



HORTICULTURE RESEARCH INTERNATIONAL
STOCKBRIDGE HOUSE

Commercial - In Confidence

BUTTERHEAD LETTUCE
SUMMER VARIETY TRIAL 1991

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Rijk Zwaan
Breeders Seeds
Pinetree Vandenberg

The results and conclusions in this report are based on one experiment. The conditions under which the experiment was carried out and the results have been reported with detail and accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial product recommendations.

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Summary

Titania (ENZ) was used as a control variety to make comparisons with 10 butterhead lettuce varieties for production during the summer. When sown on 16 April, Titania (ENZ) was an excellent control variety as it produced good marketable head weights of Class I lettuce, requiring very little trimming. Several varieties were as quick as Titania (ENZ) to reach marketable head weights. However, only Titania (ENZ), Michelle (ENZ), E6399 (ENZ) and Calibra (ELS) were able to withstand the warm weather conditions for any length of time from start of maturity. Although both 42-23 (RZ) and Sundance (PTR) produced well filled heads that could be attractively displayed when packed, they required harvesting over a relatively short period of time once maturity was reached.

Objective

To evaluate the performance of a range of butterhead lettuce varieties grown under glass for summer production.

Introduction

Favourable attributes for a summer butterhead lettuce variety include good head weights at maturity, high percentage Class I, good uniformity and good standing ability. This trial compared 10 varieties of butterhead lettuce with the control variety Titania.

Materials and Methods

<u>Varieties</u>	<u>Seed House</u>
Titania (control)	Enza Zaden
Michelle	Enza Zaden
E6399	Enza Zaden
Cortina	Elsoms Seeds
Calibra	Elsoms Seeds
6203	Elsoms Seeds
TS 3025	Rijk Zwaan
42-23	Rijk Zwaan
SO256	Breeders Seeds
SO254	Breeders Seeds
Sundance	Pinetree Vandenberg

Culture

Sown: 16 April (48 hours in Coldstore at 3°C post-sowing)

Planted: 21 May

Spacing: 20 x 20 cm

Disease Control

Propagation: Zineb - One application
Mancozeb + Metalaxyl (as Favour 600w) - One application
Iprodione (as Rovral WP) - One application

Post-Planting: Iprodione (as Rovral WP) - One application

Harvests: 21 June
25 June
27 June

Design: Blocked design with three replicates to eliminate both North-South and East-West effects. Three harvests of 20 plants per plot.

Records: At each harvest:
Individual head weights
Percentage Class I
Percentage trimmings

Detailed notes on variety characteristics and physiological disorders.

Shelf life characteristics.

Assessment of disease levels.

Results

Table 1: Mean Head Weight (g)

Variety	HARVEST DATE		
	21 June	25 June	27 June
Titania (control)	208	256	266
Michelle	202	237	244
E6399	198	258	268
Cortina	178	230	249
Calibra	208	245	240
6203	177	221	226
TS 3025	198	237	265
42-23	204	247	277
S0256	189	230	252
S0254	168	221	234
Sundance	215	248	285
SED 1 (21 df)	10.9	15.2	13.9
LSD 1	23	32	29
SED 2 (21 df)	9.4	13.2	12.0
LSD 2	20	27	25
SED 1	To make comparisons between all varieties except the control.		
SED 2	To compare varieties with the control.		

At all three harvests 6203 and S0254 were significantly smaller than the control variety Titania. Titania quickly reached a marketable weight around 240 g and then showed good standing ability. Other varieties that displayed a similar growth pattern were Michelle, E6399 and Calibra.

Table 2: Percentage Trimmings

Variety	HARVEST DATE		
	21 June	25 June	27 June
Titania (control)	9	9	11
Michelle	7	10	10
E6399	7	10	13
Cortina	8	12	9
Calibra	6	8	13
6203	8	10	12
TS 3025	8	16	15
42-23	10	12	13
SO256	10	11	10
SO254	5	5	8
Sundance	9	17	15
SED 1 (21 df)	1.3	2.4	1.4
LSD 1	3	5	3
SED 2 (21 df)	1.1	2.0	1.2
LSD 2	2	4	2
SED 1	To make comparisons between all varieties except the control.		
SED 2	To compare varieties with the control.		

Significantly less trimming was required to SO254 compared with Titania for all three harvests. TS 3025 and Sundance required significantly more trimming than Titania at the second and third harvests. Yellowing leaves was the reason for increased trimming with very little bottom rot seen in the trial.

Table 3: Percentage Class I

Variety	HARVEST DATE		
	21 June	25 June	27 June
Titania (control)	100	100	99
Michelle	97	100	97
E6399	100	100	100
Cortina	100	100	100
Calibra	100	100	100
6203	100	100	100
TS 3025	100	100	100
42-23	100	100	100
SO256	100	100	98
SO254	98	98	100
Sundance	100	100	100

All varieties produced nearly 100 percent Class I heads at all three harvests. Tip-burn was the reason for downgrading a small percentage of some varieties.

Table 4: Shelf Life of Harvest 2 (25 June)

Variety	Percentage Dry Weight	Base Density (Score 0-5*)	Basal Browning After 24 Hours Shelf Life (Score 0-5+)
Titania (control)	3.5	3	1
Michelle	3.7	3	1
E6399	3.8	4	1
Cortina	3.5	3	1
Calibra	3.6	3	2
6203	3.7	3	1
TS 3025	3.3	3	2
42-23	3.4	5	1
S0256	2.9	2	1
S0254	4.0	2	1
Sundance	3.5	4	1

* Score: 0 = Loose Base; 5 = Dense Base

+ Score: 0 = Severe Browning; 5 = No Browning

The varieties were placed in a shelf life room shortly after harvest for 24 hours at 20°C with 16 hours illumination using fluorescent tubes before the above assessment was carried out.

There were few differences in percentage dry matter between varieties.

E6399, 42-23 and Sundance had well filled bases that looked attractive when packed in boxes. All varieties showed obvious basal browning after 24 hours in shelf life conditions. Rapid browning of the butt of the lettuce was probably due to high field temperatures experienced during harvest, even though harvesting was carried out early in the morning.

Discussion

Titania was an excellent control variety for the trial. It quickly produced good marketable weights of Class I lettuce, requiring little trimming.

After quickly reaching maturity, the ability to stand in hot summer conditions was shown by Titania, Michelle, E6399 and Calibra. E6399 tended to produce a fairly small frame but densely filled base. Other varieties with well filled bases were 42-23 and Sundance, but tended to lack standing ability.

Although Michelle has a similar growth rate to Titania, it showed greater variability in head size.

The significantly less trimming required for S0254 compared to Titania, could not compensate for the loose, open base and low mean head weight.

Conclusions

1. Titania, Michelle, E6399 and Calibra once reaching marketable head weights showed good standing ability throughout the harvest periods.
2. TS 3025, 42-23 and Sundance quickly reached maturity but were required to be harvested quickly as standing ability was limited.

APPENDIX I: LETTUCE ASSESSMENT AT HARVEST 2 - 25 JUNE 1991

- Titania Attractive rounded heads. Short, wide leaves surrounding a fairly solid heart. Fairly large mid-rib to leaves but pliable to touch. Uniformity very good. Ground cover complete. Overall good.
- Michelle Dark green leaves with more obvious bubble to leaves tightly surrounding the heart. Quite variable in size. Heart well formed and fairly upright. Silvery green underside to leaves visible around the heart. Some mid-ribs were brittle when bagging.
- E6399 Small framed, well hearted. Large bubble to leaf. Slight tip-burn to mature edges. Young leaves in heart visible, pale yellow. Pale green underneath to leaves. Leaves quite long.
- Cortina Small frames, compact habit. A very rounded heart, tightly surrounded by wrapper leaves tended to be cupped by the flatter more mature leaves. Very slight bubble to the generally smooth mature leaves. Underside of leaves was quite visible as they wrap around the heart. Some of the young leaves protruding vertically above the heart spoils the appearance slightly.
- Calibra Broad flat leaves. Slight bubble to leaf. Leaves held fairly upright. Solid head, but very pliable to touch. Apart from the few ragged vertical young leaves near the heart, it was quite attractive.
- 6203 Moderately pale green leaves, which were smooth and held fairly flat. Large frame and good ground cover. Reasonable uniformity. Heart development was good and may stand for some time.

- TS 3025 Moderate green, very rounded head with short-wide leaves surrounding heart. Well hearted. Smooth leaves but fairly thick, slightly leathery texture. Slight spiny, spiky edges to leaves where veins meet edge. Pale green underside. Flexible to touch. Flat habit - spreading.
- 42-23 Large very smooth medium green leaves, becoming open quickly and flat. A rounded heart with silvery green underside to leaves was clearly visible above the flat surrounding leaves. Leaves a little leathery but quite pliable to cut, but mid-ribs were easily snapped.
- SO256 Dark green narrow long leaves. Fairly compact moderate frame, heart looking a little frilly and ragged. Leaves smooth and mainly upright. Very pliable to touch. Heart quite firm and well developed. Very slightly variable in size of head.
- SO254 Small framed, compact head. Heart solid but fairly flat and open. Pale inner leaves were quite visible in the heart. Attractive rounded head but some variation in size of heads. Smooth moderate green leaves. Pliable to touch. Silvery underside to leaves.
- Sundance Very rounded compact head but good frame size and ground cover. Very symmetrical looking head, solid heart. Smooth broad leaves but with very slight pale green edge. Uniformity very good. Overall good.