

Wheat 2013 NVT trial results

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Key messages

Mace continues to increase in acreage and occupied over 53% of WA sowings in 2013.

Analysis of NVT 2013 data indicates the following:

- Magenta equalled the yield of Mace across WA in a long season, long cool rain fed finish to the season
- Emu Rock failed to out yield Mace even at the lower yielding sites,
- Corack out yielded Mace in Agzones 2 and 4,
- Following on from 2012 variety performance, Cobra once again performed best at high yielding sites. Cobra performed poorly on alkaline soils.
- With limited knowledge and experience, Trojan looks to be a possible alternative in the Yitpi growing areas for early sowing and a stem rust resistant alternative of Magenta maturity
- Harper is another possible Yitpi replacement, close to Yitpi in maturity, however potential screenings and a minimal yield advantage may be its limitation.

Background

The 2013 season in WA was typified by a perfect start to sowing with much of the state starting with a full soil moisture profile and follow up rains during crop establishment. The states crop was established in a very short time frame with a generally excellent germination and rapid initial growth due to the warm soils. The exceptionally dry June – Early July put a dampener on season expectations. When the rains started in July and did not stop until October the crops recovered and were able to go through flowering and grain fill under ideal conditions. The absence of any widespread frost events and the cool wet conditions were major factors contributing to a record crop. Leaf diseases were prevalent in many regionally specific barley and wheat crops, however with many growers and agronomists understanding the importance of spray timing and application rates, disease impact on yield was limited. The number of hectares sown to Mace continues to escalate.

Two new varieties were released out of the NVT in 2013, the APW variety Harper (Intergrain) and Trojan (LongReach) that is waiting on a final classification in WA but is currently classified as APW in the eastern states. Both varieties are later maturing than Mace and are susceptible to yellow leaf spot (YLS) although slightly better than Yitpi.

Aims

The aim of this study was to examine the performance in WA NVTs of varieties that would complement or provide superior yield and quality alternatives to the now benchmark variety Mace and the long serving and effervescent varieties, Yitpi and Calingiri.

Method

Yield data, Zadoks scores and site details including location, sowing date, and soil pH in the surface soil and at depth, were downloaded from the NVT database for the year 2013 from the website:

<http://www.nvtonline.com.au/>

Predicted variety mean yield from each trial was plotted against the yield of Mace for each of the new and recently released varieties and linear regressions fitted. The year's data was collated on a spreadsheet and sorted by Agzone (Figure 1) and subsoil pH to look for any specific adaptation of any of the newer varieties compared to Yitpi or Mace.

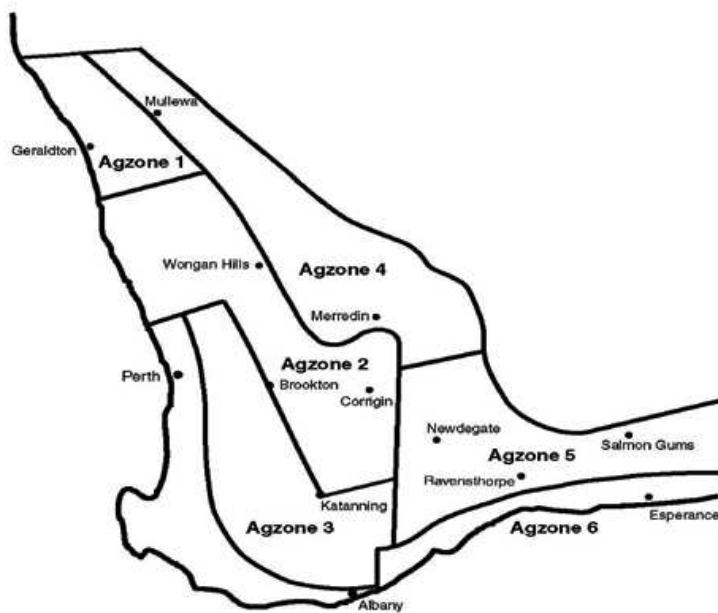


Figure 1 Agzones of the WA wheat belt. (Please note; that if cluster analysis becomes accepted analysis methodology, the Agzone map maybe become redundant).

Special notice was taken of subsoil pH's below 4.5 where there can be a marked increase in extractable Al (Wilson 1984).

Results

Zadoks scores that were taken in the range Z45 to Z70 were summarised in order to determine the maturity of the new releases relative to Mace and Yitpi (Table 1).

Table 1 Zadoks development scores in wheat NVTs in 2013 and mean difference in score of Yitpi.

variety	relative to Yitpi	Beverley	Calingiri	Gibson	Munglinup	Salmon Gums	Cadoux	York
Yitpi	0	49	48	50	49	52	51	48
Calingiri	1	52	46	51	53	52	55	44
Fortune	2	53	46	52	56	52	54	46
Magenta	3	52	47	53	55	56	54	50
Harper	3	57	50	49	50	56	56	52
Estoc	4			50	49	59	55	58
Wedin	4	54	46	51	56	59	56	57
Trojan	6			57	61	59	58	48
Justica CL Plus	8	57	48	59	62	60	60	57
Espada	9	57	48	62	62	63	60	60
Scout	11	64	52	60	68	62	66	53
Yandanooka	11	67	53					59
Envoy	12			60	68	62	63	56
Cobra	12	61	55	60	66	66	68	58
Kord CL Plus	13	64	50	64	68	63	68	59
Wyalkatchem	13	63	51	64	64	68	67	63
Mace	13	65	51	63	69	65	68	60
Grenade CL Plus	14	65	52	62	68	67	69	62
Corack	16	64	56	68	70	69	67	64
Kunjia	16	68	55	64	67	69	66	71
EGA Bonnie Rock	17	69	54	70	69	70	70	66
Emu Rock	18	69	60	69	67	70	69	71
Westonia	19	69	60	71	71	70	70	70

This showed that Trojan is mid way between Mace and Yitpi in maturity, making it very similar to Magenta. Harper was later and best described as mid way between Trojan/Magenta and Yitpi. The return to good growing conditions begged the question as to whether it would suite the later maturing Magenta more than the drier years that preceded 2013. The summary of yields of Magenta relative to Mace (Figure 2) is taken from Kevin Young's paper at the 2012 Crop Updates

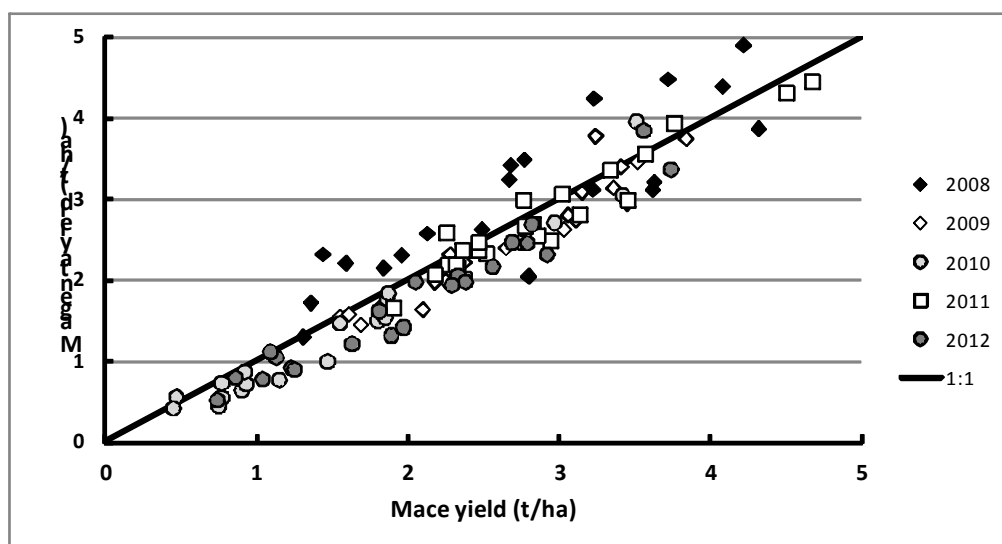


Figure 2 Grain yield of Magenta compared to Mace in Agzones 2 and 4 from 2008 to 2012 (t/ha).

When Magenta is compared directly to Mace it is clear that in all years other than 2008 its yield was not competitive with Mace (Figure 2.) other than in isolated cases. A similar comparison for Magenta and Mace is shown in Figure 3 for the year 2013.

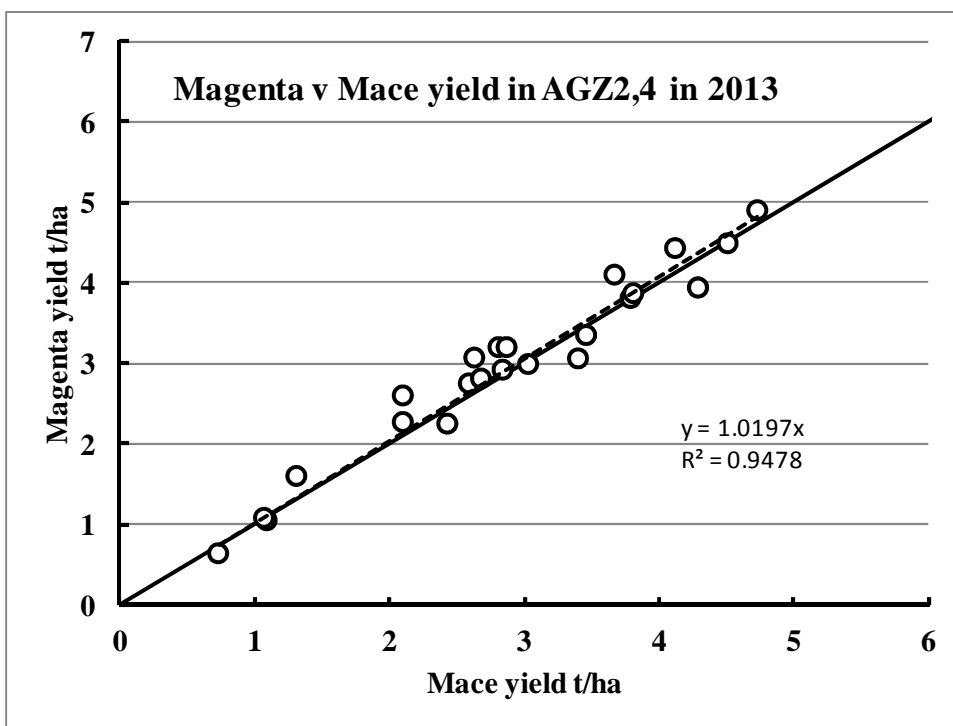


Figure 3 Grain yield of Magenta compared to Mace in Agzones 2 and 4 in 2013 (t/ha).

An increase in the severity of YLS than tends to accompany wet years may be the reason for Magenta occasionally out yielding Mace in these Agzones. The long term Met data (Table 2) indicates that Magenta is behind Mace for yield unless the growing conditions are above average.

Table 2 NVT long term summary (2009-2013), expressed as a percentage of Mace.

	Agzone1		Agzone2		Agzone3		Agzone4		Agzone5		Agzone6	
Mace (t/ha)	2.82	29	2.83	74	4.05	22	1.99	31	2.45	29	3.39	15
Name	% Mace	# trials	% Mace	# trials	% Mace	# trials	% Mace	# trials	% Mace	# trials	% Mace	# trials
Bonnie Rock	94	29	94	74	94	22	93	31	91	29	94	15
Cobra	99	19	98	43	103	18	93	18	95	20	104	9
Emu Rock	94	22	96	58	96	18	98	23	97	23	94	12
King Rock	94	23	94	58	94	17	93	25	91	23	94	12
Mace	100	29	100	74	100	22	100	31	100	29	100	15
Corack	104	22	103	58	101	18	104	23	100	23	100	12
Magenta	96	29	95	74	102	22	91	31	95	29	101	15
Scout	84	22	89	66	100	22	88	27	98	29	101	15
Envoy	88	16	92	58	97	22	92	21	96	29	98	15

Corack bounced back from a very erratic yield performance in 2012 to once again out yield Mace in Agzones 2 and 4 (Table 2 and Figure 4)

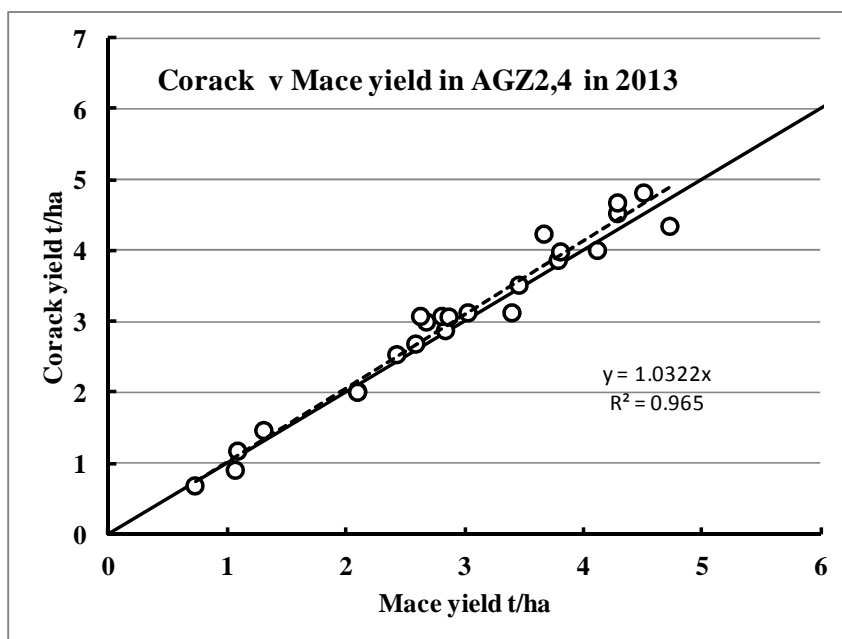


Figure 4 Yield of Corack relative to Mace in 2013(solid line is the 1:1 line).

Cobra showed a similar trend to previous years with its best performance relative to Mace being at the highest yielding sites (Figure 5).

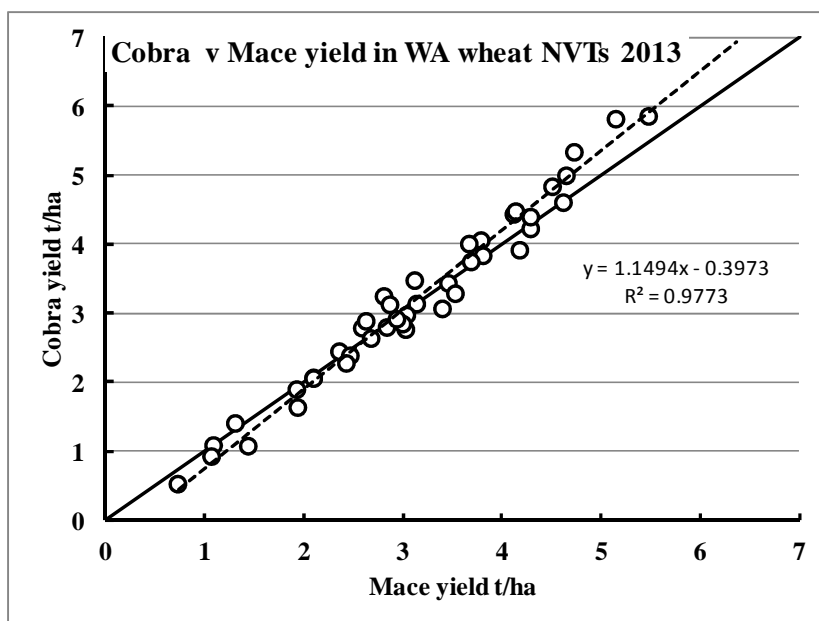


Figure 5 Yield of Cobra relative to Mace in 2013(solid line is the 1:1 line).

There was no relationship between Cobra's yield advantage and subsoil pH evident in the 2013 data. The performance of the later maturing lines relative to Yitpi is presented in the long term Met summary (Table 3).

Table 3 NVT long term summary (2009-2013), expressed as a percentage of Yitpi.

	Agzone1		Agzone2		Agzone3		Agzone4		Agzone5		Agzone6	
Mace (t/ha)	2.82	29	2.83	74	4.05	22	1.99	31	2.45	29	3.39	15
Name	% Yitpi	# trials	% Yitpi	# trials	% Yitpi	# trials	% Yitpi	# trials	% Yitpi	# trials	% Yitpi	# trials
Estoc	102	16	102	41	102	18	102	18	102	22	102	10
Harper			103	15	103	5			102	6	103	3
Magenta	113	29	108	74	106	22	105	31	102	29	106	15
Yitpi	100	23	100	59	100	18	100	23	100	24	100	13
Trojan	104	3	104	15	107	10	101	6	102	12	109	6

Of the newly released varieties the yield of Trojan was the most promising relative to Yitpi (Figure 6.)

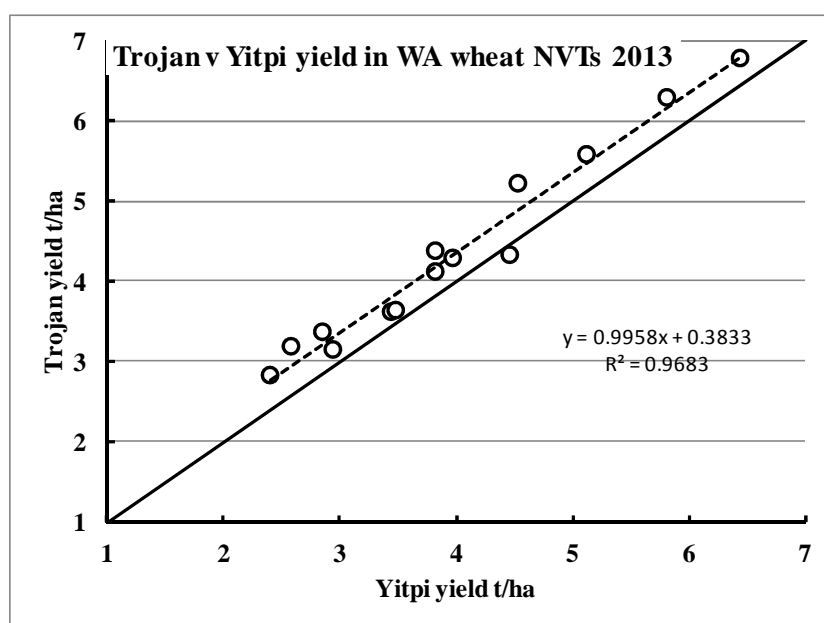


Figure 6 Yield of Trojan relative to Yitpi in 2013(solid line is the 1:1 line).

The long term met analysis shows that the yield of the noodle variety Fortune has been on par with Calingiri (Table 1.).

Table 5 NVT long term summary (2009-2013), expressed as a percentage of Calingiri.

	Agzone1		Agzone2		Agzone3		Agzone4		Agzone5		Agzone6	
Mace (t/ha)	2.82	29	2.83	74	4.05	22	1.99	31	2.45	29	3.39	15
Name	% Calingiri	# trials	% Calingiri	# trials	% Calingiri	# trials	% Calingiri	# trials	% Calingiri	# trials	% Calingiri	# trials
Calingiri	100	29	100	74	100	22	100	31	100	29	100	12
Fortune	99	29	100	74	101	22	102	31	103	29	99	15

A similar trend is seen in the 2013 data as a stand alone (Figure 7).

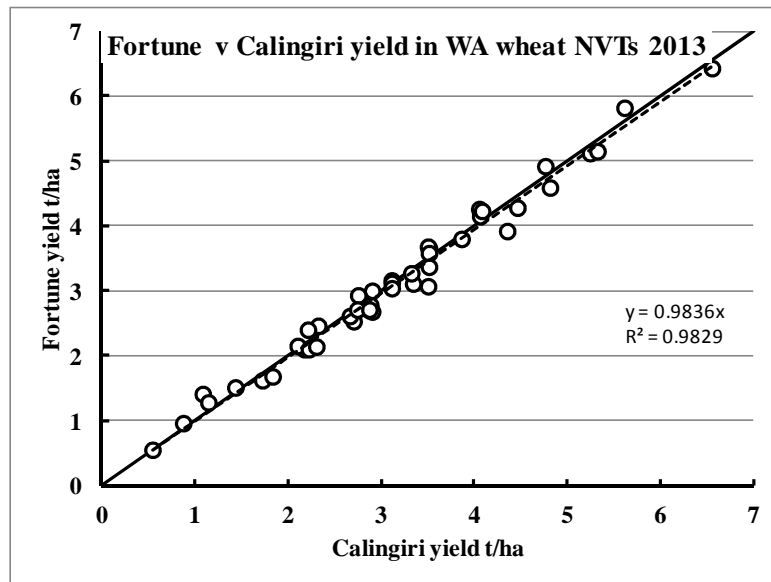


Figure 7 Yield of Fortune relative to Calingiri in 2013 (solid line is the 1:1 line).

The season had generally favourable spring rains so screenings levels were good at most sites. Of the newer varieties the one that may experience a problem with screenings appears to be Harper (Figure 8.)

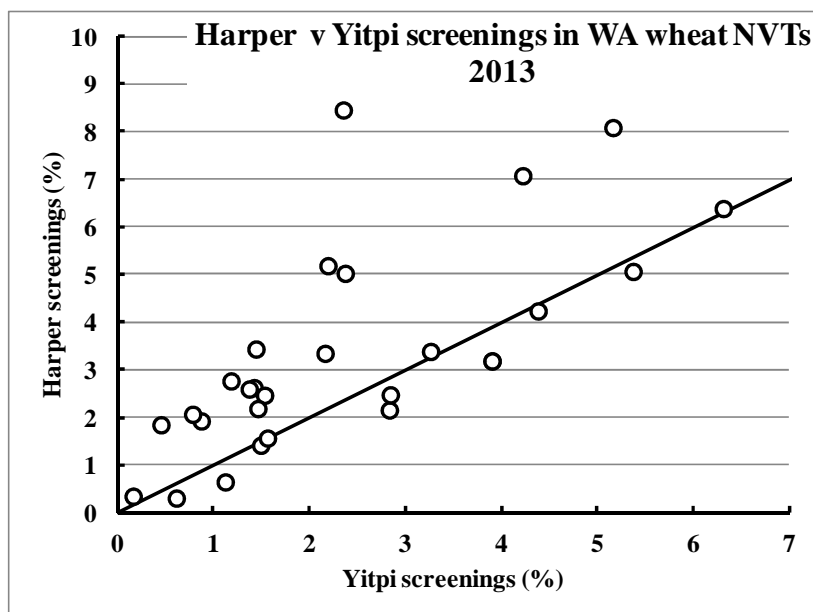


Figure 8 Screenings of Harper compared to Yitpi in 2013 (% passing through a 2mm sieve).

Conclusion

Mace continues to be a solid benchmark for yield in WA even in a season that would be expected to favour the longer season varieties. Yitpi has remained a popular choice for a late maturing line in some regions (particularly frost risk areas). There may now be viable higher yielding alternatives if the rusts become a problem:

- Magenta: 2013 was a year to suit Magenta and was as good a performer as Mace, edging ahead slightly at top end yields. 2013 does not occur frequently enough.
- Corack: Shows an ability to handle terminal drought and maximise yield potential should the season extend. Not suitable for areas of high blackpoint frequency.

- Cobra (AH) has improved YLS resistance and has tended to out-yield Mace at sites where yields are above 3t/ha. Lower grain weight more common in poor finishing seasons and lower yielding sites
- Trojan is a later (Magenta maturity) variety that may find a niche in WA.

Fortune continues to produce yields comparable to Calingiri but is unlikely to replace Calingiri.

- Wyalkatchem has been replaced as the benchmark after many productive years at the top of the tree

References

Wilson, I.R. 1984. Soil testing for acidity. *Journal of Agriculture Western Australia* 25: 121-122.

Key words

Wheat, varieties, National Variety Trials, grain yield

Acknowledgments

The author thanks the GRDC for funding the National Variety Testing project.

Grower Co-operators for providing trial sites

Grower Groups for providing research focus sites for the NVT

Kevin Young for his assistance in producing this paper

Kalyx Staff for planning and implementing the WA NVT program

GRDC project No.: KAL00003

Paper reviewed by: Kevin Young, DAFWA