Pacific Seeds

Growing possibilities

2019 Pacific Seeds Hybrid Canola Plant Population by Seed Size/Count Trial Results

2019 Hyola® TD - Plant Population by Seed Count/Size Trial Details

Trial Location	Trial State	Trial Service Provider	Trial Purpose	Number of Plots (excl Buffers)	Number of Reps	Sowing Date	GSR (mm) Rainfall	Trial Mean Yield (t/ha)
York	WA	Living Farms	RR - Pop by Size	36	3	21.05.2019	304	2.02
Kojonup	WA	Kalyx	RR - Pop by Size	36	3	14.05.2019	280	1.17
Lake Bolac	VIC	Kalyx	RR - Pop by Size	36	3	15.05.2019	385	2.38
Greenethorpe	NSW	Kalyx	RR - Pop by Size	36	3	06.05.2019	135	0.58
Gnowangerup	WA	TrialCo	CT/TT - Pop by Size	72	3	18.05.2019	254	1.04
Nyabing	WA	Living Farms	CT/TT - Pop by Size	72	3	14.05.2019	240	1.54
Kellerberrin	WA	Living Farms	CT/TT - Pop by Size	72	3	02.05.2019	183	1.01
Wagin	WA	Living Farms	CT/TT - Pop by Size	72	3	14.05.2019	280	1.68
Lockhart	NSW	Kalyx	CT/TT - Pop by Size	72	3	06.05.2019	233	0.67
Ardlethan	NSW	Kalyx	CT/TT - Pop by Size	72	3	24.04.2019	185	0.49
Beulah	VIC	Kalyx	CT/TT - Pop by Size	72	3	29.04.2019	260	1.75

Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population by Seed Size Trial – RR Treatment Listing

Treatment #	Treatment Name	Hybrid	Seed Count (seeds/kg)	Population Target
1	Hyola 404RR-154-15	Hyola 404RR	154,000	15 plants per m2
2	Hyola 404RR-154-25	Hyola 404RR	154,000	25 plants per m2
3	Hyola 404RR-154-40	Hyola 404RR	154,000	40 plants per m2
4	Hyola 404RR-181-15	Hyola 404RR	181,000	15 plants per m2
5	Hyola 404RR-181-25	Hyola 404RR	181,000	25 plants per m2
6	Hyola 404RR-181-40	Hyola 404RR	181,000	40 plants per m2
7	Hyola 404RR-196-15	Hyola 404RR	196,000	15 plants per m2
8	Hyola 404RR-196-25	Hyola 404RR	196,000	25 plants per m2
9	Hyola 404RR-196-40	Hyola 404RR	196,000	40 plants per m2
10	Hyola 404RR-213-15	Hyola 404RR	213,000	15 plants per m2
11	Hyola 404RR-213-25	Hyola 404RR	213000	25 plants per m2
12	Hyola 404RR-213-40	Hyola 404RR	213000	40 plants per m2

2019 Greenethorpe NSW - RR Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population by Seed Size Trial – RR Quality Details

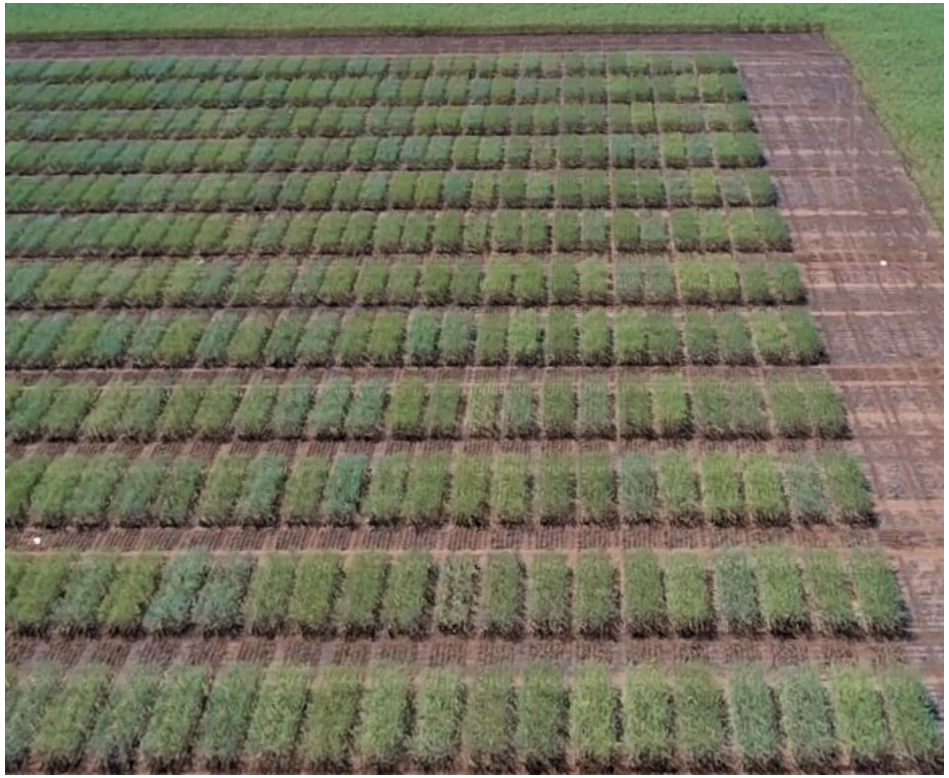
Treatment Numbers	Treatment Name	Seed Count (seeds/kg)	Population Targets	Germination %	Seed Vigor %	TSW & Seed Size (mm)
1,2,3	Hyola 404RR-154	154,000	15,25, 40 p/m2	99%	98%	6.49 2.0-2.2mm
4,5,6	Hyola 404RR-181	181,000	15,25, 40 p/m2	98%	94%	5.52 2mm
7,8,9	Hyola 404RR-196	196,000	15,25, 40 p/m2	96%	92%	5.10 2mm
10,11,12	Hyola 404RR-213	213,000	15,25, 40 p/m2	94%	90%	4.69 1.8<2mm

2019 Lake Bolac VIC - RR Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population by Seed Size Trial – TT/CT Treatment Listing

Treatment #	Treatment Name	Hybrid	Seed Count (seeds/kg)	Population Target
1	Hyola 350TT-112-15	Hyola 350TT	112,000	15 plants per m2
2	Hyola 350TT-112-25	Hyola 350TT	112,000	25 plants per m2
3	Hyola 350TT-112-40	Hyola 350TT	112,000	40 plants per m2
4	Hyola 350TT-130-15	Hyola 350TT	130,000	15 plants per m2
5	Hyola 350TT-130-25	Hyola 350TT	130,000	25 plants per m2
6	Hyola 350TT-130-40	Hyola 350TT	130,000	40 plants per m2
7	Hyola 350TT-155-15	Hyola 350TT	155,000	15 plants per m2
8	Hyola 350TT-155-25	Hyola 350TT	155,000	25 plants per m2
9	Hyola 350TT-155-40	Hyola 350TT	155,000	40 plants per m2
10	Hyola 559TT-150-15	Hyola 559TT	150,000	15 plants per m2
11	Hyola 559TT-150-25	Hyola 559TT	150,000	25 plants per m2
12	Hyola 559TT-150-40	Hyola 559TT	150,000	40 plants per m2
13	Hyola 559TT-180-15	Hyola 559TT	180,000	15 plants per m2
14	Hyola 559TT-180-25	Hyola 559TT	180,000	25 plants per m2
15	Hyola 559TT-180-40	Hyola 559TT	180,000	40 plants per m2
16	Hyola 559TT-213-15	Hyola 559TT	213,000	15 plants per m2
17	Hyola 559TT-213-25	Hyola 559TT	213,000	25 plants per m2
18	Hyola 559TT-213-40	Hyola 559TT	213,000	40 plants per m2
19	Hyola 580CT-206-15	Hyola 580CT	206,000	15 plants per m2
20	Hyola 580CT-206-25	Hyola 580CT	206,000	25 plants per m2
21	Hyola 580CT-206-40	Hyola 580CT	206,000	40 plants per m2
22	Hyola 580CT-220-15	Hyola 580CT	220,000	15 plants per m2
23	Hyola 580CT-220-25	Hyola 580CT	220,000	25 plants per m2
24	Hyola 580CT-220-40	Hyola 580CT	220,000	40 plants per m2



2019 Lockhart NSW - TT/CT Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population by Seed Size Trial – TT/CT Treatment Quality Details

Treatment Numbers	Treatment Name	Seed Count (seeds/kg)	Population Targets	Germination %	Seed Vigor %	TSW & Seed Size (mm)
1,2,3	Hyola 350TT-112	112,000	15,25, 40 p/m2	98%	98%	8.92 >2.2mm
4,5,6	Hyola 350TT-130	130,000	15,25, 40 p/m2	96%	95%	7.69 >2.2mm
7,8,9	Hyola 350TT-155	155,000	15,25, 40 p/m2	98%	95%	6.45 2.0-2.2mm
10,11,12	Hyola 559TT-150	150,000	15,25, 40 p/m2	97%	93%	6.66 2.0-2.2mm
13,14,15	Hyola 559TT-180	180,000	15,25, 40 p/m2	99%	97%	4.69 1.8<2mm
16,17,18	Hyola 559TT-213	213,000	15,25, 40 p/m2	92%	90%	4.69 1.8<2mm
19,20,21	Hyola 580CT-206	206,000	15,25, 40 p/m2	94%	93%	4.69 1.8<2mm
22,23,24	Hyola 580CT-220	220,000	15,25, 40 p/m2	91%	90%	4.69 1.8<2mm

2019 Beulah VIC - TT/CT Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population by Seed Size RR Technology Trials
Mean Agronomic Results – 4 Environments

Treatment	Mean % Target Population	Mean Plant Maturity Series	Mean Plant Height (cm)
Hyola 404RR-154-15	90	4.68	140
Hyola 404RR-154-25	86	4.25	138
Hyola 404RR-154-40	84	4.13	138
Hyola 404RR-181-15	82	4.58	140
Hyola 404RR-181-25	83	4.18	140
Hyola 404RR-181-40	78	4.00	138
Hyola 404RR-196-15	83	4.45	139
Hyola 404RR-196-25	78	4.43	138
Hyola 404RR-196-40	70	4.05	134
Hyola 404RR-213-15	73	4.50	137
Hyola 404RR-213-25	79	4.23	140
Hyola 404RR-213-40	68	3.83	134

2019 York WA RR Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population by Seed Size TT-CT Technology Trials
Mean Agronomic Results – 7 Environments

Treatment	Mean % Target Population	Mean Plant Maturity Series	Mean Plant Height (cm)
Hyola 350TT-112-15	88	3.94	128
Hyola 350TT-112-25	83	3.78	126
Hyola 350TT-112-40	78	3.59	125
Hyola 350TT-130-15	94	3.71	124
Hyola 350TT-130-25	86	3.66	124
Hyola 350TT-130-40	76	3.46	120
Hyola 350TT-155-15	87	3.61	124
Hyola 350TT-155-25	81	3.55	123
Hyola 350TT-155-40	77	3.34	120
Hyola 559TT-150-15	98	4.66	133
Hyola 559TT-150-25	85	4.71	131
Hyola 559TT-150-40	73	4.43	129
Hyola 559TT-180-15	95	4.97	129
Hyola 559TT-180-25	81	4.84	127
Hyola 559TT-180-40	69	4.79	123
Hyola 559TT-213-15	90	4.95	128
Hyola 559TT-213-25	77	5.00	129
Hyola 559TT-213-40	70	4.91	125
Hyola 580CT-206-15	89	5.11	132
Hyola 580CT-206-25	74	4.86	131
Hyola 580CT-206-40	69	4.75	127
Hyola 580CT-220-15	85	5.04	131
Hyola 580CT-220-25	74	5.14	133
Hyola 580CT-220-40	69	4.91	128

2019 Wagin WA TT-CT Trial Environment

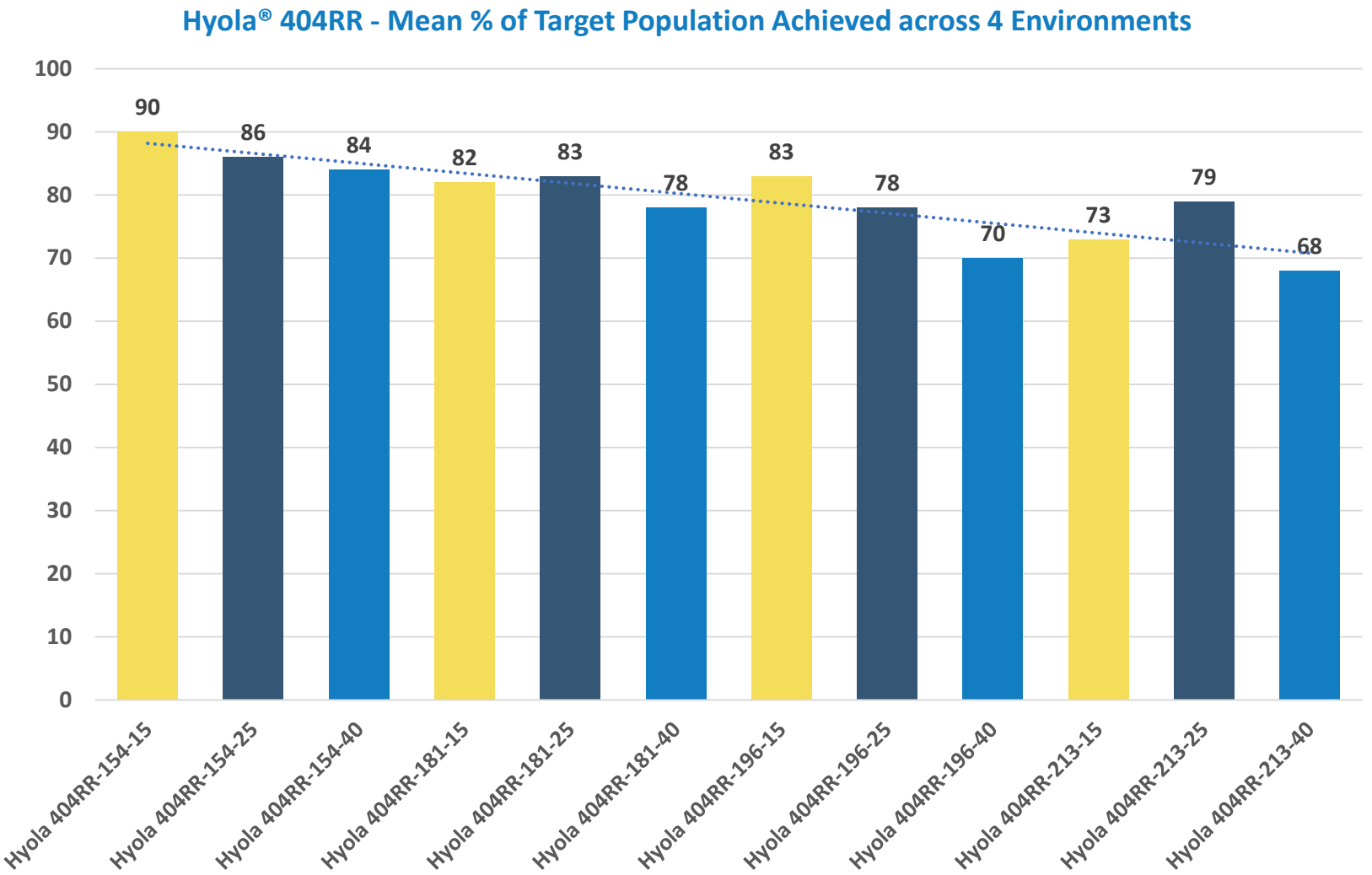
Pacific Seeds
Growing possibilities

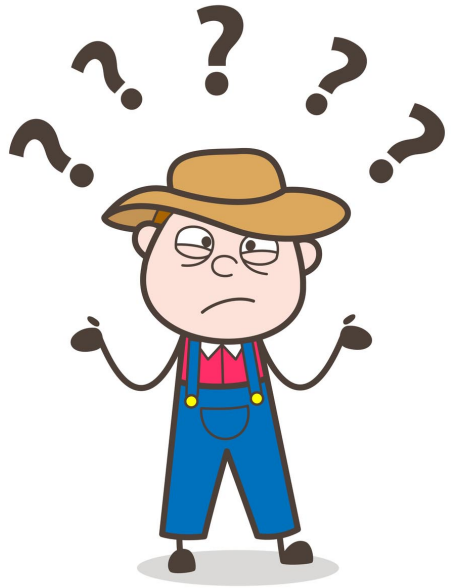
2019 Pacific Seeds Hybrid Canola Plant Population by Seed Size/Count Trial Results

- RR Hybrid Plant Population Comparisons
- TT-CT Hybrid Plant Population Comparisons

Photo: 2019 Lake Bolac Vic Trial Environment

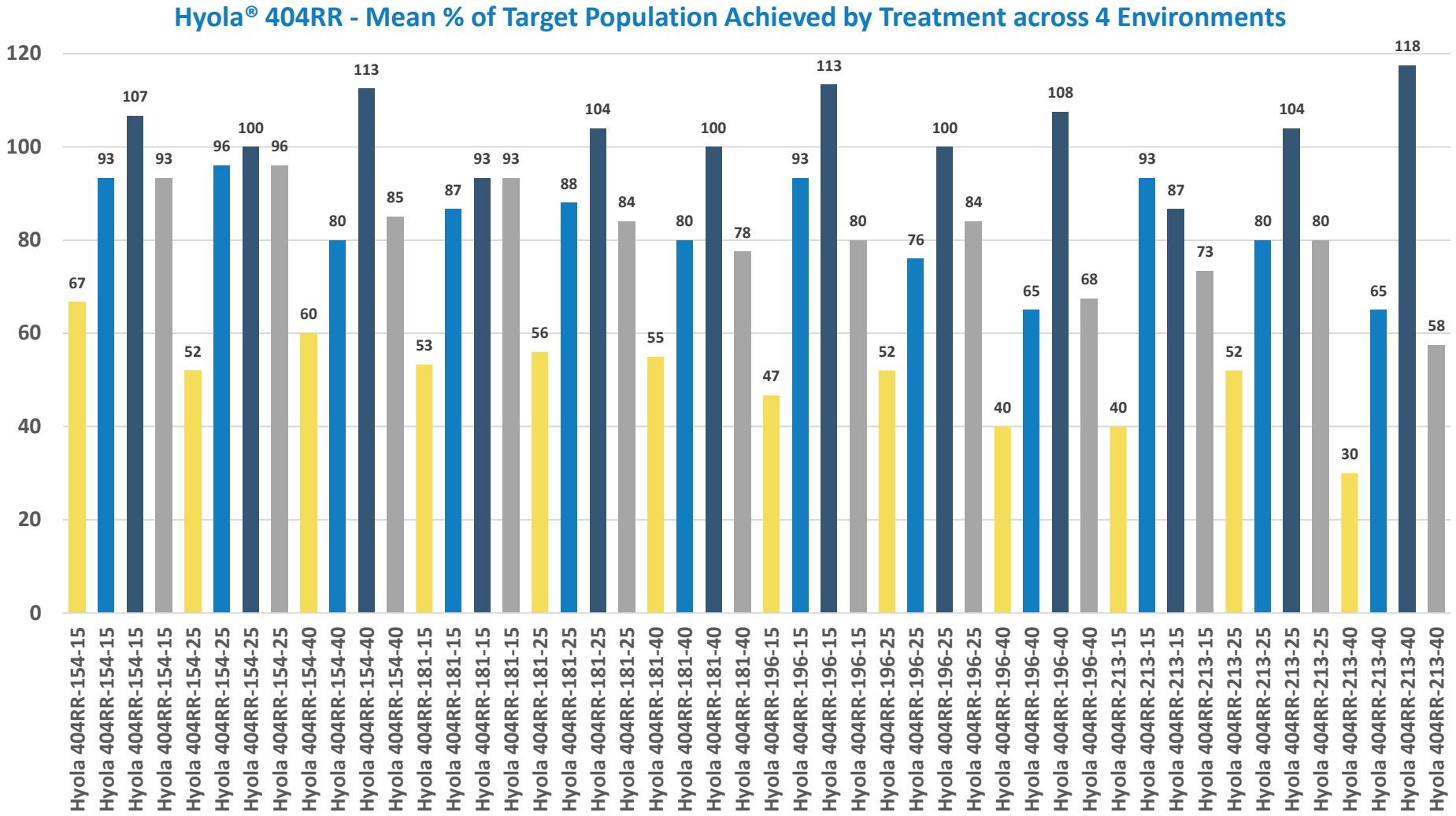
2019 Hyola® TD Plant Population Achieved vs Target Results – RR Technology





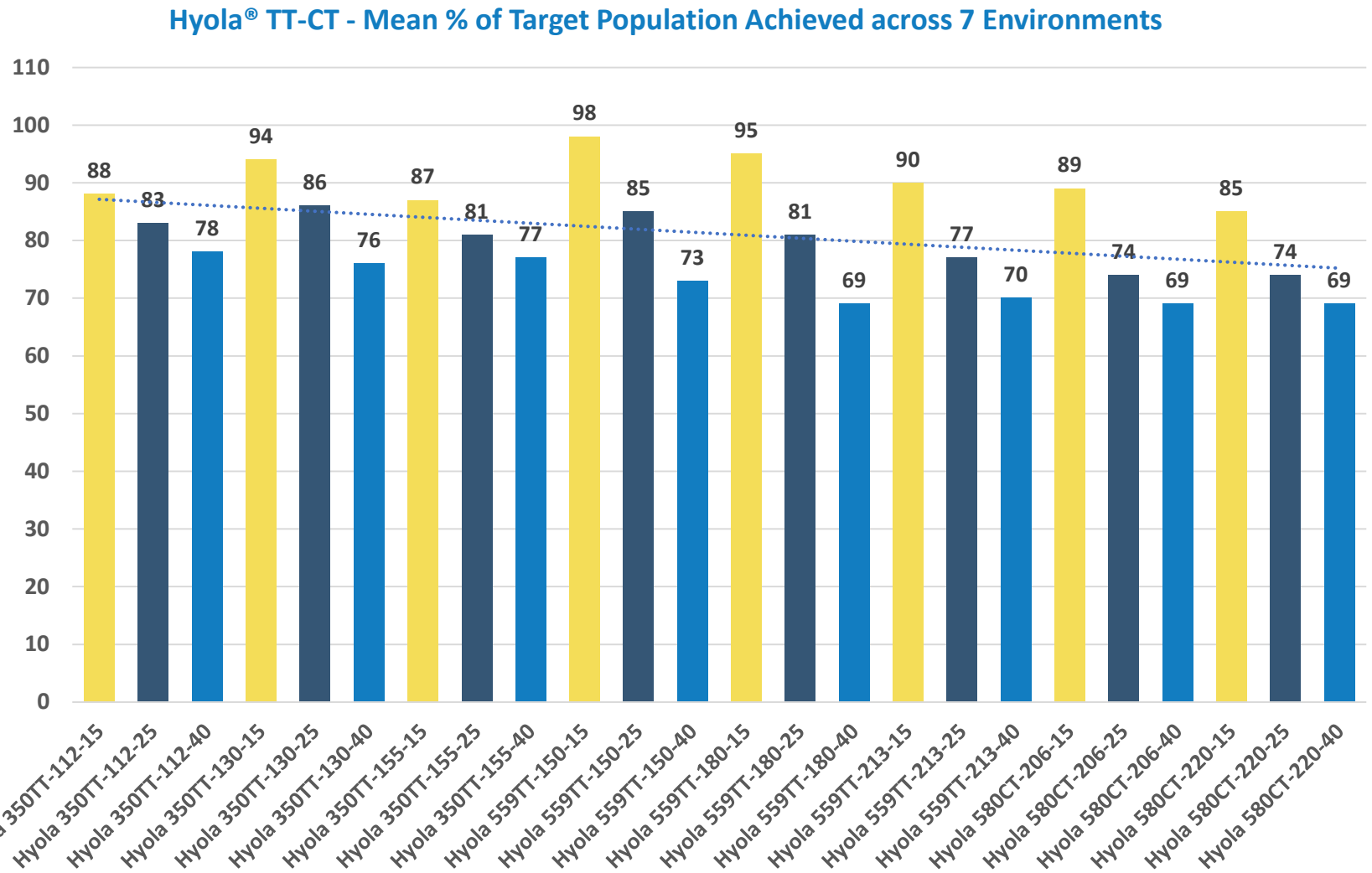
Pacific Seeds
Growing possibilities

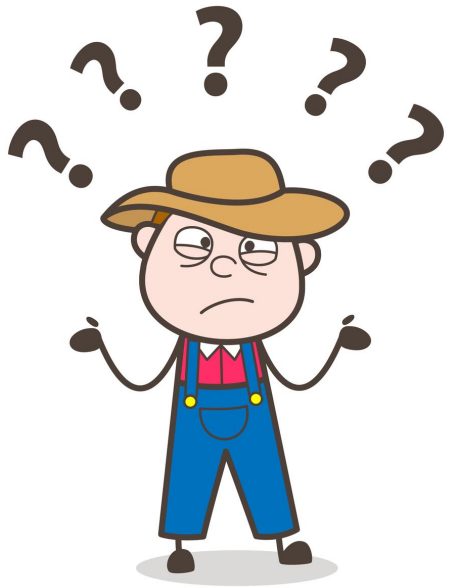
2019 Hyola® TD Plant Population Achieved vs Target Results – RR Technology



Pacific Seeds
Growing possibilities

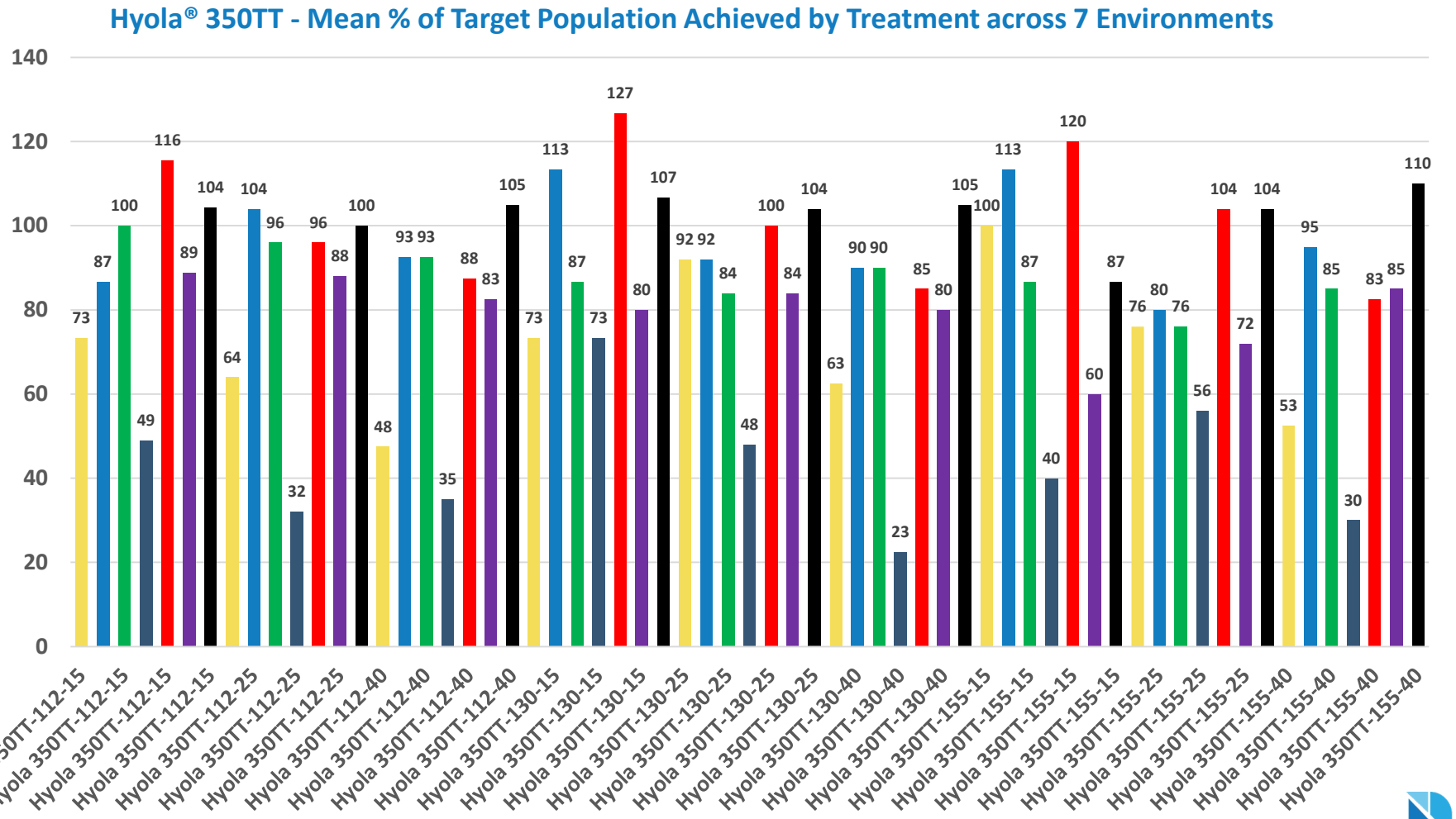
2019 Hyola® TD Plant Population Achieved vs Target Results – TT-CT Technology





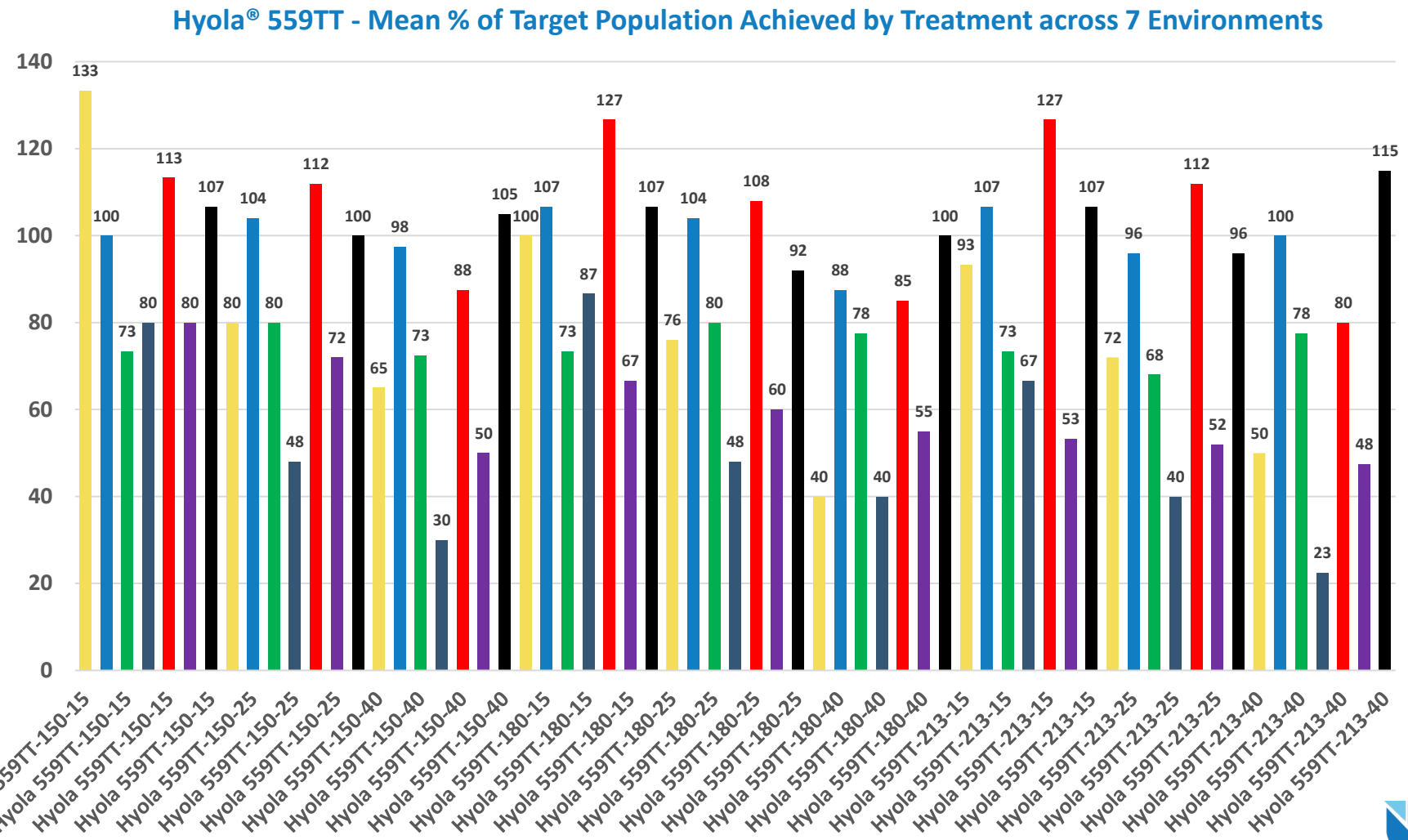
Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population Achieved vs Target Results – TT-CT Technology



Pacific Seeds
Growing possibilities

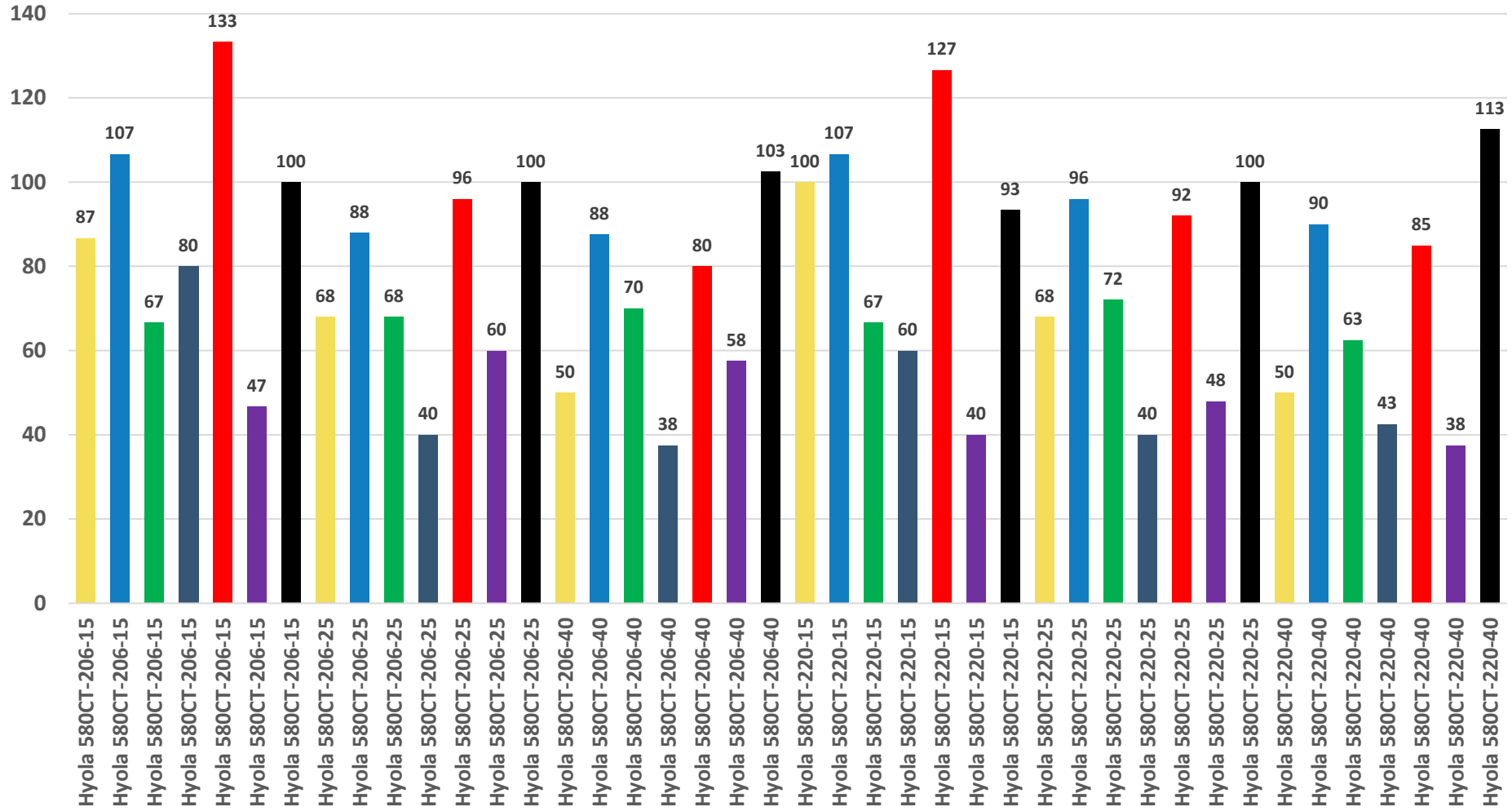
2019 Hyola® TD Plant Population Achieved vs Target Results – TT-CT Technology



Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Population Achieved vs Target Results – TT-CT Technology

Hyola® 580CT - Mean % of Target Population Achieved by Treatment across 7 Environments



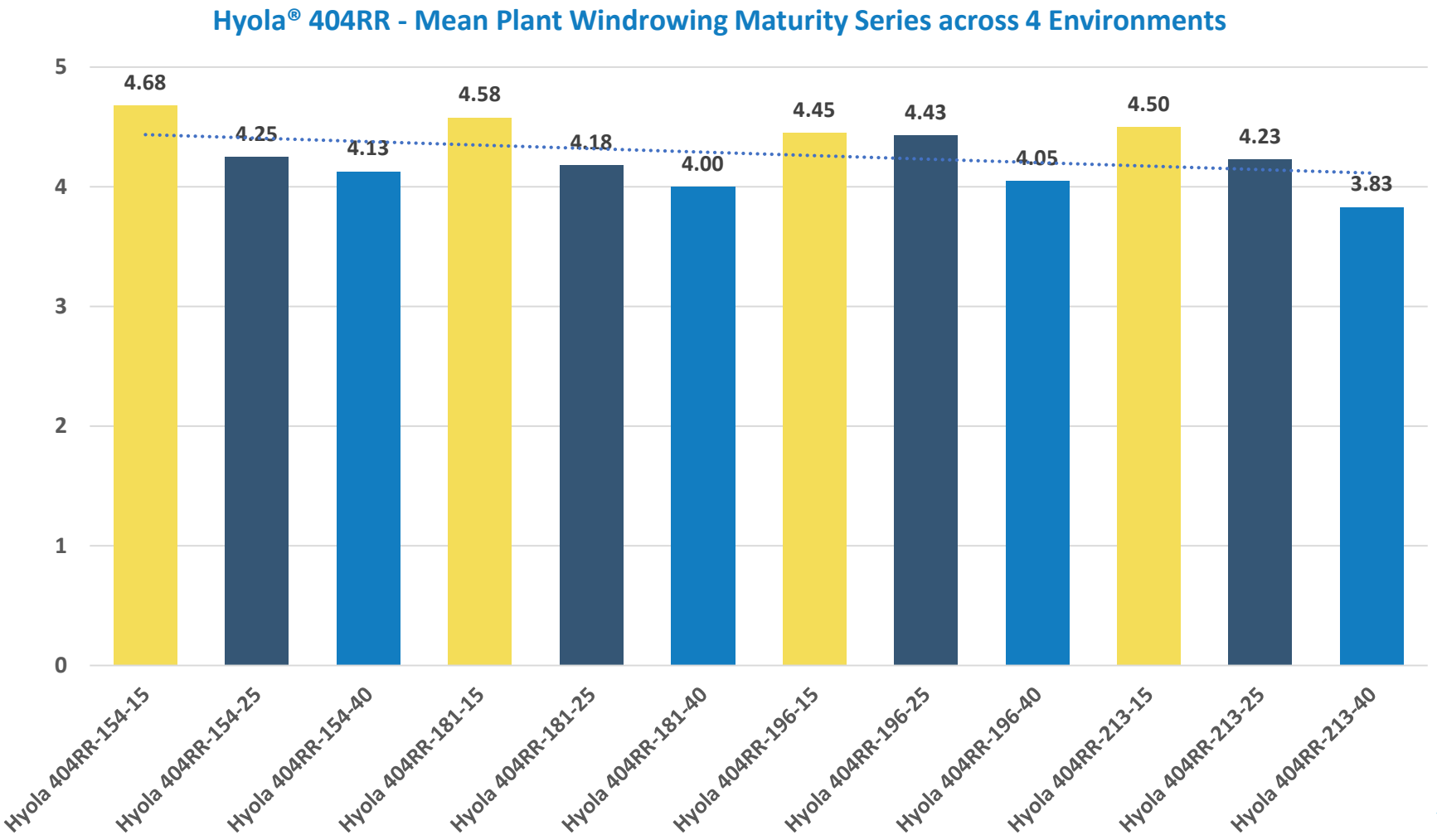
Pacific Seeds
Growing possibilities

2019 Pacific Seeds Hybrid Canola Plant Population by Seed Size/Count Trial Results

- RR Hybrid Windrowing Maturity and Plant Height Comparisons
- TT-CT Hybrid Windrowing Maturity and Plant Height Comparisons

Photo: 2019 Nyabing WA Trial Environment

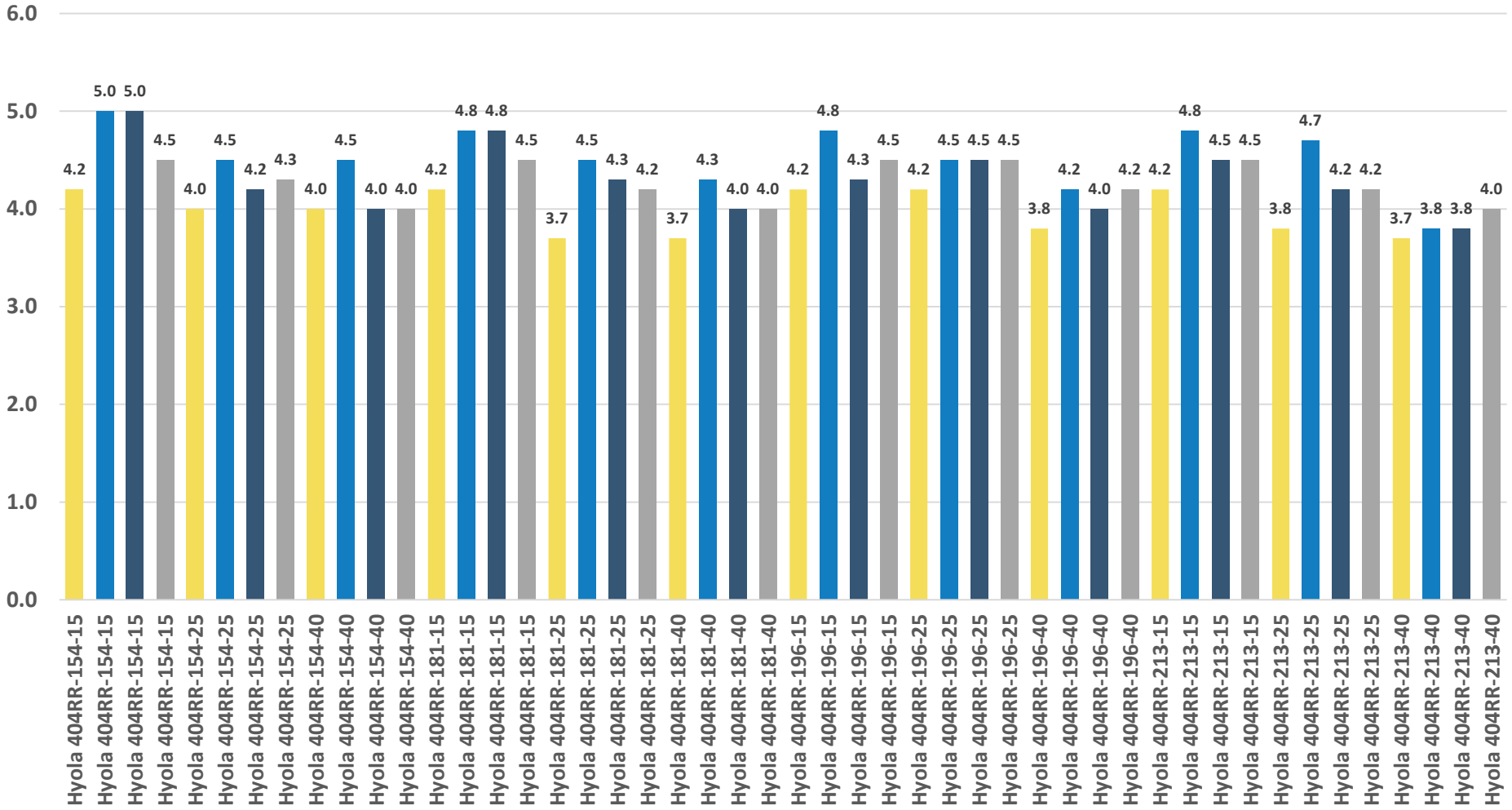
2019 Hyola® TD Windrowing Maturity Series Results – RR Hybrid Technology



Pacific Seeds
Growing possibilities

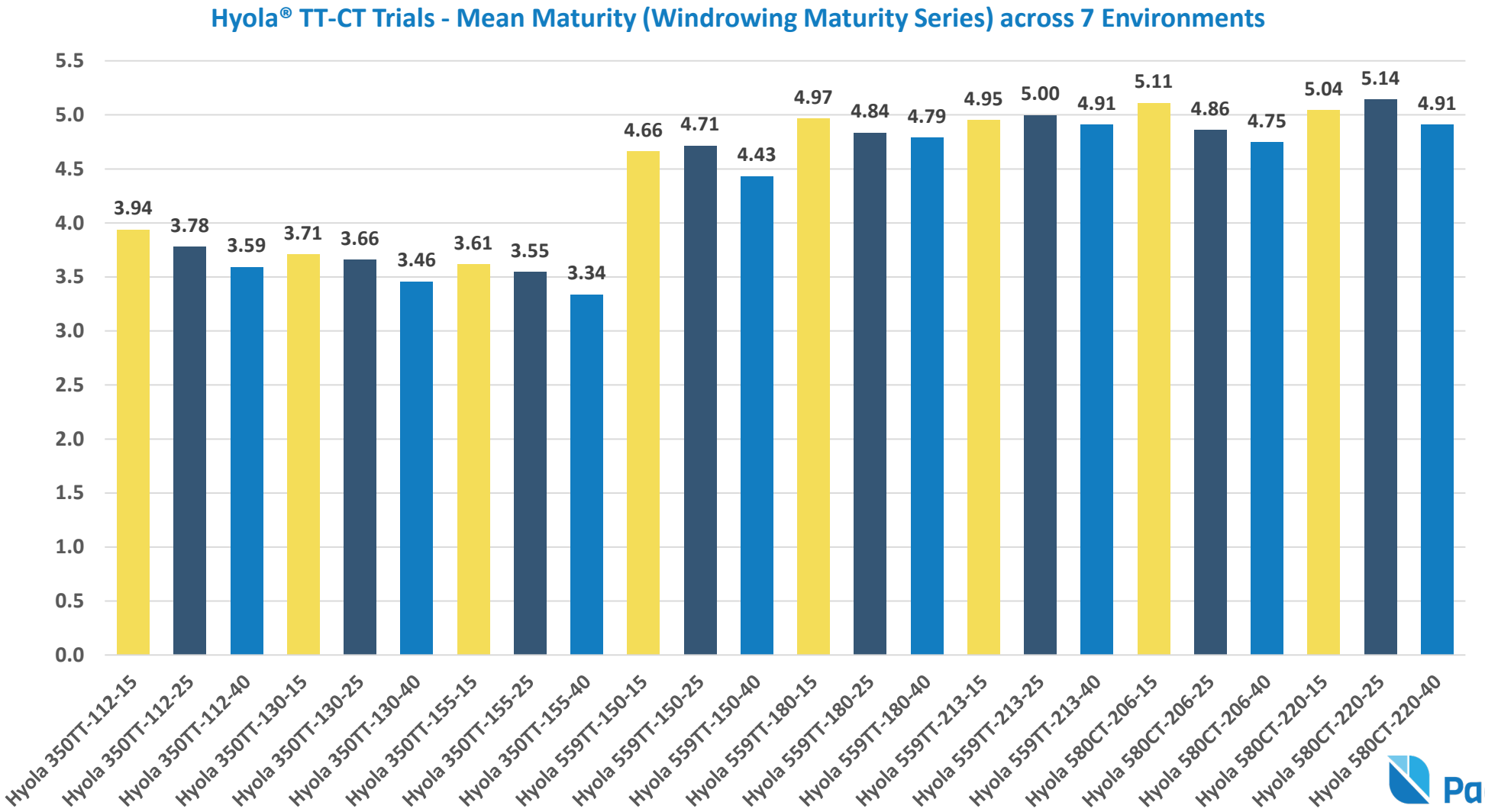
2019 Hyola® TD Windrowing Maturity Series Results – RR Hybrid Technology

Hyola® 404RR - Mean Plant Maturity Windrowing Series by Treatment across each Environment



Pacific Seeds
Growing possibilities

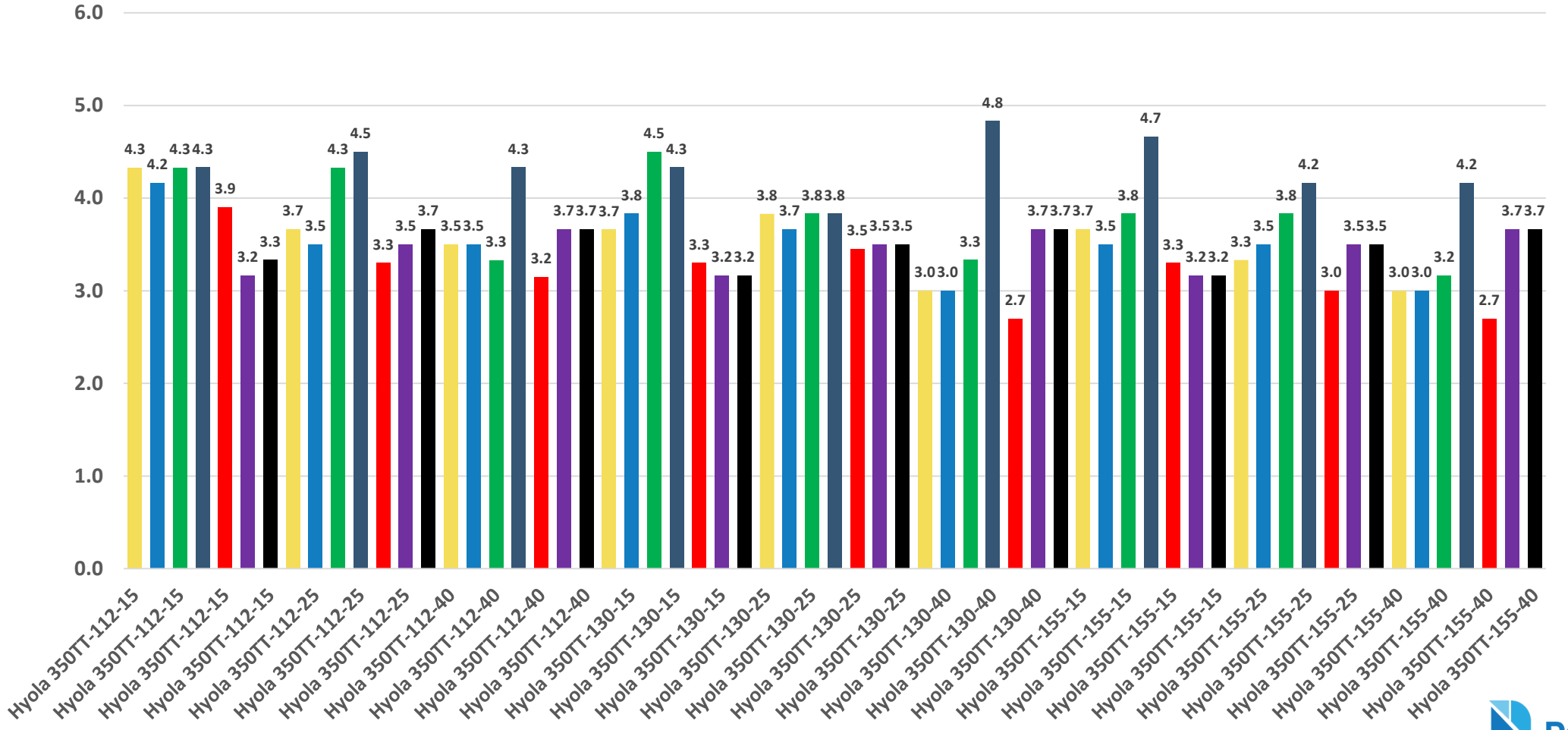
2019 Hyola® TD Windrowing Maturity Series Results – TT-CT Hybrid Technology



Pacific Seeds
Growing possibilities

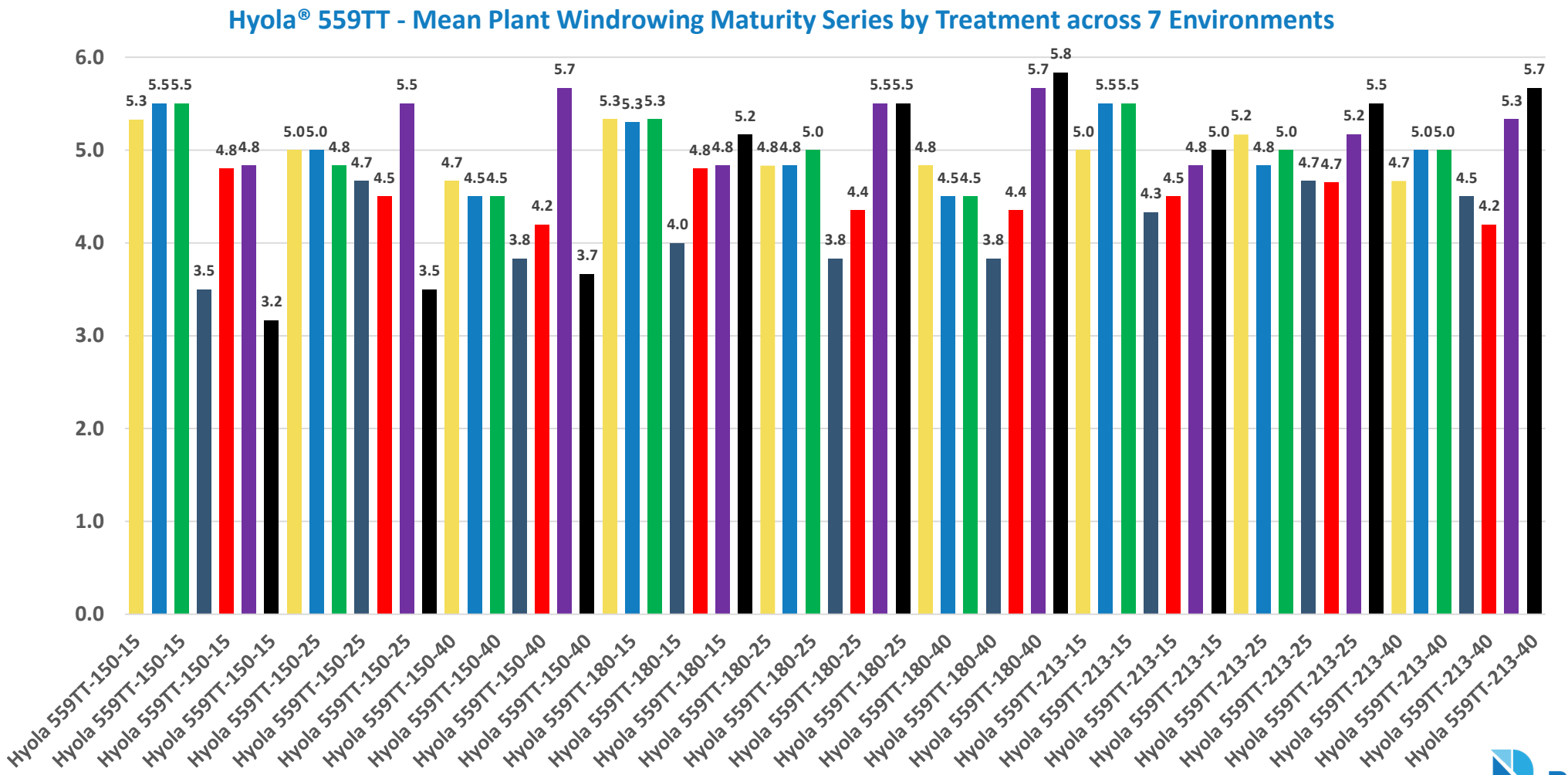
2019 Hyola® TD Windrowing Maturity Series Results – TT-CT Hybrid Technology

Hyola® 350TT - Mean Plant Windrowing Maturity Series by Treatment across 7 Environments



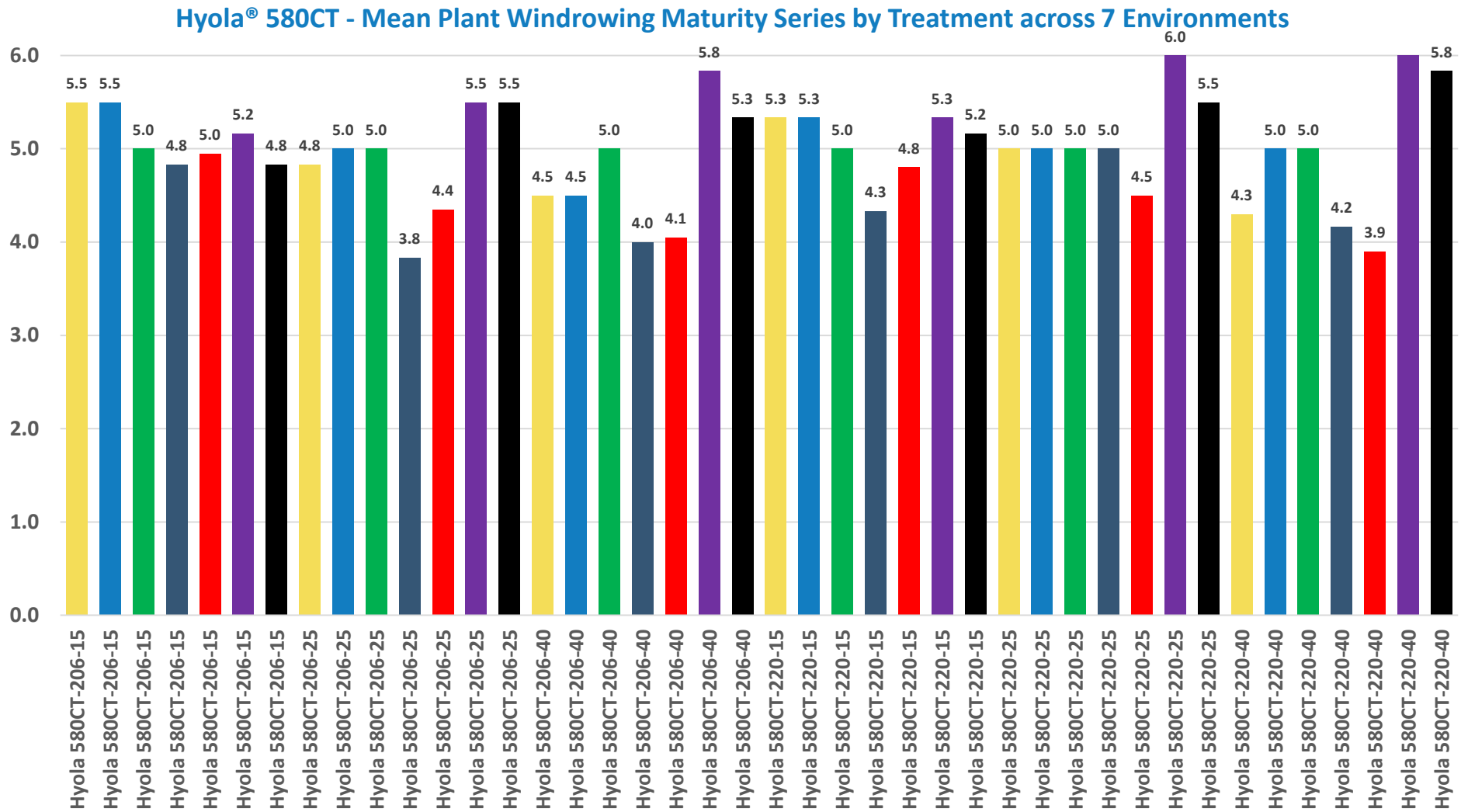
Pacific Seeds
Growing possibilities

2019 Hyola® TD Windrowing Maturity Series Results – TT-CT Hybrid Technology



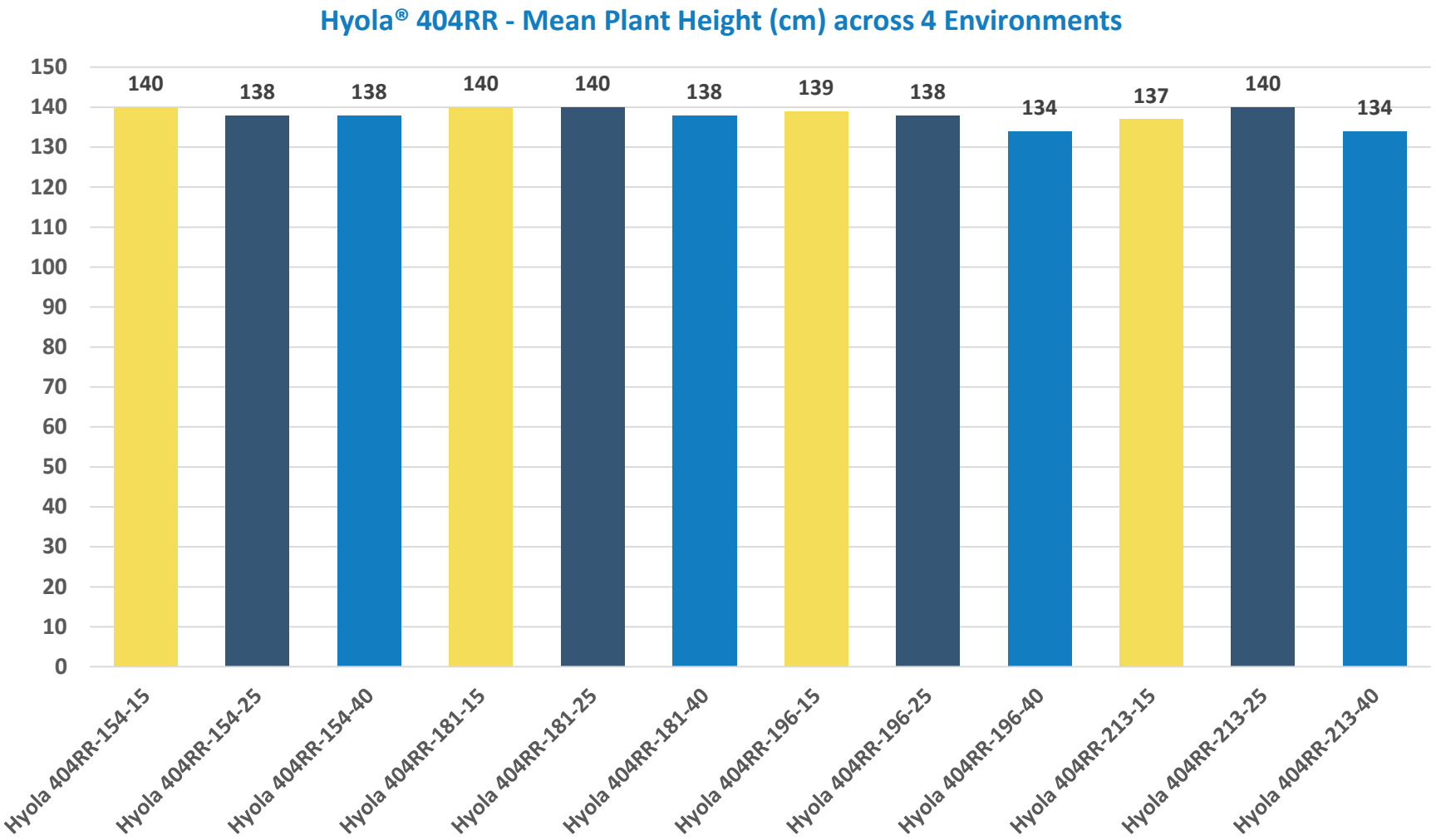
Pacific Seeds
Growing possibilities

2019 Hyola® TD Windrowing Maturity Series Results – TT-CT Hybrid Technology



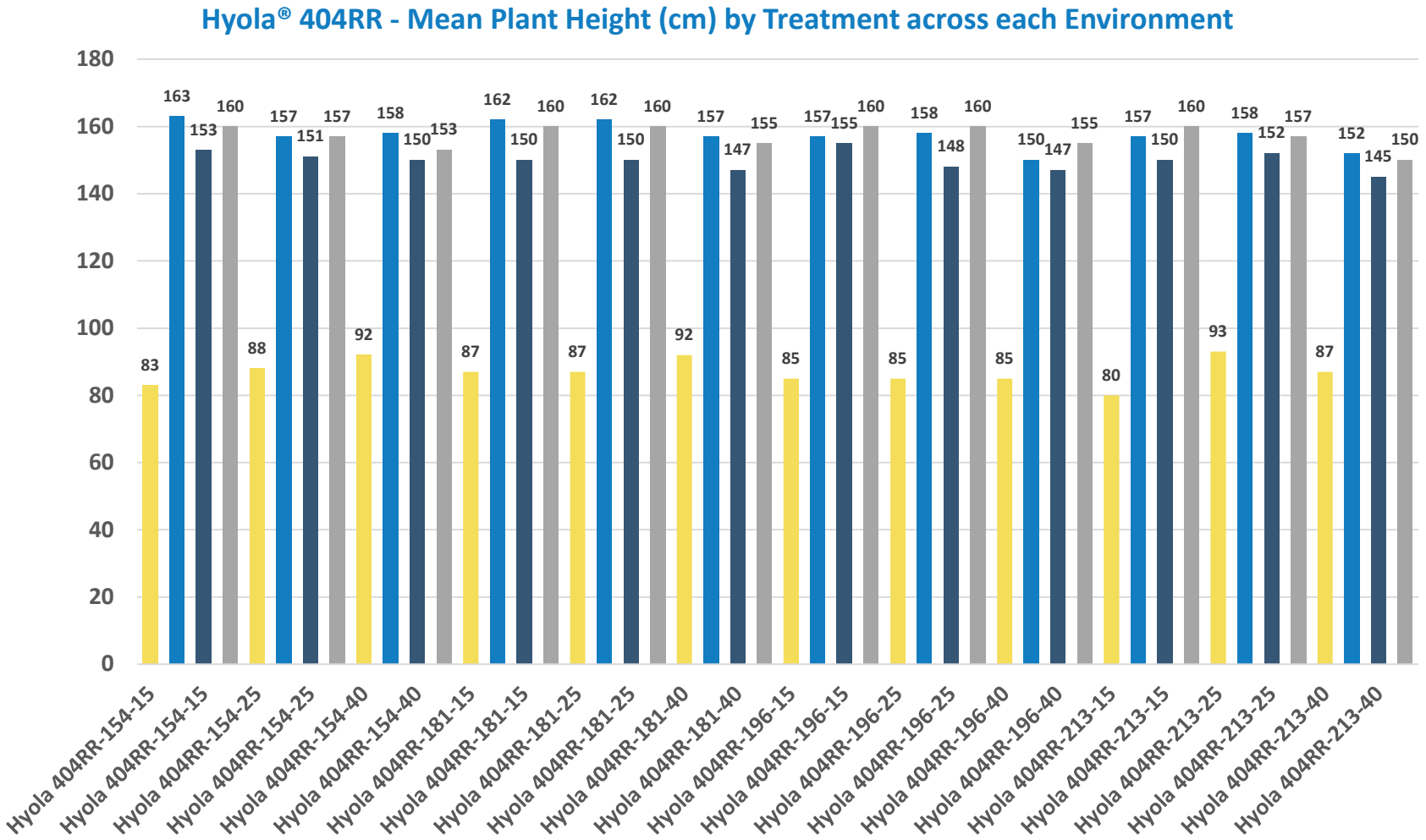
Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Height (cm) Results – RR Hybrid Technology



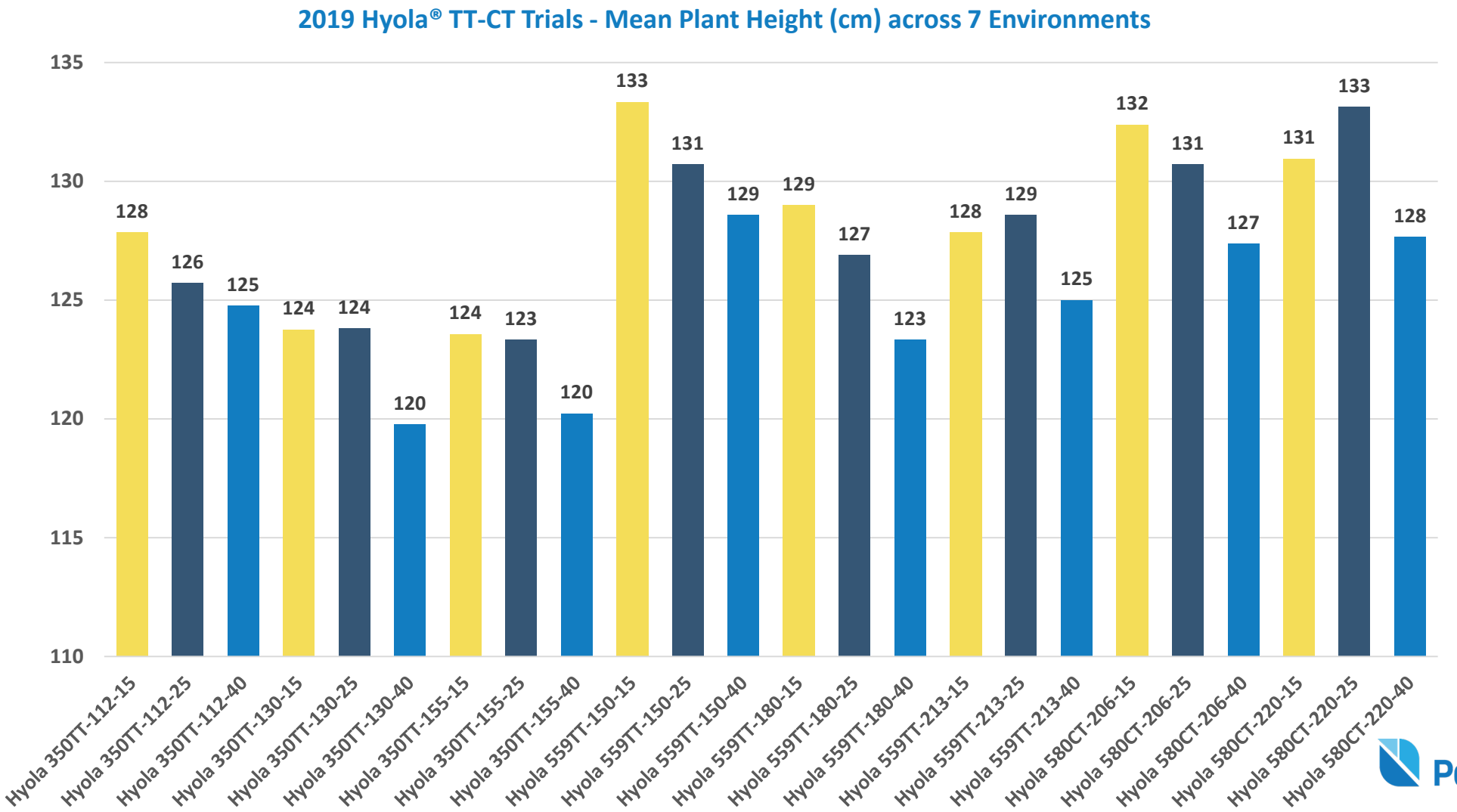
Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Height (cm) Results – RR Hybrid Technology



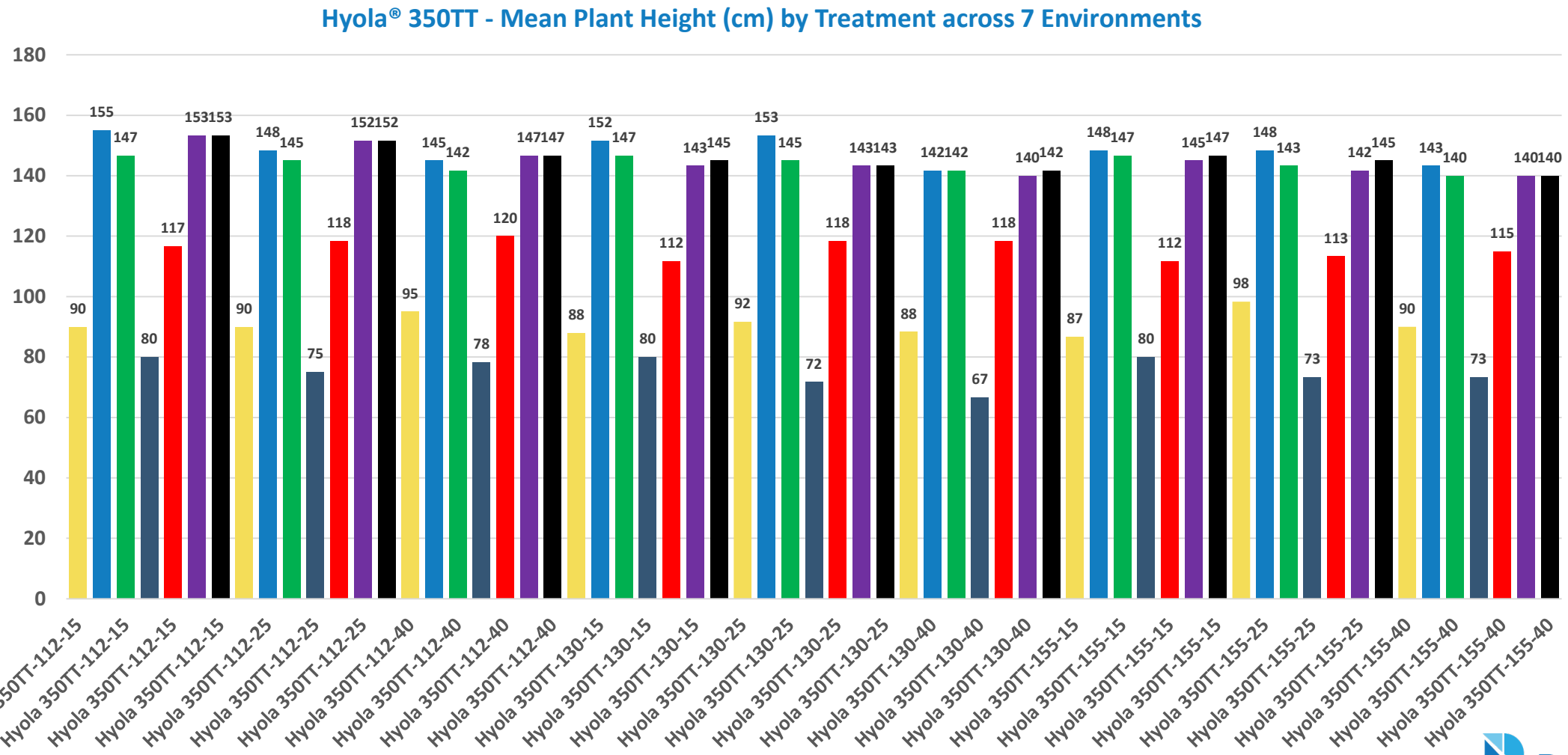
Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Height (cm) Results – TT-CT Hybrid Technology



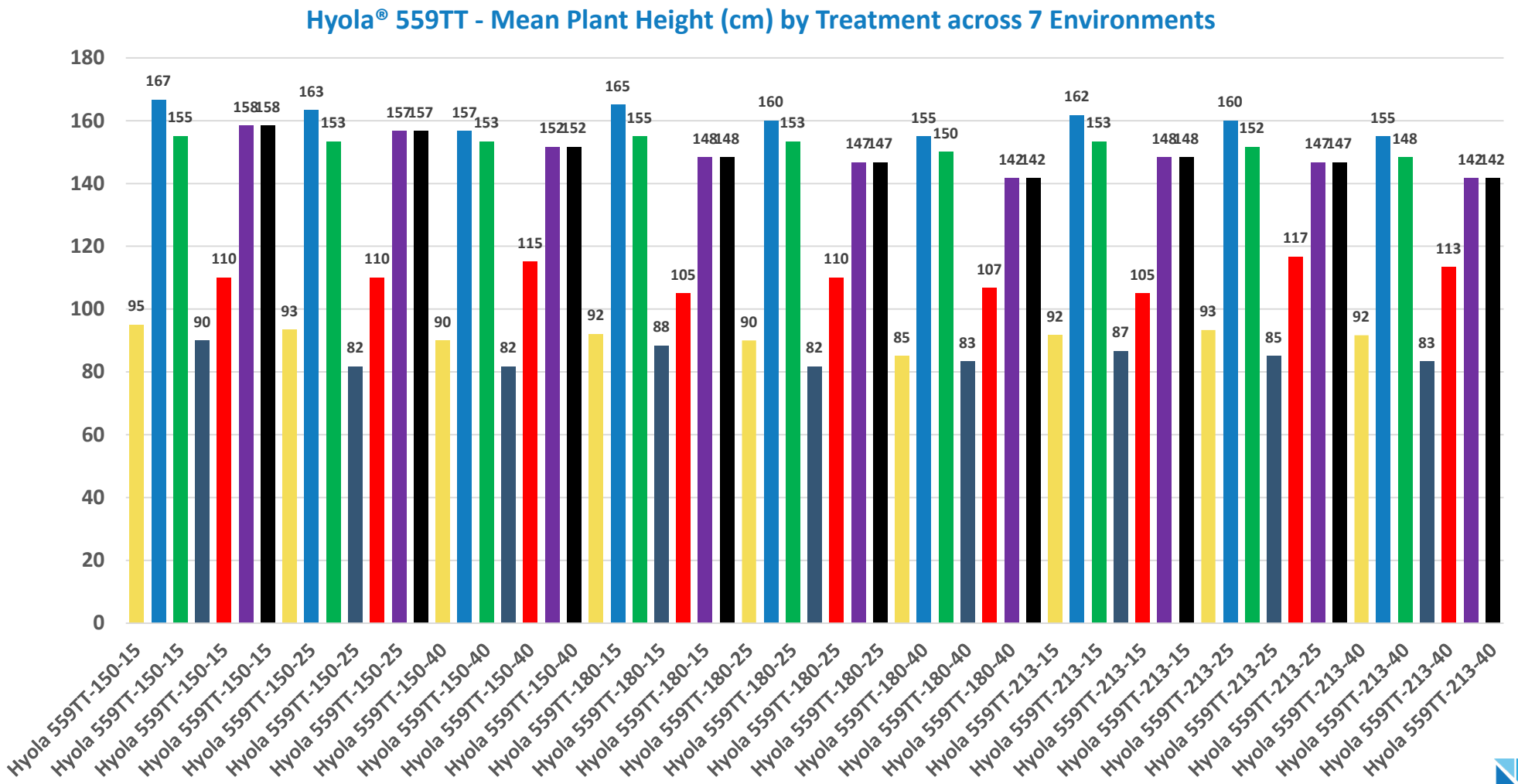
Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Height (cm) Results – TT-CT Hybrid Technology



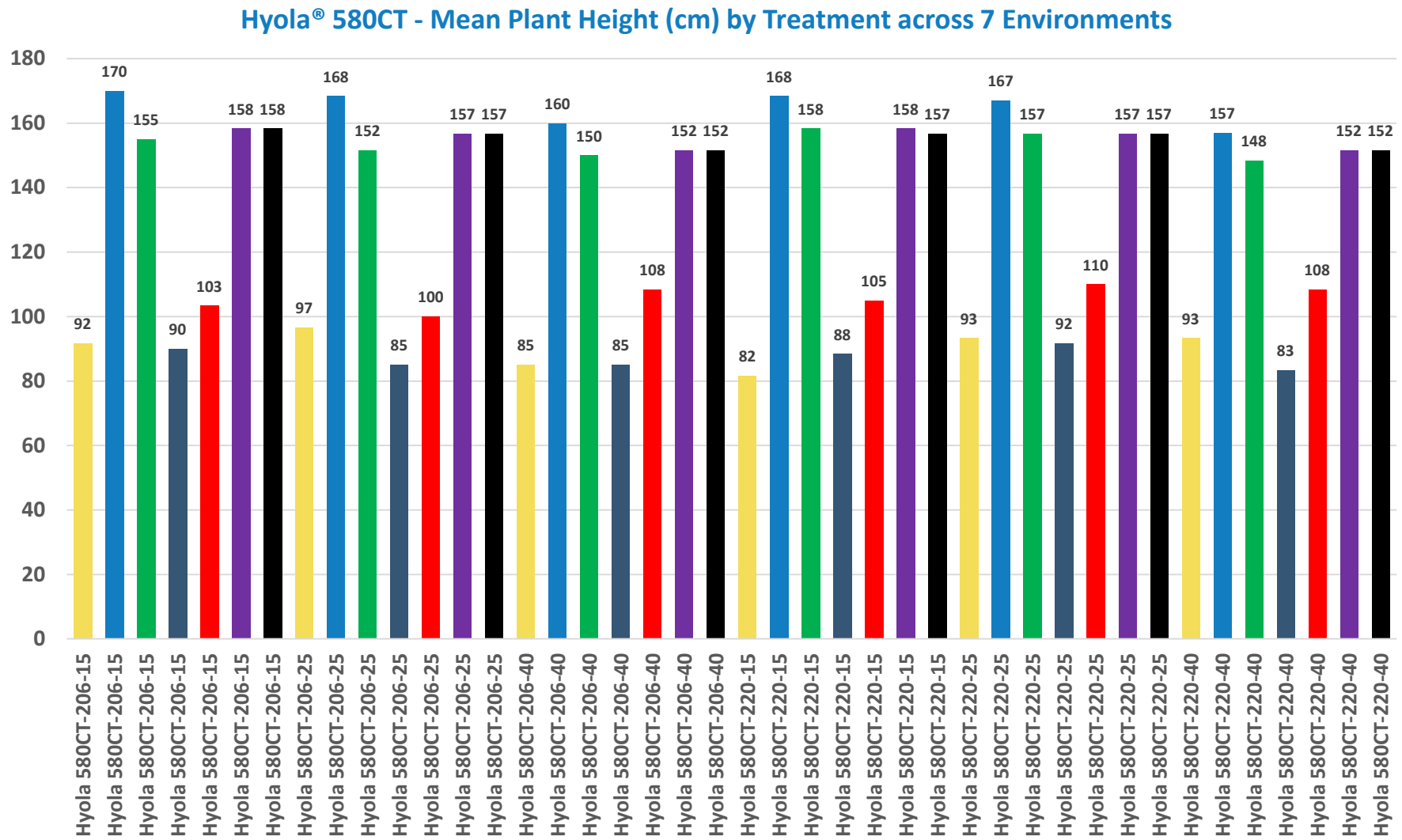
Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Height (cm) Results – TT-CT Hybrid Technology



Pacific Seeds
Growing possibilities

2019 Hyola® TD Plant Height (cm) Results – TT-CT Hybrid Technology



Pacific Seeds
Growing possibilities

2019 Pacific Seeds Hybrid Canola Plant Population by Seed Size/Count Trial Results

- RR Hybrid Grain Yield (t/ha) Comparisons
- TT-CT Grain Yield (t/ha) Comparisons

Photo: 2019 Kellerberrin WA Trial Environment

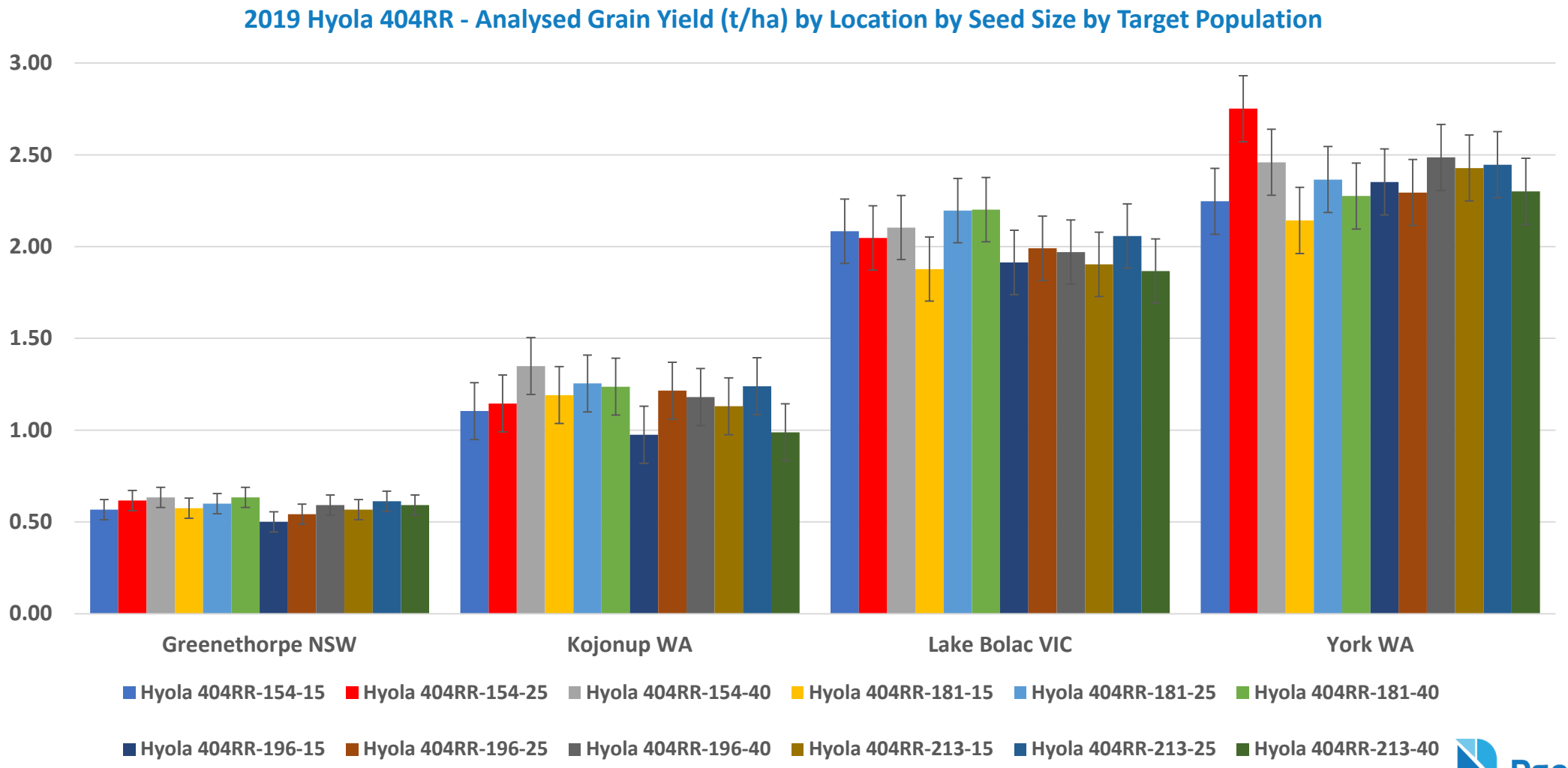
2019 Hyola® TD Analysed Grain Yield (t/ha) Results – RR Hybrid Technology

Location	Greenethorpe NSW		Kojonup WA		Lake Bolac VIC		York WA	
Treatment	Yield t/ha	sig	Yield t/ha	sig	Yield t/ha	sig	Yield t/ha	sig
Hyola 404RR-154-15	0.57	ab	1.10	ab	2.25	b	2.08	a
Hyola 404RR-154-25	0.62	a	1.15	ab	2.75	a	2.05	a
Hyola 404RR-154-40	0.63	a	1.35	a	2.46	ab	2.10	a
Hyola 404RR-181-15	0.58	ab	1.19	ab	2.14	b	1.88	a
Hyola 404RR-181-25	0.60	ab	1.25	ab	2.37	b	2.20	a
Hyola 404RR-181-40	0.63	a	1.24	ab	2.28	b	2.20	a
Hyola 404RR-196-15	0.50	b	0.97	b	2.35	b	1.91	a
Hyola 404RR-196-25	0.54	ab	1.21	ab	2.29	b	1.99	a
Hyola 404RR-196-40	0.59	ab	1.18	ab	2.49	ab	1.97	a
Hyola 404RR-213-15	0.57	ab	1.13	ab	2.43	ab	1.90	a
Hyola 404RR-213-25	0.61	a	1.24	ab	2.45	ab	2.06	a
Hyola 404RR-213-40	0.59	ab	0.99	b	2.30	b	1.87	a
Raw Mean	**0.59**		**1.17**		**2.38**		**2.02**	
CV	**11.05**		**15.98**		**9.16**		**10.67**	
LSD (P=0.05)	**0.11**		**0.31**		**0.35**		**0.36**	

2019 Kojonup WA TT-CT Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – RR Hybrid Technology



Pacific Seeds
Growing possibilities

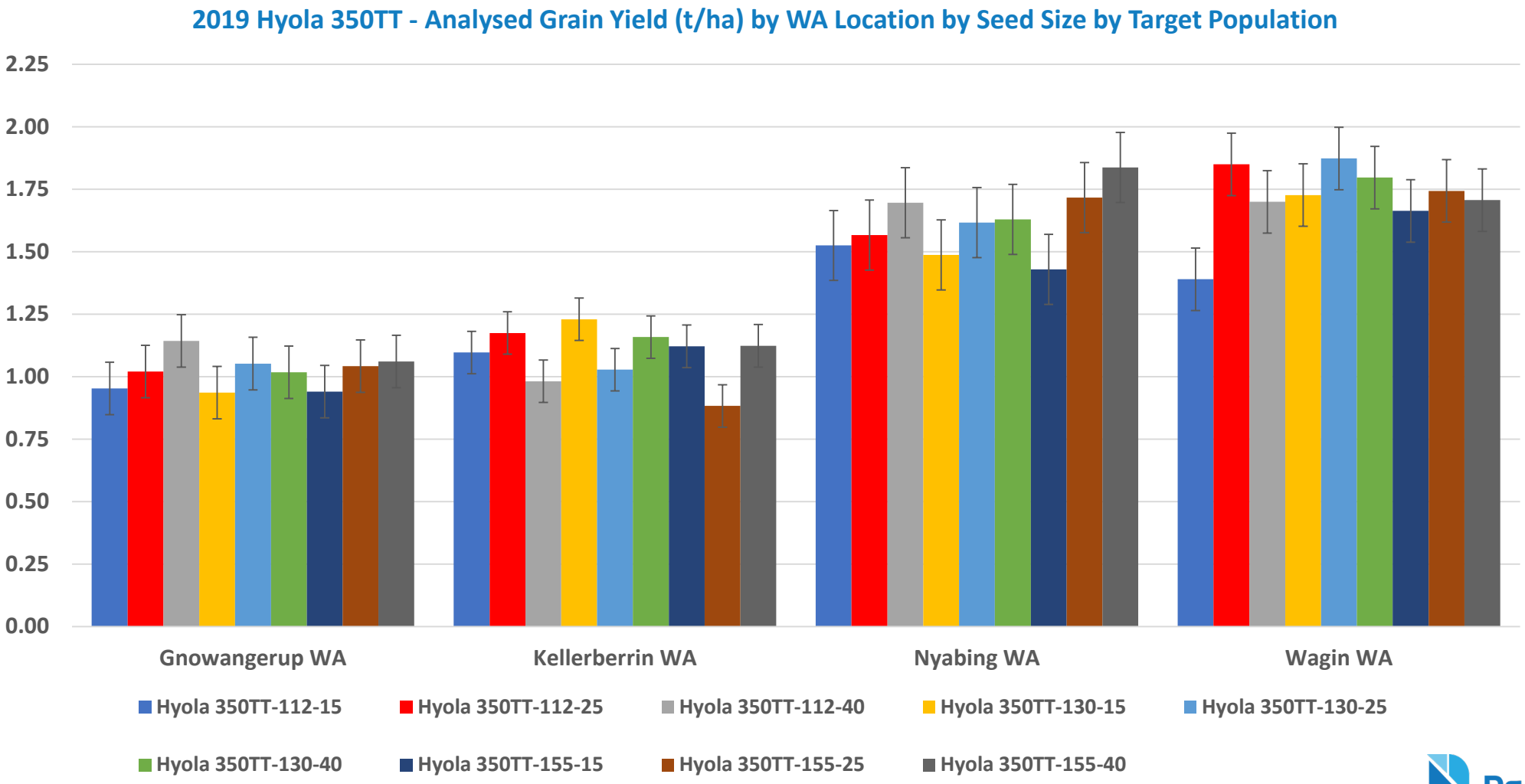
2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Western Australia

Location	Gnowangerup WA		Kellerberrin WA		Nyabing WA		Wagin WA	
Treatment	Yield t/ha	sig	Yield t/ha	sig	Yield t/ha	sig	Yield t/ha	sig
Hyola 350TT-112-15	0.95	e	1.10	abcd	1.53	bcdef	1.39	g
Hyola 350TT-112-25	1.02	cde	1.17	ab	1.57	abcde	1.85	abcd
Hyola 350TT-112-40	1.14	abc	0.98	bcdef	1.70	abc	1.70	cdef
Hyola 350TT-130-15	0.94	e	1.23	a	1.49	bcdef	1.73	bcdef
Hyola 350TT-130-25	1.05	cde	1.03	abcde	1.62	abcd	1.87	abc
Hyola 350TT-130-40	1.02	cde	1.16	ab	1.63	abcd	1.80	abcde
Hyola 350TT-155-15	0.94	e	1.12	abcd	1.43	cdef	1.66	cdef
Hyola 350TT-155-25	1.04	cde	0.88	efgh	1.72	ab	1.74	abcdef
Hyola 350TT-155-40	1.06	cde	1.12	abc	1.84	a	1.71	cdef
Hyola 559TT-150-15	0.94	e	1.19	ab	1.50	bcdef	1.51	fg
Hyola 559TT-150-25	1.07	bcde	1.05	abcde	1.66	abcd	1.67	cdef
Hyola 559TT-150-40	1.27	a	1.20	a	1.70	abc	1.60	defg
Hyola 559TT-180-15	1.00	cde	0.95	cdef	1.50	bcdef	1.74	abcdef
Hyola 559TT-180-25	1.02	cde	1.01	bcde	1.56	abcde	1.79	abcde
Hyola 559TT-180-40	1.24	ab	1.17	ab	1.69	abc	1.96	ab
Hyola 559TT-213-15	1.00	cde	1.05	abcde	1.44	bcdef	1.55	efg
Hyola 559TT-213-25	0.97	de	0.92	defg	1.55	bcde	1.70	cdef
Hyola 559TT-213-40	1.10	abcde	1.12	abcd	1.60	abcd	1.98	a
Hyola 580CT-206-15	0.99	cde	0.79	fghi	1.25	f	1.55	efg
Hyola 580CT-206-25	1.02	cde	0.92	defg	1.38	def	1.57	efg
Hyola 580CT-206-40	1.05	cde	0.67	i	1.50	bcdef	1.53	fg
Hyola 580CT-220-15	0.98	cde	0.73	hi	1.31	ef	1.52	fg
Hyola 580CT-220-25	1.06	cde	0.99	bcde	1.43	cdef	1.60	defg
Hyola 580CT-220-40	1.13	abcd	0.77	ghi	1.51	bcdef	1.58	efg
Raw Mean	**1.04**		**1.00**		**1.55**		**1.68**	
CV	**9.99**		**10.94**		**10.81**		**9.03**	
LSD (P=0.05)	**0.17**		**0.21**		**0.28**		**0.25**	

2019 Gnowangerup WA TT-CT Trial Environment

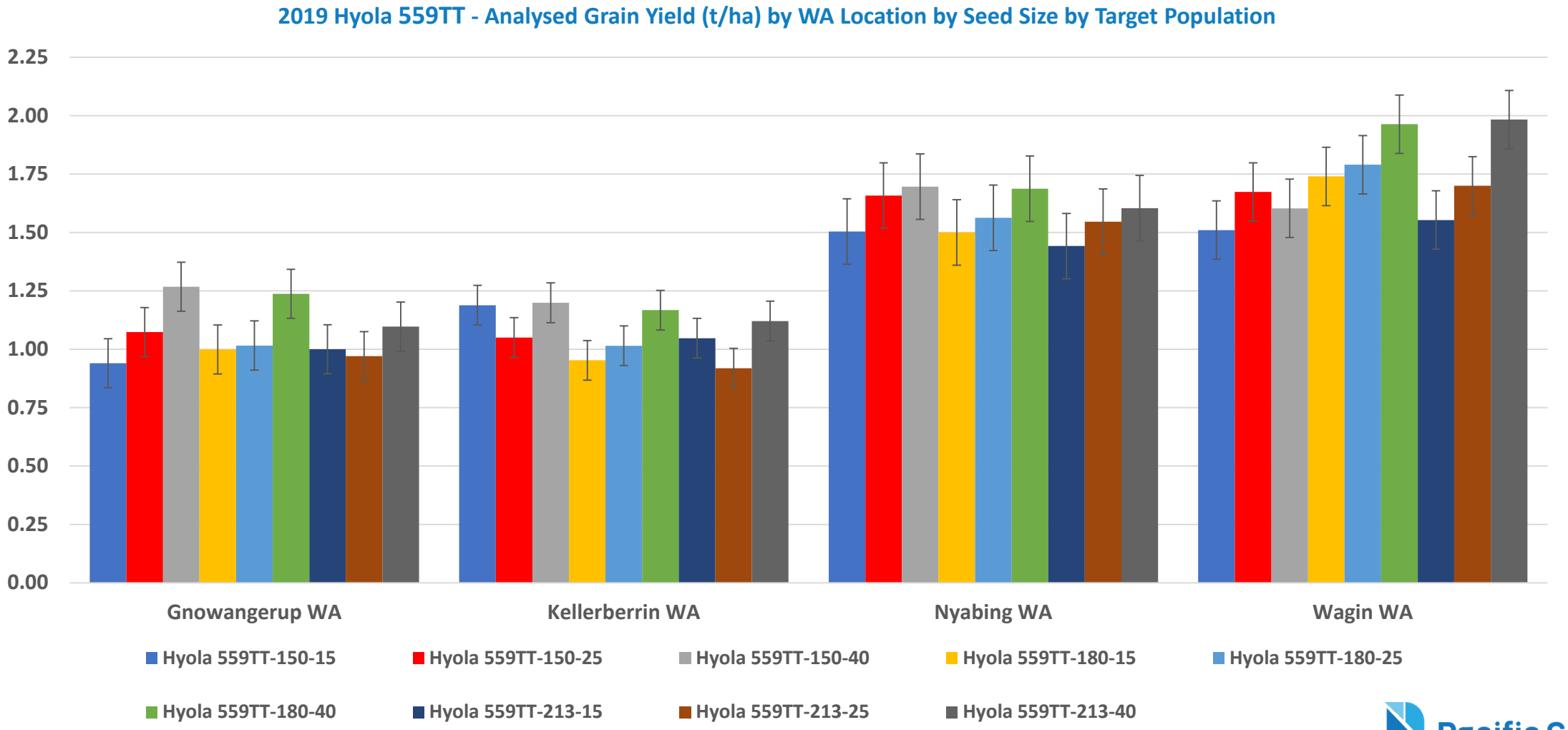
Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Western Australia



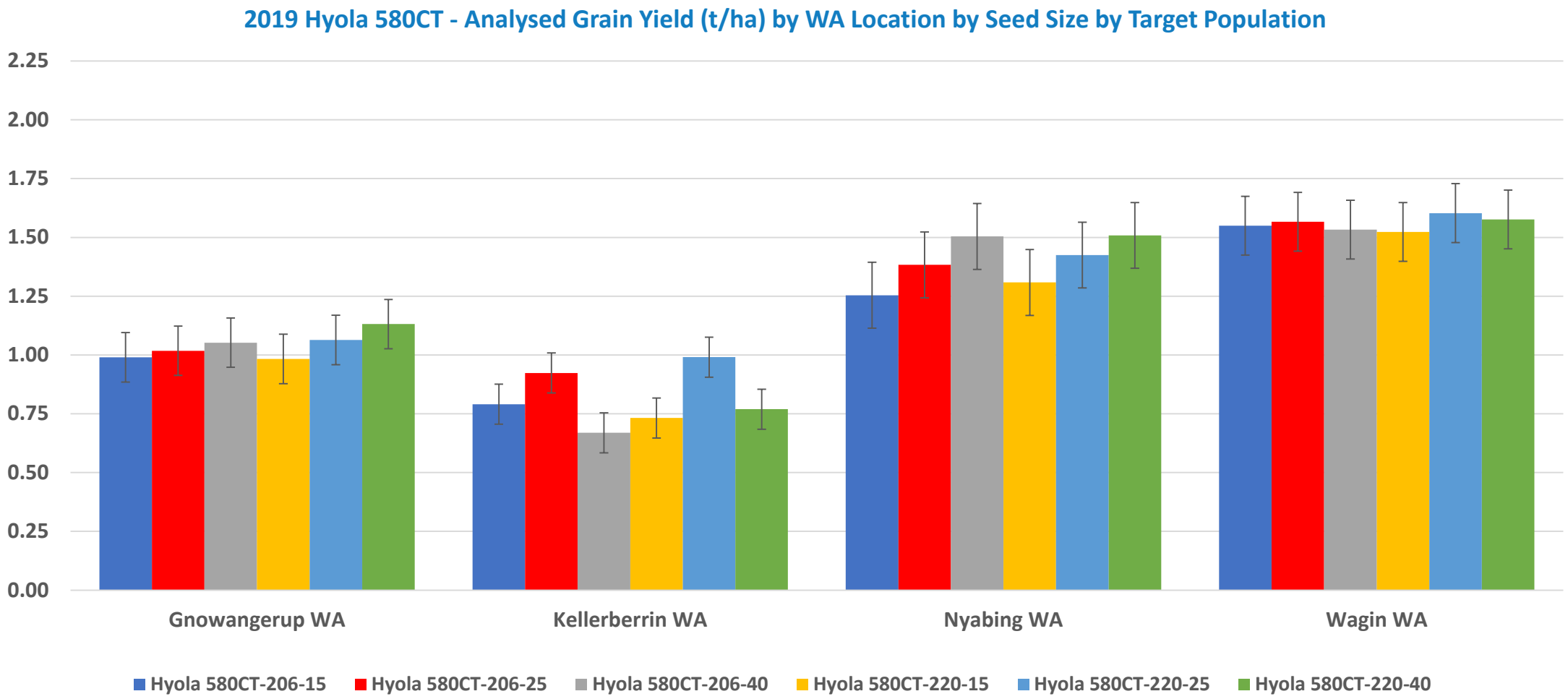
Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Western Australia



Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Western Australia



Pacific Seeds
Growing possibilities

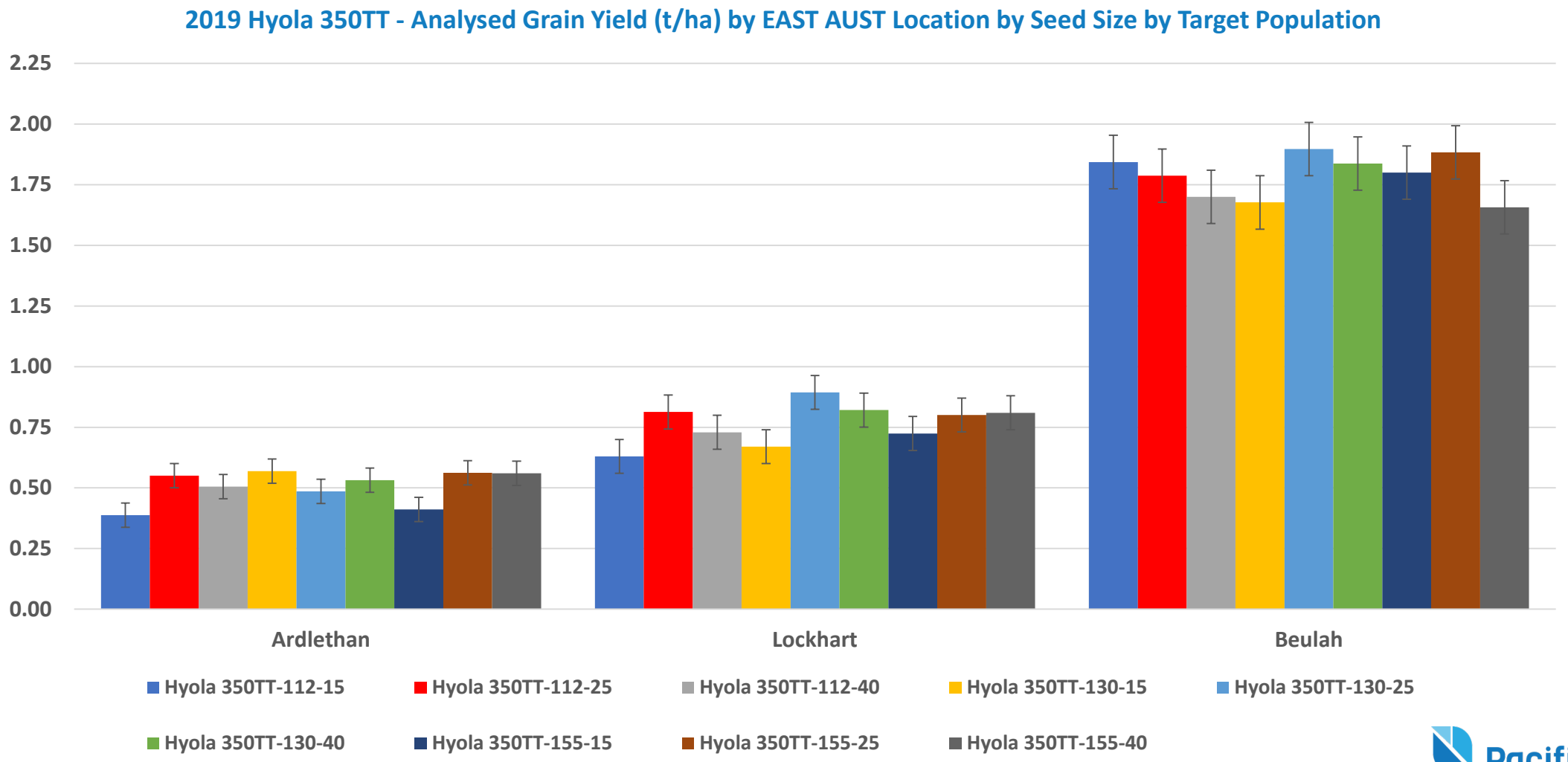
2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Eastern Australia

Location	Ardlethan NSW		Beulah VIC		Lockhart NSW	
Treatment	Yield t/ha	sig	Yield t/ha	sig	Yield t/ha	sig
Hyola 350TT-112-15	0.39	gh	1.84	abc	0.63	def
Hyola 350TT-112-25	0.55	cde	1.79	abcde	0.81	abc
Hyola 350TT-112-40	0.51	ef	1.70	bcdef	0.73	bcde
Hyola 350TT-130-15	0.57	cde	1.68	bcdefg	0.67	cdef
Hyola 350TT-130-25	0.49	ef	1.90	ab	0.89	a
Hyola 350TT-130-40	0.53	de	1.84	abc	0.82	ab
Hyola 350TT-155-15	0.41	fg	1.80	abcde	0.72	bcde
Hyola 350TT-155-25	0.56	cde	1.88	ab	0.80	abc
Hyola 350TT-155-40	0.56	cde	1.66	cdefg	0.81	abc
Hyola 559TT-150-15	0.50	ef	1.58	efg	0.78	abc
Hyola 559TT-150-25	0.61	bcd	1.75	abcdef	0.76	abcd
Hyola 559TT-150-40	0.58	cde	1.66	cdefg	0.85	ab
Hyola 559TT-180-15	0.50	ef	1.55	fg	0.59	efg
Hyola 559TT-180-25	0.63	bc	1.71	bcdef	0.67	cdef
Hyola 559TT-180-40	0.78	a	1.96	a	0.71	bcde
Hyola 559TT-213-15	0.55	cde	1.46	g	0.62	def
Hyola 559TT-213-25	0.51	e	1.61	defg	0.75	bcd
Hyola 559TT-213-40	0.70	ab	1.78	abcde	0.75	abcd
Hyola 580CT-206-15	0.33	gh	1.88	ab	0.35	h
Hyola 580CT-206-25	0.38	gh	1.87	abc	0.45	gh
Hyola 580CT-206-40	0.30	h	1.77	abcde	0.57	fg
Hyola 580CT-220-15	0.33	gh	1.90	ab	0.46	gh
Hyola 580CT-220-25	0.34	gh	1.81	abcd	0.46	gh
Hyola 580CT-220-40	0.38	gh	1.70	bcdef	0.53	fg
Raw Mean	**0.50**		**1.75**		**0.67**	
CV	**11.28**		**7.62**		**12.75**	
LSD (P=0.05)	**0.10**		**0.22**		**0.14**	

2019 Beulah Vic TT-CT Trial Environment

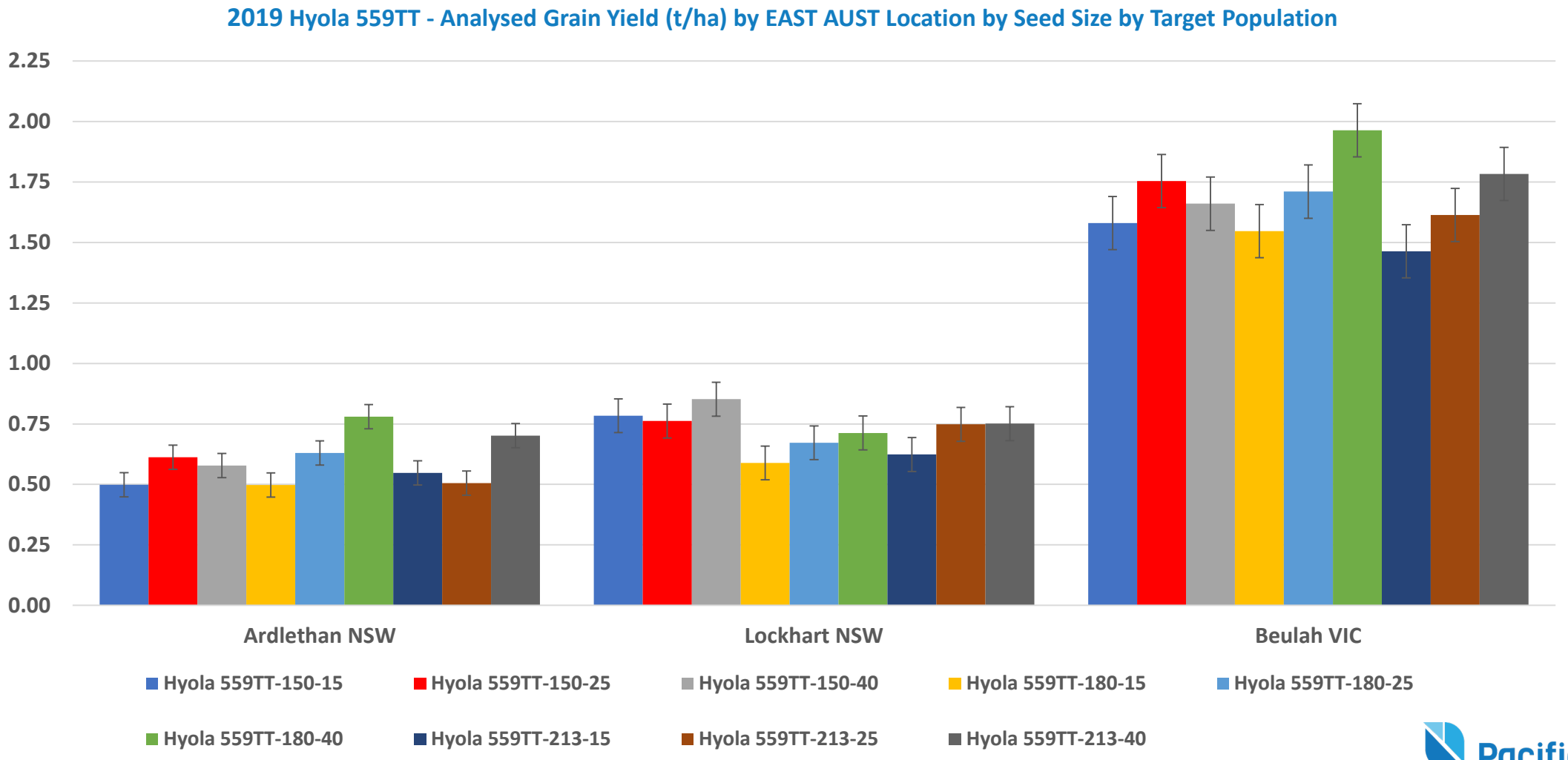
Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Eastern Australia



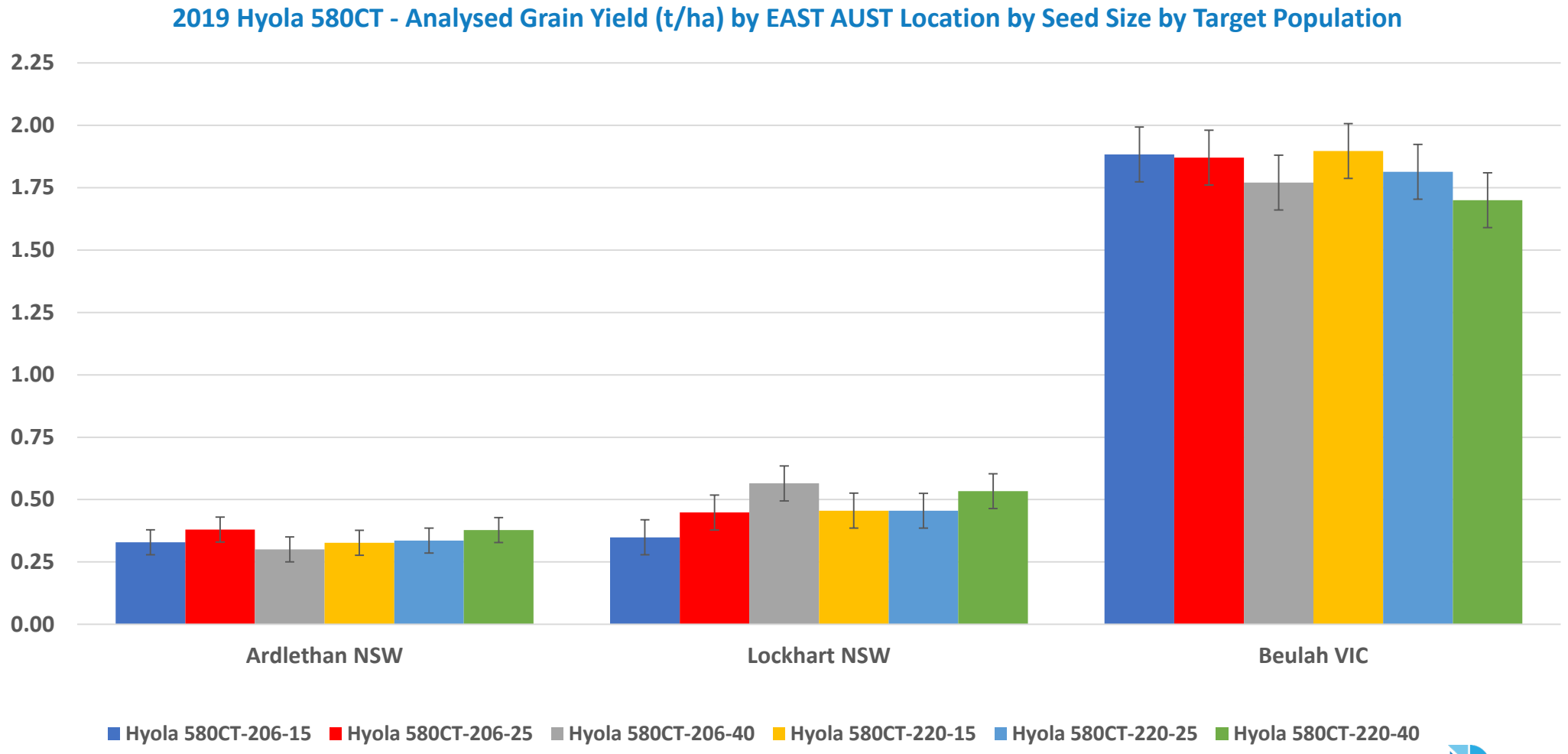
Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Eastern Australia



Pacific Seeds
Growing possibilities

2019 Hyola® TD Analysed Grain Yield (t/ha) Results – TT-CT Hybrids – Eastern Australia



Pacific Seeds
Growing possibilities

2019 Pacific Seeds Hybrid Canola Plant Population by Seed Size Trials Summary

2019 Hyola® TD - Canola Plant Population by Seed Size Trials Summary

- Yield responses across the 11 trial environments varied between varieties, seed sizes and plant population targets.
- Previous research studies - mixed outcomes relating to the effect of seed size and plant densities on grain yield
- Seed size, yield benefit from larger canola seed was observed by Elliot et al (2008) and Brill et al (2016),
- Harker et al (2015), Clayton et al (2009), and Lamb and Johnson (2004) did not measure a benefit of larger seed on canola yield

Pacific Seeds
Growing possibilities

2019 Hyola® TD - Canola Plant Population by Seed Size Trials Summary

Seed size can impact the percentage of plants both emerged and established to varying levels in different environments

Larger seed has been found to provide higher observed biomass accumulation and % establishment in some environments

Larger seed at lower plant populations leads to final plant maturity being delayed.

2019 Kojonup WA - RR Trial Environment

Pacific Seeds
Growing possibilities

2019 Hyola® TD - Canola Plant Population by Seed Size Trials Summary

Higher plant populations irrespective of seed size and variety genetics often showed observed earlier maturity and sometimes decreased plant height

(G) X (E) interactions often override (M) management decisions based around seed size and population targets on the resultant grain yields.

2019 York WA - RR Trial Environment

Pacific Seeds
Growing possibilities

2020 Hyola® TD - Research Trials Project Outline

- Pacific Seeds will continue this important industry research by focusing the evaluation on the relationships between TT and CT hybrids vs 3 OP TT varieties (farmer prepared retained samples)

- Evaluations of various plant populations and seed sizes across 10 Australian Environments

- Determining any ‘potential’ grain yield and gross return $/ha value of grading OP TT varieties to larger seed sizes and planting at higher rates versus TT and CT hybrids.

Pacific Seeds
Growing possibilities