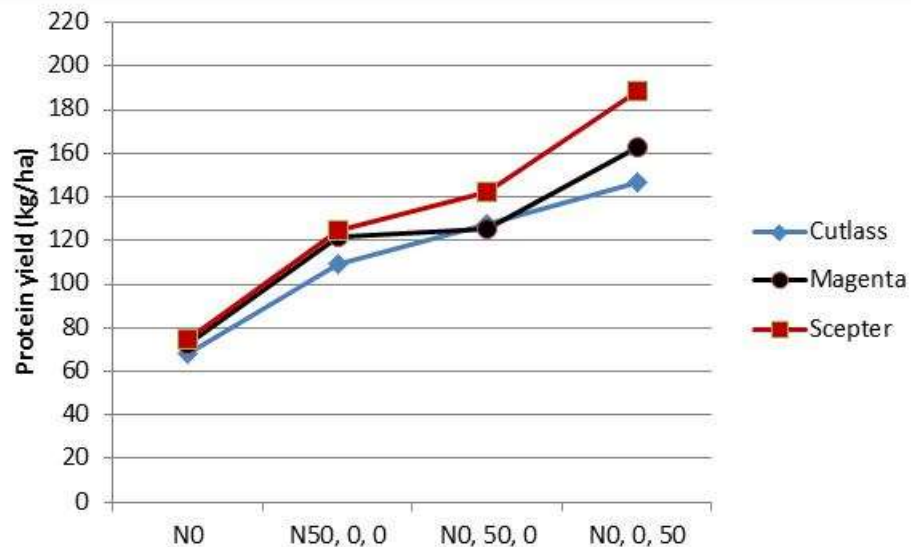
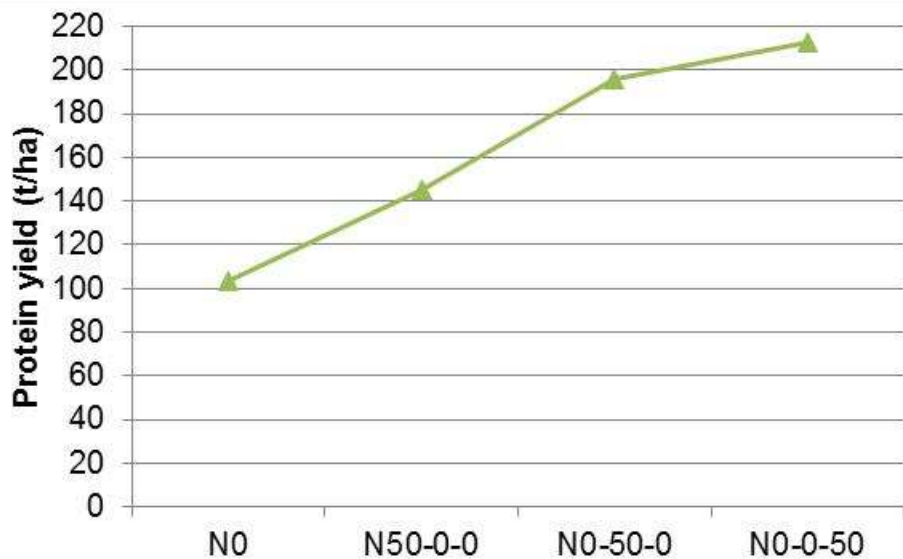


- ◆— Cutlass protein
- Magenta protein
- Scepter protein
- ...◆... Cutlass yield
- ...●... Magenta yield
- ...■... Scepter yield

Protein yield

Yield will influence protein

Mingenew 2016 Canola stubble



Mingenew 2017 Canola stubble



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AH comparisons

	Scepter	LRPB Havoc	Mace	LRPB Cobra	Tungsten	Yitpi
Yield (%NVT)	110%	104%	104%	103%	97%	97%
Yd (% Scept.)	100	93%	92%	91%	87%	87%
Maturity	Mid	Short-mid	Short-mid	Short-mid	Mid-long	Mid-long
Falling no. index	5	<i>4p</i>	5	2	?	5
Stem Rust	MR	<i>Sp</i>	MR	RMR	SVS	S
Stripe Rust	MR	MR <i>p</i>	MR	MS	RMR	MRMS
Leaf rust	MR# -> MS?	RMR <i>p</i>	MS# (MSS?)	R	MS#	MSS
Powdery mildew	SVS	MS	MSS	MSS	MS	MRMS
Yellow spot	MRMS	MRMS <i>p</i>	MRMS	MRMS	MSS	SVS
Other					Poor hectolitre in 2017 NVT	

Disease ratings courtesy of DPIRD Pathology team. See Wheat Variety guide

AH comparisons

	Scepter	LRPB Havoc	Mace	LRPB Cobra	Tungsten	Yitpi
Yield (% Scepter.)	100	93%	92%	91%	87%	87%
Maturity	Mid	Short-mid	Short-mid	Short-mid	Mid-long	Mid-long
Falling no. index	5	4p	5	2	?	5
Stem Rust	MR	Sp	MR	RMR	SVS	S
Stripe Rust	MR	MRp	MR	MS	RMR	MRMS
Leaf rust	MR# -> MS?	RMRp	MS# (MSS?)	R	MS#	MSS
Powdery mildew	SVS	MS	MSS	MSS	MS	MRMS
Yellow spot	MRMS	MRMSp	MRMS	MRMS	MSS	SVS
Other					Poor hectolitre in 2017 NVT	

Disease ratings courtesy of DPIRD Pathology team. See Wheat Variety guide

APW comparisons

	Scepter (AH)	Hydra	Cutlass	Corack	Chief CL Plus	Magenta	LRPB Trojan
Yield (% Scepter)	100%	93%	92%	92%	91%	91%	90%
Phenology	Mid	Short-mid	Mid-long	Short-mid	Mid	Mid-long	Mid-long
Falling no.	5	3	4	4	4	3	5
Stem Rust	MR	MRMS	R	MR	RMR	RMR	MRMS
Stripe Rust	MR	MS	RMR	MS	S	MS	MR
Leaf rust	MR# -> MS	MRMS#	RMR	S	R	R	MR#
Powdery mildew	SVS	S	Sp	SVS	MSSp	MRMS	SVS
Yellow spot	MRMS	MRMS	MSS	MR	MRMS	MR	MSS
Other		Screenings (>5% in ~30% NVT)		S-Blackpoint		S-Blackpoint	

*LRPB Arrow not included as not promoted for WA.

AH+APW comparisons

	Scepter (AH)	LRPB Havoc	Hydra	Mace	Cutlass	Chief CL Plus
Yield (%Scepter)	100%	93%	93%	92%	92%	91%
Phenology	Mid	Short-mid	Short-mid	Short-mid	Mid-long	Mid
Falling no.	5	4 _p	3	5	4	4
Stem Rust	MR	Sp	MRMS	MR	R	RMR
Stripe Rust	MR	MR _p	MS	MR	RMR	S
Leaf rust	MR# -> MS	RMR _p	MRMS#	MS# (MSS?)	RMR	R
Powdery mildew	SVS	MS	S	MSS	Sp	MSS _p
Yellow spot	MRMS	MRMS _p	MRMS	MRMS	MSS	MRMS
Other			Screenings (>5% in ~30%)			



Imi-tolerant comparisons

	Scepter (AH)	Chief CL Plus	Grenade CL Plus	Impress CL Plus
Yield (% Scepter)	100%	91%	82%	78%
Phenology	Mid	Mid	Short-mid	Short-mid
Falling no.	5	4	5	2
Stem Rust	MR	RMR	MR	MR
Stripe Rust	MR	S	RMR	MSS
Leaf rust	MR# -> MS	R	MS#	R
Powdery mildew	SVS	MSSp	MS	SVS
Yellow spot	MRMS	MRMS	S	MRMS
Other				S-Blackpoint

*No clearfield wheat varieties are free to trade

ANW comparisons

	Scepter	Ninja	Zen	Supreme	Calingiri
Yield %Scepter	100%	98%	93%	89%	87%
Phenology	Mid	Mid	Mid-long	Short-mid	Mid-long
Falling numbers	5	4	3	4	4
Stem Rust	MR	SVS	MSS	RMR	S
Stripe Rust	MR	MS	MRMS	MR	S
Leaf rust	MR# -> MS	MS#	MR#	RMR	MS#
Powdery mildew	SVS	VS	SVS	MSS	S
Yellow spot	MRMS	MRMS	MRMS	MS	MSS

Mid-long maturity comparisons

	Scepter	Cutlass	LRPB Trojan	Magenta	Yitpi	Zen
% Scepter	100%	92%	90%	91%	87%	93%
Phenology	Mid	+10	+5	+5	+10	+5
Falling numbers	5	4	5	3	5	3
Stem Rust	MR	R	MRMS	RMR	S	MSS
Stripe Rust	MR	RMR	MR	MS	MRMS	MRMS
Leaf rust	MR# -> MS	RMR	MR#	R	MSS	MR#
Powdery mildew	SVS	S	SVS	MRMS	MRMS	SVS
Yellow spot	MRMS	MSS	MRMS	MR	SVS	MRMS

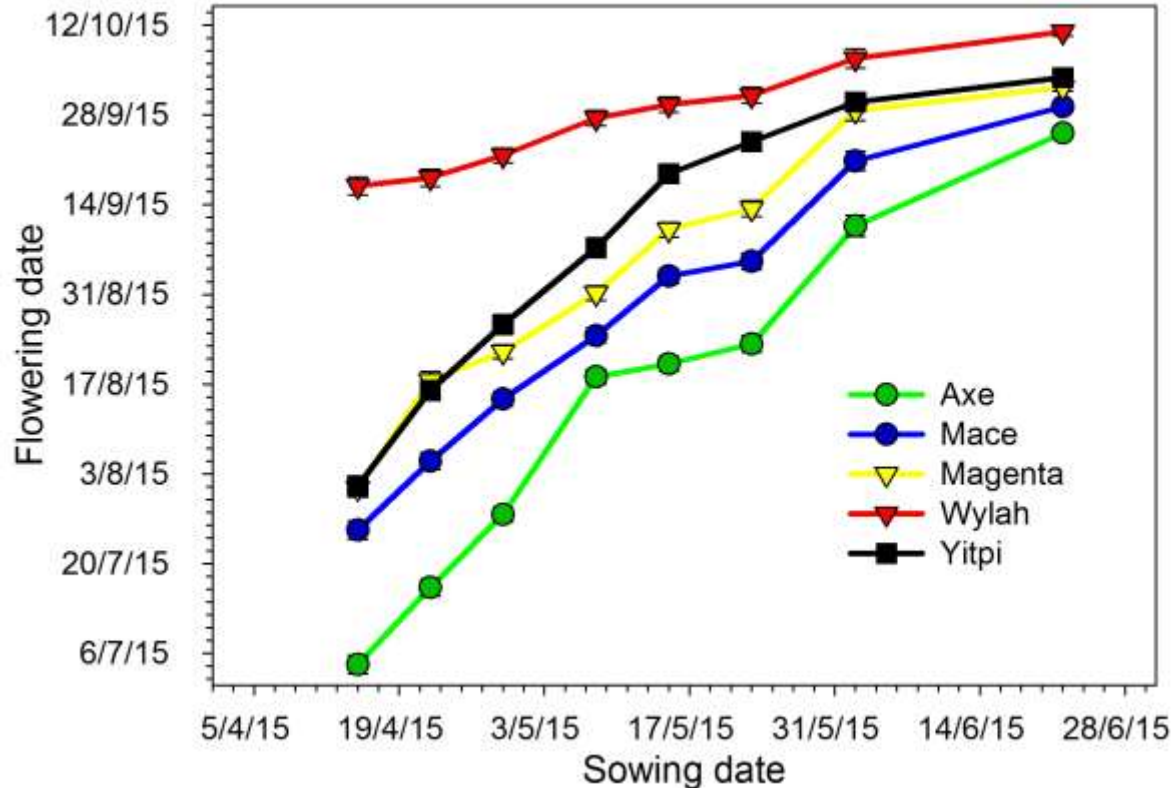
See Shackley et al 2018 GRU & 2018 DPIRD Wheat variety guide.

Mid-long maturity comparisons

	Scepter	Cutlass	LRPB Trojan	Magenta	Yitpi	Zen
% Scepter	100%	92%	90%	91%	87%	93%
Phenology	Mid	+10	+5	+5	+10	+5
Falling numbers	5	4	5	3	5	3
Stem Rust	MR	R	MRMS	RMR	S	MSS
Stripe Rust	MR	RMR	MR	MS	MRMS	MRMS
Leaf rust	MR# -> MS	RMR	MR#	R	MSS	MR#
Powdery mildew	SVS	S	SVS	MRMS	MRMS	SVS
Yellow spot	MRMS	MSS	MRMS	MR	SVS	MRMS

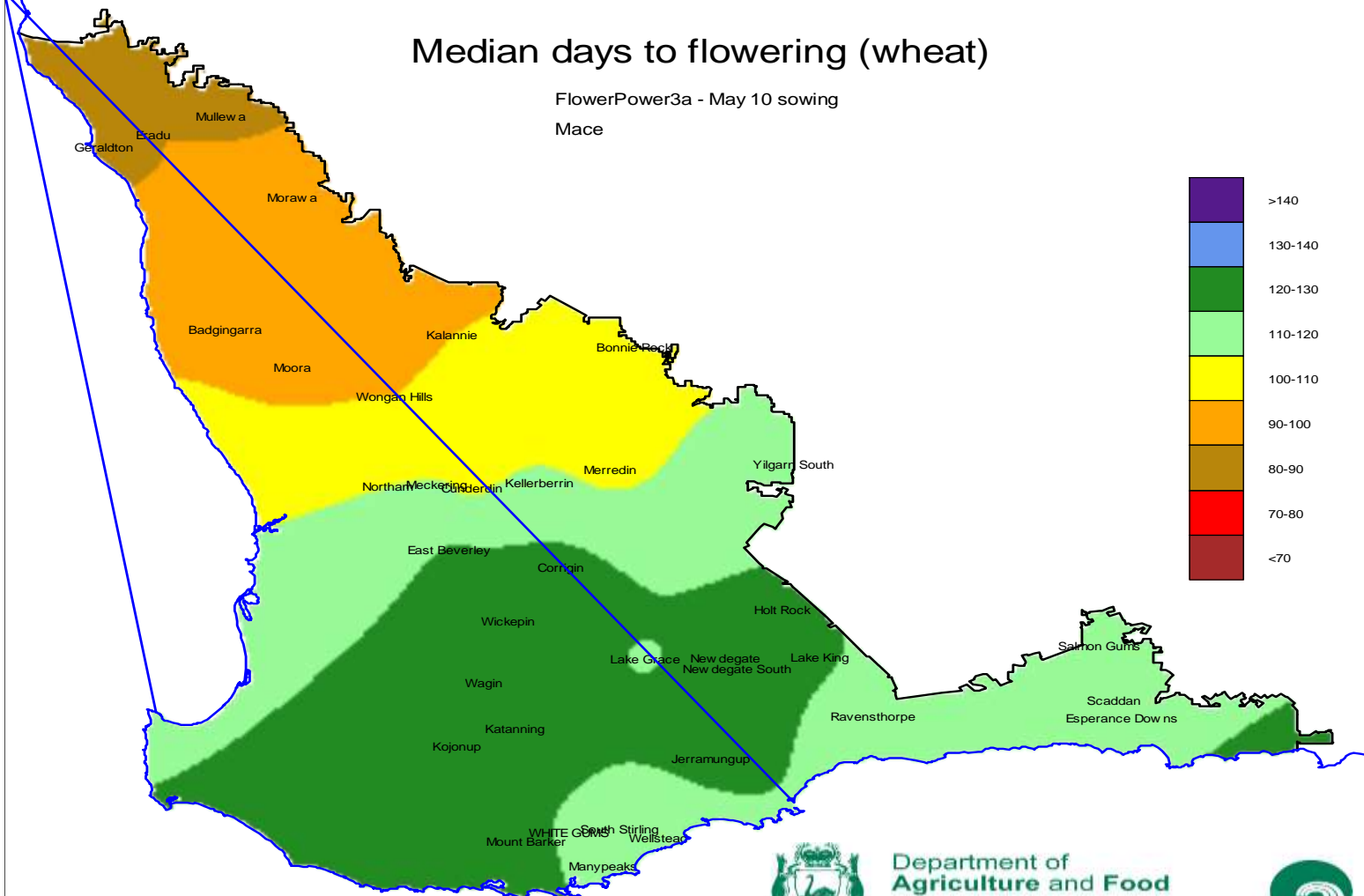
See Shackley et al 2018 GRU & 2018 DPIRD Wheat variety guide.

Phenology of long season options



Median days to flowering (wheat)

FlowerPower3a - May 10 sowing
Mace



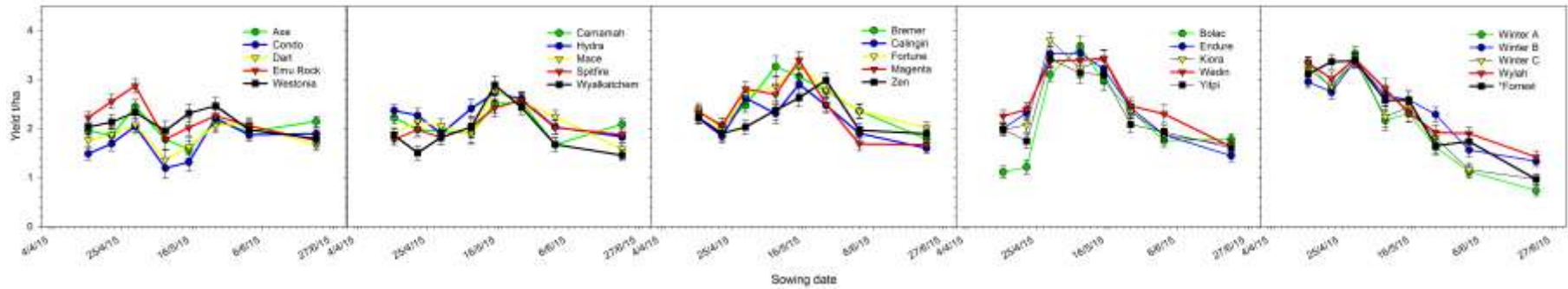
Source: Kefei Chen, Mario D'Antuono (DPIRD)



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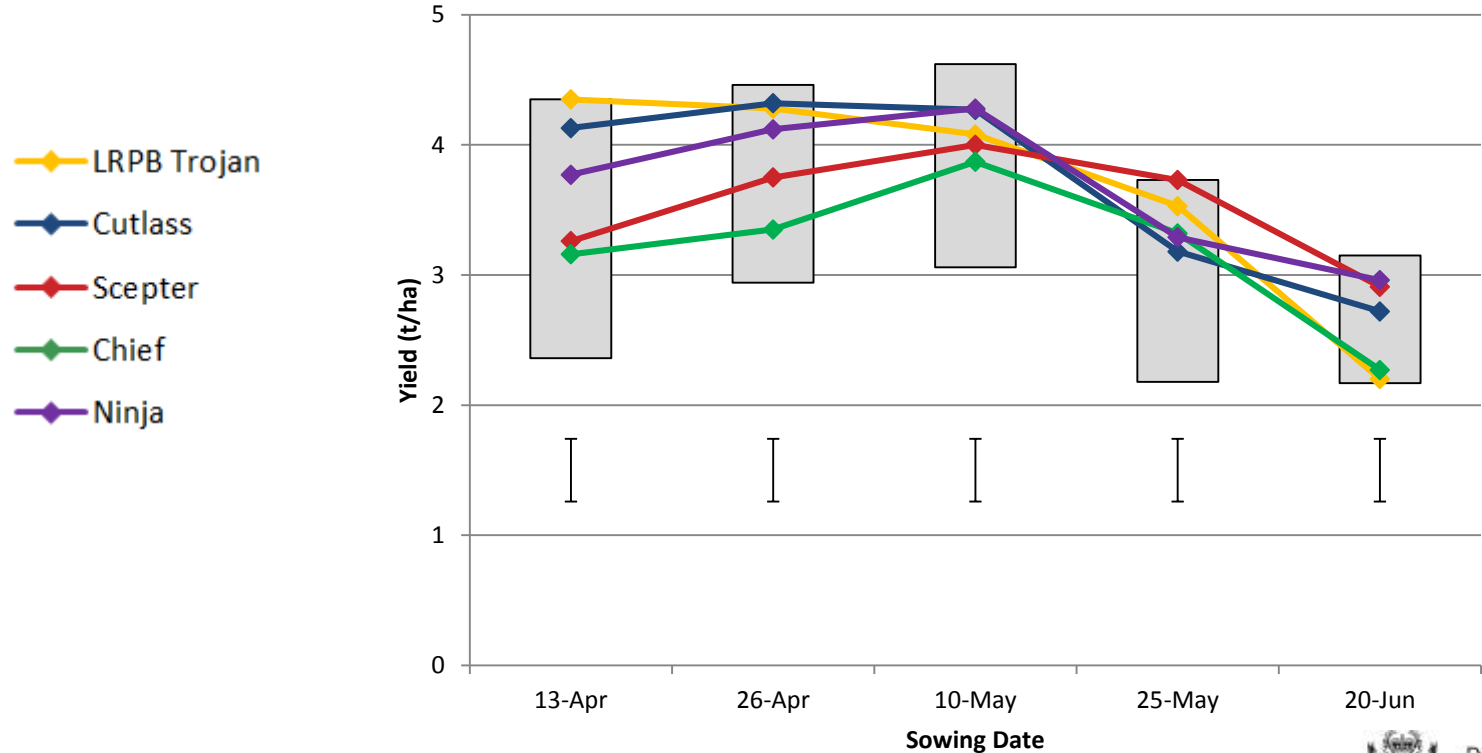


Yield patterns with maturity and sowing time

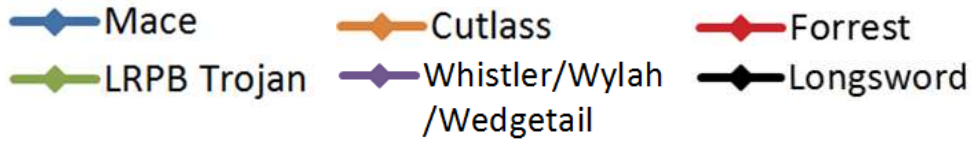


Courtesy DPIRD - DAW00234 – Nicol, Biddulph, Leske 2016

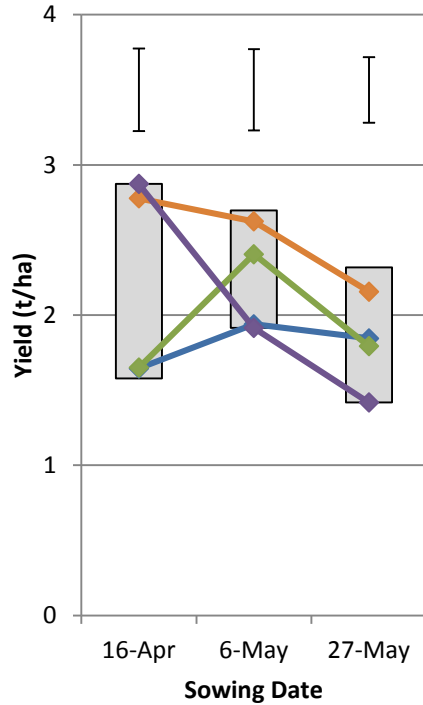
Merredin 2017



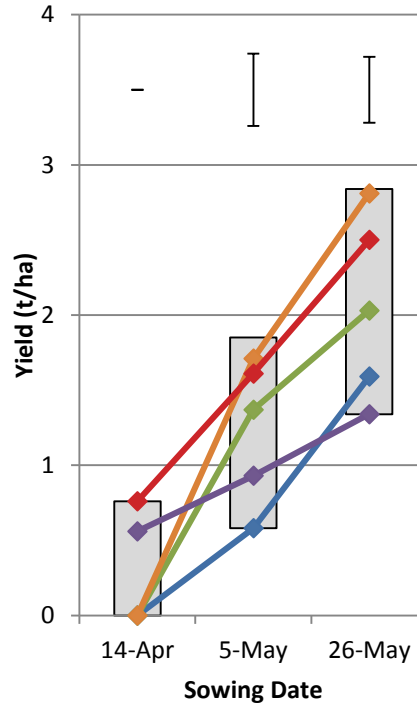
Katanning



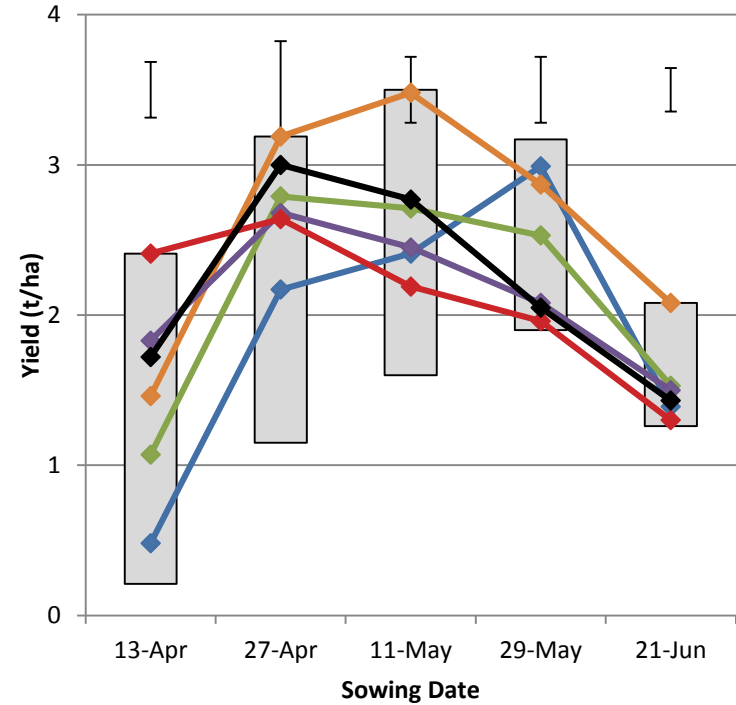
2015



2016



2017

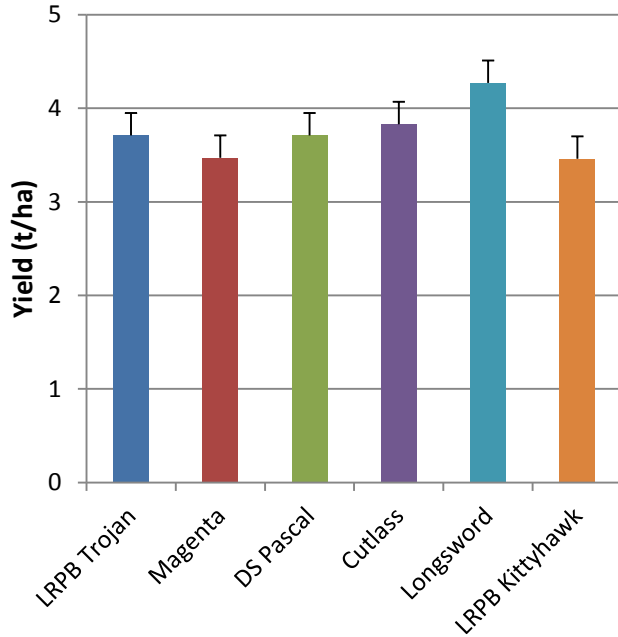


Error bar = LSD ($p < 0.05$) for within TOS.

Source: B Shackley, J Curry, D Nicol, C Zaicou, DPIRD

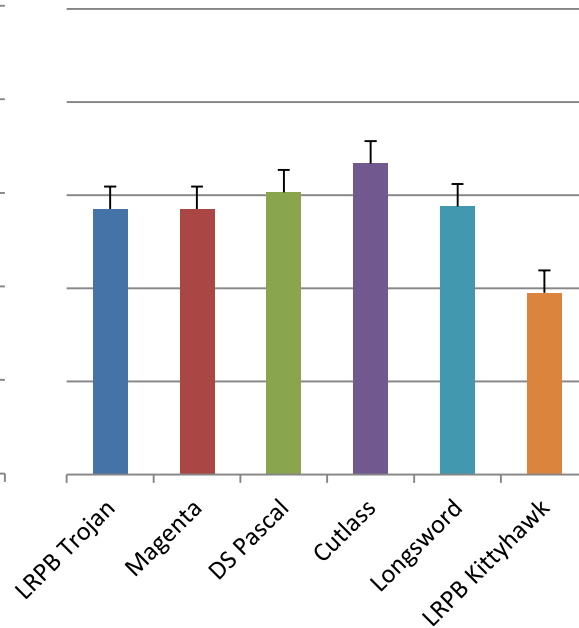
WA early season NVT 2017

Ogilvie



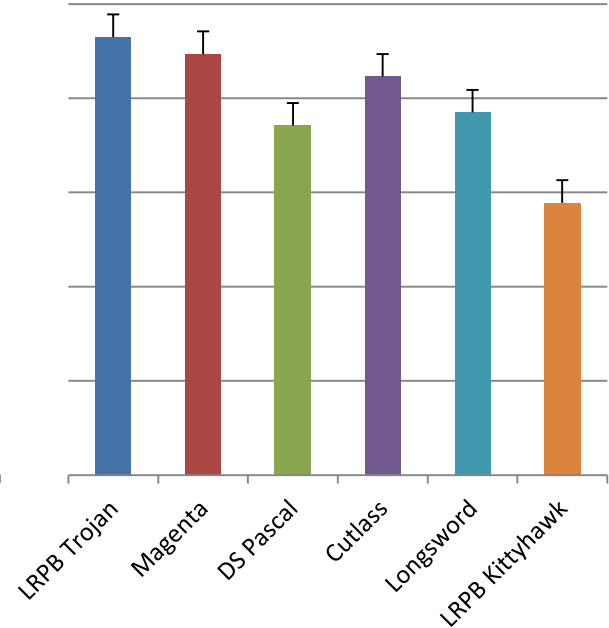
Sown 20th April
Irrigated 23rd April

Eneabba



Sown 20th April
into moisture

York



Sown 24th April
into moisture

Mid-long maturity comparisons

	Scepter	Cutlass	LRPB Trojan	Magenta	Yitpi	Zen
% Scepter	100%	92%	90%	91%	87%	93%
Phenology	Mid	+10	+5	+5	+10	+5
Falling numbers	5	4	5	3	5	3
Stem Rust	MR	R	MRMS	RMR	S	MSS
Stripe Rust	MR	RMR	MR	MS	MRMS	MRMS
Leaf rust	MR# -> MS	RMR	MR#	R	MSS	MR#
Powdery mildew	SVS	S	SVS	MRMS	MRMS	SVS
Yellow spot	MRMS	MSS	MRMS	MR	SVS	MRMS

See Shackley et al 2018 GRU & 2018 DPIRD Wheat variety guide.

Conclusions

Scepter's yield performance is very strong, across environments.
-Manage protein through N, particularly focus on N timing.

Ninja is the only wheat to stay close to Scepter, though ANW (premium but smaller market) and disease susceptibility should limit plantings to less than 10% of WA

Chief CL Plus is easily best Imi-tolerant option but competitive as an APW package

Cutlass is the current leading longer maturing wheat in the main season NVT. Regionally, Magenta and LRPB Trojan are yield competitive and each with different strengths/weaknesses

Thank you

Acknowledgements:

National Variety Trials

- GRDC, ACAS limited, SAGI
- Service providers (Living Farm, Kalyx)
- Hosts of NVT sites

Supporting data also from

DPIRD/GRDC co-funded DAW00249 – Tactical wheat agronomy for the West

DAW00260 – Advancing profitable farming systems

-Frost Risk Management