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UNIVERSITY of GUELPH

RIDGETOWN COLLEGE

Processing Tomato Cultivar Trials Research Report 2001

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Introduction

The following pages represent a summary of the results from the 2001 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 2001?

(a) The fungicide spray program included a scheduled number of sprays using a combination of Bravo 500 and Kocide to reduce possible problems with bacterial diseases. The dry 2001 growing season did not result in any bacterial disease problems.

(b) Similar to last year, a second harvest was done at one location to estimate holding ability. This year the Leamington site was chosen and the second harvest was taken between 15 and 16 days after the optimum harvest date.

(c) Preliminary data were collected on the incidence of blossom end rot however they are not reported in this document. It was decided that more experience is necessary in assessing this problem before results are published.

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
- Nabisco Limited, Dresden
- H.J. Heinz Company of Canada Limited, 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.
- Land O'Lakes
- Ontario Ministry of Agriculture, Food and Rural Affairs
- University of Guelph

Field space and plot maintenance were generously provided by AAFC-GPCRC, Nabisco, and H.J.Heinz at each site.

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

Plot Establishment

Locations:	4
Replications per location:	3
Entries in trial:	36

Plot size
- Plant spacing: twin rows, 18" apart, and plant spacing of 17" (= population of 12,375 pl/Acre)
- Length: 27' (= 36 plants per plot)

Planting dates:
- Harrow 04 June 2001
- Leamington 09 May
- Dresden 10 May
- Ridgetown 09 May

Fertilizer Rates: Starter fertilizer was used at Ridgetown at a rate of 1 L of 10-52-10 in 182 L of water, continuous flow of solution. At the Ridgetown site a soil test indicated that nutrient levels were very high. Based on fertilizer recommendations: 1 000 kg/ha of 10-14-33, were applied, all broadcast preplant.

Weed Control: At the Ridgetown site weed control consisted of 1.65 L / ha Dual Magnum applied preplant incorporated. Multiple applications of 0.3 L/ha of Sencor 500 F were applied as a postemergent broadcast spray.

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

Processing Tomato Cultivar Trial Entries 2001		
H.J. Heinz Co.	**Land O'Lakes**	**OARDC - OSU**
H 9423 H 9553 H 9661 H 9704 H 9706 H 9992 H 9995 H 9996 H 9997	TR 12 TR 82 TX 90	OX 23 OX 52 OX 150 OX 323 OX 325 OX 328 OX 329 Ohio 7983
Petoseed	**Ridgetown College**	**Tomato Solutions**
Hypeel 312 Hypeel 696 Hypeel 2130	R002 R003 R 9812 R 9814	TSH 1 TSH 2 TSH 4 TSH 5 TSH 6 TSH 7 TSH 8 TSH 9 TSH 10

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.	

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.

Cultivar or Variety - What's the difference?

*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.

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.

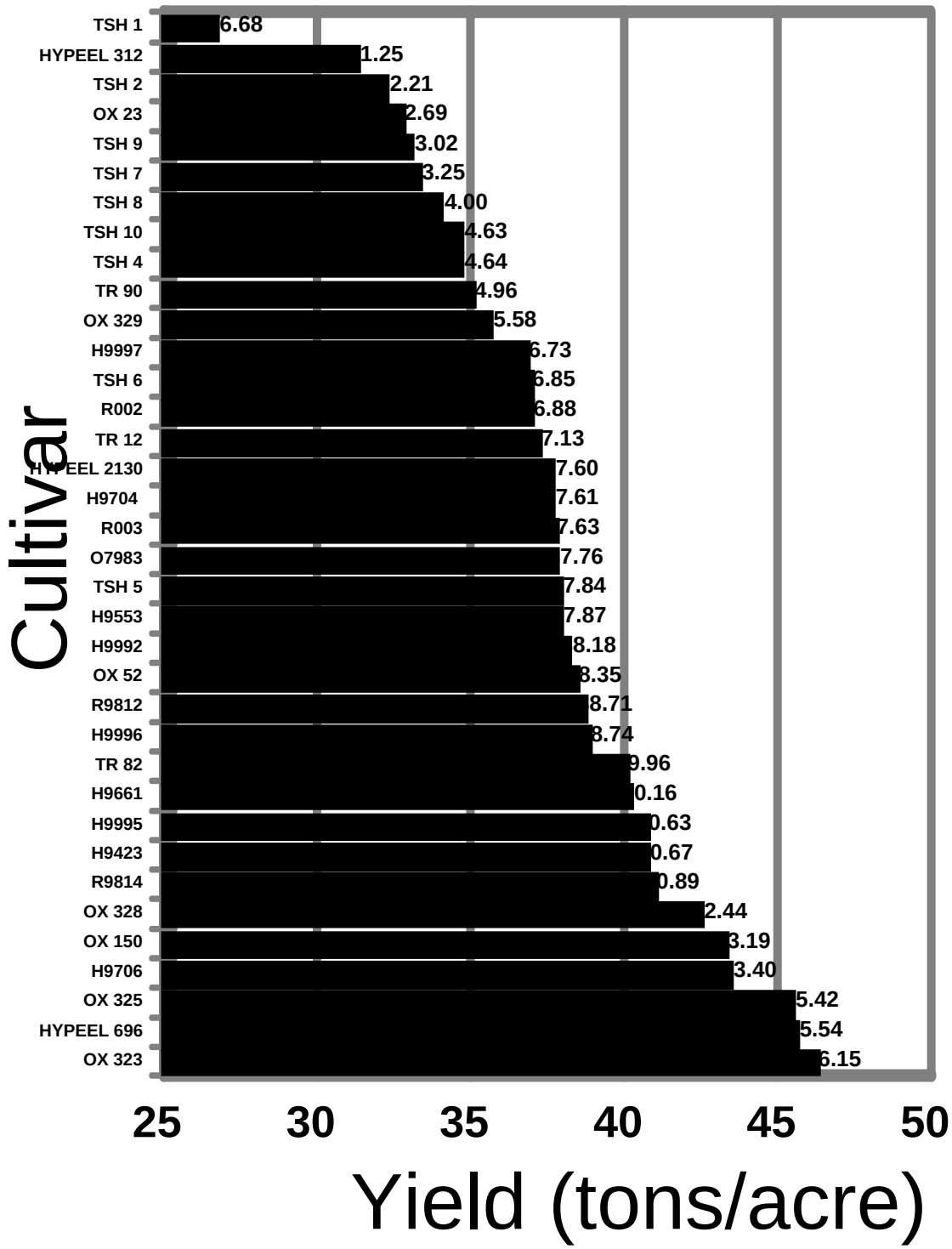
In a cultivar trial like this one, note the trends or rankings since these are probably as important as understanding the statistics.

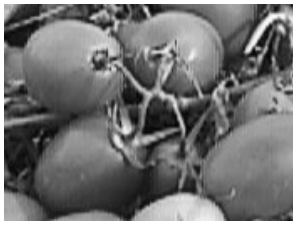
R9812	38.71
OX 52	38.35
H9992	38.18
H9553	37.87
TSH 5	37.84
O7983 (C)	**37.76**
R003	37.63

H9704	37.61
HYPEEL 2130	37.60
TR 12	37.13
R002	36.88
TSH 6	36.85
H9997	36.73
OX 329	35.58
TR 90	34.96
TSH 4	34.64
TSH 10	34.63
TSH 8	34.00
TSH 7	33.25
TSH 9	33.02
OX 23	32.69
TSH 2	32.21
HYPEEL 312	31.25
TSH 1	26.68
PROBABILITY	0.0000
LSD	5.1773
CV	20.35%
Mean	37.8

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 12 plots;5 plants from each plot.

Yield Potential over 4 Locat





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 4 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
Table 6

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.

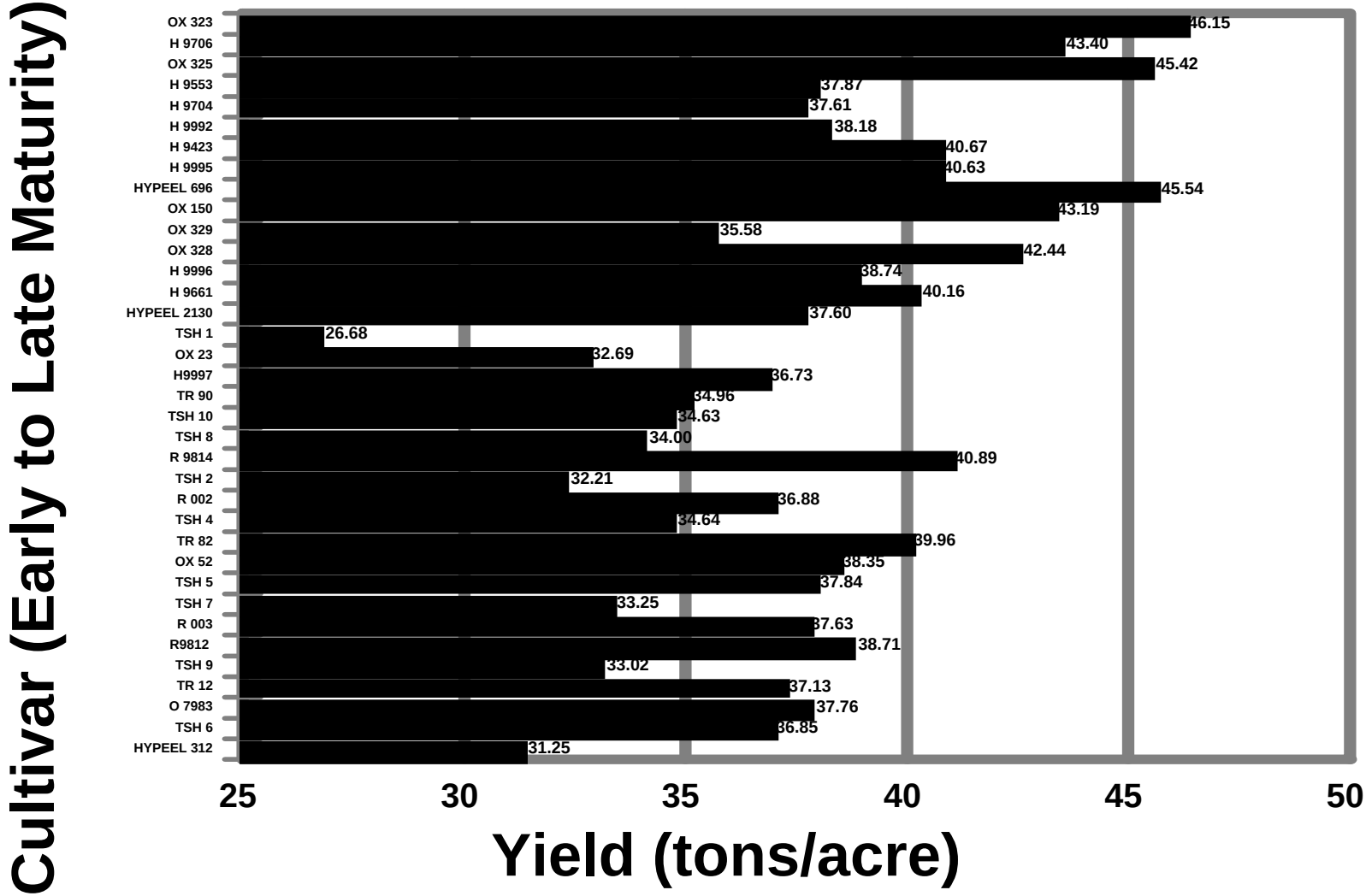
Table 2. Processing tomato yield trial, 2001. Yield (tons/acre) averaged over 4 locations.

Name	Total	Red	Breakers	Processing Green	Grass Green	LimitedUse Rots	Red & Breakers	Red, Breakers , Processing Green	Red, Breakers, Processing & Grass
HYPEEL 312	31.25	23.20	1.01	0.72	3.08	3.24	24.21	24.93	28.01
TSH 6	36.85	30.12	1.76	0.54	3.04	1.39	31.88	32.42	35.46
O 7983 (C)	**37.76**	**31.40**	**1.51**	**0.56**	**2.20**	**2.08**	**32.91**	**33.47**	**35.68**
TR 12	37.13	32.09	0.90	0.37	2.59	1.17	33.00	33.37	35.96
TSH 9	33.02	24.66	1.07	0.75	4.24	2.31	25.73	26.48	30.71
R9812	38.71	30.97	1.89	0.66	3.50	1.70	32.85	33.51	37.00
R 003	37.63	31.41	1.54	0.46	2.46	1.77	32.94	33.40	35.86
TSH 7	33.25	26.35	1.42	0.54	3.45	1.49	27.77	28.31	31.76
TSH 5	37.84	29.47	1.53	0.89	3.72	2.23	30.99	31.89	35.61
OX 52	38.35	30.60	1.43	0.81	3.63	1.88	32.03	32.84	36.47
TR 82	39.96	33.82	1.19	0.56	2.93	1.46	35.01	35.57	38.50
TSH 4	34.64	28.28	1.29	0.64	3.08	1.36	29.57	30.21	33.28
R 002	36.88	28.31	1.85	1.24	2.50	2.99	30.16	31.39	33.89
TSH 2	32.21	23.81	1.59	0.69	4.40	1.72	24.40	26.09	30.49
R 9814	40.89	34.99	1.39	0.52	2.33	1.65	36.38	36.91	39.24
TSH 8	34.00	26.50	2.11	0.74	3.38	1.28	28.61	29.35	32.73
TSH 10	34.63	27.91	0.69	0.77	3.08	2.19	28.59	29.37	32.44
TR 90	34.96	30.56	1.26	0.43	1.90	0.81	31.82	32.25	34.16
H9997	36.73	27.45	2.02	1.01	3.77	2.48	29.46	30.47	34.25
OX 23	32.69	25.54	0.87	0.50	4.12	1.65	26.41	26.92	31.04
TSH 1	26.68	19.67	1.25	0.78	2.60	2.39	20.92	21.70	24.29
HYPEEL 2130	37.60	30.91	1.27	0.87	3.39	1.16	32.18	33.04	36.44
H 9661	40.16	30.43	0.92	1.21	4.25	3.35	31.35	32.56	36.81
H 9996	38.74	30.80	2.12	1.43	2.58	1.82	32.91	34.34	36.92
OX 328	42.44	36.28	1.61	0.91	2.75	0.90	37.89	38.80	41.55 C
OX 329	35.58	29.11	1.08	0.57	2.77	2.06	30.19	30.75	33.53
OX 150	43.19 C	36.45	1.91	1.06	2.93	0.84	38.36 C	39.42 C	42.35 C
HYPEEL 696 (B)	**45.54 C**	**37.34**	**1.65**	**1.43**	**3.27**	**1.86**	**38.99 A C**	**40.42 A C**	**43.69 A C**
H 9995	40.63	26.89	3.42	2.35	4.84	3.12	30.32	32.67	37.52
H 9423 (A)	**40.67**	**31.59**	**2.01**	**1.06**	**3.70**	**2.31**	**33.60**	**34.66**	**38.36**
H 9992	38.18	26.60	1.81	1.61	5.69	2.47	28.42	30.03	35.71
H 9704	37.61	28.75	1.63	1.70	3.97	1.56	30.38	32.08	36.05
H 9553	37.87	27.64	1.34	0.85	5.34	2.70	28.98	29.83	35.17
OX 325	45.42 C	35.24	2.22	2.26	4.04	1.67	37.46	39.72 C	43.76 A C
H 9706	43.40 C	30.73	1.89	2.53	6.72	1.54	32.62	35.15	41.87 C
OX 323	46.15 A C	36.49	3.78	1.78	3.11	1.00	40.27 A C	42.05 A C	45.16 A C
Probability	0.0000	0.0000	0.0000	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000
LSD	5.1773	5.0726	0.9258	0.6133	1.4291	0.9838	5.2881	5.3272	5.2016
CV	20.35%	25.28%	84.98%	91.60%	60.93%	77.80%	24.99%	24.41%	21.52%
Mean	37.75	29.79	1.62	0.99	3.48	1.88	31.41	32.40	35.88

Entries are ranked according to average maturity from 2 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 12 plots; 5 plants from each plot .

Yield Potential ranked by maturity, 2001



Red, Breaker & Processing Green Yield
2001

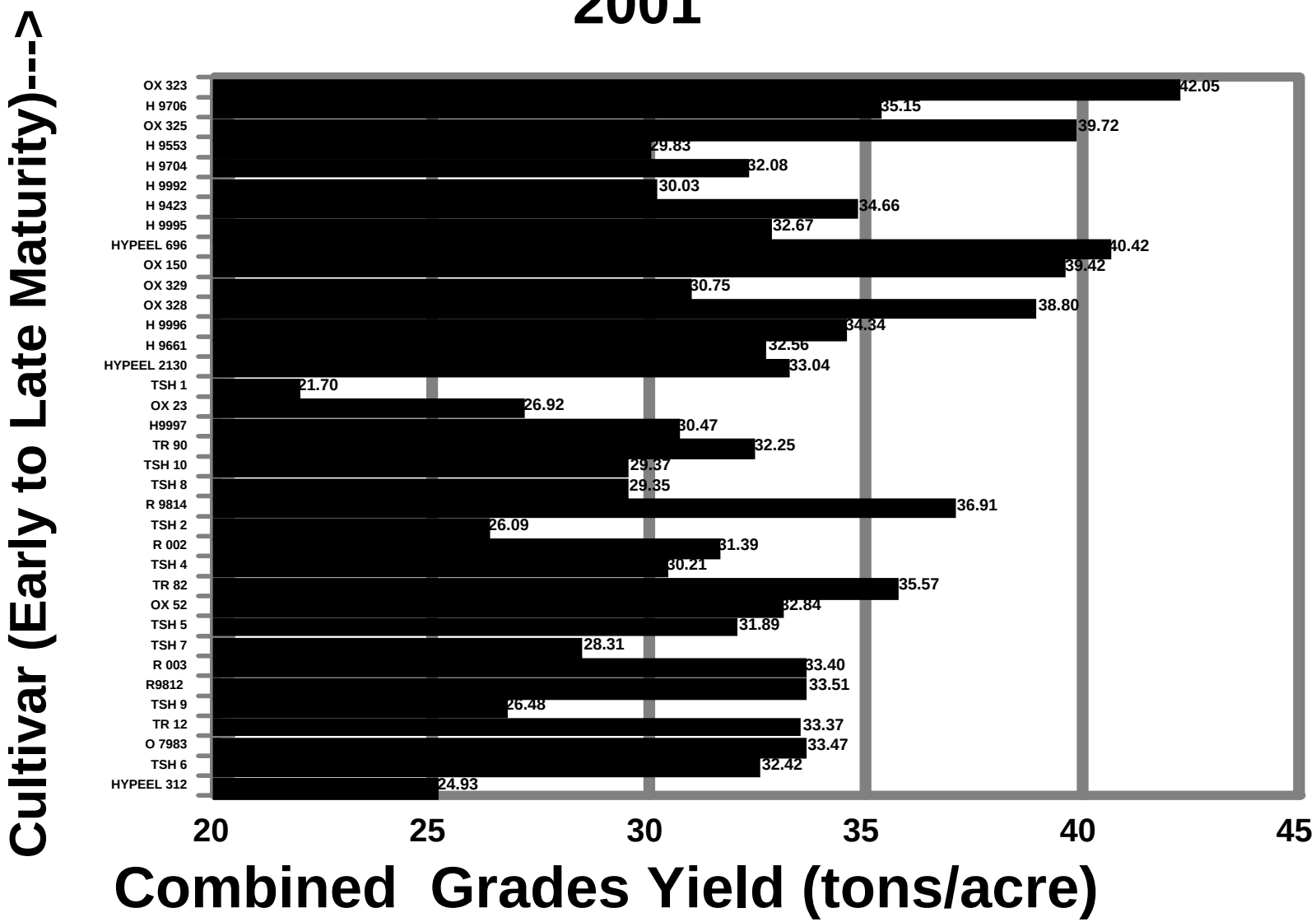


Table 3. Processing tomato yield trial, 2001. Yield (tons/acre) from the Dresden site (berrian sand - low organic matter).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use Rots	Red & Breakers	Red, Breakers, Processing	Red, Breakers, Processing & Grass Green
HYPEEL 312	20.48	9.36	0.22	0.05	2.51	8.33	9.59	9.64	12.15
TSH 6	25.50	20.92	1.63	0.21	1.58	1.15	22.56	22.77	24.35
O 7983 (C)	**31.47**	**26.76**	**0.69**	**0.31**	**0.99**	**2.70**	**27.45**	**27.77**	**28.76**
TR 12	33.01	29.20	1.23	0.20	1.86	0.52	30.43	30.63	32.49
TSH 9	26.77	17.63	1.36	0.81	2.77	4.19	18.99	19.81	22.58
R9812	29.45	21.08	1.39	0.50	3.52	2.95	22.48	22.98	26.49
R 003	29.63	25.16	0.44	0.33	1.54	2.16	25.59	25.93	27.47
TSH 7	27.82	22.88	0.15	0.16	2.19	2.45	23.02	23.18	25.37
TSH 5	27.95	20.06	0.49	0.26	3.48	3.65	20.55	20.81	24.29
OX 52	30.74	21.06	1.33	1.38	3.83	3.14	22.39	23.77	27.60
TR 82	32.42	25.31	0.91	0.21	4.03	1.96	26.22	26.43	30.46
TSH 4	28.85	23.52	1.33	0.22	2.37	1.40	24.85	25.07	27.44
R 002	33.46	27.72	0.55	0.38	1.08	3.73	28.27	28.65	29.73
TSH 2	21.59	12.41	1.15	0.81	2.88	4.34	13.56	14.37	17.25
R 9814	42.86 C	35.27	1.75	0.34	2.63	2.87	37.03	37.37	40.00
TSH 8	24.57	16.95	1.16	0.39	3.12	2.95	18.11	18.50	21.62
TSH 10	27.01	17.64	0.09	1.00	2.97	5.32	17.72	18.72	21.69
TR 90	29.49	24.62	1.60	0.51	1.60	1.16	26.22	26.72	28.32
H9997	31.37	25.46	0.99	0.38	1.71	2.82	26.45	26.84	28.55
OX 23	31.79	20.98	0.95	1.05	5.87	2.93	21.93	22.99	28.86
TSH 1	20.23	11.70	0.24	0.39	2.90	5.01	11.94	12.33	15.22
HYPEEL 2130	31.70	25.09	1.11	0.56	3.07	1.87	26.20	26.76	29.83
H 9661	32.83	22.12	0.37	0.31	3.51	6.52	22.49	22.80	26.31
H 9996	34.38	30.05	0.64	0.60	1.51	1.57	30.69	31.29	32.81
OX 328	35.07	28.31	1.27	0.87	3.26	1.36	29.58	30.45	33.71
OX 329	31.39	26.77	0.86	0.30	1.85	1.61	27.63	27.93	29.78
OX 150	39.84	32.55	1.11	0.56	4.01	1.60	33.66	34.22	38.23
HYPEEL 696 (B)	**40.47**	**31.18**	**1.23**	**1.27**	**3.77**	**3.01**	**32.41**	**33.69**	**37.46**
H 9995	31.34	19.91	1.83	1.44	4.63	3.52	21.74	23.18	27.81
H 9423 (A)	**39.06**	**27.71**	**3.11**	**1.15**	**4.31**	**2.76**	**30.83**	**31.98**	**36.29**
H 9992	28.63	20.42	1.22	1.00	2.87	3.12	21.64	22.64	25.52
H 9704	36.82	29.18	1.58	1.32	3.40	1.34	30.76	32.08	35.48
H 9553	35.95	24.22	2.19	1.31	5.58	2.64	26.41	27.73	33.31
OX 325	40.48	31.35	3.65	0.97	2.98	1.54	35.00	35.96	38.94
H 9706	34.76	21.71	1.09	1.73	7.57	2.65	22.80	24.53	32.11
OX 323	49.67 C	39.53	4.14	1.20	4.05	0.75	43.67	44.87	48.92
Probability	0.0129	0.0070	0.0022	0.1818	0.1007	0.0038	0.0039	0.0034	0.0020
LSD	10.7165	10.6441	1.4060	0.9365	2.7268	2.6142	11.1708	11.2506	11.2831
CV	24.67%	32.52%	82.56%	101.2%	64.51%	68.05%	32.44%	31.81%	28.50%
Mean	31.91	24.05	1.25	0.68	3.11	2.82	25.30	25.98	29.09

Entries are ranked according to average maturity from 2 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, 2001. Yield (tons/acre) from the Harrow site (fox sand - low organic matter).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use Rots	Red & Breakers	Red, Breakers, Processing	Red, Breakers, Processing & Grass Green
HYPEEL 312	30.66	21.60	1.29	1.37	5.26	1.14	22.89	24.26	29.52
TSH 6	28.95	18.37	0.22	0.41	6.94	3.02	18.59	19.00	25.93
O 7983 (C)	**35.48**	**26.93**	**1.58**	**0.94**	**5.15**	**0.87**	**28.51**	**29.45**	**34.61**
TR 12	40.09	33.60	0.87	0.42	4.10	1.10	34.47	34.89	38.99
TSH 9	31.15	16.31	0.19	0.95	10.94	2.76	16.50	17.45	28.39
R9812	34.52	26.67	0.67	0.28	5.26	1.65	27.33	27.61	32.87
R 003	40.41	32.90	1.66	0.72	4.13	1.01	34.56	35.28	39.40
TSH 7	25.56	13.77	0.50	0.72	8.29	2.28	14.26	14.99	23.28
TSH 5	33.10	19.27	0.94	2.03	7.86	3.17	20.21	22.25	29.92
OX 52	31.37	22.59	0.50	0.34	6.97	0.97	23.10	23.44	30.41
TR 82	42.16	36.37	0.75	0.66	3.31	1.05	37.12	37.79	41.10
TSH 4	32.25	19.78	0.63	1.62	7.94	2.29	20.40	22.02	29.96
R 002	30.83	21.07	1.88	1.96	3.58	2.33	22.95	24.91	28.50
TSH 2	31.01	18.13	0.21	0.45	11.33	0.90	18.34	18.78	30.11
R 9814	34.02	27.60	0.93	0.44	4.05	1.01	28.52	28.97	33.01
TSH 8	32.68	24.58	1.29	0.63	5.53	0.64	25.88	26.51	32.04
TSH 10	29.56	22.94	0.18	0.45	4.98	1.00	23.12	23.57	28.55
TR 90	30.63	24.62	0.74	0.54	3.82	0.92	25.35	25.90	29.71
H9997	26.16	14.33	0.34	1.12	8.01	2.36	14.66	15.79	23.80
OX 23	28.02	19.01	0.86	0.48	6.76	0.91	19.87	20.35	27.11
TSH 1	22.86	13.32	2.60	1.47	4.14	1.34	15.92	17.39	21.52
HYPEEL 2130	34.40	22.68	1.26	1.98	7.09	1.39	23.94	25.91	33.01
H 9661	38.75	24.75	0.73	2.53	7.34	3.41	25.47	28.01	35.35
H 9996	32.22	21.26	1.93	2.31	4.95	1.75	23.20	25.51	30.46
OX 328	44.04	38.69	0.71	1.04	2.68	0.91	39.39	40.44	43.12
OX 329	34.40	29.07	0.61	0.36	3.15	1.21	29.68	30.03	33.18
OX 150	40.90	33.48	2.18	1.45	3.31	0.47	35.66	37.11	40.42
HYPEEL 696 (B)	**41.79**	**33.15**	**0.89**	**2.71**	**4.29**	**0.75**	**34.04**	**36.75**	**41.06**
H 9995	38.92	24.45	1.52	3.74	7.92	1.28	25.97	29.71	37.64
H 9423 (A)	**41.41**	**31.92**	**2.00**	**0.93**	**4.48**	**2.07**	**33.92**	**34.85**	**39.34**
H 9992	35.29	17.91	1.80	3.19	10.14	2.25	19.71	22.90	33.04
H 9704	40.87	29.01	2.33	3.64	5.46	0.43	31.34	34.98	40.44
H 9553	37.31	22.51	0.50	1.55	10.34	2.40	23.01	24.56	34.90
OX 325	45.85	31.70	1.12	4.81	6.36	1.87	32.82	37.63	43.99
H 9706	42.75	28.17	2.76	4.43	6.28	1.11	30.92	35.36	41.64
OX 323	37.46	28.68	2.00	2.45	3.21	1.13	30.68	33.12	36.33
Probability	0.0649	0.0625	0.3407	0.0001	0.0138	0.0096	0.0371	0.0120	0.0345
LSD	10.7622	12.4454	1.6074	1.7187	4.0261	1.3484	12.3459	12.0642	10.7469
CV	22.63%	36.94%	103.3%	82.44%	49.49%	64.62%	35.03%	32.32%	23.64%
Mean	34.94	24.75	1.14	1.53	5.98	1.53	25.90	27.43	33.41

Entries are ranked according to average maturity from 2 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, 2001. Yield (tons/acre) from the Leamington site (berrian sandy loam).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use Rots	Red & Breakers	Red, Breakers, Processing	Red, Breakers, Processing & Grass Green
HYPEEL 312	47.39	39.06	2.05	1.17	3.23	1.88	41.11	42.28	45.51
TSH 6	58.92 C	49.88 C	4.65	1.30	2.23	0.86	54.53 C	55.83 C	58.06 C
O 7983 (C)	**44.96**	**37.88**	**1.92**	**0.58**	**1.35**	**3.22**	**39.81**	**40.39**	**41.74**
TR 12	45.80	40.09	0.98	0.38	1.71	2.64	41.07	41.45	43.16
TSH 9	49.21	43.00	1.61	0.60	2.57	1.44	44.61	45.21	47.78
R9812	58.16 C	47.32 C	4.83	1.51	3.01	1.50	52.15 C	53.65 C	56.66 C
R 003	42.62	35.51	1.55	0.65	1.83	3.07	37.06	37.71	39.54
TSH 7	50.38	43.03	3.86	0.79	1.86	0.84	46.89	47.69	49.54
TSH 5	55.58 C	48.02 C	3.92	0.86	2.04	0.74	51.94 C	52.80 C	54.84 C
OX 52	49.62	42.23	2.46	0.78	1.72	2.43	44.69	45.47	47.19
TR 82	52.32	43.57	2.46	1.11	2.78	2.41	46.03	47.13	49.91
TSH 4	49.00	45.27	1.59	0.34	0.65	1.16	46.86	47.19	47.85
R 002	41.13	33.02	2.36	0.91	1.58	3.25	35.38	36.30	37.88
TSH 2	45.78	39.43	2.57	1.17	1.50	1.11	42.01	43.17	44.68
R 9814	50.50	43.84	1.58	1.17	1.42	2.50	45.41	46.59	48.01
TSH 8	47.95	39.38	3.43	1.20	3.07	0.87	42.81	44.01	47.08
TSH 10	52.78	45.65	1.80	0.99	2.41	1.93	47.45	48.44	50.85
TR 90	50.52	47.44 C	1.05	0.39	1.00	0.64	48.49	48.88	49.88
H9997	49.72	43.35	1.64	1.15	2.12	1.46	44.99	46.14	48.26
OX 23	41.13	35.38	0.62	0.31	2.38	2.43	36.00	36.31	38.69
TSH 1	43.61	38.39	1.71	0.78	1.60	1.12	40.11	40.89	42.49
HYPEEL 2130	48.84	43.70	1.55	0.71	2.05	0.82	45.25	45.96	48.01
H 9661	55.89 C	48.34 C	1.52	1.05	2.87	2.10	49.86 C	50.91 C	53.79 C
H 9996	51.28	43.51	3.08	1.25	1.70	1.74	46.59	47.84	49.55
OX 328	54.30	46.41	2.05	1.14	4.05	0.65	48.46	49.60	53.64 C
OX 329	47.60	34.76	1.97	1.34	4.70	4.84	36.73	38.07	41.77
OX 150	54.30	46.64	3.24	0.95	2.77	0.70	49.87 C	50.82 C	53.59 C
HYPEEL 696 (B)	**57.93 C**	**52.09 C**	**2.30**	**0.90**	**1.16**	**1.48**	**54.39 C**	**55.29 C**	**56.45 C**
H 9995	47.52	35.24	3.48	2.40	3.17	3.24	38.72	41.12	44.29
H 9423 (A)	**48.82**	**44.38**	**1.93**	**0.64**	**1.46**	**0.41**	**46.30**	**46.94**	**48.41**
H 9992	53.00	44.90	0.96	1.14	3.98	2.02	45.86	46.99	50.97
H 9704	42.11	35.92	1.41	0.31	2.54	1.93	37.33	37.63	40.18
H 9553	50.77	42.97	0.41	0.18	2.77	4.43	43.39	43.57	46.34
OX 325	57.58 C	49.21 C	2.12	1.77	2.99	1.49	51.33 C	53.11 C	56.09 C
H 9706	63.21 A C	49.65 C	1.43	2.39	8.44	1.29	51.08 C	53.47 C	61.92 A C
OX 323	61.23 A C	48.65 C	4.21	2.89	3.65	1.91	52.77 C	55.66 C	59.32 A C
Probability	0.0561	0.0217	0.0007	0.0839	0.0000	0.0000	0.0170	0.0208	0.0185
LSD	10.4923	8.8380	1.6625	1.1570	1.8562	1.3034	9.3720	9.8925	10.5596
CV	15.24%	15.11%	54.76%	82.26%	54.32%	51.81%	15.23%	15.72%	15.92%
Mean	50.60	42.97	2.23	1.03	2.51	1.85	45.24	46.24	48.75

Entries are ranked according to average maturity from 2 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 6. Processing tomato yield trial, 2001. Yield (tons/acre) from the Ridgetown site (berrian sandy loam).

Name	Total	Red	Breakers	Processing Green	Grass Green	Limited Use Rots	Red & Breakers	Red, Breakers, Processing	Red, Breakers, Processing & Grass Green
HYPEEL 312	26.47	22.77	0.47	0.30	1.32	1.61	23.24	23.54	24.86
TSH 6	34.05	31.31 A	0.52	0.25	1.42	0.55	31.83	32.08	33.50
O 7983 (C)	**39.13**	**34.04 A**	**1.82**	**0.42**	**1.32**	**1.53**	**35.86 A**	**36.28 A**	**37.60**
TR 12	29.62	25.49	0.53	0.47	2.69	0.43	26.02	26.49	29.19
TSH 9	24.94	21.71	1.11	0.62	0.67	0.83	22.83	23.45	24.11
R9812	32.70	28.80	0.66	0.35	2.19	0.71	29.46	29.80	31.99
R 003	37.86	32.06 A	2.49	0.14	2.34	0.83	34.56 A	34.69 A	37.03
TSH 7	29.24	25.71	1.18	0.49	1.46	0.39	26.90	27.39	28.86
TSH 5	34.75	30.51	0.76	0.43	1.69	1.37	31.27	31.70	33.38
OX 52	41.67	36.51 A	1.44	0.74	2.00	0.99	37.95 A	38.69 A	40.68 A
TR 82	32.95	30.01	0.64	0.26	1.60	0.44	30.65	30.91	32.51
TSH 4	28.46	24.57	1.61	0.36	1.34	0.58	26.18	26.54	27.88
R 002	42.09	31.42 A	2.60	1.69	3.75	2.63	34.02 A	35.72 A	39.46 A
TSH 2	30.45	25.27	2.42	0.34	1.89	0.53	27.69	28.03	29.93
R 9814	36.16	33.25 A	1.31	0.14	1.24	0.22	34.65 A	34.70 A	35.94
TSH 8	30.81	25.08	2.57	0.74	1.78	0.64	27.65	28.38	30.17
TSH 10	29.16	25.40	0.68	0.64	1.94	0.50	26.08	26.72	28.67
TR 90	29.21	25.57	1.64	0.29	1.20	0.50	27.22	27.50	28.71
H9997	39.65	26.64	5.11	1.38	3.25	3.26	31.75	33.13	36.39
OX 23	29.83	26.80	1.05	0.16	1.47	0.34	27.85	28.02	29.49
TSH 1	20.02	15.28	0.44	0.46	1.75	2.10	15.72	16.18	17.93
HYPEEL 2130	35.46	32.17 A	1.15	0.23	1.34	0.56	33.32 A	33.55	34.90
H 9661	33.15	26.52	1.07	0.92	3.27	1.37	27.59	28.51	31.78
H 9996	37.07	28.36	2.81	1.54	2.15	2.22	31.16	32.70	34.85
OX 328	36.38	31.73 A	2.41	0.57	1.00	0.67	34.14 A	34.71 A	35.71
OX 329	28.95	25.86	0.87	0.26	1.39	0.57	26.73	26.99	28.38
OX 150	37.73	33.12 A	1.12	1.28	1.63	0.57	34.25 A	35.53 A	37.16
HYPEEL 696 (B)	**41.97**	**32.93 A**	**2.18**	**0.84**	**3.85**	**2.18**	**35.11 A**	**35.95 A**	**39.80 A**
H 9995	44.75 A	27.98	6.85	1.84	3.65	4.42	34.84 A	36.68 A	40.33 A
H 9423 (A)	**33.41**	**22.35**	**1.01**	**1.52**	**4.54**	**4.00**	**23.36**	**24.87**	**29.41**
H 9992	35.80	23.19	3.27	1.11	5.76	2.48	26.46	27.56	33.32
H 9704	30.63	20.90	1.21	1.52	4.47	2.53	22.10	23.63	28.10
H 9553	27.47	20.84	2.27	0.35	2.68	1.33	23.11	23.46	26.14
OX 325	37.78	28.70	1.99	1.49	3.83	1.77	30.69	32.18	36.01
H 9706	32.89	23.40	2.28	1.57	4.57	1.09	25.67	27.24	31.81
OX 323	36.24	29.18	4.78	0.57	1.51	0.19	33.96 A	34.54 A	36.05
Probability	0.0377	0.0572	0.0414	0.0547	0.1311	0.2858	0.0926	0.0908	0.0416
LSD	9.8383	8.5863	2.5819	0.9855	2.4991	2.3343	9.5615	9.6575	9.3459
CV	21.53%	23.05%	103.0%	99.18%	78.76%	131.6%	24.05%	23.69%	21.27%
Mean	33.58	27.37	1.84	0.73	2.33	1.30	29.95	29.95	32.28

Entries are ranked according to average maturity from 2 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 .

Measuring Field Holding Ability

All plots in this trial were harvested at the optimum stage of maturity. In some seasons wet field conditions may prevent harvest at the ideal time. During these situations it is especially important that the variety is able to sustain quality until harvest is possible.

In an attempt to evaluate the ability of a cultivar to hold fruit quality after the optimum harvest date (at 80% ripe fruit), a second harvest was taken from each plot at the Leamington site only.

The target for the second harvest was set at 15 days after the date of the optimum harvest. This delay was chosen so that differences between cultivars would show clearly. The data are reported as a range of 15 to 16 days.

At the second harvest, the same procedure was followed as for the first harvest; 5 plants, with no adjacent plants missing were chosen and fruit graded according to the same standard used previously.

What Do These Tables Tell Me?

Table 7 Shows the yield results at the second harvest date. This shows what the yield would have been if harvest was delayed past the optimum.

Table 8. Shows the change in yield, between the first and second harvest, for each cultivar.

This difference, shown in table 8, may be of more interest since it shows how much, or how little change (tons per acre) in fruit quality took place over the holding period. Cultivars with the smallest amount of change have the best field holding ability.

In all but 12 cases, there was an overall decrease in usable fruit, as might be expected. The few that actually increased might be explained as the result of an extended setting period, a split set, additional sizing of too-small fruit, or possibly an early developing external colour that doesn't reflect the internal colour.

Table 7. Processing tomato yield trial, 2001. Yield (tons/acre) 15 to 16 days after optimum harvest at the Leamington site.

Name	Red	Breakers	Processing Green	Grass Green	LimitedUse Rots	Red & Breakers	Red, Breakers, Processing Green	Red, Breakers, Processing & Grass Green
HYPEEL 312	36.05	0.29	0.22	2.39	6.25	36.34	36.56	38.95
TSH 6	40.34 C	0.36	0.14	0.80	7.51	40.70 C	40.84 C	41.64 C
O 7983 (C)	**26.56**	**0.75**	**0.03**	**0.92**	**8.34**	**27.31**	**27.34**	**28.25**
TR 12	29.30	0.44	0.19	3.52	6.12	29.74	29.92	33.44
TSH 9	42.89 C	0.26	0.56	3.09	5.73	43.14 C	43.70 C	46.79 C
R9812	41.71 C	0.47	0.30	3.72	5.57	42.18 C	42.48 C	46.20 C
R 003	29.00	0.38	0.15	1.99	7.31	29.39	29.53	31.52
TSH 7	38.32 C	0.37	0.39	2.02	5.25	38.70 C	39.08 C	41.10 C
TSH 5	43.02 C	0.55	0.93	1.99	4.85	43.56 C	44.49 C	46.47 C
OX 52	36.45	0.41	0.65	2.74	7.75	36.86	37.51	40.25 C
TR 82	40.64 C	0.87	0.44	2.94	5.12	41.51 C	41.96 C	44.89 C
TSH 4	39.98 C	0.32	0.47	1.06	4.06	40.29 C	40.77 C	41.83 C
R 002	39.45 C	0.66	0.02	2.23	2.62	40.11 C	40.12 C	42.35 C
TSH 2	37.97 C	0.42	0.23	3.80	2.61	38.39 C	38.62 C	42.42 C
R 9814	39.65 C	0.30	0.10	2.31	5.29	39.95 C	40.05 C	42.37 C
TSH 8	37.15	0.59	0.52	1.70	2.68	37.74	38.26	39.95
TSH 10	34.14	0.45	0.64	2.61	10.54	34.60	35.24	37.85
TR 90	41.24 C	0.40	0.27	1.16	7.00	41.64 C	41.91 C	43.08 C
H9997	36.69 C	0.23	1.03	1.69	7.49	39.92 C	40.95 C	42.64 C
OX 23	25.79	0.52	0.05	3.42	4.90	26.31	26.36	29.79
TSH 1	30.94	0.06	0.40	3.06	3.10	31.00	31.39	34.45
HYPEEL 2130	38.00 C	0.94	0.80	2.53	5.25	38.95 C	39.74 C	42.27 C
H 9661	29.81	0.34	0.27	1.32	9.85	30.16	30.42	31.74
H 9996	36.25	1.06	0.72	1.11	9.24	37.31	38.03	39.14
OX 328	39.72 C	0.53	0.68	3.64	7.01	40.24 C	40.93 C	44.58 C
OX 329	34.06	0.89	1.32	4.69	11.46	34.95	36.27	40.95 C
OX 150	38.10 C	1.24	1.28	3.36	8.34	39.35 C	40.63 C	43.98 C
HYPEEL 696 (B)	**48.27 C**	**0.34**	**0.37**	**1.79**	**4.87**	**48.61 C**	**48.98 C**	**50.77 C**
H 9995	36.76	1.05	1.26	4.25	4.34	37.82	39.07 C	43.32 C
H 9423 (A)	**48.15 C**	**0.21**	**0.24**	**2.80**	**2.50**	**48.36 C**	**48.60 C**	**51.39 C**
H 9992	31.91	0.44	0.68	6.16	6.76	32.36	33.03	39.19
H 9704	33.14	0.76	0.53	3.64	6.42	33.90	34.44	38.07
H 9553	32.83	0.67	0.63	7.29	8.43	33.50	34.12	41.41 C
OX 325	41.00 C	0.43	0.86	4.16	4.44	41.42 C	42.29 C	46.45 C
H 9706	49.18 C	0.46	0.93	9.61	4.25	49.64 C	50.57 C	60.18 C
OX 323	39.44 C	0.97	1.73	3.35	3.90	40.41 C	42.14 C	45.50 C
Probability	0.0651	0.5449	0.0212	0.0000	0.0000	0.0880	0.0862	0.0534
LSD	10.7494	0.6684	0.7253	1.8951	2.7088	10.9425	11.1472	11.6808
CV	21.11%	90.88%	95.84%	46.06%	33.00%	21.18%	21.27%	20.66%
Mean	37.41	0.54	0.56	3.02	6.03	37.95	38.51	41.53

Entries are ranked according to average maturity from 2 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 8. Processing tomato yield trial, 2001. Change in yield (tons/acre) Leamington site.

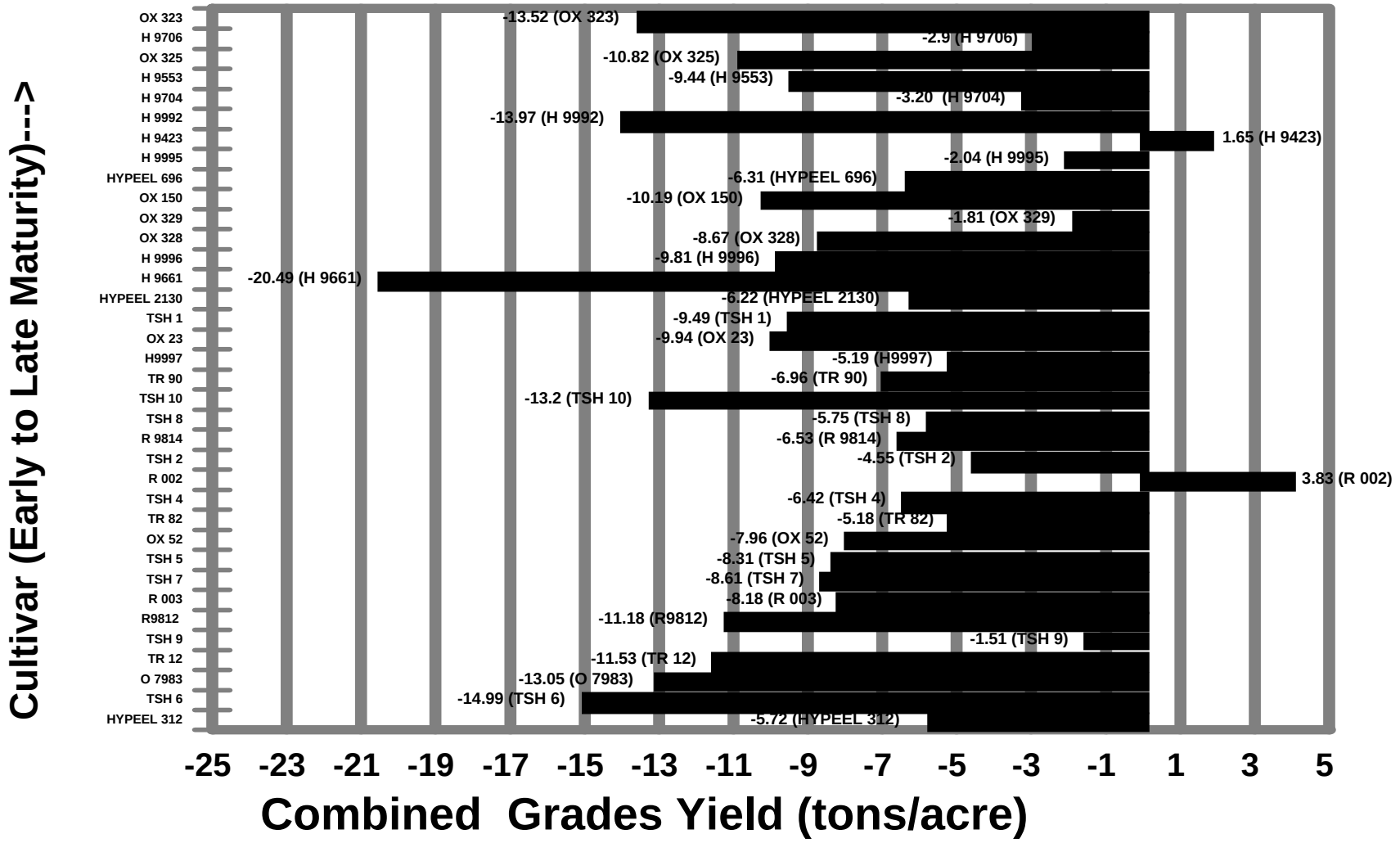
Name	Red	Breakers	Processing Green	Grass Green	Limited Use Rots	Red & Breakers	Red, Breakers, Processing	Red, Breakers, Processing & Grass Green
HYPEEL 312	-3.01	-1.75	-0.95	-0.84	4.36	-4.76	-5.72	-6.55
TSH 6	-9.54	-4.29	-1.16	-1.43	6.66	-13.83	-14.99	-16.42
O 7983 (C)	**-11.32**	**-1.17**	**-0.56**	**-0.43**	**5.12**	**-12.49**	**-13.05**	**-13.49**
TR 12	-10.79	-0.54	-0.19	1.80	3.48	-11.33	-11.53	-9.72
TSH 9	-0.11	-1.35	-0.04	0.52	4.29	-1.46	-1.51	-0.98
R9812	-5.61	-4.36	-1.21	0.71	4.08	-9.97	-11.18	-10.47
R 003	-6.51	-1.16	-0.51	0.15	4.24	-7.68	-8.18	-8.03
TSH 7	-4.72	-3.48	-0.41	0.16	4.41	-8.20	-8.61	-8.45
TSH 5	-5.01	-3.37	0.07	-0.06	4.11	-8.38	-8.31	-8.37
OX 52	-5.78	-2.05	-0.13	1.02	5.32	-7.83	-7.96	-6.94
TR 82	-2.94	-1.58	-0.66	0.15	2.72	-4.52	-5.18	-5.02
TSH 4	-5.29	-1.27	0.14	0.41	2.90	-6.56	-6.42	-6.01
R 002	6.42	-1.70	-0.90	0.64	-0.63	4.72	3.83	4.47
TSH 2	-1.46	-2.16	-0.93	2.29	1.50	-3.62	-4.55	-2.26
R 9814	-4.19	-1.28	-1.07	0.89	2.79	-5.46	-6.53	-5.64
TSH 8	-2.23	-2.84	-0.67	-1.38	1.80	-5.08	-5.75	-7.13
TSH 10	-11.51	-1.34	-0.35	0.21	8.61	-12.85	-13.20	-13.00
TR 90	-6.21	-0.65	-0.11	0.16	6.36	-6.85	-6.96	-6.80
H9997	-3.66	-1.41	-0.12	-0.43	6.02	-5.07	-5.19	-5.62
OX 23	-9.59	-0.10	-0.26	1.03	2.47	-9.69	-9.94	-8.91
TSH 1	-7.46	-1.65	-0.38	1.45	1.98	-9.11	-9.49	-8.03
HYPEEL 2130	-5.70	-0.61	0.09	0.48	4.43	-6.31	-6.22	-5.74
H 9661	-18.53	-1.18	-0.79	-1.56	7.76	-19.71	-20.49	-22.05
H 9996	-7.27	-2.02	-0.53	-0.59	7.51	-9.29	-9.81	-10.41
OX 328	-6.69	-1.52	-0.45	-0.40	6.36	-8.21	-8.67	-9.07
OX 329	-0.70	-1.08	-0.03	-0.01	6.62	-1.78	-1.81	-1.82
OX 150	-8.53	-1.99	0.33	0.58	7.64	-10.52	-10.19	-9.61
HYPEEL 696 (B)	**-3.82**	**-1.96**	**-0.53**	**0.63**	**3.39**	**-5.78**	**-6.31**	**-5.68**
H 9995	1.52	-2.43	-1.14	1.08	1.10	-0.91	-2.04	-0.96
H 9423 (A)	**3.77**	**-1.72**	**-0.40**	**1.33**	**2.09**	**2.06**	**1.65**	**2.99**
H 9992	-12.99	-0.51	-0.46	2.18	4.74	-13.50	-13.97	-11.78
H 9704	-2.78	-0.64	0.22	1.09	4.49	-3.42	-3.20	-2.11
H 9553	-10.14	0.26	0.45	4.52	4.00	-9.88	-9.44	-4.92
OX 325	-8.21	-1.69	-0.91	1.17	2.95	-9.91	-10.82	-9.64
H 9706	-0.47	-0.97	-1.46	1.16	2.95	-1.44	-2.90	-1.73
OX 323	-9.12	-3.24	-1.17	-0.30	2.00	-12.36	-13.52	-13.82
Probability	0.2296	0.0057	0.7577	0.0830	0.0000	0.3124	0.3578	0.3589
LDS	10.3498	1.7554	1.2686	2.2389	2.8045	10.6327	10.8453	11.6521
CV	136.8%	76.34%	195.3%	-322.0%	-49.3%	107.8%	103.1%	118.7%
Mean	-5.56	-1.69	-0.48	0.51	4.18	-7.25	-7.73	-7.21

Entries are ranked according to average maturity from 2 test sites.

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

Change in Yield after 15-16 days

Combined Red+Breaker+Processing Green



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 9. Average fruit size and uniformity of fruit size, 2001.

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 9661	61.41 A C	0.00	21.74	29.76	48.42	51.50
H 9997	60.75 A C	0.00	19.82	44.86	35.74	64.68
H 9995	60.29 A C	0.08	22.30	32.85	44.68	55.16
OX 325	56.80	0.08	24.81	34.25	40.94	59.06
TR 90	56.02	0.00	30.24	40.03	29.64	70.28
HYPEEL 696 (B)	**56.01**	**0.00**	**26.58**	**36.33**	**36.84**	**62.92**
TSH 10	54.13	0.42	35.47	42.63	21.15	78.09 B
H 9996	54.02	0.00	29.16	27.03	43.22	56.20
R002	53.13	0.08	45.42	35.19	19.23	80.61 B
HYPEEL 2130	52.76	0.08	34.20	26.85	30.51	61.05
OX 323	52.70	0.00	46.30	32.28	21.43	78.58 B
TR 82	51.12	6.19	36.77	39.84	17.03	76.62
H 9423 (A)	**51.01**	**0.00**	**30.38**	**37.16**	**32.71**	**67.54**
H 9992	49.84	0.33	47.75	41.00	10.75	88.75 AB
O7983 (C)	**49.80**	**0.00**	**46.67**	**36.40**	**16.78**	**83.06 AB**
R 9812	49.14	0.17	56.46	37.63	4.91	94.09 AB
H 9706	48.35	0.00	46.18	35.83	17.74	82.01 B
OX 150	47.64	0.25	45.99	41.00	12.76	86.99 AB
H 9704	47.45	0.00	36.25	35.13	27.70	71.38
HYPEEL 312	44.27	1.50	49.24	40.94	7.99	90.18 AB
TR 12	42.86	0.08	57.74	28.34	14.25	86.09 AB
TSH 4	42.62	1.00	71.89	21.84	5.18	93.74 AB
R003	42.36	1.00	64.93	26.58	7.42	91.50 AB
OX 23	42.33	0.33	58.00	36.33	5.34	94.33 AB
H 9553	41.62	1.16	70.55	21.71	6.33	92.26 AB
OX 328	40.82	0.00	71.37	21.06	7.24	92.43 AB
TSH 8	40.62	1.33	73.13	20.47	5.07	93.60 AB
TSH 6	40.21	0.58	83.15	14.77	1.42	97.91 ABC
TSH 2	38.91	1.25	75.56	22.11	1.08	97.67 ABC
OX 329	38.78	0.58	76.21	19.89	2.91	96.09 AB
TSH 1	37.81	0.50	82.37	14.56	2.24	96.93 AB
TSH 9	37.66	1.00	90.92	7.83	0.00	98.75 ABC
R 9814	37.52	0.33	81.93	11.83	5.58	93.76 AB
TSH 5	36.76	0.59	81.90	16.35	0.58	98.25 ABC
TSH 7	36.36	3.42	82.16	12.51	1.83	94.67 AB
OX 52	33.44	2.01	81.24	14.92	1.76	96.16 AB
Probability	0.0000	0.4729	0.0000	0.0000	0.0000	0.0000
LSD	8.6613	2.7770	19.1334	13.1829	14.6922	14.6041
CV	15.75%	350.3%	30.34%	38.96%	76.61%	15.07%
Mean	46.87	0.68	53.74	28.84	16.34	82.58

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 4 samples. Each sample consisted of 3kg of fruit.

Table 10. Percent fruit with stems still attached after shaking from plant, 2001.

Name	Stems %
TSH 10	26.80
R002	11.60
H 9661	7.69
H 9995	6.95
H 9996	5.64
H 9706	5.24
H 9997	5.20
H 9704	5.14
H 9423 (A)	**5.11**
TR 82	2.36
TSH 6	2.31
H 9553	2.29
TR 12	1.79
HYPEEL 2130	1.76
H 9992	1.58
O 7983 (C)	**1.58**
TSH 7	1.50
OX 323	1.32
OX 23	1.01
OX 325	0.93
OX 329	0.92
HYPEEL 312	0.92
HYPEEL 696 (B)	**0.91**
TR 90	0.91
R 9812	0.84
TSH 4	0.71
TSH 8	0.67
R003	0.51
TSH 5	0.48
TSH 2	0.35
TSH 1	0.31
TSH 9	0.22
OX 150	0.00
OX 52	0.00
R 9814	0.00
OX 328	0.00
Probability	0.0000
LSD	3.4274
CV	99.65%
Mean	2.931

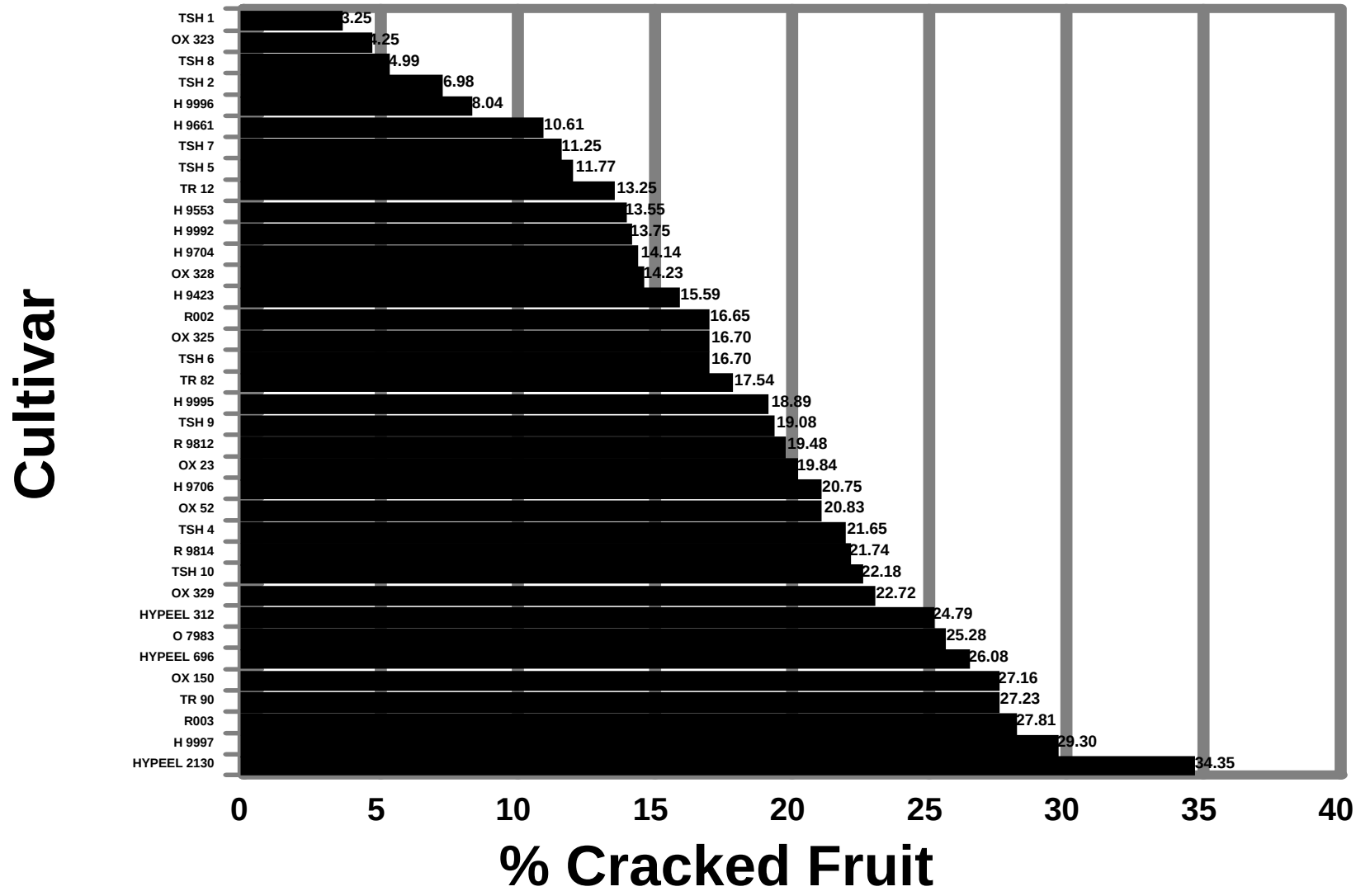
Means are based on4 samples. Each sample consists of 3 kg of fruit

Table 11. Percent fruit (by weight) with cracks extending into the flesh after dropping on concrete from a four foot height, 2001. This test estimates firmness.

Name	Cracked Fruit (%)
HYPEEL 2130	34.35
H 9997	29.30
R003	27.81
TR 90	27.23
OX 150	27.16
HYPEEL 696 (B)	**26.08**
O 7983 (C)	**25.28**
HYPEEL 312	24.79
OX 329	22.72
TSH 10	22.18
R 9814	21.74
TSH 4	21.65
OX 52	20.83
H 9706	20.75
OX 23	19.84
R 9812	19.48
TSH 9	19.08
H 9995	18.89
TR 82	17.54
TSH 6	16.70
OX 325	16.70
R002	16.65
H 9423 (A)	**15.59**
OX 328	14.23
H 9704	14.14
H 9992	13.75
H 9553	13.55
TR 12	13.25
TSH 5	11.77
TSH 7	11.25
H 9661	10.61
H 9996	8.04
TSH 2	6.98
TSH 8	4.99
OX 323	4.25
TSH 1	3.25
Probability	0.0005
LSD	11.4588
CV	54.72%
Mean	17.85

Means followed by the same letter are significantly better than the check cultivar denoted by that same letter. Means are based on 4 samples. Each sample consisted of 3 kg of fruit.

Percent Cracked Tomato Fruit, 2001



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 +/- 1°C 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 12, 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 12. Percent (by weight) of fruit recovered after peeling but before sorting, 2001. Demonstrates how much remains after exposure to caustic and peeler.

Name	Peeling Recovery (%)	
R002	84.95	BC
TSH 9	84.63	C
TSH 2	84.60	C
H 9997	84.26	
H 9996	83.88	
OX 323	83.86	
TSH 1	83.78	
H 9423 (A)	**83.56**	
H 9995	83.30	
H 9706	82.90	
H 9661	82.58	
TR 82	82.40	
H 9992	81.72	
TSH 8	81.67	
H 9553	81.64	
H 9704	81.61	
HYPEEL 696 (B)	**81.04**	
TSH 4	80.99	
TR 12	80.57	
R003	80.34	
OX 329	80.19	
HYPEEL 2130	80.18	
OX 150	80.06	
TSH 10	79.93	
HYPEEL 312	79.92	
OX 328	79.64	
TSH 7	79.30	
OX 325	79.26	
TSH 5	79.01	
OX 23	78.93	
OX 52	78.90	
TR 90	78.74	
R 9812	78.67	
TSH 6	78.29	
O 7983 (C)	**77.16**	
R 9814	75.92	
Probability	**0.0035**	
LSD	**3.7751**	
CV	**3.97%**	
Mean	**81.07**	

Means followed by the same letter are significantly better than the check cultivar denoted by that same letter. Means are based on 4 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 13), 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 2001.

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 13. Percent (by weight) of cannable tomatoes when sorted after peeling, 2001. Shows how little or how much sorting is required after peeling.

Name	% Cannable
TSH 2	99.14 B
TSH 5	96.89
TSH 7	96.78
TSH 1	96.67
H 9996	96.40
OX 323	96.32
TSH 9	96.20
R002	96.20
TSH 8	96.16
H 9997	96.10
TSH 4	95.69
H 9706	95.43
TR 82	95.40
HYPEEL 312	95.38
OX 23	94.57
OX 328	94.49
R 9812	94.09
OX 329	94.03
H 9423 (A)	**94.01**
H 9992	93.77
R003	93.21
TR 12	92.62
OX 325	92.23
TSH 6	92.03
R 9814	91.65
H 9553	91.32
O 7983 (C)	**91.18**
TSH 10	90.59
H 9704	90.02
TR 90	89.29
HYPEEL 696 (B)	**88.76**
OX 150	88.30
OX 52	88.22
HYPEEL 2130	86.73
H 9995	85.16
H 9661	83.15
Probability	0.7047
LSD	9.3900
CV	8.60%
Mean	93.00

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 4 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.

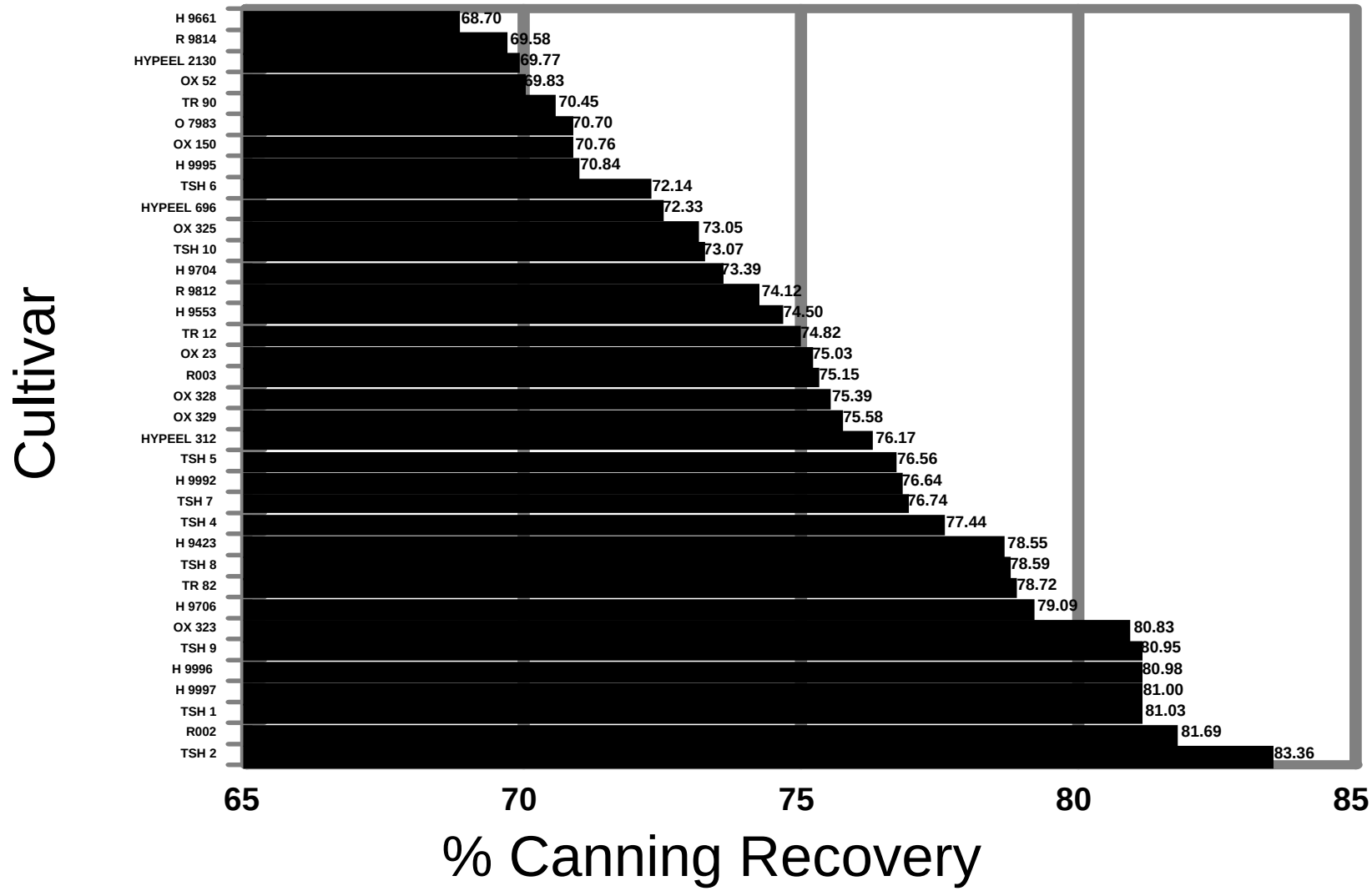
In this case it’s more important to look at the ranking of cultivars, rather than the actual numbers.

Table 14. Percent (by weight) canning recovery, 2001. Shows the percent fruit suitable for canning based on the initial weight sent through the peeling line.

Name	% Canning Recovery	
TSH 2	83.36	BC
R002	81.69	BC
TSH 1	81.03	BC
H 9997	81.00	C
H 9996	80.98	C
TSH 9	80.95	C
OX 323	80.83	C
H 9706	79.09	
TR 82	78.72	
TSH 8	78.59	
H 9423 (A)	**78.55**	
TSH 4	77.44	
TSH 7	76.74	
H 9992	76.64	
TSH 5	76.56	
HYPEEL 312	76.17	
OX 329	75.58	
OX 328	75.39	
R003	75.15	
OX 23	75.03	
TR 12	74.82	
H 9553	74.50	
R 9812	74.12	
H 9704	73.39	
TSH 10	73.07	
OX 325	73.05	
HYPEEL 696 (B)	**72.33**	
TSH 6	72.14	
H 9995	70.84	
OX 150	70.76	
O 7983 (C)	**70.70**	
TR 90	70.45	
OX 52	69.83	
HYPEEL 2130	69.77	
R 9814	69.58	
H 9661	68.70	
Probability	**0.2123**	
LSD	**8.6816**	
CV	**9.80%**	
Mean	**75.50**	

Means are based on 4 samples. Each sample consisted of 3 kg of fruit.

Percent Canning Recovery, 2001



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.

Table 15. Results of quality evaluations on juice samples, 2001.

Name	Agtron	Soluble Solids	pH	Modified Boswick (cm)	Total Solids
H 9423 (A)	**20.75**	**5.48**	**4.23**	**4.38**	**6.82**
H 9553	21.25	5.28	4.28	3.40	6.73
H 9661	19.50	5.35	4.25	3.40	6.63
H 9704	18.50	4.68	4.28	2.88	5.95
H 9706	20.25	5.78 B	4.31	4.03	7.19 B
H 9992	25.75	4.83	4.31	3.75	6.24
H 9995	22.75	5.15	4.21	3.88	6.44
H 9996	16.50	5.25	4.20	2.78	6.69
H 9997	17.75	5.58 B	4.23	3.45	6.96
HYPEEL 2130	18.50	5.15	4.34	5.95	6.20
HYPEEL 312	25.00	5.95 B	4.27	3.83	7.29 BC
HYPEEL 696	**21.25**	**4.70**	**4.27**	**3.95**	**6.10**
O 7983 (C)	**23.25**	**5.23**	**4.28**	**4.70**	**6.40**
OX 150	19.00	5.15	4.31	5.28	6.56
OX 23	23.25	5.33	4.25	4.38	6.47
OX 323	21.00	5.20	4.32	3.75	6.55
OX 325	19.00	4.95	4.37	4.65	6.20
OX 328	17.00	5.43	4.28	4.43	6.50
OX 329	18.75	5.68 B	4.33	4.70	7.04 B
OX 52	20.25	5.55 B	4.26	4.35	6.79
R 002	22.00	5.30	4.20	3.98	6.57
R 003	19.25	5.65 B	4.26	4.50	6.84
R 9812	17.00	5.20	4.31	5.23	6.35
R 9814	20.75	5.45	4.26	4.53	6.71
TR 12	22.75	5.28	4.19	4.15	6.39
TR 82	20.00	5.28	4.27	3.50	6.51
TR 90	15.00	5.15	4.35	5.05	6.26
TSH 1	21.75	6.30 ABC	4.28	4.10	7.76 ABC
TSH 2	20.25	6.60 ABC	4.25	4.50	7.98 ABC
TSH 4	20.25	5.80 B	4.25	3.88	7.04 B
TSH 5	21.25	5.80 B	4.26	4.20	7.15 B
TSH 6	19.50	5.20	4.32	3.38	6.38
TSH 7	17.25	5.70 B	4.35	3.98	6.85
TSH 8	21.75	5.43	4.29	4.03	6.99 B
TSH 9	17.25	6.18 BC	4.36	3.43	7.64 BC
TSH 10	19.75	5.88 B	4.32	4.85	7.02 B
Probability	**0.0000**	**0.0616**	**0.0000**	**0.0018**	**0.0339**
LSD	**3.3291**	**0.8022**	**0.0624**	**1.0831**	**0.8555**
CV	**14.09%**	**12.57%**	**1.24%**	**22.28%**	**10.84%**
Mean	**20.14**	**5.44**	**4.28**	**4.14**	**6.73**

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 4 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 2001 season. Having acknowledged this limitation, the following summary comments are provided.

(For each source, the entries are listed in order of observed maturity in 2001.)

Heinz Seed: H9997, H9661, H9996, H9995, H9423, H9992, H9704, H9553, H9706
H9997 - good peeled colour and appearance, midseason maturity
H9661 - large fruit, good yield and firmness
H9996 - combines good yield, firmness, colour and fruit size
H9423 - mid-late season check, good performer
H9992 - good peeled colour
H9706 - late maturity, good yield and peeled colour similar to last year, excellent solids

Ohio State University: Ohio 7983, OX 52, OX23, OX 328, OX 329, OX150, OX 325, OX 323
Ohio 7983 - early season check, had poor colour this year
OX 328 - midseason maturity, good yield and firmness
OX 329 - good peeled colour and appearance
OX 325 - excellent yield, good firmness, good visual appeal rating, late maturing
OX 323 - very good yield, excellent firmness and peeled colour, very late maturing (res. bacterial spot?)

Petoseed: Hypeel 312, Hypeel 2130, Hypeel 696
Hypeel 312 - very early maturity, good solids
Hypeel 696 - mid/late season check, colour was poor this year

Ridgetown College: R9812, R003, R002, R9814
R 9812 - good early season performance with good yield, peeled colour and good fruit size

Land O'Lakes: TR 12, TR 82, TR 90
TR 12 - early maturity, good firmness and good yield
TR 82 - good performance this year, similar to last year

Tomato Solutions: TSH 6, TSH 9, TSH 7, TSH 5, TSH 4, TSH 2, TSH 10, TSH 8, TSH 1
TSH 6 - very early, good yield and firmness
TSH 9 - excellent peeling characteristics and good solids
TSH 4 - excellent peeled colour, good SS similar to last year
TSH 2 - excellent peeling recovery, good firmness, excellent SS and total solids, similar performance last year
TSH 8 - very firm, good peeled colour
TSH 1 - very good peeling recovery similar to last year

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 5 traits: 'red ripe yield', 'red + breakers yield', 'cracking/firmness', '% canning recovery', and 'visual appearance rating', then the following 8 cultivars (in order of maturity) have a score of 5 or 4:

TR 82 H9661 H9996 OX328 H9423 OX325 H9706 OX323

One of the weaknesses of this approach becomes obvious in a year like 2001 where early maturing entries tended to suffer more from weather conditions during fruit setting.

As a result, the following early maturing entries should also be considered for evaluation under your specific production conditions.

TSH 6 TR 12 TSH 9

The growing conditions encountered during 2001 make it difficult to pick very good cultivars for trial. Many entries performed reasonably well and very few stood out above all others.

You can try this 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.

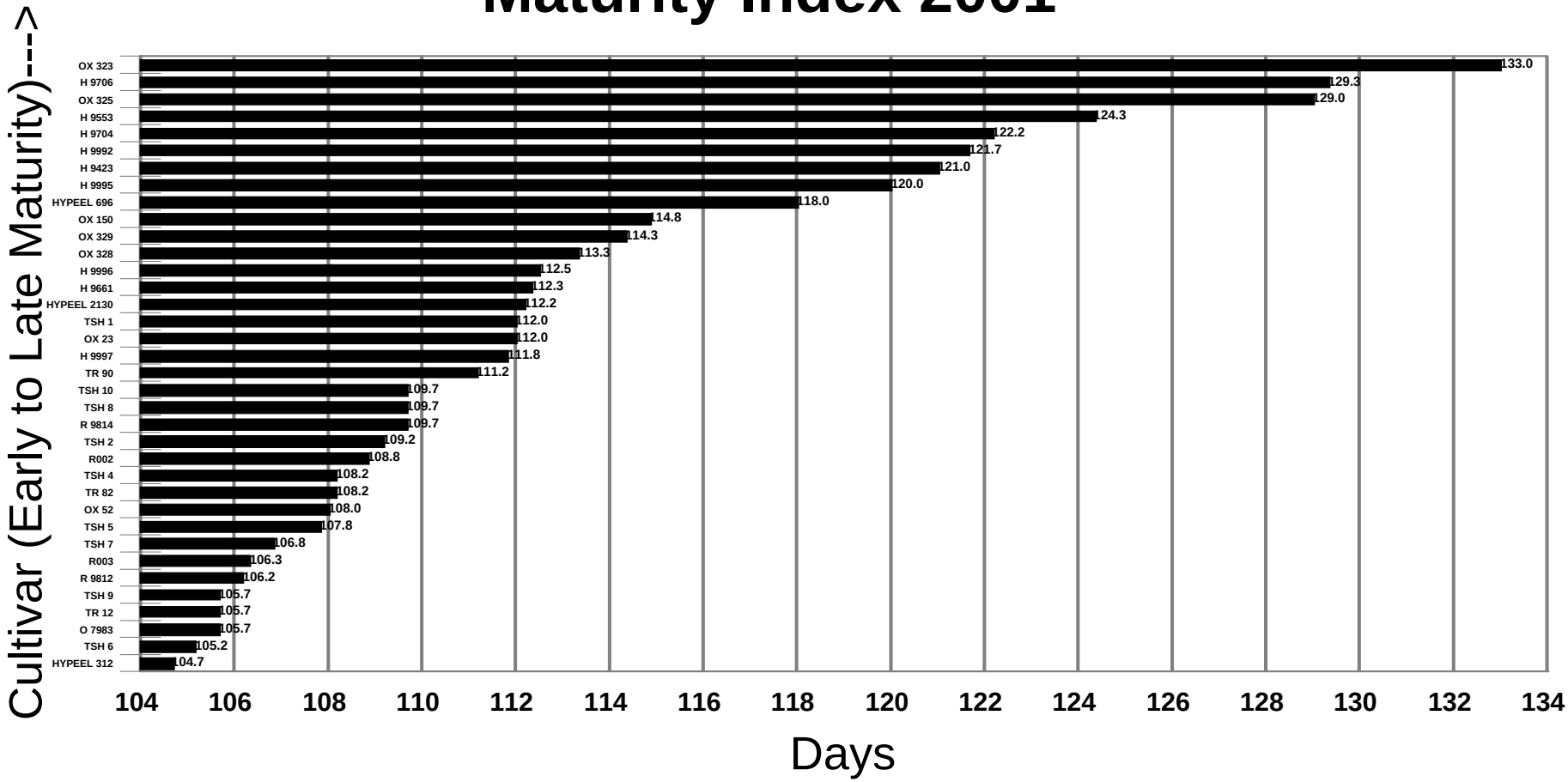
Please note that this simple method provides only a guide for picking cultivars for trial.

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 2001, based on results from Leamington and Dresden sites.

Name	Days to Harvest
HYPEEL 312	104.67
TSH 6	105.17
O 7983	**105.67**
TR 12	105.67
TSH 9	105.67
R 9812	106.17
R003	106.33
TSH 7	106.83
TSH 5	107.83
OX 52	108.00
TR 82	108.17
TSH 4	108.17
R002	108.83
TSH 2	109.17
R 9814	109.67
TSH 8	109.67
TSH 10	109.67
TR 90	111.17
H 9997	111.83
OX 23	112.00
TSH 1	112.00
HYPEEL 2130	112.17
H 9661	112.33
H 9996	112.50
OX 328	113.33
OX 329	114.33
OX 150	114.83
HYPEEL 696	**118.00**
H 9995	120.00
H 9423	**121.00**
H 9992	121.67
H 9704	122.17
H 9553	124.33
OX 325	129.00
H 9706	129.33
OX 323	133.00

Maturity Index 2001



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, 2001. Rating scale of 1 (poor) to 5 (excellent). See text for explanation.

Name	Rating
TSH 1	4.25
H 9996	4.13
TSH 9	4.00
TSH 2	3.88
R 002	3.88
H 9706	3.75
R 9812	3.75
OX 328	3.75
OX 23	3.63
OX 329	3.63
TR 90	3.50
OX 325	3.50
H 9661	3.50
TSH 8	3.38
H 9992	3.38
OX 323	3.38
TSH 7	3.38
O 7983 (C)	**3.38**
H 9423 (A)	**3.38**
H 9997	3.38
TSH 5	3.25
TR 82	3.25
TSH 4	3.13
OX 150	3.13
HYPEEL 2130	3.13
H 9553	3.13
H 9704	3.13
TR 12	3.13
TSH 10	3.13
R003	3.00
HYPEEL 312	3.00
TSH 6	3.00
HYPEEL 696 (B)	**3.00**
H 9995	2.88
R 9814	2.88
OX 52	2.75
Mean rating	**3.378**

Means are based on 4 samples.