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UNIVERSITY of GUELPH

RIDGETOWN COLLEGE

Processing Tomato Cultivar Trials Research Report 2004

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Introduction

The following pages represent a summary of the results from the 2004 processing tomato cultivar evaluation trials. One of the main goals of this project has been to evaluate performance of cultivars over a range of soil types and microclimates. The results have been summarized to show average performance over all sites, as well as performance at each site separately.

The reader will find results from both the field performance (ie. yield trials), fruit characteristics (including size, uniformity, firmness and others), processing performance (ie. peeling trials) and juice quality characteristics in order to provide a more complete picture of a cultivar's suitability for the industry.

What's Changed for 2004?

Yields were calculated using the plant populations for each individual site. Cooperators used slightly different plant populations for the trials at their respective sites. While the differences in plant population were small, this new method of calculation should give a more accurate estimate of the yields.

Who Had a Part in This Project?

This research was made possible through monetary and in-kind support provided by the following agencies:

- Ontario Tomato Research Institute
- Kraft Canada Limited, Dresden
- H.J. Heinz Company of Canada, Leamington
- Agriculture & Agri-Food Canada, Greenhouse and Processing Crops Research Centre, Harrow
- Agriculture & Agri-Food Canada, Pest Management Research Centre, London
- Heinz Seed
- Tomato Solutions Inc.
- Gem Seeds
- Ontario Ministry of Agriculture and Food
- University of Guelph

Field space and plot maintenance were generously provided by Kraft Canada and H. J. Heinz Company of Canada.

The diligent work and unflagging enthusiasm of Richard Wright, Technician; Jennifer Newport, Technical Assistant; Beth Eagen, and many others is gratefully acknowledged.

Plot Establishment

Locations:	3
Replications per location:	3
Entries in trial:	36

Plant populations

- The Dresden site was planted at a rate of 14,000 plants per acre
- The Leamington and Ridgetown sites were planted at a rate of 13,000 plants per acre

Planting dates:

Dresden	13 May 2004
Leamington	17 May
Ridgetown	21 May

Fertilizer Rates: Starter fertilizer was used at Ridgetown at a rate of 1 L of 6 - 24 - 6 plus 2% zinc in 182 L of water, continuous flow of solution. At the Ridgetown site a soil test indicated that nutrient levels were moderate to high. Based on fertilizer recommendations 283 kg/ha of 46 - 0 - 0, were applied, all broadcast preplant.

Weed Control: At the Ridgetown site weed control consisted of 1.47 L / ha Dual Magnum and 0.5 L/ha Sencor 480 applied preplant incorporated. Multiple applications of 0.9 L/ha of Sencor 480 were applied as a postemergent broadcast spray.

Disease Control: At the Ridgetown site alternate fungicide applications of Bravo 500, Cabrio and Kocide were timed every seven days throughout the growing season.

Processing Tomato Cultivar Trial Entries 2004		
GEM Seeds	**Heinz Seed**	**Kraft Canada**
GEM 15 GEM 89 GEM 94 GEM 111 GEM 331 GEM 611 GEM 818	H 2501 H 3002 H 3102 H 3202 H 3402 H 3702 H 5203 H 9704 H 9706 H 9997	CC 337 N 1069 N 1477 N 1480E
OARDC - OSU	**Seminis**	**Tomato Solutions**
FG00-115 FG00-118 OX 323 OX 325 OX 9816 O 7983	Hypeel 696	TSH 04 TSH 07 TSH 08 TSH 16 TSH 18 TSH 20 TSX 21 TSX 22

Yield Evaluation Trials

How Was Harvest Date Determined?

Plots at each site were visited twice each week.

A plot was harvested when 80% or more fruit were red ripe.

To see how much actual difference in maturity there is between varieties refer to Appendix 1.

Many of the tables in this report have varieties ranked in order of maturity from earliest to latest - check the titles to be sure.

How Was the Yield Actually Measured?	
For each plot, 5 representative plants, with no adjacent plants missing, were cut off at the soil level. Fruit were then shaken from the vines into a wheel barrow and then sorted into 5 categories:	
red ripe	fruit that had less than 5% visible yellowish exterior colour
breakers	more than 10% coloured and less than 10% green
processing green	less than 100% green showing some visible blush of colour (yellow, pink)
grass green	green or white green
limited use/ rots	any fruit with a rotten spot 2 cm in diameter or greater, other blemishes, includes MOT
Weights were taken for each of these categories and converted to yield on a tons/acre basis.	

Cultivar or Variety - What's the difference?

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*The term 'cultivar' is a shortened form of 2 words; '**culti**vated **var**iety'.*

This term was chosen by plant scientists to distinguish a variety which occurs in cultivation, (as a result of human activity), from a botanical variety, which can sometimes be found in nature.

Although cultivar is the correct term you will see both used interchangeably in this report - mostly to avoid repetition of the same word over and over.

WHAT DOES THIS TABLE TELL ME?

Table 1 Answers the question, "Which cultivar has the ability to produce the most tomatoes, regardless of the grade?"

You can find the best ones very quickly by looking at the top of the table.

"But, why do you bother to report 'yield potential'? Tomatoes are paid for on the basis of grades."

We report yield potential because the management system and microclimate of each grower will be slightly different. In an actual production situation, growers would be in a better position to minimize rots/greens through the use of Ethrel, and thus achieve yields closer to the potential than we were able to in our plots.

Will someone please tell me what all the little letters behind the numbers mean?

One of the challenges with field research on plants is that we have to cope with variations in soil, microclimate, and a whole host of other factors that affect plant growth.

Although the numbers 45.4 and 44.6 are numerically different, the question scientists try to answer is,"Are they actually different given the amount of variation that we find from plot to plot?" "Is the difference between those numbers due to the treatment (in this case genetics) or did we just get lucky and happen to pick the right plants to measure yield on?" "Is the difference real, or is it just because of the plants we happened to pick?"

Scientists use those letters, as part of something called a 'means separation procedure', to show which varieties are really different - or which varieties they are different from and similar to.

Only those cultivars that perform better than the checks are marked. If a check cultivar has the letter 'B' after it, then the cultivar means followed by the letter B are better than check B. If there are no trial entries with the letter C after them, then there are no entries significantly better than check variety C.

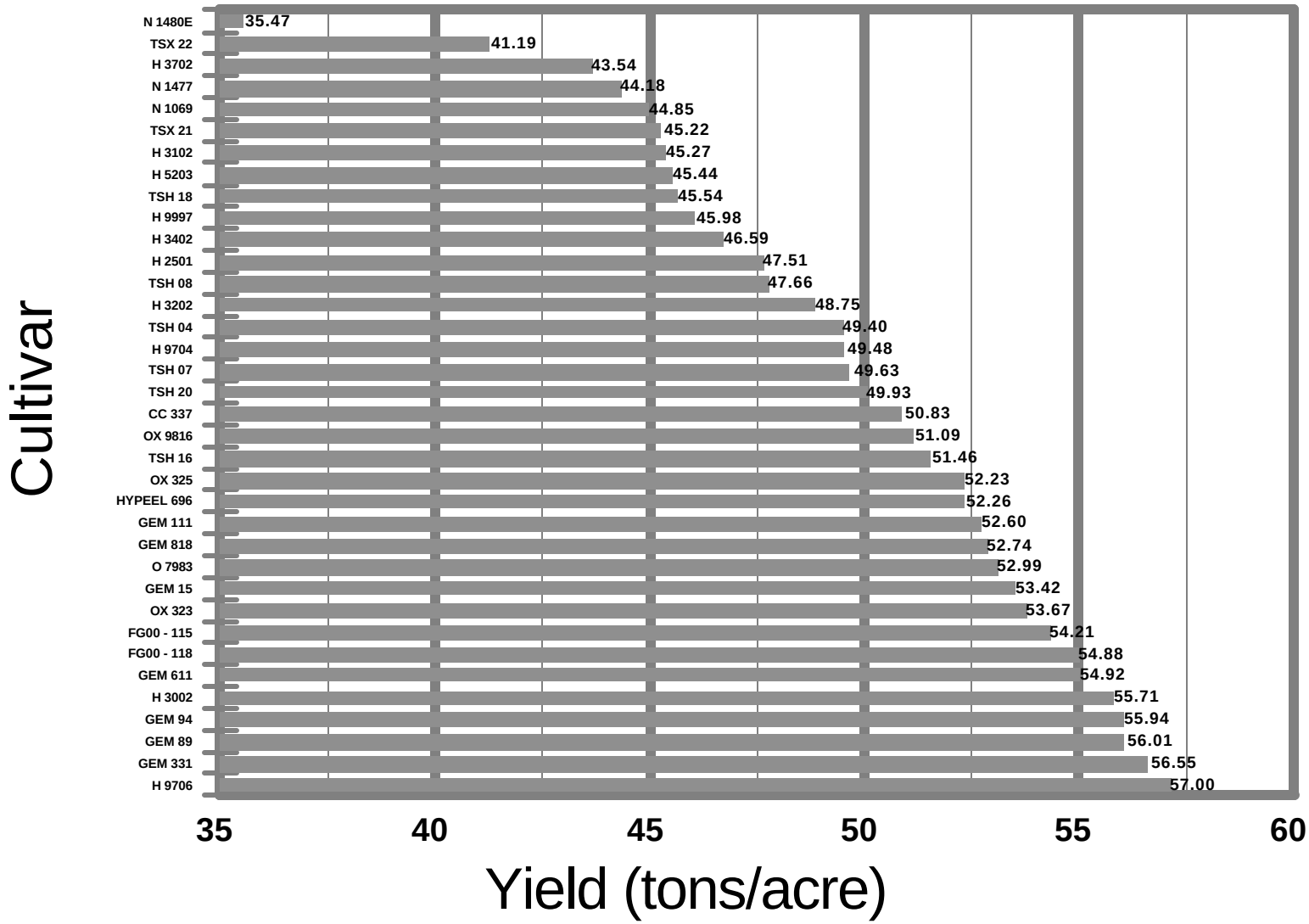
In a cultivar trial like this one, note the trends or rankings since these are probably as important as understanding the statistics.

Table 1. Processing Tomato Cultivar Trial, 2004. Yield Potential (tons/acre) over 3 locations.

Name	Yield Potential (tons/acre)		
H 9706	57.00	A	C
GEM 331	56.55	A	C
GEM 89	56.01	A	C
GEM 94	55.94	A	C
H 3002	55.71	A	C
GEM 611	54.92		C
FG00 - 118	54.88		
FG00 - 115	54.21		
OX 323	53.67		
GEM 15	53.42		
O 7983	52.99		
GEM 818	52.74		
GEM 111	52.60		
HYPEEL 696 (B)	**52.26**		
OX 325	52.23		
TSH 16	51.46		
OX 9816	51.09		
CC 337	50.83		
TSH 20	49.93		
TSH 07	49.63		
H 9704 (A)	**49.48**		
TSH 04 (C)	**49.40**		
H 3202	48.75		
TSH 08	47.66		
H 2501	47.51		
H 3402	46.59		
H 9997	45.98		
TSH 18	45.54		
H 5203	45.44		
H 3102	45.27		
TSX 21	45.22		
N 1069	44.85		
N 1477	44.18		
H 3702	43.54		
TSX 22	41.19		
N 1480E	35.47		
PROBABILITY	0.0000		
LSD	5.5075		
CV	14.19%		
Mean	49.837		

Means followed by the same letter are significantly better than the check cultivar with that same letter. Yields in this table are based on harvested fruit from 9 plots;5 plants from each plot.

Yield Potential over 3 Locations, 2004



WHAT DO THESE TABLES TELL ME?

Table 2

This table answers the question, "What were the best all 'round varieties for yield?". The table shows the results averaged over 3 different trial locations.

The "**Total**" column shows the same numbers as in table 1 (ie. yield potential), but the cultivars are ranked according to maturity. This is probably a more fair way of comparing total yield since, at least historically, early maturing cultivars have tended to have lower yields than later cultivars.

The "**Red"** column shows the yield of red ripe fruit at harvest in tons per acre. The other columns, **"Breakers**", "**Processing Green**", "**Grass Green**", and **"Limited Use & Rots**", show the yield, in tons per acre, of each grade category at harvest.

Depending on the grade option that grow under/receive under, you may have interest in one of the last 3 columns.

For example, the second last column, "**Red, Breakers, Processing Green**" is the total of those 3 separate columns. This shows the yield results you might expect if that happens to be the grading option you deal with.

Table 3
Table 4
Table 5

Each of these tables follows the same format as Table 2. The important difference is that these tables show the results for each trial location separately.

If possible, it is valuable to look at the results from a trial location with a soil type and/or microclimate similar to the one you are working with.

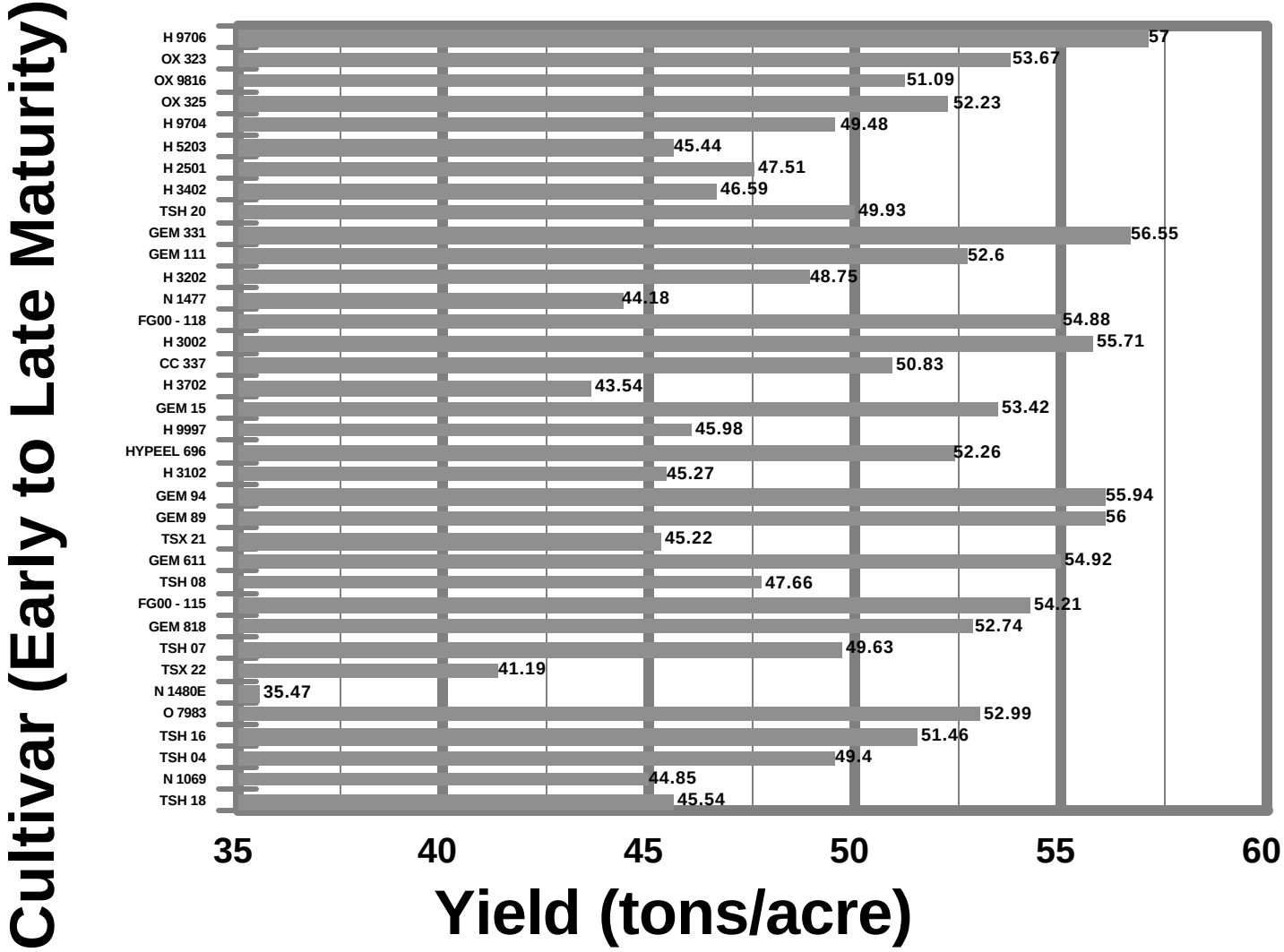
Table 2. Processing tomato yield trial, 2004. Yield (tons/acre) averaged over 3 locations.

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use Rots	Red & Breakers	Red, Breakers, Processing	Red, Breakers, Processing & Grass Green
TSH 18	45.54	38.77	2.77	0.58	0.69	2.74	41.53	42.11	42.80
N 1069	44.85	38.67	2.95	0.63	0.72	1.87	41.62	42.25	42.97
TSH 04 (C)	**49.40**	**43.36**	**2.60**	**0.76**	**0.75**	**1.94**	**45.95**	**46.71**	**47.46**
TSH 16	51.46	44.65	2.67	0.77	1.06	2.32	47.32	48.09	49.15
O 7983	52.99	45.80	3.41	0.77	0.84	2.16	49.21	49.98	50.82
N 1480E	35.47	28.58	3.78	0.62	0.99	1.50	32.36	32.98	33.97
TSX 22	41.19	34.65	3.16	0.88	0.92	1.58	37.81	38.69	39.61
TSH 07	49.63	43.32	3.35	0.90	0.82	1.23	46.67	47.57	48.39
GEM 818	52.74	44.59	4.28	0.81	1.27	1.79	48.87	49.68	50.95
FG00 - 115	54.21	47.15	2.89	0.78	0.76	2.63	50.04	50.83	51.59
TSH 08	47.66	41.45	3.22	0.80	1.09	1.10	44.67	45.47	46.56
GEM 611	54.92 C	47.35	3.95	1.25	1.10	1.27	51.29	52.54 C	53.65 A C
TSX 21	45.22	38.65	2.53	0.61	0.92	2.52	41.18	41.79	42.70
GEM 89	56.01 A C	48.75 A	3.29	0.96	1.08	1.93	52.04 C	53.00 C	54.08 A C
GEM 94	55.94 A C	47.79 A	3.58	0.95	1.74	1.89	51.36	52.32	54.06 A C
H 3102	45.27	38.39	2.52	0.78	1.11	2.47	40.91	41.68	42.80
HYPEEL 696 (B)	**52.26**	**44.95**	**2.69**	**0.86**	**1.16**	**2.59**	**47.64**	**48.50**	**49.67**
H 9997	45.98	39.57	2.49	0.73	1.00	2.18	42.07	42.80	43.80
GEM 15	53.42	46.15	4.02	0.70	0.59	1.95	50.17	50.87	51.46
H 3702	43.54	37.10	2.73	1.08	1.26	1.39	39.81	40.89	42.15
CC 337	50.83	44.74	3.08	0.61	1.23	1.16	47.82	48.43	49.67
H 3002	55.71 A C	47.74 A	3.95	0.84	1.25	1.95	51.68 C	52.52 C	53.76 A C
FG00 - 118	54.88	44.75	5.40	1.18	1.25	2.30	50.14	51.33	52.58
N 1477	44.18	36.98	2.98	1.23	1.65	1.33	39.96	41.19	42.84
H 3202	48.75	43.22	2.60	0.34	1.05	1.55	45.81	46.15	47.21
GEM 111	52.60	43.27	4.11	1.59	1.93	1.70	47.38	48.97	50.90
GEM 331	56.55 A C	48.56 A	3.89	0.96	0.77	2.36	52.45 C	53.41 A C	54.18 A C
TSH 20	49.93	42.43	4.21	0.77	1.13	1.38	46.64	47.42	48.55
H 3402	46.59	40.35	2.71	0.60	1.35	1.55	43.08	43.68	45.03
H 2501	47.51	39.96	3.99	0.82	0.57	2.16	43.95	44.78	45.34
H 5203	45.44	38.25	3.16	1.16	1.08	1.79	41.41	42.57	43.65
H 9704 (A)	**49.48**	**42.03**	**4.83**	**0.65**	**0.56**	**1.40**	**46.87**	**47.52**	**48.08**
OX 325	52.23	43.89	4.81	0.88	0.76	1.89	48.70	49.58	50.34
OX 9816	51.09	36.02	6.87	2.25	3.32	2.63	42.89	45.14	48.46
OX 323	53.67	43.16	5.38	1.47	1.64	2.01	48.54	50.01	51.66
H 9706	57.00 A C	44.04	6.43	1.98	3.35	1.19	50.47	52.45 C	55.80 ABC
Probability	0.0000	0.0000	0.0000	0.0081	0.0213	0.0012	0.0000	0.0000	0.0000
LSD	5.5075	5.5591	1.4671	0.6824	1.1390	0.7794	5.6615	5.5629	5.4566
CV	14.19%	16.92%	51.67%	93.97%	123.0%	53.43%	15.86%	15.27%	14.61%
Mean	49.837	42.196	3.646	0.932	1.189	1.873	45.842	46.775	47.963

Entries are ranked according to average maturity from 3 test sites. Means followed by the same letter are significantly better than the check cultivar denoted by that same letter.

Yields in this table are based on harvested fruit from 9 plots; 5 plants from each plot .

Yield Potential ranked by maturity, 2004



Red, Breaker & Processing Green Yield
2004

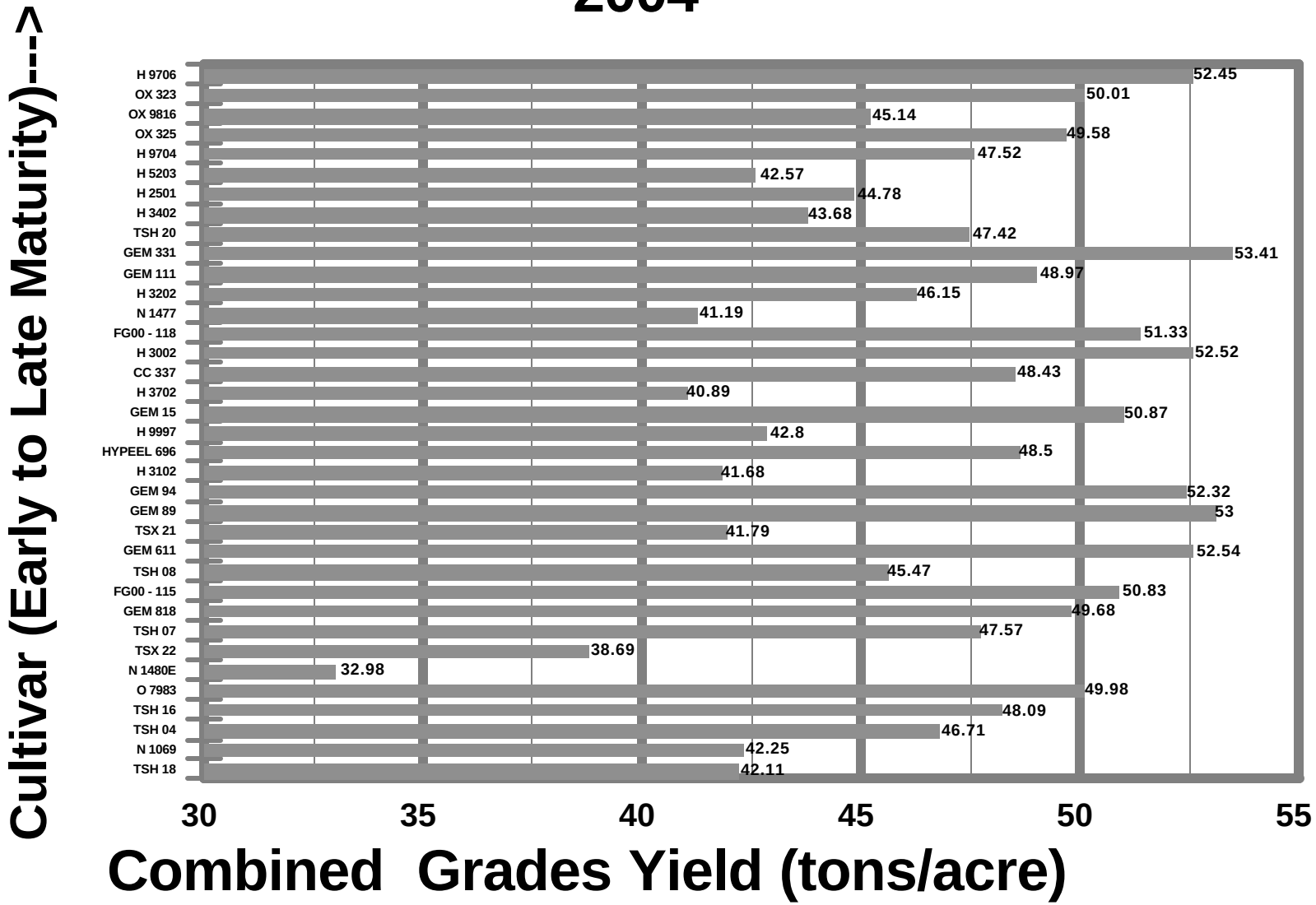


Table 3. Processing tomato yield trial, 2004. Yield (tons/acre) from the Dresden site (berrian sand - low organic matter).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use	Red & Breaker	Red, Breakers, Processing	Red, Breakers, Processing & Grass
TSH 18	54.96	49.26	2.57	0.54	1.05	1.53	51.84	52.38	53.42
N 1069	57.22	52.03	1.57	0.41	1.34	1.87	53.60	54.00	55.35
TSH 04 (C)	**61.62**	**56.03**	**2.21**	**1.02**	**1.48**	**0.88**	**58.24**	**59.26**	**60.74**
TSH 16	65.61	58.41	1.63	0.53	2.08	2.96	60.03	60.57	62.65
O 7983	57.19	52.67	1.54	0.55	1.20	1.23	54.21	54.76	55.96
N 1480E	43.43	37.00	2.05	0.69	1.91	1.77	39.05	39.75	41.66
TSX 22	54.60	48.06	2.43	0.93	2.18	1.01	50.49	51.41	53.59
TSH 07	61.98	56.98	1.70	0.58	1.26	1.46	58.68	59.26	60.52
GEM 818	67.41	61.58	2.53	0.51	1.23	1.55	64.11 B	64.63 B	65.85 AB
FG00 - 115	60.50	55.73	1.56	0.32	0.85	2.04	57.28	57.61	58.46
TSH 08	61.04	56.39	1.61	0.66	1.18	1.21	58.00	58.66	59.84
GEM 611	62.21	58.78	1.10	0.33	1.11	0.88	59.89	60.22	61.33
TSX 21	53.73	47.38	0.56	0.26	1.85	3.69	47.93	48.19	50.04
GEM 89	70.30 AB	66.02 ABC	1.55	0.82	1.01	0.89	67.58 ABC	68.40 ABC	69.41 AB
GEM 94	65.80	62.39 AB	0.85	0.08	1.72	0.76	63.24 B	63.32	65.05 B
H 3102	51.65	44.77	1.54	0.25	1.65	3.43	46.31	46.56	48.21
HYPEEL 696 (B)	**59.90**	**53.78**	**0.81**	**0.24**	**1.34**	**3.72**	**54.59**	**54.83**	**56.18**
H 9997	66.10	61.53	1.93	0.52	0.81	1.31	63.46 B	63.98 B	64.78
GEM 15	68.26 A	61.92	3.00	0.51	0.95	1.89	64.91 AB	65.42 AB	66.37 AB
H 3702	51.43	47.52	1.13	0.26	0.91	1.60	48.66	48.92	49.83
CC 337	55.00	48.85	2.03	0.57	2.69	0.87	50.87	51.44	54.13
H 3002	69.34 AB	60.24	3.87	1.05	2.44	1.74	64.11 B	65.16 AB	67.60 AB
FG00 - 118	64.94	56.79	4.48	0.75	0.95	1.99	61.26	62.01	62.96
N 1477	56.15	51.61	1.31	0.38	1.01	1.84	52.92	53.30	54.31
H 3202	55.07	51.75	0.51	0.00	1.89	0.93	52.26	52.26	54.15
GEM 111	65.26	60.12	2.28	0.42	0.76	1.69	62.40	62.82	63.57
GEM 331	60.64	55.51	1.45	0.05	0.42	3.19	56.97	57.02	57.44
TSH 20	68.86 AB	62.88 AB	2.06	0.61	1.55	1.76	64.94 AB	65.55 AB	67.09 AB
H 3402	55.94	51.83	0.96	0.38	2.04	0.74	52.79	53.16	55.20
H 2501	61.47	56.26	2.20	0.44	0.86	1.69	58.47	58.91	59.77
H 5203	50.52	47.39	0.73	0.20	1.03	1.17	48.12	48.32	49.35
H 9704 (A)	**59.09**	**53.59**	**2.06**	**0.45**	**1.03**	**1.96**	**55.65**	**56.10**	**57.14**
OX 325	67.27	60.93	3.55	0.13	0.58	2.09	64.48 AB	64.61 B	65.18 B
OX 9816	64.45	56.14	4.52	0.86	1.42	1.51	60.65	61.52	62.94
OX 323	57.63	53.01	2.83	0.53	0.58	0.69	55.84	56.37	56.95
H 9706	64.51	56.02	4.05	0.56	2.68	1.21	60.07	60.63	63.30
Probability	0.0001	0.0001	0.0065	0.1951	0.0176	0.0110	0.0000	0.0000	0.0001
LSD	8.7671	8.4581	1.7456	0.5407	1.0243	1.3901	8.6155	8.7153	8.7160
CV	10.68%	11.35%	63.46%	82.23%	55.25%	60.51%	11.15%	11.18%	10.92%
Mean	60.308	54.754	2.021	0.483	1.362	1.688	56.775	57.258	58.620

Entries are ranked according to average maturity from 3 test sites. Means followed by the same letter are significantly better than the check cultivar denoted by that same letter.

Yields in this table are based on harvested fruit from 3 plots; 5 plants from each plot .

Table 4. Processing tomato yield trial, 2004. Yield (tons/acre) from the Leamington site (berrian sandy loam).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use	Red & Breaker	Red, Breakers, Processing	Red, Breakers, Processing & Grass
TSH 18	44.93	36.49	2.00	0.31	0.47	5.65	38.48	38.80	39.27
N 1069	43.70	35.85	4.06	0.72	0.36	2.72	39.91	40.63	40.99
TSH 04 (C)	**41.19**	**35.27**	**2.07**	**0.63**	**0.21**	**3.01**	**37.34**	**37.97**	**38.18**
TSH 16	48.73 B	41.30	3.56	0.95	0.53	2.37	44.87 B	45.82 B	46.35 B
O 7983	53.22 BC	46.17 BC	2.39	0.68	0.86	3.12	48.56	49.24 BC	50.10 BC
N 1480E	31.61	24.93	3.77	0.78	0.48	1.65	28.70	29.48	29.96
TSX 22	38.53	33.28	2.11	0.60	0.36	2.18	35.39	35.99	36.36
TSH 07	44.79	40.33	1.60	0.85	0.60	1.41	41.93	42.78	43.38
GEM 818	46.56	40.51	3.61	0.15	0.59	1.69	44.13	44.27	44.87
FG00 - 115	43.45	36.90	1.49	0.86	0.85	3.36	38.38	39.24	40.09
TSH 08	41.63	37.57	1.77	0.80	0.38	1.11	39.34	40.14	40.52
GEM 611	50.09 BC	45.34 BC	2.88	0.77	0.27	0.83	48.22	48.98 BC	49.25 BC
TSX 21	47.32	42.41	2.10	0.51	0.39	1.91	44.51	45.02 B	45.41 B
GEM 89	48.13 B	40.26	3.21	0.46	0.81	3.39	43.47	43.93	44.74
GEM 94	46.12	39.91	2.52	0.36	0.16	3.16	42.43	42.80	42.96
H 3102	48.58 B	42.98	2.50	0.83	0.47	1.80	45.48 B	46.30 B	46.78 BC
HYPEEL 696 (B)	**38.91**	**35.32**	**0.85**	**0.19**	**0.27**	**2.29**	**36.17**	**36.36**	**36.62**
H 9997	36.15	30.75	1.21	0.20	0.11	3.88	31.97	32.16	32.27
GEM 15	43.46	38.62	1.97	0.54	0.28	2.05	40.59	41.13	41.41
H 3702	41.87	36.32	2.47	0.63	0.38	2.06	38.80	39.43	39.81
CC 337	53.48 BC	47.06 BC	3.55	0.65	0.24	1.99	50.60	51.25 BC	51.49 BC
H 3002	52.69 BC	45.55 BC	3.23	0.49	0.14	3.28	48.78	49.27 BC	49.41 BC
FG00 - 118	46.11	37.51	4.25	0.80	0.64	2.92	41.76	42.55	43.19
N 1477	42.50	36.32	3.12	0.83	0.68	1.56	39.44	40.27	40.95
H 3202	49.57 B	45.28 BC	1.81	0.16	0.39	1.92	47.09	47.25 BC	47.65 BC
GEM 111	41.95	37.01	1.95	0.93	0.20	1.87	38.96	39.88	40.08
GEM 331	51.31 BC	45.45 BC	3.05	0.55	0.08	2.18	48.50	49.06 BC	49.13 BC
TSH 20	45.48	39.29	4.08	0.38	0.27	1.46	43.37	43.74	44.02
H 3402	48.28 B	43.45	2.07	0.38	0.33	2.06	45.52 B	45.89 B	46.22 B
H 2501	45.95	37.97	4.11	0.71	0.20	2.96	42.08	42.79	42.99
H 5203	47.64 B	41.35	2.63	0.31	0.13	3.22	43.98	44.29	44.42
H 9704 (A)	**46.64**	**39.92**	**4.64**	**0.49**	**0.19**	**1.40**	**44.56**	**45.05 B**	**45.24 B**
OX 325	53.15 BC	47.54 BC	2.73	0.32	0.21	2.36	50.27	50.59 BC	50.80 BC
OX 9816	44.21	28.71	6.99	2.20	1.30	5.00	35.71	37.90	39.20
OX 323	58.85 ABC	48.66 ABC	5.39	0.60	0.09	4.11	54.04 ABC	54.65 ABC	54.74 ABC
H 9706	57.35 ABC	49.98 ABC	3.70	0.82	0.85	2.00	53.68 ABC	54.50 ABC	55.35 ABC
Probability	0.0010	0.0007	0.2282	0.2893	0.2768	0.0023	0.0004	0.0006	0.0007
LSD	8.5849	8.3814	2.6467	0.7754	0.5942	1.6544	8.4176	8.4686	8.5049
CV	13.65%	15.49%	66.39%	91.45%	106.6%	48.67%	14.49%	14.36%	14.29%
Mean	46.225	39.766	2.929	0.623	0.410	2.498	42.694	43.317	43.727

Entries are ranked according to average maturity from 3 test sites. Means followed by the same letter are significantly better than the check cultivar denoted by that same letter.

Yields in this table are based on harvested fruit from 3 plots; 5 plants from each plot .

Table 5. Processing tomato yield trial, 2004. Yield (tons/acre) from the Ridgetown site (berrian sandy loam).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use	Red & Breaker	Red, Breakers, Processing	Red, Breakers, Processing & Grass
TSH 18	36.74	30.55	3.72	0.89	0.53	1.04	34.28	35.16	35.70
N 1069	33.62	28.14	3.22	0.76	0.46	1.03	31.36	32.12	32.58
TSH 04 (C)	**45.38**	**38.76**	**3.52**	**0.62**	**0.57**	**1.91**	**42.28**	**42.90**	**43.47**
TSH 16	40.05	34.23	2.83	0.82	0.56	1.62	37.06	37.87	38.44
O 7983	48.55	38.55	6.30	1.08	0.47	2.14	44.86	45.94	46.41
N 1480E	31.37	23.81	5.52	0.39	0.57	1.09	29.32	29.71	30.28
TSX 22	30.45	22.62	4.94	1.11	0.23	1.56	27.56	28.66	28.89
TSH 07	42.11	32.66	6.74	1.27	0.60	0.84	39.40	40.67	41.27
GEM 818	44.26	31.68	6.68	1.77	1.99	2.13	38.37	40.14	42.13
FG00 - 115	58.70 A C	48.84	5.61	1.17	0.59	2.48	54.45	55.62	56.21 A C
TSH 08	40.30	30.39	6.28	0.93	1.72	0.97	36.67	37.60	39.32
GEM 611	52.45	37.92	7.86	2.65	1.93	2.10	45.77	48.43	50.36
TSX 21	34.62	26.17	4.92	1.04	0.52	1.96	31.10	32.14	32.66
GEM 89	49.59	39.97	5.09	1.59	1.43	1.51	45.06	46.66	48.09
GEM 94	55.91 A	41.07	7.36	2.41	3.33	1.74	48.42	50.84	54.17 a
H 3102	35.58	27.41	3.52	1.25	1.21	2.19	30.93	32.18	33.39
HYPEEL 696 (B)	**57.98 A C**	**45.76**	**6.40**	**2.16**	**1.88**	**1.77**	**52.16**	**54.32**	**56.20 A C**
H 9997	35.70	26.44	4.34	1.48	2.09	1.36	30.77	32.25	34.34
GEM 15	48.53	37.92	7.09	1.04	0.55	1.92	45.01	46.06	46.61
H 3702	37.32	27.44	4.53	2.35	2.48	0.51	31.98	34.33	36.81
CC 337	44.00	38.33	3.66	0.62	0.77	0.62	41.99	42.61	43.38
H 3002	45.09	37.41	4.74	0.97	1.16	0.82	42.15	43.12	44.27
FG00 - 118	53.58	39.94	7.47	2.01	2.17	2.00	47.41	49.42	51.59
N 1477	33.88	23.01	4.50	2.49	3.27	0.60	27.51	30.00	33.27
H 3202	41.62	32.62	5.47	0.87	0.87	1.79	38.09	38.95	39.83
GEM 111	50.58	32.69	8.09	3.43	4.85	1.53	40.78	44.21	49.05
GEM 331	57.69 A C	44.71	7.18	2.27	1.80	1.72	51.89	54.17	55.97 A
TSH 20	35.44	25.12	6.50	1.33	1.58	0.92	31.62	32.95	34.52
H 3402	35.55	25.77	5.17	1.05	1.70	1.86	30.94	31.99	33.69
H 2501	35.11	25.65	5.65	1.32	0.65	1.83	31.30	32.62	33.27
H 5203	38.17	26.02	6.10	2.98	2.07	0.99	32.12	35.10	37.17
H 9704 (A)	**42.71**	**32.58**	**7.80**	**1.01**	**0.46**	**0.85**	**40.39**	**41.40**	**41.86**
OX 325	36.27	23.20	8.17	2.19	1.49	1.23	31.36	33.55	35.04
OX 9816	44.62	23.21	9.10	3.69	7.25	1.37	32.31	36.00	43.25
OX 323	44.52	27.82	7.93	3.28	4.25	1.24	35.74	39.02	43.28
H 9706	49.13	26.11	11.55	4.57	6.54	0.36	37.66	42.23	48.76
Probability	0.0001	0.0059	0.0068	0.0439	0.0855	0.0128	0.0052	0.0014	0.0002
LSD	11.2841	11.8885	3.1094	1.8365	3.2377	0.9466	12.1891	11.6551	11.1570
CV	19.29%	27.24%	38.15%	79.80%	132.6%	48.52%	23.53%	21.54%	19.73%
Mean	42.977	32.070	5.988	1.691	1.794	1.434	38.057	39.749	41.543

Entries are ranked according to average maturity from 3 test sites. Means followed by the same letter are significantly better than the check cultivar denoted by that same letter.

Yields in this table are based on harvested fruit from 3 plots; 5 plants from each plot .

Handling Evaluations

After plot harvest, samples from the second replication at each site were retained for fruit handling evaluation trials.

Step 1: Weigh out a 3 kg sample of fruit and drop the sample onto a concrete floor from a height of 4 feet.

Only the fruit with cracks extending into the flesh are weighed.

This test estimates resistance to cracking or firmness. It answers the question, “Which cultivar is firmest?”

This procedure also simulates mechanical handling on the tomatoes that will be peeled at a later step.

Step 2: Count the number of fruit that have stems still attached.

This will provide an answer to the questions, “Is the cultivar jointless?”, “Are there any stems attached after harvest?”.

Depending on the end use, and methods used, some processors are able to tolerate a few attached stems, while others are not.

Step 3: Count the total number of fruit in the 3 kg sample.

This provides an answer to the question, “What is the average fruit size?”

Step 4: The uniformity of fruit size is estimated, on a weight basis by grading the fruit into 4 categories.

(a) 1" or less - fruit in this category are smaller that most users will want to deal with

(b) greater than 1" and less than or equal to 1 1/2" - this is a fairly typical size for wholepeel tomatoes

(c) greater than 1 1/2"and less than or equal to 1 3/4" - this is also a fairly typical size for whole, canned tomatoes

(d) greater than 1 3/4" - these fruit tend to be a bit too large, depending on the size of can

Wholepeel tomatoes need to have “cosmetic appeal” - in other words, they need to look good. A can of very uniformly sized, shaped, and coloured tomatoes will be more attractive to look at than a can of tomatoes that contains a mixture of sizes, shapes and colours (degrees of redness).

Consumers tend to equate attractive food with good quality food. The more uniform the tomatoes, the more likely the repeat sale.

Table 6. Average fruit size and uniformity of fruit size, 2004.

Name	Average Fruit Size	Size (1)% <1"	Size (2)% >1" & <1.5"	Size (3)% >1.5" & <1.75"	Size (4)% >1.75"	Size (2+3)%
H 3102	73.63 ABC	0.00	10.97	17.98	70.94	28.95
H 2501	72.14 AB	0.00	13.92	18.00	67.96	31.93
H 9706	67.53 A	0.00	18.86	29.90	51.35	48.76
GEM 89	67.30 A	0.00	16.67	26.47	56.53	43.14
H 3002	66.24 A	0.00	14.69	19.47	65.84	34.16
GEM 94	64.69	0.11	17.61	40.19	42.09	57.80 B
GEM 111	64.63	0.00	16.16	34.92	48.80	51.08
TSH 04 (C)	**63.84**	**0.00**	**25.71**	**41.42**	**32.99**	**67.12 AB**
H 3402	62.85	0.22	33.19	42.84	23.63	76.03 AB
FG00 - 118	62.53	0.00	15.79	39.26	45.15	55.06
H 3202	62.25	0.00	18.08	45.01	36.81	63.08 B
OX 325	61.50	0.00	25.82	26.82	47.58	52.64
HYPEEL 696 (B)	**61.40**	**0.00**	**16.00**	**24.86**	**59.26**	**40.86**
FG00 - 115	61.00	0.00	20.98	34.15	44.88	55.12
TSH 18	59.78	0.00	31.82	39.05	29.24	70.87 AB
TSX 22	59.15	0.00	26.76	47.57	25.55	74.34 AB
OX 323	58.87	0.00	22.88	27.16	50.07	50.04
O 7983	58.31	0.56	25.41	32.32	42.26	57.74 B
TSH 16	58.09	0.11	42.79	40.05	16.61	82.84 AB
H 5203	58.08	0.00	27.31	42.29	30.51	69.60 AB
H 9997	56.27	0.00	20.24	20.79	58.97	41.02
H 9704 (A)	**55.99**	**0.00**	**25.05**	**24.99**	**50.63**	**50.04**
GEM 611	55.94	0.00	20.61	30.81	38.57	51.43
H 3702	55.91	0.33	42.94	30.84	24.78	73.78 AB
GEM 818	55.03	0.00	28.78	31.82	39.24	60.60 B
GEM 331	54.96	0.00	28.06	32.17	39.88	60.23 B
TSX 21	54.57	0.22	27.86	37.26	34.55	65.12 B
TSH 20	54.39	0.00	62.54	28.76	8.71	91.29 ABC
OX 9816	53.40	0.11	47.65	32.92	18.87	80.58 AB
TSH 07	52.99	0.78	43.90	38.10	17.88	82.00 AB
GEM 15	52.32	0.22	35.33	40.92	23.99	76.26 AB
TSH 08	50.39	0.11	47.50	44.84	7.21	92.34 ABC
N 1477	50.20	0.33	55.88	40.91	2.88	96.79 ABC
N1480E	48.92	0.11	56.54	41.90	1.67	98.45 ABC
N 1069	48.04	0.56	77.03	21.31	1.00	98.33 ABC
CC 337	47.38	0.56	62.47	36.97	0.00	99.44 ABC
Probability	0.0000	0.4271	0.0000	0.0000	0.0000	0.0000
LSD	8.7143	0.4687	13.4681	11.0275	17.1030	16.3228
CV	10.92%	286.3%	31.70%	24.20%	35.99%	18.54%
Mean	58.624	0.120	31.217	33.474	34.913	64.691

Means in the average fruit size and size (2+3) columns followed by the same letter are significantly better than the check cultivar denoted by that same letter. The sum of different size categories across rows may not total 100 due to rounding off. Means are based on 3 samples. Each sample consisted of 3kg of fruit.

Table 7. Percent fruit with stems still attached after shaking from plant, 2004.

Name	Stems %
N 1069	17.18
H 3702	15.89
H 9997	9.57
H 3102	8.08
CC 337	6.82
HYPEEL 696 (B)	**6.29**
H 3202	6.28
TSH 18	6.16
H 2501	5.69
H 9704 (A)	**5.15**
GEM 15	5.10
TSX 21	5.07
GEM 818	4.92
H 3402	4.07
H 9706	3.93
TSH 04 (C)	**3.39**
GEM 94	3.04
H 3002	2.95
TSX 22	2.67
GEM 611	2.55
FG00 - 118	2.18
GEM 89	2.17
O 7983	2.08
GEM 111	1.85
GEM 331	1.73
H 5203	1.45
TSH 16	1.30
N 1477	1.05
OX 325	0.85
FG00 - 115	0.81
TSH 07	0.60
OX 9816	0.52
N1480E	0.49
TSH 20	0.00
OX 323	0.00
TSH 08	0.00
Probability	**0.0000**
LSD	**5.3817**
CV	**100.3%**
Mean	**3.942**

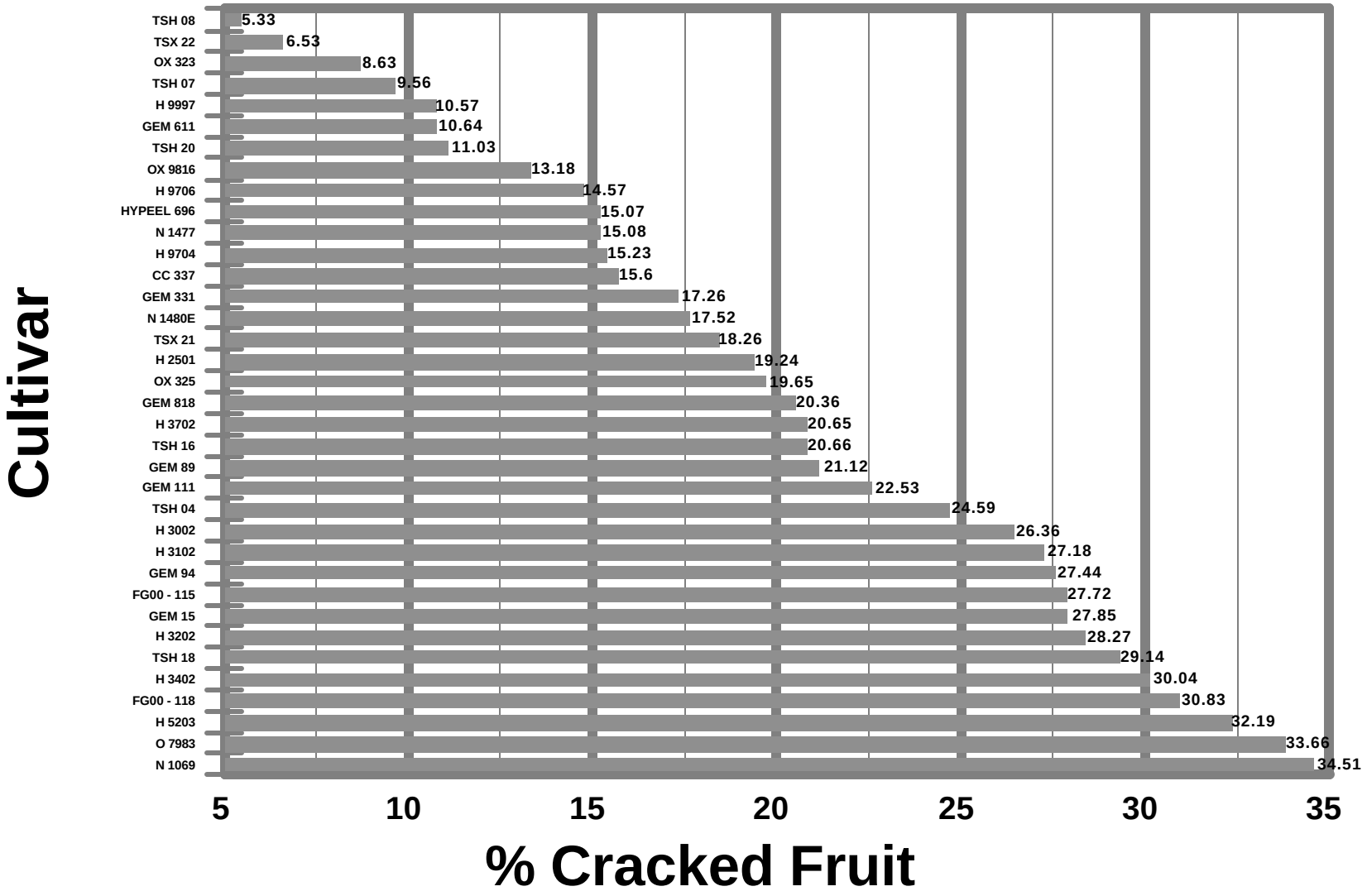
Means are based on 3 samples. Each sample consists of 3 kg of fruit.

Table 8. Percent fruit (by weight) with cracks extending into the flesh after dropping on concrete from a four foot height, 2004. This test estimates firmness.

Name	Cracked Fruit (%)
N 1069	34.51
O 7983	33.66
H 5203	32.19
FG00 - 118	30.83
H 3402	30.04
TSH 18	29.14
H 3202	28.27
GEM 15	27.85
FG00 - 115	27.72
GEM 94	27.44
H 3102	27.18
H 3002	26.36
TSH 04 (C)	**24.59**
GEM 111	22.53
GEM 89	21.12
TSH 16	20.66
H 3702	20.65
GEM 818	20.36
OX 325	19.65
H 2501	19.24
TSX 21	18.26
N 1480E	17.52
GEM 331	17.26
CC 337	15.60
H 9704 (A)	**15.23**
N 1477	15.08
HYPEEL 696 (B)	**15.07**
H 9706	14.57
OX 9816	13.18
TSH 20	11.03
GEM 611	10.64
H 9997	10.57
TSH 07	9.56
OX 323	8.63
TSX 22	6.53
TSH 08	5.33
Probability	**0.0025**
LSD	**12.8451**
CV	**46.67%**
Mean	**20.224**

Means followed by the same letter are significantly better than the check cultivar denoted by that same letter. Means are based on 3 samples. Each sample consisted of 3 kg of fruit.

Percent Cracked Tomato Fruit, 2004



Peeling Evaluations

After going through the handling evaluations (Steps 1 through 4) described above, the 3 kg fruit samples were peeled.

Step 5: The tomatoes were submerged in caustic potash (30% solution by weight) with Turgitol surfactant (0.3% by volume), at 102 +/- 1EC for 40 seconds.

The sample was rinsed twice in water and the peels were removed mechanically.

The peeled tomatoes were rinsed in a citric acid solution (pH 3.5) to neutralize any remaining caustic solution.

The tomatoes were drained and weighed.

The weight measured here (in kg) was divided by the initial weight (3 kg) to determine what percent of the weight was lost in the chemical action of the caustic and the aggressive action of the peeling equipment.

What does this tell me?

These results, shown in Table 9, answer the questions, “What is the peeling recovery?”, “How much is lost in the peeling process?”, or conversely, “How much remains after the peels are taken off?”.

There is some evidence that peeling recovery is also a good indicator of firmness.

Table 9. Percent (by weight) of fruit recovered after peeling but before sorting, 2004. Demonstrates how much remains after exposure to caustic and peeler.

Name	Peeling Recovery (%)	
H 3102	86.43	BC
TSX 21	85.03	BC
TSH 08	84.77	BC
H 2501	83.82	BC
TSH 07	83.42	BC
OX 323	83.37	B
N 1477	83.24	B
H 9997	83.18	B
H 9704 (A)	**82.72**	**B**
O 7983	82.65	B
H 3402	82.54	B
N 1480E	82.47	B
TSX 22	82.46	B
OX 325	82.33	B
H 9706	82.22	B
H 3202	81.67	
TSH 16	81.44	
H 5203	81.36	
H 3002	81.04	
GEM 611	80.81	
GEM 331	80.56	
TSH 20	80.41	
TSH 04 (C)	**79.60**	
TSH 18	79.08	
GEM 818	78.66	
GEM 111	78.59	
HYPEEL 696 (B)	**77.96**	
H 3702	77.54	
OX 9816	77.52	
GEM 94	77.36	
FG00 - 115	77.21	
GEM 89	76.18	
FG00 - 118	75.75	
N 1069	75.55	
CC 337	74.97	
GEM 15	73.89	
Probability	**0.0000**	
LSD	**3.8148**	
CV	**3.48%**	
Mean	**80.494**	

Means followed by the same letter are significantly better than the check cultivar denoted by that same letter. Means are based on 3 samples. Each sample consisted of 3kg of fruit.

Step 6: After peeling, the tomatoes were sorted for colour, peels still attached, and blemishes.

The Colourmet spectrophotometer was used as a standard for acceptable colour.

After sorting the fruit that were good enough to be canned were weighed.

This weight was divided by the weight of peeled tomatoes. The resulting number, the Percent Cannable (Table 10), shows the percent of fruit that have no significant colour defects, and that peeled relatively easily.

What does this tell me?

This answers the following questions, "How much sorting will be required in the factory?", "What percent of tomatoes will have to be put into the juice/sauce line after peeling?", "How good do the tomatoes look after they've been peeled?".

NOTE ON STEP 6:

The peeling process in this study was kept the same for all cultivars and it should be noted that the caustic concentration was 30% by weight for 2004.

In actual practice, processors will adjust the time, temperature and concentration of caustic, in the peeling procedure in order to efficiently remove the peels from most cultivars.

Table 10. Percent (by weight) of cannable tomatoes when sorted after peeling, 2004. Shows how little or how much sorting is required after peeling.

Name	% Cannable	
TSH 07	90.28	BC
N 1480E	89.17	BC
GEM 111	87.65	BC
N 1069	87.17	BC
GEM 331	84.45	B
CC 337	83.38	B
GEM 94	82.89	B
GEM 818	82.41	B
GEM 611	82.10	B
TSH 16	82.02	B
H 3202	81.95	B
H 3102	81.75	B
OX 323	81.68	B
GEM 15	80.73	B
TSH 08	80.73	B
TSX 21	79.98	B
GEM 89	79.45	
H 3702	78.91	
N 1477	78.84	
H 5203	78.40	
H 9704 (A)	**76.33**	
TSH 18	75.68	
TSX 22	75.49	
H 3402	73.97	
TSH 20	73.26	
TSH 04 (C)	**72.32**	
FG00 - 118	72.28	
OX 325	70.48	
H 9997	69.05	
FG00 - 115	67.37	
H 2501	66.09	
O 7983	64.87	
HYPEEL 696 (B)	**64.36**	
H 3002	63.29	
OX 9816	62.89	
H 9706	49.29	
Probability	**0.0122**	
LSD	**15.1070**	
CV	**14.53%**	
Mean	**76.415**	

Means followed by the same letter are significantly better than the check cultivar denoted by that same letter. In this case no entries were better than the poorest check. Means are based on 3 samples. Each samples consisted of 3 kg of fruit.

Step 7: This step consists of making a calculation of % Canning Recovery with data already gathered.

In step 6 above, we looked at % Cannable by comparing the weight of the tomatoes after peeling, with the weight after sorting.

In this step the % Canning Recovery is calculated by comparing the weight of tomatoes before peeling with the weight after sorting.

What does this tell me?

These results answer the questions, “Of the initial weight of tomatoes received at the factory, what % will actually end up in the can?”, “If 100 tons of tomatoes are put in the flume, how many tons will end up in a can?”

The actual % canning recovery that processors get will probably be very different than what we report here.

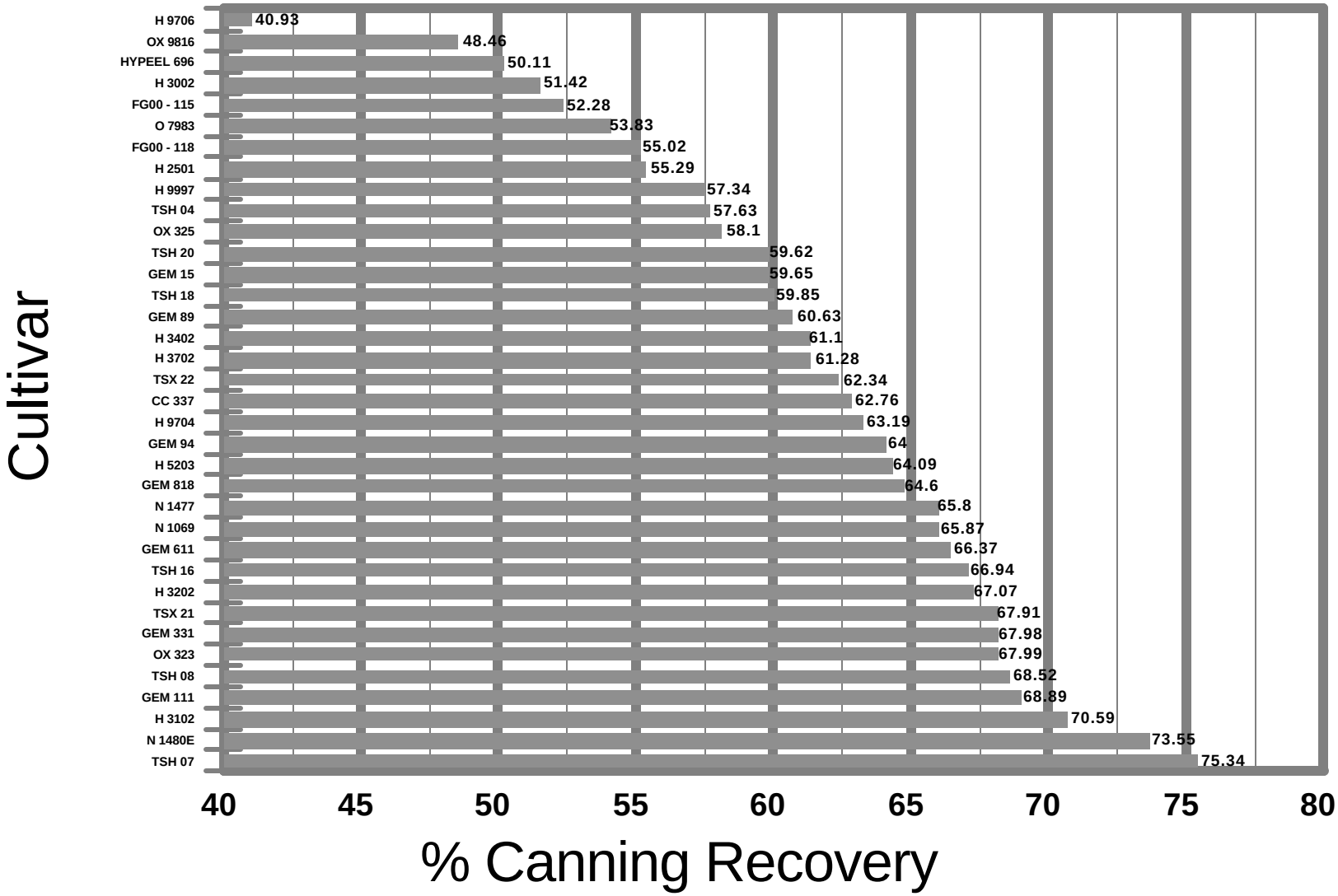
In this case it’s more important to look at the ranking of cultivars, rather than the actual numbers.

Table 11. Percent (by weight) canning recovery, 2004. Shows the percent fruit suitable for canning based on the initial weight sent through the peeling line.

Name	% Canning Recovery	
TSH 07	75.34	BC
N 1480E	73.55	BC
H 3102	70.59	B
GEM 111	68.89	B
TSH 08	68.52	B
OX 323	67.99	B
GEM 331	67.98	B
TSX 21	67.91	B
H 3202	67.07	B
TSH 16	66.94	B
GEM 611	66.37	B
N 1069	65.87	B
N 1477	65.80	B
GEM 818	64.60	B
H 5203	64.09	B
GEM 94	64.00	B
H 9704 (A)	**63.19**	**B**
CC 337	62.76	
TSX 22	62.34	
H 3702	61.28	
H 3402	61.10	
GEM 89	60.63	
TSH 18	59.85	
GEM 15	59.65	
TSH 20	59.62	
OX 325	58.10	
TSH 04 (C)	**57.63**	
H 9997	57.34	
H 2501	55.29	
FG00 - 118	55.02	
O 7983	53.83	
FG00 - 115	52.28	
H 3002	51.42	
HYPEEL 696 (B)	**50.11**	
OX 9816	48.46	
H 9706	40.93	
Probability	**0.0203**	
LSD	**13.0173**	
CV	**15.54%**	
Mean	**61.564**	

Means are based on 3 samples. Each sample consisted of 3 kg of fruit.

Percent Canning Recovery, 2004



Quality Evaluations

When yield was evaluated in the field, a sample of tomatoes were taken to the pilot plant for handling and peeling evaluations. Part of this same sample was used for juice quality evaluations.

Step 8: The tomatoes for quality evaluations were washed and dried and cut in half from end to end.

One half of each tomato was blended, under vacuum, for 40 seconds.

The other half of each tomato went into a covered pyrex dish for microwave heating (to 95 EC for 15 sec) in order to deactivate the pectinase enzyme.

Step 9: Juice from the blended sample was collected through a screen to remove seeds.

Agtron colour, pH , Soluble Solids (EBrix) and Total Solids (on an AVC 80) were measured.

What does this tell me?

The lower the number for Agtron colour, the better the red colour in the juice.

A pH value of 4.3 is considered the threshold for food safety. If the pH is higher than this, there may be concerns about can spoilage unless more acid is added to the can.

Soluble solids were measured on a Palette PR101 digital refractometer. Soluble solids are important in the manufacture of paste since paste is bought and sold on the basis of the solids content. If the soluble solids content is low, then it is more expensive to evaporate more water to get the required solids content.

The total solids provide a measure of all of the solids (excluding the seeds and skin) - both the soluble solids and the water insoluble solids.

Step 10: Microwaved tomato halves were run through a finisher (0.033 mesh) and the juice was cooled to 20 +/- 2 EC.

Consistency was estimated using this juice (50 ml for 30 sec) on a Bostwick consistometer.

What does this tell me?

A low Bostwick reading is important. It indicates that paste made from these tomatoes will be relatively “thick”. In some tomato products sugar can be added but, by definition, no starch or other thickeners may be added. All of the “thickness” of the end product must come from the tomato.

Table 12. Results of quality evaluations on juice samples, 2004.

Name	Agtron	Soluble Solids	pH	Modified Boswick (cm)
CC 337	22.00	4.50 A	4.39 B	6.23
FG00 - 115	23.33	4.30 A	4.37	6.77 A
FG00 - 118	26.00 A	4.27 A	4.32	6.00
GEM 15	28.33 A C	3.97	4.31	7.50 ABC
GEM 89	19.00	4.50 A	4.38	7.13 AB
GEM 94	29.00 A C	4.20 A	4.38	7.07 AB
GEM 111	24.67 A	4.03	4.32	6.97 A
GEM 331	25.67 A	4.23 A	4.35	6.87 A
GEM 611	24.33	3.83	4.36	7.00 AB
GEM 818	24.33	3.93	4.31	6.57 A
H 2501	22.00	4.30 A	4.28	6.77 A
H 3002	29.33 A C	4.37 A	4.27	6.70 A
H 3102	24.33	4.53 A C	4.32	7.33 ABC
H 3202	25.33 A	4.50 A	4.37	5.70
H 3402	22.33	4.43 A	4.36	6.23
H 3702	21.00	4.33 A	4.26	6.30
H 5203	25.33 A	4.40 A	4.32	5.97
H 9704 (A)	**20.33**	**3.77**	**4.34**	**5.33**
H 9706	27.33 A	4.23 A	4.33	6.47 A
H 9997	18.67	3.93	4.41 AB	6.00
HYPEEL 696 (B)	**28.00 A**	**4.23 A**	**4.32**	**6.00**
N 1069	19.00	4.43 A	4.30	7.67 ABC
N 1477	24.00	4.03	4.39 B	6.67 A
N 1480E	20.33	4.27 A	4.41 AB	7.27 AB
O 7983	28.00 A	4.23 A	4.32	7.33 ABC
OX 323	20.33	4.43 A	4.39 B	6.77 A
OX 325	25.67 A	4.13	4.40 B	7.43 ABC
OX 9816	25.33 A	4.20 A	4.42 AB	6.50 A
TSH 04 (C)	**24.00**	**4.13**	**4.36**	**6.30**
TSH 07	20.33	4.30 A	4.41 AB	6.57 A
TSH 08	25.33 A	4.40 A	4.37	6.17
TSH 16	19.00	4.37 A	4.43 ABC	7.40 ABC
TSH 18	21.67	4.27 A	4.35	6.80 A
TSH 20	21.00	4.23 A	4.42 AB	7.23 AB
TSX 21	25.67 A	4.13	4.39 B	7.50 ABC
TSX 22	21.00	4.50 A	4.32	6.17
Probability	**0.0001**	**0.0705**	**0.0003**	**0.0159**
LSD	**4.2121**	**0.3758**	**0.0638**	**0.9986**
CV	**13.09%**	**6.50%**	**1.08%**	**10.97%**
Mean	**23.648**	**4.246**	**4.354**	**6.685**

Means followed by the same letter are significantly better than the check cultivar denoted by that same letter. Please see text for explanation of the modified bostwick measurement. Means are based on 3 samples.

Summary

These summary statements are presented in this format with the understanding that end users of cultivars may have preferences for a particular cultivar source based on general characteristics of material released.

Processors and growers are encouraged to evaluate material, on a relatively small scale, from a variety of programs in order to find the cultivars that best meet their particular management methods and ultimate needs.

It should be noted that these conclusions are based primarily on the results from the 2004 season. Having acknowledged this limitation, the following summary comments are provided.

(For each source, the entries are listed in order of observed maturity in 2004.)

GEM Seeds: GEM818, GEM611, GEM89, GEM94, GEM15, GEM111, GEM331
GEM818 - midseason maturity, good field performance, good peeled colour
GEM611 - very good yield and firmness, good peeled colour
GEM89 - excellent yield, Agtron colour, and SS., good peeled colour
GEM94 - excellent yield, very good peeled colour
GEM15 - very good red ripe yield, good peeled colour
GEM111 - late maturity, good yield, excellent peeled colour
GEM331 - late, excellent yield, good firmness, very good peeled colour

Heinz Seed: H3102, H9997, H3702, H3002, H3202, H3402, H2501, H5203, H9704, H9706
H3102 - excellent peeling recovery, good peeled colour, excellent SS.
H9997 - very good firmness and peeling recovery, excellent Agtron colour
H3702 - good firmness, good peeled colour, Agtron colour, and SS.
H3002 - excellent yield, good SS., good peeling recovery
H3202 - good red ripe yield, good peeling characteristics, excellent SS.
H3402 - good peeling recovery, good Agtron colour, very good SS.
H2501 - good firmness, very good peeling recovery, good Agtron and SS.
H5203 - good peeling characteristics and very good SS.
H9704 - consistent performer
H9706 - late maturity, excellent yield and firmness, consistent performance for these traits over many years

Kraft: N1069, N1480E, CC337, N1477
N1069 - very early maturity, excellent peeled colour and Agtron colour, very good SS.
N1480E - early maturity, good firmness and peeling recovery
CC337 - good yield, very good peeled colour, excellent SS.
N1477 - late maturity, very good peeling recovery, good firmness

OARDC-OSU: O7983, FG00-115, FG00-118, OX325, OX9816, OX323
O7983 - early season check for comparison of performance over many years
FG00-115 - very good yield, good Agtron colour and SS.
FG00-118 - very good yield (consistent with last year) midseason maturity, good SS.
OX325 - consistently good peeling recovery and firmness, similar to last year
OX9816 - good yield potential (similar to last year), very good firmness
OX323 - very good yield, excellent firmness and peeled colour, very late maturing, consistent performer over several years

Seminis: Hypeel 696
Hypeel 696 - mid/late season check, fairly consistent in good yield

Tomato Solutions: TSH18, TSH04, TSH16, TSX22, TSH07, TSH08, TSX21, TSH20
TSH 18 - very early maturity, very good Agtron colour, both traits consistent with 2003
TSH04 - good red ripe yield, early maturity

TSH 16 - early maturity, good yield and quality, very good Agtron colour consistent with 2003
TSX22 - excellent firmness, very good SS.
TSH07 - midseason maturity, very good yield, consistently good peeled quality over several years
TSH08 - consistently good firmness and peeled colour for last 4 years
TSX21 - excellent peeling recovery, good peeled colour
TSH20 - late maturity, good yield, consistently good firmness

THE FINAL WORD . . .

SO WHAT SHOULD I EVALUATE OR GROW NEXT YEAR?

With 36 entries in the trial and many traits that influence success with a cultivar, this can be a difficult question.

The best way to answer this question is to run your own, larger scale, trials. There are several ways, however, to decide which varieties you should include in your trials. Here is a very simple method (there may be other preferable ways):

First, decide which traits are your highest priorities. Then go to the relevant tables in this report and assign a score of 1 to every variety that is equal to, or better than the average for that trait. Then tally the results and choose those with top scores.

For example, if we choose a combination of field and processing traits: 'rot' (a lower number is better), 'yield potential', 'red ripe yield', 'cracking (a low number indicates firm fruit), '% peeling recovery', '% cannable', 'Agtron colour', and 'soluble solids', then the following cultivars (in order of maturity) tend to be very high scoring (5 or more points out of 8):

N1069	TSH16	N1480E	TSX22	TSH07	GEM818
TSH08	GEM611	GEM89	H3702	CC337	N1477
H3202	GEM331	TSH20	H3402	H5203	OX323
H9706					

From this example you can see that in 2004 many cultivars performed well.

You can try this method yourself by picking and choosing which traits are most important to you and finding which entries will get a perfect score, or at least the highest score.

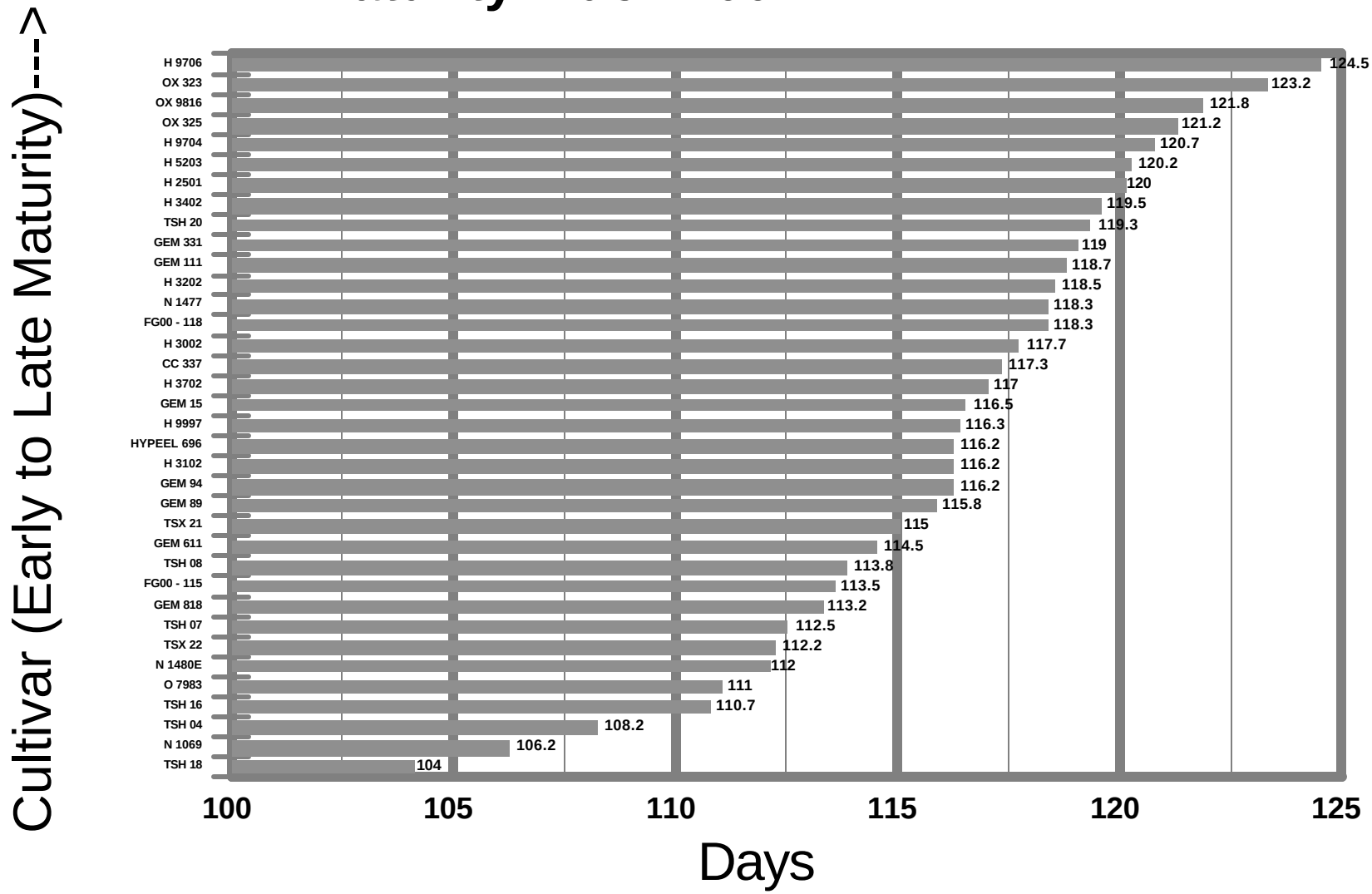
Please note that this simple method provides only a guide for picking cultivars for trial.

This method is not a substitute for proper, on-site trials and evaluations of varieties under your specific management system, soils and microclimate.

Appendix 1. Maturity ranking 2004, based on results from the Dresden and the Leamington sites.

Name	Days to Harvest
TSH 18	104.0
N 1069	106.2
TSH 04	**108.2**
TSH 16	110.7
O 7983	111.0
N 1480E	112.0
TSX 22	112.2
TSH 07	112.5
GEM 818	113.2
FG00 - 115	113.5
TSH 08	113.8
GEM 611	114.5
TSX 21	115.0
GEM 89	115.8
GEM 94	116.2
H 3102	116.2
HYPEEL 696	**116.2**
H 9997	116.3
GEM 15	116.5
H 3702	117.0
CC 337	117.3
H 3002	117.7
FG00 - 118	118.3
N 1477	118.3
H 3202	118.5
GEM 111	118.7
GEM 331	119.0
TSH 20	119.3
H 3402	119.5
H 2501	120.0
H 5203	120.2
H 9704	**120.7**
OX 325	121.2
OX 9816	121.8
OX 323	123.2
H 9706	124.5

Maturity Index 2004



Appendix 2 - Visual Ratings on Peeled Tomatoes

The table on the next page shows the average visual rating given to the peeled tomato samples.

This rating is based on a general impression of peeled colour, wholeness, uniformity of colour and freedom from peels, defects, disease and the overall appeal of the sample.

The scale ranged from 1 (bad) to 5 (excellent).

This is another case where the ranking is more important than the actual score received.

Rating in this way provides a means to communicate the overall impression of a cultivar that is very difficult or time consuming to measure or describe in any other way.

Appendix 2. Visual appearance rating on peeled fruit, 2004. Rating scale of 1 (poor) to 5 (excellent). See text for explanation.

Name	Rating
TSH 07	4.33
N 1480E	4.33
H 3402	4.00
GEM 89	4.00
TSH 08	3.83
TSH 16	3.83
OX 323	3.83
H 3702	3.67
H 3202	3.67
GEM 611	3.67
TSX 22	3.50
H 2501	3.50
TSX 21	3.50
GEM 111	3.50
H 5203	3.33
H 9706	3.33
GEM 818	3.33
TSH 04	**3.33**
GEM 94	3.33
TSH 20	3.33
N 1477	3.17
N 1069	3.17
FG00 - 118	3.17
CC 337	3.17
FG00 - 115	3.17
H 9704	**3.17**
GEM 331	3.17
H 3102	3.00
TSH 18	3.00
O 7983	3.00
H 9997	2.83
HYPEEL 696	**2.83**
GEM 15	2.67
OX 325	2.50
H 3002	2.33
OX 9816	2.00
Mean rating	**3.319**

Means are based on 3 samples.