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A REPORT TO THE HORTICULTURAL DEVELOPMENT COUNCIL,
18 LAVANT STREET, PETERSFIELD, HANTS GU32 3ES

AND TO

THE NATIONAL LETTUCE TRIALS GROUP

GLASSHOUSE SUMMER LETTUCE
VARIETY TRIALS
1994

Project Number: PC21e
Project Title: Glasshouse summer lettuce variety trial

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INTRODUCTION & OBJECTIVES

As introductions of new lettuce varieties become available, they require evaluation on as near a commercial basis as possible. This evaluation needs regional replication to take into account climatic and soil temperature differences. These trials on three sites evaluated eleven butterhead varieties, including the standard variety Diego, for production during the summer.

TRIAL SITE DETAILS

Yorkshire Site
HRI Stockbridge House
Cawood
Selby
North Yorkshire
YO8 OTZ

Lancashire Site
Taylors Farm
Moss Lane
Hesketh Bank
Preston
Lancashire
PR4 6XJ

(by kind permission of Messrs R & K Bond)

Sussex Site
Leythorne Nursery
Vinnetrov Road
Runcton
Chichester
West Sussex

(by kind permission of N V Produce Marketing Ltd)

VARIETIES

Seed Suppliers & Claimed Resistance to Bremia Races

<u>Variety</u>	<u>Supplier</u>	<u>Claimed resistance to Bremia races</u>
Prior Clinton (LM 3055) Douglas (LM 7622)	Elsoms Seeds Ltd	NL 1-7, 10, 11, 13-15 NL 1-7, 10-16 NL 1-7, 10, 11, 13, 15
E7122 E8914 E8918	Enza Zaden UK Ltd	NL 1-7, 10-16 NL 1-7, 10-16 NL 1-7, 10-16
Vegas (42-57)	Pinetree de Ruiters Seeds Ltd	NL 1-16
Diego 42-64 RZ 42-72 RZ	Rijk Zwaan UK Ltd	NL 1-7, 10, 11, 13-15 NL 1-16 NL 1-16
Pedro	Yates	NL 1-15

CULTURAL DETAILS

	<u>Yorkshire</u>	<u>Lancashire</u>	<u>Sussex</u>
Sowing date	6 July	15 June	15 June
Planting date	27 July	30 June	30 June
Spacing	20 cm x 20 cm	21.5 cm x 21.5 cm	20 cm x 23 cm
Harvest date	24 August	2 August	27 July

All plants were block-raised and grown according to ADAS fertiliser recommendations, with appropriate pesticide applications for usual pest and disease control.

EXPERIMENTAL DESIGN

Fully randomised with four replicates (five replicates at Stockbridge House)

	<u>Yorkshire</u>	<u>Lancashire</u>	<u>Sussex</u>
Plot size (heads)	56	60	60
Recorded area (heads)	20	20	24

In addition to head weights after trimming to a commercial standard, records were taken of trimmings and germination percentages on selected sites. On two sites, visitors attending open days scored the varieties for “overall usefulness”.

SITE RESULTS

1. Yorkshire Trial

Table 1: Mean Head Weight

Variety	(g)
42-64	209.6
E8918	203.5
Diego	195.9
Vegas	191.6
Douglas	191.4
Pedro	185.6
Clinton	178.6
42-72	179.1
E8914	176.1
E7122	168.2
Prior*	162.9
SED (30 df)	8.32
LSD (P = 0.05)	16.99
Significance	***

* Poor primary germination of Prior resulted in the low mean head weight.

Table 2: Percentage Class I, Class II and Waste Heads - by number

Variety	% Class I Heads	% Class II Heads	% Waste
42-64	100.0	0.0	0.0
E8918	98.5	1.2	0.0
Diego	98.3	0.3	1.1
Vegas	97.6	2.3	0.5
Douglas	98.5	0.3	0.9
Pedro	82.6	16.6	0.5
Clinton	98.5	1.2	0.0
42-72	92.6	6.6	1.1
E8914	82.6	15.3	1.8
E7122	91.5	2.8	2.7
Prior	100.0	0.0	1.8
SED (30 df)	6.82	5.91	1.86
LSD (P = 0.05)	-	-	-
Significance	NS	NS	NS

Table 3: Colour, base and head size scores

Variety	Colour	Base	Head Size
42-64	2.8	4.1	4.3
E8918	2.6	4.1	4.4
Diego	2.6	4.1	4.0
Vegas	2.7	3.9	4.0
Douglas	2.4	4.3	4.3
Pedro	2.4	4.3	3.8
Clinton	2.3	4.2	4.2
42-72	2.7	4.1	3.9
E8914	3.1	4.1	4.0
E7122	2.1	3.9	3.7
Prior	2.6	3.9	3.4

Scores

Colour 1-5, where 5 = dark
 Base 1-5, where 5 = well filled
 Head Size 1-5, where 5 = large

Table 4: Percentage of trimmings, grower usefulness scores, and percentage final germination

Variety	Trimmings (%)	Usefulness Score	% Germination
42-64	6.2	2.8	99
E8918	7.4	2.8	65
Diego	5.9	3.3	95
Vegas	5.1	2.8	76
Douglas	6.3	2.8	95
Pedro	4.2	1.4	71
Clinton	6.5	2.5	97
42-72	5.0	2.9	96
E8914	4.6	2.7	73
E7122	10.3	2.2	77
Prior	7.1	1.9	73

Grower Usefulness Score: 0-5, where 5 = excellent

VISUAL ASSESSMENTS on 17 August (Score 0-5, 0 = poor, 5 = good)

- Diego 90% ground cover, starting to heart well. Large broad leaves but uneven shaped head. Less than 0.5% off-types, uniformity good. Medium green colour. Score = 3.
- Vegas 95% ground cover, squat compact looking plants, starting to heart well. Fairly long leaves, moderate green matt colour. Score = 2.
- E8914 Tidy uniform, symmetrical looking heads. 90% ground cover, glossy medium green. Tulip shaped head, just hearting, but would be light. Small framed. Score = 3.
- Prior 85-90% ground cover. Pale-medium green, flat, open heart, slight bubbling to inner leaves. Very uniform and symmetrical. This variety suffered from poor primary germination, therefore had a low mean head weight at harvest. Score = 3.
- Douglas 95% ground cover. Well filled head, hearting well, medium matt green colour, lower leaves held from ground well. Score = 4.
- 42-72 85% ground cover, moderately flat habit, moderate-pale green colour, hearting stage variable. Symmetrical heads. Score = 3.
- Clinton 85-90% ground cover, rounded tapering leaves, just starting to heart. Moderate green matt leaves, flat lower leaves. Score 3.
- 42-64 95% ground cover, untidy looking heads, very undefined outline to head due to twisting direction of growth of leaves. Some leaves sticking up very vertically. Moderate matt green. Less than 0.5 off-types, hearting well. Score = 2.
- Pedro 85-90% ground cover. Very upright, tulip shaped head, hearting well, pale bright glossy green with distinct silvery underside to leaves. Heads leaning in different directions. Score = 2.
- E8918 95% ground cover. Large broad leaves, hearting well, moderate green. Lower leaves fairly flat. Score = 3.
- E7122 90% ground cover. Moderate-pale bright green, downward cupping leaves, just starting to heart. Some younger leaves a little upright and untidy. Score = 3.

2. Lancashire Trial

Table 5: Mean Head Weights & Trimmings

Assessment of Varieties Without Adjustments for Losses

Variety	Mean Headweight (g)	Sample Standard Deviation (g)	% Trimmings (by weight)
Pedro	289.25	36.9	13.15
Douglas	281.93	45.58	15.42
Diego	275.68	37.6	15.49
42-64	270.35	29.09	18.09
E7122	268.93	43.18	22.38
Clinton	265.23	39.36	15.64
Vegas	261.37	37.46	19.88
E8918	252.15	46.32	21.52
42-72	251.95	37.13	18.75
Prior	248.40	36.53	17.67
E8914	232.53	40.99	19.24
Trial Mean	263.43		
LSD (var. mean)	19.72		
P =	0.05		

Table 6: Mean Head Weights & Trimmings

Assessment of Varieties with Adjustment for Losses

Variety	Mean Headweight (g)	Sample Standard Deviation (g)	% Trimmings (by weight)
Diego	307.88	86.74	24.47
Douglas	303.84	29.53	19.97
Pedro	296.83	29.08	14.24
E7122	293.15	26.65	30.81
E8918	291.00	23.52	37.30
Vegas	287.82	23.09	31.86
Clinton	285.61	26.69	21.26
42-64	284.30	18.56	23.44
Prior	279.08	21.02	36.30
42-72	276.86	20.30	27.67
E8914	273.85	23.91	49.00
Trial Mean	290.32		
LSD (var mean)	19.72		
P =	0.05		

VISUAL ASSESSMENTS

Clinton

Medium green, medium thin, smooth, upright leaves. Head hearted and closed. Base flat, broad, closed and white. Difficult to cut due to closeness to ground and small brittle leaves at the base of the stem. Produced a well filled and attractive market pack, but some browning of the cut stems was present and pointed market pack.

Douglas

Medium green, medium thick, smooth, upright leaves. Head hearted and open. Base broad, slightly concave, closed and white. Very close to the ground, so presents some difficulty in cutting. This variety is "shallow" and tends to be "square" producing a loosely filled box. The stem base is rather large but not much evidence of browning was seen.

Prior

Medium green, medium thick, smooth, upright leaves. Head hearted and closed. Base broad, slightly pointed, closed and white. Easy to cut and pack, but this variety produced an unattractive market pack due to gaps between the lettuce in the box.

E7122

Medium green, medium thick, smooth, upright leaves. Head hearted and open with a large frame. Base broad, flat, closed and white. A variable variety to cut and pack with a "soft texture". A "deep" lettuce which filled the market pack, but spaces could be seen between the lettuces in the box.

E8914

Medium to dark green, medium thick, smooth upright leaves. Head hearted, well filled and closed, the base broad, flat, closed and white. Easy to cut and pack. Another "deep" or tall lettuce, which again filled the pack, but with spaces between the lettuces in the box.

E8918

Light to medium green, medium thick, smooth upright leaves. Head hearted, well filled and closed. The base broad, flat, closed and white. Easy to cut and trim, but very soft. The market pack produced by this variety was not well filled.

Vegas

Medium green, thin, smooth, recumbent leaves. Head hearted and open. The base broad, flat, closed and greenish white. East to cut, trim and pack. This variety gave a rather green, well-filled market pack.

Diego

Medium green, medium thick, smooth, upright leaves. Head hearted, closed and well-filled. The base broad, flat to slightly concave, closed and white. Easy to cut, trim and pack. This variety produced an attractive market pack, but did not fully fill the box. This variety produced an attractive market pack, but did not fully fill the box. This variety is rather compact, somewhat reminiscent of an outdoor butterhead variety. Downy Mildew was present on this variety.

42-64

Medium green, medium thick, moderately blistered, upright leaves. Head hearted and open, but slightly folding in. The base broad, flat, closed and white. This variety produced a tough stem with basal shoots which made cutting difficult. Basal rotting was also apparent. This variety produced a reasonable market pack, but spaces could be seen in the box due to its variable nature, however this cultivar had the least basal browning in the trial. This variety had a tough stem which made it difficult to cut, but was easy to pack and give an attractive market pack.

42-72

Medium green, medium thick, smooth, upright leaves. Head hearted, open and slightly pointed. The base broad, flat to slightly pointed, closed and white. Difficult to cut and trim due to a tough stem and closeness to ground. This variety gave an attractive, evenly filled market pack, but a few spaces were apparent in the box.

Pedro

Medium green, medium thick, moderately blistered, upright leaves. Head hearted, well filled and solid. The base broad, flat, closed and white. This variety was easy to cut and trim. This variety produced a very attractive market pack - the best in the trial. The individual heads have a slightly "square" appearance and with a very slightly pronounced base.

3. Sussex Trial

Table 7: Mean Head Weight & Visual Assessments (0 = Poor, 5 = Good)

Variety	Average Head Weight (g)	Score
Pedro	271	3.7
E8918	262	3.7
Diego	258	3.3
Vegas	252	3.6
Douglas	250	3.2
42-64	248	3.3
Clinton	245	3.0
Prior	242	3.5
E7122	235	2.2
E8914	233	2.8
42-72	224	3.3

TRIAL SUMMARIES

Sussex Trial

The highest head weights were Pedro, Diego and E8918 with all having a rather upright habit but making a good pack. Growers scored Pedro and E8918 highly, with Vegas also well-liked.

Lancashire Trial

Diego, Douglas and Pedro produced the heaviest heads but both Diego and Pedro suffered from some Downy mildew. Pedro was the most attractive variety in the pack, and also had the least amount of trimming in the trial.

Yorkshire Trial

The trial was harvested when head weights were still rather low but 42-64 RZ and E8918 still achieved over 200 grams. Diego was scored highest by growers with several varieties including Douglas, Vegas, 42-72 and E8918 coming a close second.

OVERALL CONCLUSIONS

No variety was outstanding in terms of overall performance on all 3 sites. The standard variety Diego performed well on all of the trials and Pedro, Douglas, Vegas and E8918 all gave good results. There was little opportunity to test susceptibility to bottom rots due to the relatively warm, dry summer although mildew did occur in the Lancashire trial on Diego and Pedro. Neither of these varieties has claimed resistance to *Bremia* race NL-16.