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FAR HYBRID EVALUATION



FOUNDATION FOR ARABLE RESEARCH



maize hybrids 2017/2018

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Welcome to the fourth edition of the Maize Hybrid Performance Trials results booklet.

This is the second edition to include results from multiple sites and multiple years. This means that some hybrid results are given as averages from four different seasons, and from up to eleven separate trials. Data from multiple seasons for a maize hybrid's performance is more valuable than results from a single season, as they show the hybrid's ability to perform over seasons with different weather patterns. Ultimately, the most consistent performers will rise to the top of multiple year results. The more trials a cultivar has been in, the more confidence can be taken from its reported performance.

For the 2017/18 season, the number of sites increased to eight, with two of the maize seed

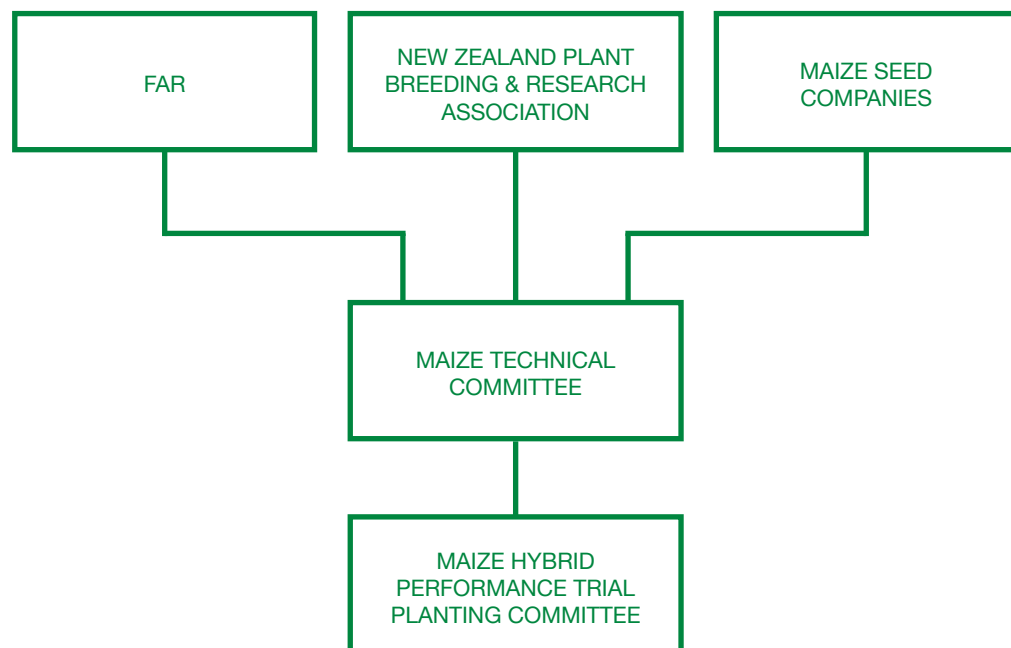
companies in the programme hosting, managing and harvesting MPT trials. The MPT system relies on companies collaborating and including their cultivars for the overall good of the industry. We encourage you to use the information in this booklet to help you make sound hybrid selection decisions.

We welcome any queries or suggestions on how we might further improve these booklets. Please contact us if you have ideas, or if you require any additional information not included in this booklet.

Tom Bruynel
President
New Zealand Plant Breeders Association

July 2018

STRUCTURE OF THE MAIZE HYBRID PERFORMANCE TRIALS



For a number of years maize growers were asking for an independent maize hybrid-testing scheme. FAR convened a discussion group comprising members of the maize industry in 2014, which ultimately led to the establishment of the Maize Hybrid Performance Trials, similar to the Cereal Performance Testing (CPT) programme that has been operating successfully for over 30 years.

A pilot testing programme for maize grain and silage hybrids was undertaken at three sites in the 2014/15 maize season, in the Waikato, Bay of Plenty and Canterbury. The trial design was a fully replicated, small plot design that includes agreed standard hybrids for comparison.

Following the success of this first season, the Maize Trials Committee increased the number of sites to six, with an additional site in the Waikato, on peat ground, and two trials in the Rangitikei and Manawatu regions.

The development of an independent maize hybrid testing programme is a considerable

investment for the industry collectively, but a well-operated scheme should reduce individual company investment, and as a consequence grower investment, in developing hybrids. Seed companies will invest in the programme by paying to have their hybrids included in the scheme. Maize levy money is invested in the governance of the programme, analysis of the results and reporting. We started with a pilot scheme in 2014, and now present the results from eight trials in the 2017/18 season.

The results from previous seasons of the MPT trials are available on the FAR website.

FAR welcomes any queries or suggestions on the MPT system. If you require any additional information, please contact us.

Allister Holmes
Maize Hybrid Performance Trials Project Manager

July 2018

MPT STRUCTURE

The Maize Hybrid Performance Trials (MPT) are organised and funded through the Maize Hybrid Performance Trial Committee with representatives from FAR, NZ Plant Breeding & Research Association (NZPBRA) and the participating seed companies.

Any organisation or company may join the committee if they agree to pay an appropriate share of the operating costs, participate in the running of the trials or contribute a service to the scheme.

Secretarial services are provided by NZPBRA.

Parties who are not members of the committee are welcome to participate as observers in appropriate meetings where their hybrids are under discussion. If their involvement becomes long-term, they will be invited to join the committee.

The committee meets at least once a year to review the trial results, and at any other time that a meeting is required. The committee also views the field trial sites prior to harvest.

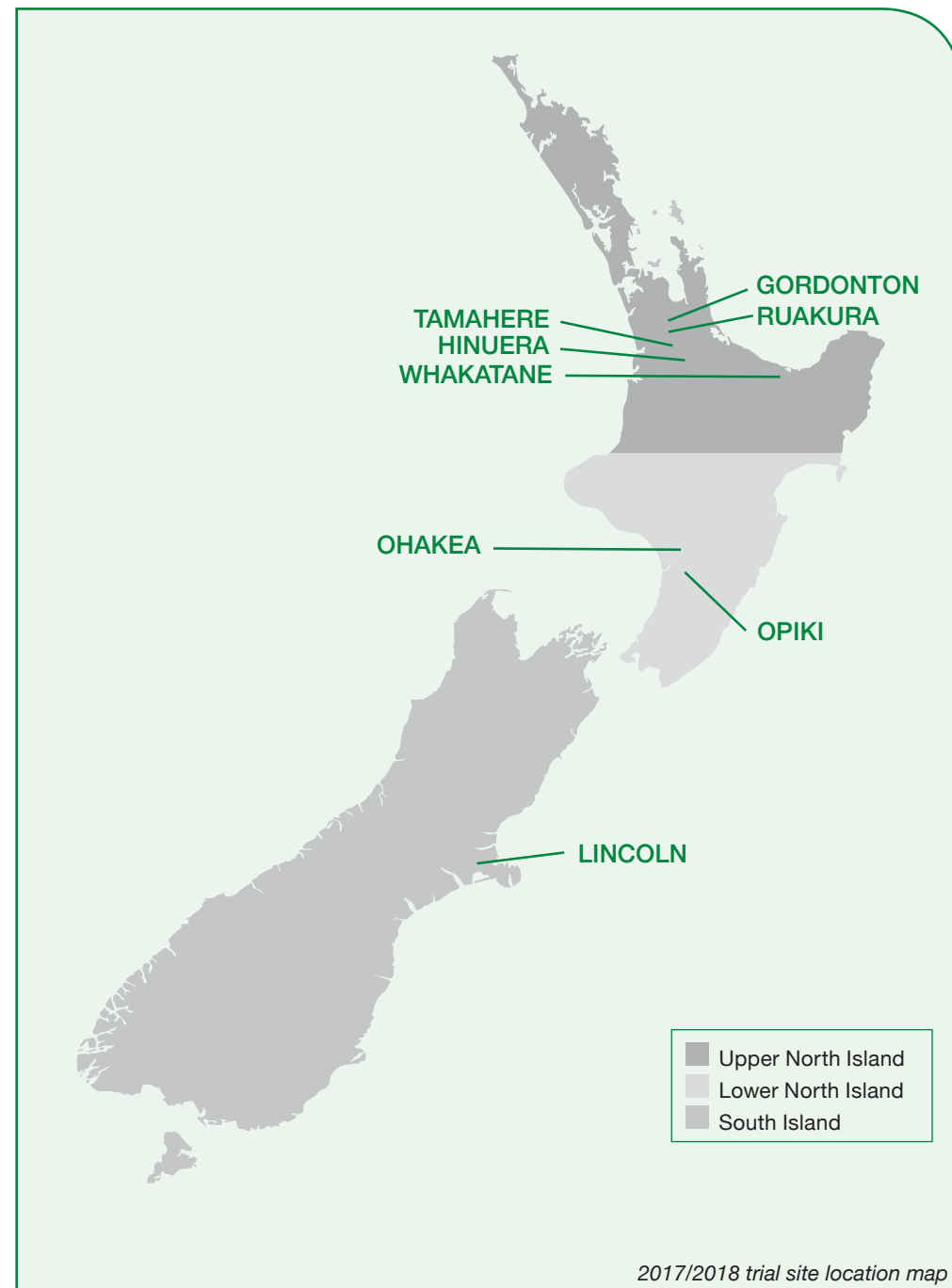
COMMERCIAL HYBRIDS

HYBRID	Seed supplier	Silage CRM*	Grain CRM*	Website
Delitop	Corson	78	88	corsonmaize.co.nz
PAC040	Pacific	80	94	corsonmaize.co.nz/Products/Pacific-Seeds
Titus	Nutritech/HSR	82	82	nutritech.co.nz
N23-K3	Corson	87	Silage only	corsonmaize.co.nz
PAC123	Pacific	91	91	corsonmaize.co.nz/Products/Pacific-Seeds
CMS Comet	Corson	92	94	corsonmaize.co.nz
Obelix	Nutritech/HSR	94	94	nutritech.co.nz
PAC249	Pacific	95	97	corsonmaize.co.nz/Products/Pacific-Seeds
C29-A1	Corson	96	96	corsonmaize.co.nz
N39-Q1	Corson	97	100	corsonmaize.co.nz
Velocity	Corson	95	98	corsonmaize.co.nz
Afinity	Corson	97	100	corsonmaize.co.nz
PAC314	Pacific	101	101	corsonmaize.co.nz/Products/Pacific-Seeds
Maximus	Nutritech/HSR	102	Silage only	nutritech.co.nz
N51-N4	Corson	104	104	corsonmaize.co.nz
PAC343	Pacific	105	104	corsonmaize.co.nz/Products/Pacific-Seeds
Brutus	Nutritech/HSR	105	105	nutritech.co.nz
C56-C4	Corson	106	102	corsonmaize.co.nz
Plenitude	Corson	107	107	corsonmaize.co.nz
PAC432	Pacific	105	107	corsonmaize.co.nz/Products/Pacific-Seeds
PAC456	Pacific	108	108	corsonmaize.co.nz/Products/Pacific-Seeds
Z71-F1	Corson	111	Silage only	corsonmaize.co.nz
Olympiad	Nutritech/HSR	112	112	nutritech.co.nz

PRECOMMERCIAL HYBRIDS

HYBRID	Seed supplier	Silage CRM*	Grain CRM*	Website
CMX1566PC	Corson	85	85	corsonmaize.co.nz
CMX2303PC	Corson	90	90	corsonmaize.co.nz
PAC ME132	Pacific	94	94	corsonmaize.co.nz/Products/Pacific-Seeds
PAC ME217	Pacific	97	97	corsonmaize.co.nz/Products/Pacific-Seeds
CMX4735PC	Corson	107	107	corsonmaize.co.nz
PAC564	Pacific	113	115	corsonmaize.co.nz/Products/Pacific-Seeds

* CRM = Comparative relative maturity



The multi-year adjusted mean is the most important result in the MPT Results Booklet. This is the second year we have presented multi-year, multi-site data. This is a big step forward for the MPT programme because it shows how the hybrids perform over multiple different seasons, and across multiple different locations.

To analyse this data, the trials have been separated into three zones:

- Upper North Island (includes Waikato and Bay of Plenty).
- Lower North Island (includes Manawatu and Rangitikei).
- South Island.

The combined trial analysis is undertaken in a way to avoid an advantage to an entry being in a high yielding trial versus another being in a low yielding trial. The variations from the trial means are then averaged using a weighted average, where more weight is given to trials with higher precision (less variability).

For example, if Trial A had twice the precision of Trial B, the weighted average would be $(2 \times \text{Trial A result} + \text{Trial B result})/3$, and so the result would be closer to the Trial A mean than the Trial B mean.

Data from multiple seasons for a maize hybrid's performance is more valuable than results from a single season as they show the hybrid's ability to perform over different seasons with different weather patterns. Ultimately, the most consistent performers will rise to the top of multiple year results. The more trials a cultivar has been in, the more confidence can be taken from its reported performance.

THE LEAST SIGNIFICANT DIFFERENCE

The Least Significant Difference (LSD) listed at the bottom of each table for each column of data should be used to determine if the difference between hybrids is due to performance differences or random chance.

This booklet presents data with an LSD of 5%. If the difference between two hybrids were equal to or greater than the LSD, the difference would be attributable to hybrid differences in 95% of instances when the two hybrids are evaluated under conditions like those of the test.

Hybrids with the same letter beside them are not significantly different for the characteristic listed. When no significant difference for a given parameter is found among hybrids, "ns" (non-significant) replaces an LSD value. A difference which is less than the LSD is likely due to chance.

For example, on page 14 the hybrids PAC432 (a), P1636 (ab), P0791 (abc) and C56-C4 (abcd) all include the letter 'a' beside them in the yield column. This indicates that while their yields in this trial varied, this variation is not statistically significant. Likewise, any hybrid with another letter beside it, will not be significantly different from any other hybrid which includes that same letter.

COEFFICIENT OF VARIATION

The "Coefficient of Variation", or CV%, is another measure of the variability in a trial. If the differences between cultivars are similar across all replicates, the trial CV% is low (below 10%). Where there is a high level of unexplained variation the CV% is high, and the trial results are less accurate.

Upper North Island

HYBRID	CRM	Number of trials	Number of years	Yield (t DM/ha)
PAC432	105	12	4	27.7
Z71-F1	111	12	4	27.6
PAC456	108	12	4	27.4
P0791	106	13	4	27.3
Plenitude	107	11	3	26.8
Olympiad	112	11	3	26.3
34P88	109	5	2	26.2
C56-C4	106	13	4	26.1
PAC343	105	13	4	26.0
N51-N4	104	12	4	25.5
Brutus	105	8	2	24.9
Maximus	102	11	3	24.8
Afinity	97	8	3	24.6
C29-A1	96	10	4	24.5
PAC230	98	8	3	24.3
P0021	100	5	2	24.0
N39-Q1	97	10	4	23.8
37Y12	95	5	2	23.8
G49-T9	104	5	2	22.8
PAC249	95	9	3	22.5
Titus	82	6	2	21.6
Mean				25.2
LSD 5%				1.9

Lower North Island

HYBRID	CRM	Number of trials	Number of years	Yield (t DM/ha)
37Y12	95	4	2	23.3
38V12	91	4	2	23.2
P0021	100	4	2	23.2
PAC230	98	4	2	23.1
N39-Q1	97	6	3	22.9
Afinity	97	6	3	22.5
PAC343	105	4	2	22.2
CMS Comet	92	6	3	22.0
Maximus	102	6	3	21.9
PAC249	95	6	3	21.6
C29-A1	96	4	2	21.6
P9400	94	6	3	21.4
PAC123	91	6	3	21.4
N23-K3	87	6	3	20.1
PAC040	80	4	2	20.1
Titus	82	6	3	18.5
39G12	78	6	3	18.4
Delitop	78	6	3	18.3
Mean				21.4
LSD 5%				2.1

South Island

HYBRID	CRM	Number of trials	Number of years	Yield (t DM/ha)
CMS Comet	92	3	3	23.5
P9400	94	3	3	22.2
38V12	91	4	4	22.0
PAC040	80	3	3	21.0
PAC123	91	4	4	20.6
N23-K3	87	4	4	20.5
Delitop	78	4	4	20.3
39G12	78	4	4	19.6
Titus	82	3	3	19.6
39V43	72	3	3	16.4
Mean				20.6
LSD 5%				3.0

Upper North Island

HYBRID	CRM	Number of trials	Number of years	Harvest moisture (%)	Yield (t/ha @ 14% moisture)
PAC432	107	11	4	22.1	15.5
PAC343	104	11	4	21.2	15.1
PAC456	108	8	3	23.0	14.8
Afinity	100	6	3	20.3	14.6
N51-N4	104	11	4	20.9	14.5
C29-A1	96	8	4	20.0	14.1
Plenitude	107	9	3	21.2	14.0
P0021	100	5	2	20.2	13.9
34P88	109	5	2	23.3	13.8
37Y12	95	5	2	19.3	13.7
Olympiad	112	9	3	23.1	13.7
Brutus	105	6	2	24.5	13.2
PAC249	97	7	3	19.7	13.1
N39-Q1	100	8	4	20.3	13.0
Titus	82	5	2	19.0	10.4
Mean				21.2	13.8
LSD 5%				1.0	1.1

Lower North Island

HYBRID	CRM	Number of trials	Number of years	Harvest moisture (%)	Yield (t/ha @ 14% moisture)
Afinity	100	6	3	20.7	14.6
P0021	100	4	2	20.5	14.0
PAC249	95	6	3	20.3	14.0
37Y12	95	4	2	19.9	13.9
PAC343	104	4	2	24.1	13.6
PAC123	91	6	3	18.5	13.6
CMS Comet	94	6	3	19.8	13.3
PAC230	98	4	2	19.6	13.2
N39-Q1	100	6	3	20.8	12.9
P9400	94	6	3	19.1	12.8
PAC040	94	4	2	19.9	12.4
C29-A1	96	4	2	21.8	12.3
Delitop	88	6	3	18.9	11.7
39G12	78	6	3	18.6	11.2
Titus	82	6	3	19.5	10.6
Mean				20.1	12.9
LSD 5%				1.4	1.6

Trial site	Soil type	Host farmer	Planting date	Altitude
Northern Crop Research Site, Tamahere, Waikato	Otorohonga deep loam over clay	Foundation for Arable Research	17 October 2017	49 metres
Seddon Road, Gordonton, Waikato	Ardmore deep peat	Gavins Limited	16 November 2017	49 metres
Paroa Road, Whakatane, Bay of Plenty	Awakaponga deep loam	Power Grain Limited	20 October 2017	0 metres
Tangimoana Road, Ohakea, Manawatu	Manawatu fine sandy loam	David Dempsey	10 October 2017	41 metres
Opiki Road, Opiki, Manawatu	Opiki peat loam	Adrian Noaro	25 October 2017	6 metres
Kimihia Research Centre, Lincoln, Canterbury	Templeton deep silty loam	PGG Wrightson Seeds	19 October 2017	20 metres
Ruakura, Hamilton, Waikato	Te Kowhai peaty silt loam	Corson Maize Seed	15 November 2017	40 metres
Hinuera, Waikato	Haupehi steepland soils	Pacific Seeds	13 October 2017	161 metres

DATA FORMAT

The performance data for each trial site is reported in a single table. Hybrids in each table are listed by yield in descending order. Comparisons can be made only between hybrids within a table. Comparing two hybrids from different tables (i.e. different environments and/or production levels) would likely lead to a mistaken conclusion.

LODGING

If no lodging data is presented, it is because there was no significant lodging present in the trial.

SILAGE HARVEST PROTOCOLS

The trials were harvested at approximately 35% dry matter. The decision to harvest was made based on leaf and stalk state, and milk line in grain.

The hybrids within the trial represent a broad range of maturities and it is important to note that typically the longer maturity hybrids should have the greater yield potential as they are receiving sunlight energy, growing, and accumulating yield for a longer period of time than the shorter maturity hybrids.

GRAIN HARVEST

Lodging counts were undertaken on the day of harvest, with stalk lodging defined as plants that have broken stalk below the ear; and root lodging defined as plants that are touching the adjacent row or equivalent angle if lodged along the row. All of the cobs (primary or secondary) of all of the plants in one of the plot centre rows was harvested, then shelled. Grain was then weighed and the grain moisture and test weight (bulk density) of each grain sample was measured using a Dickey-John GAC 2100 Agri-meter.

Waikato (Tamahere) Planted 17 October 2017

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
PAC564	113	87790	e	146	39.1	defghij	30.0	a
PAC456	108	93319	abcde	140	42.5	b	29.7	a
P1636	112	98458	a	146	40.6	bcdefg	28.9	ab
P0791	106	90521	bcde	140	41.0	bcdef	28.9	ab
PAC432	107	88373	de	140	42.3	bc	28.7	ab
P1253	109	92938	abcde	140	40.2	bcdefgh	28.7	ab
PAC343	104	94700	abcde	140	41.9	bcd	28.7	ab
Olympiad	112	96648	abc	146	41.9	bcde	28.4	abc
P9721	97	90298	bcde	132	37.4	hijk	27.3	abcd
P9911	99	95682	abcd	132	39.1	defghij	27.2	abcd
Z71-F1	111	97451	abc	146	37.9	ghijk	27.1	abcde
C29-A1	96	87958	e	140	49.1	a	26.7	bcde
Plenitude	107	88817	de	140	39.4	cdefghij	26.7	bcde
N51-N4	104	92305	abcde	132	38.8	efghij	26.3	bcde
Maximus	102	93286	abcde	132	37.3	hijk	26.1	bcde
N39-Q1	97	91740	abcde	132	37.3	hijk	25.7	cde
CMX4735PC	107	90119	cde	140	35.6	k	25.6	cde
C56-C4	106	94394	abcde	132	36.7	jk	25.5	def
Afinity	100	97057	abc	132	39.7	bcdefghi	25.4	def
Brutus	105	93107	abcde	140	42.3	bc	24.5	def
Velocity	98	97685	ab	132	38.7	fghijk	24.3	ef
PAC249	95	87307	e	132	35.6	k	22.4	fg
Mean		90968		138	39.6		26.6	
LSD 5%		7510			2.9		2.9	
CV%		6.0			6.0		7.2	

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
PAC432	107	92925	abc	132	40.6	bc	29.9	a
P1636	112	94739	ab	133	36.3	defgh	29.2	ab
P0791	106	92784	abc	132	39.1	bcd	28.8	abc
C56-C4	106	93298	ab	131	38.7	bcde	28.2	abcd
CMX4735PC	107	92014	abc	132	37.1	cdefg	27.4	bcde
P1253	109	91966	abc	133	35.7	efgh	27.3	bcde
PAC564	113	92642	abc	133	34.2	gh	27.2	bcde
P9721	97	95410	ab	124	39.7	bc	26.7	cdef
PAC456	108	88423	bc	133	36.5	defgh	26.5	defg
Plenitude	107	92704	abc	132	35.4	fgh	26.3	defg
Z71-F1	111	92919	abc	133	30.0	i	26.3	defgh
PAC314	101	80078	d	130	38.5	bcdef	26.1	defgh
Brutus	105	92604	abc	131	39.2	bcd	26.0	efgh
N51-N4	104	94165	ab	130	47.7	a	25.9	efgh
Afinity	100	92876	abc	124	40.9	b	25.9	efgh
Olympiad	112	92741	abc	133	35.3	fgh	25.3	efghi
Velocity	98	96307	a	124	38.3	bcdef	24.7	fghij
N39-Q1	97	94080	ab	124	37.9	bcdef	24.6	ghij
PAC343	104	89990	abc	131	35.8	efgh	24.6	ghij
Maximus	102	91504	abc	131	37.2	cdefg	24.1	hij
C29-A1	96	93756	ab	124	33.5	h	23.6	ij
P9911	99	96751	a	130	37.8	bcdef	23.2	j
PAC249	95	85486	cd	124	37.2	cdefg	22.9	j
Mean		92181		130	37.5		26.1	
LSD 5%		7513			3.2		2.1	
CV%		6.0			5.9		5.8	

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
PAC432	107	91479	defghi	131	35.3	cd	30.5	a
Z71-F1	111	94627	abcde	138	36.4	abcd	30.3	a
P1636	112	96188	abc	138	38.8	ab	30.0	a
CMX4735PC	107	91652	defghi	131	35.8	bcd	29.2	ab
PAC456	108	88065	hij	131	35.1	cd	28.5	abc
PAC343	104	96898	ab	125	35.1	cd	27.5	abcd
P0791	106	90127	fghij	131	33.7	de	27.1	bcde
PAC564	113	90483	efghij	138	34.8	cd	26.9	bcde
Olympiad	112	94351	abcdef	138	36.6	abcd	26.7	bcde
Brutus	105	92016	cdefgh	125	34.5	cde	26.6	bcdef
P9911	99	91048	defghi	125	34.6	cde	26.4	cdefg
Plenitude	107	92428	cdefg	131	37.6	abc	26.4	cdefg
Maximus	102	95117	abcd	125	34.0	de	26.3	cdefg
N51-N4	104	92559	cdefg	125	39.2	a	25.4	defgh
P1253	109	93022	bcdefg	131	34.5	cde	25.0	defghi
Afinity	100	97629	a	119	33.7	de	24.8	defghi
C56-C4	106	92853	bcdefg	119	34.0	de	24.7	defghi
C29-A1	96	93580	abcdefg	119	31.5	ef	24.7	efghi
PAC314	101	86453	j	119	29.0	f	23.8	fghi
Velocity	98	94116	abcdefg	119	35.1	cd	23.8	ghi
P9721	97	90042	ghij	119	33.8	de	23.5	hi
N39-Q1	97	93736	abcdefg	119	33.9	de	22.7	i
PAC249	95	87646	ij	119	33.4	de	22.4	i
Mean		92440		127	34.8		26.2	
LSD 5%		4275			3.3		2.8	
CV%		3.0			6.8		7.2	

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
PAC564	113	89202	bcdef	161	35.8	bcdef	33.1	a
Z71-F1	111	89895	abcdef	157	38.5	abc	30.8	ab
PAC432	107	90832	abcdef	152	41.0	a	30.1	abc
P1636	112	91863	abcde	161	35.6	bcdefg	29.4	bcd
PAC456	108	86842	defg	157	38.1	abcd	28.2	bcde
CMX4735PC	107	82222	g	152	37.8	abcde	27.3	cdef
P1253	109	88671	cdefg	157	39.3	ab	27.2	cdef
Olympiad	112	95032	ab	152	33.7	efghi	26.9	cdef
P9911	99	92124	abcd	146	35.1	cdefg	26.8	cdefg
P0791	106	85972	efg	152	36.0	bodef	26.3	defgh
Plenitude	107	88218	cdefg	152	34.9	cdefgh	26.2	efghi
PAC343	104	88110	cdefg	146	33.3	fghi	25.8	efghi
Velocity	98	95690	a	136	32.8	fghi	25.8	efghi
Maximus	102	91259	abcde	146	34.3	defghi	25.4	efghi
P9721	97	90431	abcdef	136	31.3	ghi	24.9	fghij
C56-C4	106	89715	abcdef	146	36.4	abcdef	24.6	fghij
N39-Q1	97	91716	abcde	141	34.7	cdefgh	24.2	fghij
C29-A1	96	93118	abc	136	30.5	i	24.1	fghij
PAC249	95	88752	cdefg	136	31.6	ghi	23.9	ghij
PAC314	101	83575	fg	146	31.0	hi	23.8	hij
Brutus	105	87710	cdefg	146	36.8	abcdef	23.4	ij
Afinity	100	90803	abcdef	136	30.5	i	22.3	j
Mean		89625		148	35.0		26.4	
LSD 5%		6369			4.2		3.1	
CV%		5.0			8.3		8.0	

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
Z71-F1	111	98085	a	144	38.8	de	32.4	a
P1636	112	93286	ab	153	43.6	a	30.8	ab
PAC564	113	86950	c	153	42.3	abc	30.6	abc
P1253	109	95365	ab	144	42.0	abc	30.4	abc
CMX4735PC	107	92812	abc	144	40.8	bcd	30.0	abcd
PAC343	104	95082	ab	136	40.5	bcd	29.6	abcde
PAC432	107	90108	bc	144	40.1	cd	29.5	bcde
PAC456	108	92579	abc	144	41.0	abc	29.3	bcde
P0791	106	92925	abc	144	42.6	ab	29.1	bcdef
C56-C4	106	92092	abc	136	41.9	abc	28.1	cdefg
Plenitude	107	93453	ab	144	43.6	a	27.5	defg
P0640	106	90611	bc	153	40.9	abcd	26.7	efgh
Brutus	105	91666	bc	136	41.6	abc	26.6	fgh
N51-N4	104	91150	bc	136	41.0	abcd	25.7	ghi
Olympiad	112	92364	abc	144	37.6	e	24.5	hi
Maximus	102	94012	ab	122	30.4	f	23.2	i
Mean		92659		142	40.5		28.4	
LSD 5%		6311			2.3		2.7	
CV%		5.0			3.8		6.6	

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
PAC343	104	84853	abcde	151	42.9	a	24.7	a
PAC314	101	64128	ij	146	40.3	bcd	21.8	b
C29-A1	96	91065	ab	143	37.4	ghij	21.7	b
Velocity	98	93658	a	136	38.1	efghi	20.9	bc
P9911	99	72459	ghi	153	42.8	a	20.8	bcd
N39-Q1	97	87145	abcd	139	38.5	cdefg	20.5	bcd
CMS Comet	92	91917	ab	136	38.6	cdefg	20.4	bcd
P9721	97	82690	bcdefg	143	38.6	cdefg	20.3	bcde
Afinity	100	86661	abcde	139	37.6	ghij	20.0	bcdef
Maximus	102	84319	abcdef	143	36.5	j	19.9	bcdef
CMX2303PC	90	88439	abc	136	39.3	cdef	19.8	bcdef
PAC132	94	74016	ghi	143	36.3	j	19.3	cdef
CMX1566PC	85	92526	ab	129	38.4	defgh	19.2	cdef
PAC249	95	71330	hi	139	36.6	ij	19.0	cdef
P9400	94	78145	defgh	135	37.7	fghij	18.8	def
PAC065	89	76693	efghi	139	38.5	cdefg	18.3	efg
PAC040	80	90250	ab	129	39.4	cde	18.3	efg
PAC123	91	78901	cdefgh	136	41.5	ab	18.1	fg
P8805	88	74293	fghi	134	41.5	ab	16.2	gh
N23-K3	87	79974	cdefgh	133	36.8	hij	15.8	h
Delitop	78	86501	abcde	133	41.5	ab	15.3	hi
Titus	82	74030	ghi	133	38.0	efghij	15.2	hi
Mean		79570		138	39.1		18.9	
LSD 5%		10678			1.7		2.1	
CV%		8.0			2.9		6.7	

Please note Obelix and 39G12 have been removed due to low populations.

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
P9911	99	95414	abcd	141	36.8	defgh	22.3	a
PAC343	104	85341	def	141	36.0	fgh	21.0	ab
N39-Q1	97	92448	abcde	138	38.3	cd	21.0	abc
PAC314	101	92889	abcde	141	35.6	ghi	20.9	abc
PAC132	94	88472	bcdef	138	37.0	defg	20.6	abc
C29-A1	96	98174	a	141	38.2	cd	20.3	abc
CMS Comet	92	97100	ab	128	36.4	efgh	20.1	abcd
PAC249	95	90837	abcdef	131	35.4	hi	20.0	abcd
CMX2303PC	90	95557	abc	128	35.4	hi	19.5	bcde
Velocity	98	91699	abcdef	131	37.0	defg	19.4	bcdef
PAC065	89	84704	ef	138	38.1	cd	19.1	bcdef
P9721	97	95156	abcd	131	34.5	i	19.0	bcdefg
PAC123	91	88774	bcdef	138	40.7	a	18.9	bcdefg
Afinity	100	94670	abcd	131	34.4	i	18.8	bcdefg
CMX1566PC	85	97009	ab	126	38.1	cd	18.7	cdefg
Obelix	94	91018	abcdef	128	37.8	cde	17.9	defgh
P9400	94	88552	bcdef	131	36.4	efgh	17.6	efghi
N23-K3	87	98692	a	128	37.2	def	17.4	efghi
Maximus	102	83698	ef	141	34.3	i	17.0	fghij
PAC040	80	91733	abcdef	131	39.1	abc	16.6	ghijk
P8805	88	82405	f	128	38.4	cd	15.9	hijk
Delitop	78	89133	abcdef	126	38.9	bc	15.4	ijk
39G12	78	93051	abcde	126	39.9	ab	14.6	jk
Titus	82	86427	cdef	126	38.3	cd	14.3	k
Mean		91373		133	37.2		18.6	
LSD 5%		9841			1.5		2.4	
CV%		7.0			2.7		8.1	

silage 2017/18 data

HYBRID	CRM	Plants per hectare		Days to harvest	Harvest dry matter (%)		Yield (t DM/ha)	
		Result	Significance		Result	Significance	Result	Significance
CMX2303PC	90	105263	abc	146	29.4	de	24.0	a
CMX1566PC	85	102632	abcd	146	38.5	a	23.9	ab
CMS Comet	92	105921	ab	146	29.1	de	23.0	abc
PAC132	94	96053	cd	146	28.0	e	21.5	abcd
PAC040	80	100658	abcd	146	31.9	bcde	21.3	abcd
PAC065	89	102632	abcd	146	29.8	de	21.2	abcd
P8805	88	93421	d	146	35.3	abc	20.9	abcde
39G12	78	107895	a	146	36.5	ab	20.9	bcde
PAC123	91	100658	abcd	146	34.0	abcd	20.3	cde
38V12	91	107237	a	146	30.5	cde	20.2	cde
Obelix	94	106579	a	146	32.6	bcde	20.1	cde
N23-K3	87	103289	abc	146	33.7	abcd	19.4	de
Delitop	78	106579	a	146	33.5	abcde	19.3	de
Titus	82	109211	a	146	32.9	bcde	18.1	e
Mean		102982		146	32.8		21.0	
LSD 5%		9245			5.3		3.1	
CV%		6.0			11.2		10.4	

HYBRID	CRM	Plants per hectare		Harvest moisture (%)		Test weight (kg/hl)		Yield (t/ha @14% moisture)	
		Result	Significance	Result	Significance	Result	Significance	Result	Significance
PAC564	113	90369	df	25.1	a	67.7	h	18.2	a
P1253	109	93528	af	22.5	de	78.7	a	16.9	ab
PAC343	107	96838	ab	20.7	gh	73.1	ce	16.9	ab
PAC432	108	90286	df	22.1	e	72.7	df	16.5	b
P1636	112	97262	a	24.5	ab	73.9	bd	16.4	bc
Plenitude	107	91390	cf	21.2	fg	71.8	ef	16.2	bd
Afinity	100	97184	a	19.6	ij	72.8	df	16.1	bd
Olympiad	112	95751	ac	23.2	cd	70.0	g	15.7	be
P9721	97	92940	af	20.0	hj	73.1	ce	15.5	be
CMX4735PC	107	89705	ef	21.2	fg	72.7	df	15.4	be
N51-N4	104	91023	cf	20.7	gh	73.0	ce	15.4	bf
N39-Q1	97	94217	ae	19.6	ij	72.5	df	15.1	cf
C29-A1	96	88562	f	20.2	hj	73.3	ce	15.1	cf
PAC249	101	83469	g	19.5	j	72.3	df	15.0	df
PAC456	108	91850	cf	22.0	ef	73.5	cd	15.0	df
P9911	99	92374	af	19.7	ij	74.3	bc	14.5	ef
Brutus	105	91988	bf	23.9	bc	72.5	df	13.9	f
Maximus	102	94552	ae	22.4	de	71.5	f	13.7	f
Velocity	98	95065	ad	20.3	gi	75.3	b	13.7	f
Mean		91863		21.4		73.0		15.5	
LSD 5%		5292		0.9		1.6		1.5	
CV%		3.8		2.8		1.4		5.8	

grain 2017/18 data

HYBRID	CRM	Plants per hectare		Root lodging (%)		Harvest moisture (%)		Test weight (kg/hl)		Yield (t/ha @14% moisture)	
		Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.
PAC564	113	91930	ab	12.0	ac	29.4	a	67.6	j	17.8	a
PAC343	107	94913	ab	5.0	cf	24.2	ef	70.5	eh	17.3	ab
P1636	112	91386	ab	2.3	ef	26.8	b	72.3	bd	17.1	ac
CMX4735PC	107	89863	ab	2.3	ef	24.1	ef	72.3	bd	16.2	bd
PAC432	108	87956	bd	9.5	ae	24.8	de	69.9	gi	15.8	bd
P1253	109	89287	ab	2.8	ef	25.1	d	75.2	a	15.7	cd
PAC314	104	80518	d	13.3	ab	23.5	fh	72.7	bc	15.6	cd
N51-N4	104	94234	ab	0.0	f	22.8	hj	71.9	be	15.2	de
P9721	97	88041	bd	3.0	df	22.7	hj	70.3	fh	15.2	de
Afinity	100	90370	ab	15.7	a	23.8	fg	72.0	bd	15.2	de
PAC456	108	87274	bd	0.8	f	25.0	d	71.3	cf	15.1	df
P9911	99	90524	ab	7.0	bf	23.1	gj	72.5	bc	15.0	dg
Olympiad	112	81195	cd	10.8	ad	26.7	b	68.7	ij	13.9	eh
Plenitude	107	90012	ab	4.3	cf	24.1	ef	71.1	dg	13.6	fh
Brutus	105	88796	ac	1.5	f	25.9	c	73.1	b	13.6	fh
Velocity	98	96066	a	7.8	bf	22.7	ij	74.8	a	13.6	fh
PAC249	101	80759	d	1.0	f	23.3	gi	71.6	cf	13.6	gh
C29-A1	96	89501	ab	7.5	bf	22.5	j	73.0	b	13.4	hi
Maximus	102	92031	ab	1.0	f	25.3	cd	69.5	hi	12.9	hi
N39-Q1	97	88292	ad	11.5	ac	22.7	ij	71.4	cf	12.0	i
Mean		89147		5.9		24.4		71.6		14.9	
LSD 5%		7987		7.8		0.8		1.4		1.5	
CV%		6.4		93.6		2.2		1.4		7.2	

grain 2017/18 data

HYBRID	CRM	Plants per hectare		Root lodging (%)		Harvest moisture (%)		Test weight (kg/hl)		Yield (t/ha @14% moisture)	
		Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.
PAC564	113	91645	abcd	1.5	cdef	28.0	a	69.9	hi	18.6	a
PAC432	107	91911	abcd	0.8	def	22.0	de	70.9	efgh	17.9	ab
P1636	112	94990	ab	3.5	bcde	24.8	b	73.0	bc	17.8	ab
Afinity	100	91911	abcd	1.5	cdef	19.6	ijk	71.5	def	16.9	bc
PAC343	104	90711	bcd	0.8	def	21.0	fg	70.6	fghi	16.8	bc
PAC456	108	90336	bcd	3.8	bcd	22.2	de	72.0	de	16.5	cd
CMX4735PC	107	90329	bcd	1.3	def	20.9	fg	71.8	de	16.4	cd
P1253	109	90459	bcd	1.3	def	21.6	ef	75.6	a	16.1	cde
P9911	99	95038	ab	2.8	bcdef	20.1	hi	72.0	cd	15.8	cdef
PAC314	101	83910	ef	0.3	f	20.2	ghi	72.2	cd	15.5	defg
N51-N4	104	93316	abcd	0.0	f	20.7	gh	71.5	def	15.1	efgh
C29-A1	96	91662	abcd	0.0	f	19.7	ij	71.8	de	15.1	efgh
N39-Q1	97	93862	abc	0.5	ef	19.2	jkl	70.1	hi	15.0	efgh
P9721	97	94334	abc	5.3	b	18.7	i	69.9	hi	15.0	fgh
Plenitude	107	89818	bcd	2.5	bcdef	20.3	ghi	71.3	defg	14.8	fghi
Olympiad	112	93115	abcd	11.0	a	23.8	c	69.9	hi	14.7	fghi
Velocity	98	96059	a	2.8	bcdef	18.8	kl	73.3	b	14.4	ghi
Brutus	105	88088	de	2.5	bcdef	24.6	bc	72.3	bcd	14.1	hi
PAC 249	95	82763	f	4.5	bc	18.7	i	70.3	ghi	13.8	i
Maximus	102	89712	cd	1.0	def	22.7	d	69.5	i	12.6	j
Mean		91199		2.4		21.4		71.5		15.6	
LSD 5%		5268		3.2		0.8		1.1		1.2	
CV%		4.1		96.3		2.7		1.1		4.6	

grain 2017/18 data

HYBRID	CRM	Plants per hectare		Root lodging (%)		Harvest moisture (%)		Test weight (kg/hl)		Yield (t/ha @14% moisture)	
		Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.
PAC564	113	88787	bc	5.3	ac	25.8	a	68.8	f	19.2	a
P1636	112	93492	ab	0.4	c	23.8	b	74.0	b	17.6	b
PAC343	107	95927	a	9.9	ab	20.2	g	73.4	bc	17.0	bc
P1253	109	91525	ab	6.6	ac	21.5	de	78.0	a	16.6	bd
PAC314	104	79206	d	2.3	bc	20.5	fg	73.5	bc	16.3	be
CMX4735PC	107	86601	bc	4.8	ac	21.2	ef	73.7	bc	16.0	cf
PAC432	108	86537	bc	10.9	ab	21.1	eg	72.7	cd	15.7	cf
P0640	106	89757	ac	9.5	ab	22.2	cd	71.5	de	15.4	df
N51-N4	104	95887	a	7.7	ac	20.3	fg	72.7	cd	15.3	df
PAC456	108	86976	bc	8.3	ac	23.1	bc	73.2	bc	15.0	eg
Plenitude	107	82687	cd	2.9	bc	20.3	fg	73.6	bc	14.8	fg
Olympiad	112	91181	ab	11.3	a	22.8	c	70.6	e	14.7	fg
Brutus	105	91109	ab	4.6	ac	22.8	c	73.6	bc	13.7	gh
Maximus	102	89683	ac	8.1	ac	22.3	cd	70.6	e	12.8	h
Mean		89240		6.6		22.0		72.8		15.7	
LSD 5%		6796		8.8		0.9		1.2		1.4	
CV%		5.3		116.8		2.9		1.2		5.5	

grain 2017/18 data

HYBRID	CRM	Plants per hectare		Harvest moisture (%)		Test weight (kg/hl)		Yield (t/ha @14% moisture)	
		Result	Significance	Result	Significance	Result	Significance	Result	Significance
PAC343	104	82475	bcde	21.9	a	69.8	ijk	16.1	a
Afinity	100	88232	abc	20.6	b	69.3	jk	15.6	ab
P9911	99	80496	cdef	20.7	b	68.9	k	15.5	abc
CMS Comet	92	95280	a	18.0	hi	69.2	jk	14.9	bcd
PAC249	95	78611	cdefg	19.8	cde	70.1	ijk	14.4	cde
C29-A1	96	84665	bcd	20.2	bc	70.6	ij	14.0	de
Velocity	98	91050	ab	19.5	def	72.4	gh	13.9	def
PAC123	91	84467	bcd	18.2	gh	75.1	cde	13.5	ef
P9721	97	79604	cdef	18.5	gh	71.5	hi	13.4	ef
Maximus	102	77477	defg	22.3	a	69.2	jk	12.9	fg
P9400	94	83371	bcde	17.9	hi	75.8	bc	12.8	fgh
P8805	88	74402	efg	17.6	i	73.0	fgh	12.7	fgh
N39-Q1	97	76046	defg	19.9	cd	70.1	ijk	12.7	fgh
CMX2303PC	90	86036	abcd	19.4	def	75.3	cd	12.7	fgh
CMX1566PC	85	88588	abc	19.2	ef	74.2	def	12.6	fgh
PAC065	89	68242	g	18.4	gh	72.4	gh	12.4	fgh
PAC132	94	62935	g	18.8	fgh	71.6	ghi	12.3	fghi
PAC040	80	90563	ab	19.7	cdef	75.4	cd	12.0	ghi
Obelix	94	70293	fg	18.1	hi	73.0	fgh	11.9	ghi
Delitop	78	85006	bcd	18.5	gh	77.4	a	11.8	hi
N23-K3	87	89843	ab	18.3	gh	76.9	ab	11.0	ij
Titus	82	82882	bcde	18.9	fg	77.4	ab	10.3	jk
39G12	78	69226	g	18.5	gh	73.7	efg	9.8	k
Mean		81295		19.3		72.7		13.0	
LSD 5%		10398		0.7		1.6		1.2	
CV%		7.6		2.2		1.4		5.2	

grain 2017/18 data

HYBRID	CRM	Plants per hectare		Root lodging (%)		Harvest moisture (%)		Test weight (kg/hl)		Yield (t/ha @14% moisture)	
		Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.	Result	Signif.
P9911	99	96426	ab	0.7	de	21.3	cd	71.1	hi	15.5	a
PAC314	101	96916	ab	1.4	cde	21.3	cd	74.0	ef	14.5	ab
Afinity	100	98740	a	3.3	cde	21.1	cd	70.9	ij	14.4	ab
PAC065	89	89273	abc	0.8	cde	19.6	efghi	73.4	fg	14.3	ab
PAC343	104	84222	bc	0.1	e	25.4	a	69.5	k	14.2	ab
PAC249	95	90365	abc	2.8	cde	21.7	c	71.1	ij	14.2	ab
CMS Comet	92	90230	abc	4.0	bc	19.0	hij	69.9	jk	13.9	b
PAC132	94	93758	abc	0.2	e	21.5	cd	71.2	hi	13.9	bc
P9400	94	99706	a	0.0	e	18.5	ij	76.9	c	13.0	bcd
P9721	97	87146	bc	0.7	de	20.1	ef	71.1	ij	12.9	bcd
N39-Q1	97	92582	abc	0.8	cde	20.6	cde	71.1	hij	12.7	bcd
CMX1566PC	85	92716	abc	0.2	e	19.8	efgh	75.9	cd	12.4	cd
CMX2303PC	90	100005	a	9.4	a	20.0	efg	75.3	de	12.4	cde
Obelix	94	90818	abc	4.0	bc	19.0	hij	74.1	ef	12.4	de
Maximus	102	89080	abc	0.0	e	24.2	b	68.7	k	12.3	def
C29-A1	96	95606	ab	0.5	de	20.7	cde	71.7	hi	12.2	def
PAC123	91	97116	ab	0.4	de	19.1	fghij	75.4	d	12.2	def
Velocity	98	93538	abc	0.3	e	21.1	cd	72.5	gh	11.9	def
P8805	88	87328	abc	3.1	cde	18.4	j	73.8	f	11.8	def
PAC040	80	91454	abc	6.8	ab	20.5	de	75.9	cd	11.6	def
39G12	78	93547	abc	1.0	cde	18.5	ij	75.6	d	10.9	ef
Delitop	78	93361	abc	0.0	e	19.1	ghij	79.5	a	10.8	f
N23-K3	87	92857	abc	3.8	bcd	18.6	ij	78.6	ab	10.8	f
Titus	82	83931	c	1.5	cde	19.8	efgh	78.2	b	8.8	g
Mean		92530		1.9		20.4		73.6		12.7	
LSD 5%		12256		3.4		1.0		1.3		1.5	
CV%		8.6		116.8		3.2		1.1		7.9	

guiding principles

PURPOSE

- To provide objective measurement of the agronomic and quality performance of commercial maize hybrids available to the New Zealand arable industry across appropriate production regions.
- To foster industry adoption of proven hybrids to maximise industry efficiency and profitability.

The Maize Performance Trials (MPT) are organised and funded through the Maize Hybrid Performance Trial Committee with representatives from the FAR, NZ Plant Breeding & Research Association (NZPBRA), independent researchers and the participating seed companies. Secretarial services are provided by NZPBRA.

Any organisation or company may join the Committee if they agree to pay an appropriate share of the operating costs, participate in the running of the trials or contribute a service to the scheme.

Parties who are not members of the Committee are welcome to participate as observers in appropriate meetings where their hybrids are under discussion. If their involvement becomes long-term, they will be invited to join the Committee.

The Committee meets at least once a year to review the trial results, and at any other time, a meeting is required. The Committee views the field trial sites prior to harvest.

METHODOLOGY

The MPT comprises a single stage of hybrid testing administered through a single management committee. The committee recognises the purpose of the hybrid testing, and will not compromise the stakeholder requirements of the programme.

The trial programme focuses on the agronomic and quality characteristics of close-to-market pre-commercial and commercial maize hybrids. It is not intended to provide extra evaluation data for commercialisation decisions; the seed

companies must make these independently before the hybrids are entered into the MPT programme. The trial programme will evaluate silage and grain hybrids.

Harvest assessments are made at an agreed maturity value for the individual hybrids entered into the programme. These maturity values will be determined on a year-by-year basis by the Committee and an agreed harvest schedule is developed at the start of the season.

At each trial site, plots consisted of four rows, approximately 5 metres long, planted at 76 cm spacing. Each hybrid is replicated four times within a randomised complete block design. All data is collected from the middle two rows of the plot. Participating companies supplied relative maturity data for placement in trials. The plots are planted from pre-counted packets of seed using an air plot planter and harvested by hand.

In-season assessments include plant count, lodging and disease score; and harvest assessments include an assessment of ear rots, bird damage and yield. At silage harvest, a sample is taken from each plot to determine dry matter content. For grain hybrids, grain moisture and test weights are measured using a Dickey John GAC 2100 Agri moisture meter.

All information published by any party from the MPT programme must be clearly acknowledged as MPT data. The following statement must accompany any such publication.

This information has been generated by the Maize Performance Trial (MPT) operating procedures.

MPT represents the collaboration of the Foundation for Arable Research, the New Zealand Plant Breeding & Research Association and individual seed companies.

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