Grower Summary

FV 336a

Parsnip: New variety evaluation

Final 2012

Disclaimer

The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Project Leader:	Paul Armitage
Contractor:	Processors and Growers Research Organisation (PGRO)
Industry Representative:	John Kenyon, BCGA
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Headline

- Parsnip varieties are evaluated for yield and quality. Fazor applications reduced bolting and root glassiness for all varieties.

Background

A previous evaluation of parsnip varieties was made in 2008 (FV 336). At the request of the British Carrot Growers Association an evaluation of further varieties, which had since become commercially available, was carried out in 2011.

Yield, bruising, field storability, winter hardiness, bolting and root glassiness were assessed, with and without a spray application of maleic hydrazide.

Ten varieties were assessed:

Variety	Breeder
Palace	Elsoms
PH14	Elsoms
PH16	Elsoms
Countess	Nickerson-Zwaan
Duchess	Nickerson-Zwaan
Albion	Tozers
Dagger	Tozers
Gladiator	Tozers
Javelin	Tozers
TZ6191	Tozers

Results

Trials were sited in two commercial parsnip crops:

1. Suffolk – Elveden (OS TL 841794)
2. Yorkshire – Shiptonthorpe (OS SE 833422)

The soil type for both sites was sandy loam.

Sown into raised beds 2.03m wide (80inches).

Suffolk

Ten varieties were sown in a randomised block trial on 4th May 2011 in a commercial crop (variety Palace). Each variety was replicated 4 times.

The target plant establishment was 35-40 plants per square metre. Maleic hydrazide (Fazor) at 8kg/ha was applied to two replicates on 28th September 2011.

Roots were harvested on three occasions. First harvest was 9th Jan 2012, second harvest on 5th April 2012 and third harvest on 23rd April 2012. Following first harvest roots were graded, weighed and assessed for quality. At second and third harvests twenty five roots from each plot were assessed for quality (tables 1 and 2).

Table 1. Plant establishment and yield at the first harvest at Suffolk

Variety	Source	Plant establish-ment per m²	Yield t/ha Gross	t/ha Diameter 34-50 mm	t/ha Diameter 50-75 mm
Palace	Elsoms	36	57.70	17.48	31.20
PH14	Elsoms	30	48.16	19.00	23.83
PH16	Elsoms	30	49.47	15.15	28.44
Countess	Niz	31	49.42	11.41	28.02
Duchess	Niz	33	46.16	11.87	25.42
Albion	Tozers	39	62.39	14.24	38.46
Dagger	Tozers	43	54.12	28.24	16.64
Gladiator	Tozers	43	56.19	20.43	26.94
Javelin	Tozers	34	49.56	9.66	33.60
TZ6191	Tozers	38	53.48	14.96	31.39
LSD			9.129	5.22	10.20
Probability			0.028 (sig)	<.001 (sig)	0.02 (sig)
CV%			11.9	22.1	24.8

Table 2. Root quality at the first harvest at Suffolk

Variety	Source	Root Quality					
		Crown	Shape	Skin	Bruising	Oxidation	Disease
Palace	Elsoms	2.5	4.0	3.5	4.8	2.0	4.5
PH14	Elsoms	4.0	3.5	3.5	5.0	2.5	3.0
PH16	Elsoms	3.5	4.0	4.0	4.9	1.5	5.0
Countess	Niz	2.0	3.0	4.5	4.9	4.5	5.0
Duchess	Niz	5.0	3.0	4.0	5.0	4.0	5.0
Albion	Tozers	2.5	3.5	2.5	5.0	2.0	4.0
Dagger	Tozers	3.0	3.0	3.5	5.0	2.5	5.0
Gladiator	Tozers	2.0	2.5	3.0	4.9	3.0	4.5
Javelin	Tozers	3.5	2.5	2.5	5.0	2.5	3.5
TZ6191	Tozers	2.5	3.5	2.5	4.9	2.5	5.0

Crown: 1 = sunken 5 = raised
Shape: 1 = wedged/pointed 5 = filled
Skin: 1 = rough 5 = smooth
Bruising: 1 =bruised 5 = no bruising
Oxidation: 1 = browning 5 = no oxidation
Diseased: 1 = diseased 5 = no disease

At the second harvest foliage re-growth was significantly reduced by Fazor (maleic hydrazide). There were no significant differences in the degree of root infection between any varieties nor was there any interaction between Fazor treatment and disease.

At the third harvest foliage re-growth remained suppressed by the Fazor treatment for all varieties. Root disease remained low with no differences observed between varieties or treatment (Table 3). Treatment with Fazor suppressed glassiness of roots for all varieties (Table 4).

Table 3. Percentage root infection at the third harvest at Suffolk

Variety	% root infection	
	Fazor at 8kg/ha	Untreated
Palace	0.7	0.63
PH14	1.95	1.03
PH16	2.6	0.38
Countess	1.18	0.75
Duchess	2.3	0.13
Albion	1.73	0.53
Dagger	0.75	0.3
Gladiator	1.1	0.8
Javelin	0.75	0.23
TZ6191	0.7	0.3

LSD for variety = 0.92 (ns)
LSD for treatment = 0.64 (ns)
LSD for variety x treatment = 1.23 (ns)

Table 4. Root glassiness at third harvest at Suffolk

	% glassy roots	
Variety	Fazor at 8kg/ha	Untreated
Palace	0	92.5
PH14	0	92.5
PH16	0	92.5
Countess	5	55
Duchess	5	17.5
Albion	2.5	82.5
Dagger	0	90
Gladiator	0	95
Javelin	0	50
TZ6191	0	50

LSD for variety = 32.2 (ns)
LSD for treatment = 12.71 (sig)
LSD for variety x treatment = 43.25 (ns)

Discussion

Suffolk

First Harvest – 09/01/12

Gross yield

Albion had the highest gross yield, followed by Palace, Gladiator, Dagger and TZ6191. Duchess, PH14, PH16, Countess and Javelin had significantly lower yields than Albion.

Washed and graded marketable yield

Albion had the highest yield in the 50-75mm grade, followed by Javelin, TZ6191 and Palace. Javelin had the highest percentage of its gross yield in the 50-75 mm grade.
Dagger had a higher proportion of its yield in the 34-50 mm grade than all the other varieties.

Root crown

Duchess and PH14 had the least sunken crown shape.

Root shape

Palace and PH16 had the most well filled root shape

Skin finish

Countess, Duchess and PH16 had the smoothest skins. Palace, PH14 and Dagger were also acceptable.

Oxidation

Countess and Duchess showed the least browning.

Third Harvest – 23/04/12

Disease

There was less root disease on untreated plots, although there were no statistically significant differences between plots.

Root glassiness

The plots that were treated with Fazor showed significantly lower levels of glassiness. Duchess, Javelin, TZ6191 and Countess had developed the least amount of glassiness on untreated plots. The differences were not statistically significant.

Yorkshire

Ten varieties were sown in a randomised block trial on 31st May 2011 in a commercial crop of parsnips (variety Javelin) grown for the pre-pack market. Each variety was replicated 4 times.

The target plant establishment was 60 plants per square metre. Fazor (Maleic hydrazide) at 8kg/ha was applied to two replicates on 20th October 2011.

Roots were harvested on three occasions. First harvest was 18th Jan 2012, second harvest on 4th April 2012 and third harvest on 30th April 2012. Following first harvest roots were graded, weighed and assessed for quality. At second and third harvests twenty five roots from each plot were assessed for quality (tables 5 and 6).

Table 5. Plant establishment and yield at first harvest at Yorkshire

Variety	Source	Plant establish-ment m²	Yield t/ha Gross Total	t/ha Diameter 22-28 mm	t/ha Diameter 28-34 mm	t/ha Diameter 34-50 mm
Palace	Elsoms	86	43.20	8.51	9.84	22.57
PH14	Elsoms	66	36.91	6.23	7.97	19.37
PH16	Elsoms	59	43.11	2.83	5.54	30.10
Countess	Niz	75	38.55	5.53	6.90	22.53
Duchess	Niz	74	37.67	4.64	4.69	23.78
Albion	Tozers	68	46.79	3.92	5.31	28.23
Dagger	Tozers	105	43.09	11.77	11.28	16.73
Gladiator	Tozers	113	43.54	8.96	8.87	21.46
Javelin	Tozers	81	42.37	7.71	7.61	23.64
TZ6191	Tozers	83	43.08	6.85	7.51	25.63
LSD @ p = 0.05			3.209	2.915	2.483	4.899
Probability			<.001	<.001	<.001	<.001
CV%			5.3	30.0	22.7	14.4

Table 6. Root quality at first harvest at Yorkshire

	Root quality					
Variety	Crown	Shape	Skin	Bruising	Oxidation	Disease
Palace	4.0	3.5	3.0	4.6	2.5	5.0
PH14	4.5	4.0	3.0	4.8	4.0	4.5
PH16	3.5	3.5	3.5	3.5	1.5	5.0
Countess	4.5	3.5	4.0	4.7	4.5	5.0
Duchess	3.5	3.5	4.5	4.6	3.5	5.0
Albion	2.0	3.0	4.0	4.3	2.5	5.0
Dagger	3.0	2.5	2.0	4.1	2.5	5.0
Gladiator	2.0	3.0	3.0	3.7	3.0	5.0
Javelin	3.5	2.5	4.0	4.0	3.0	5.0
TZ6191	3.0	3.0	3.0	5.0	2.5	5.0

Crown: 1 = sunken 5 = raised
Shape: 1 = wedged/pointed 5 = filled
Skin: 1 = rough 5 = smooth
Bruising: 1 =bruised 5 = no bruising,
Oxidation: 1 = browning 5 = no browning
Diseased: 1 = diseased 5 = no disease

Second Harvest – 04/04/12

Foliage re-growth was significantly reduced by Fazor but there were no significant differences in the degree of root infection between any varieties nor was there any interaction between Fazor treatment and variety disease differences.

Third harvest – 30/04/12

Table 7. Root disease at third harvest at Yorkshire

	% root infection	
Variety	Fazor at 8kg/ha	Untreated
Palace	3	5
PH14	5.5	2
PH16	7	2.5
Countess	1.5	3.5
Duchess	1.5	2
Albion	5	0
Dagger	6	2
Gladiator	1	1
Javelin	6.5	3
TZ6191	9	0

Table 8. Root glassiness at third harvest at Yorkshire

	% glassy roots	
Variety	Fazor at 8kg/ha	Untreated
Palace	0	3
PH14	0	65
PH16	0	65
Countess	0	0
Duchess	0	0
Albion	0	45
Dagger	3	55
Gladiator	0	68
Javelin	0	45
TZ6191	0	18

Discussion

Yorkshire

First harvest – 18/01/12

Gross yield

Albion had the highest gross yield, followed by Gladiator, Palace, PH16, Dagger and TZ6191. PH14, Duchess and Countess had the lowest gross yields.

Washed and graded marketable yield

PH16 and Albion had the highest yield in 34-50mm grade, followed by TZ6191.
Duchess, Countess and Javelin had almost 60% of their gross yield in the 34-50mm grade. Dagger had significantly higher yield in the 22-28mm and 28-34mm grades, followed by Palace and Gladiator, both of which are smaller parsnips.

Root crown

PH14 and Countess exhibited the least sunken crown shape followed by Palace.

Root shape

PH14 showed the best well filled root shape, followed by Palace, PH16, Countess and Duchess.

Skin finish

Duchess had the smoothest skin, followed by Countess and Albion.

Bruising

Bruising was difficult to simulate on hand lifted roots but where this could be assessed, TZ6191 showed the least. PH14, Countess, Duchess and Palace had low levels and PH16 and Gladiator the most.

Oxidation

Countess and PH14 showed the least browning due to oxidation.

Third harvest at Yorkshire – 30/04/12

Disease

Due to uneven application of Fazor across the trial area, it was not possible to analyse the data statistically. There was a trend for less disease on untreated plots.

Root glassiness

In untreated plots, Countess, Duchess, Palace and TZ6191, had the least amount of glassiness.

Main conclusions

The conclusions were drawn from both sites.

First harvest

Gross yield

Albion had the highest gross yield, followed by Gladiator, Palace, Dagger and TZ6191.

Washed and graded marketable yield.

Albion and TZ6191 bulked rapidly and had the largest yields in the bigger grades making them suitable for the ware market. Javelin had a high proportion of yield in the bigger grades. Dagger had higher yields in the smaller grades making it more suitable for the pre-pack market.

Root crown

PH14 had the least sunken root crown shape.

Root shape

Palace and PH16 had the most well filled root shape.

Skin finish

Duchess and Countess had good skin finish.

Bruising

Bruising was difficult to simulate and very little difference was observed between varieties.

Oxidation

Countess showed the least browning after cutting.

Third harvest

Disease

The 2011 to 2012 season was very dry, with very low levels of disease at both sites. There were no varietal differences found. There appeared to be a trend in the cumulative levels of disease, when comparing the treated with the untreated plots. Higher disease levels were seen in the plots sprayed with Fazor.

Root glassiness

Very few roots showed glassiness when treated with Fazor. In the untreated plots Duchess, Countess and TZ6191 showed the least amount of glassiness and Gladiator, PH14, PH16 and Dagger showed the most.