Stockbridge Technology Centre

Leaders in Technology Transfer to Agriculture and Horticulture

PROJECT REPORT

Comparing lettuce propagation methods.

To:

James Bean
Crystal Heart Salad Company Ltd
Mill Lane, Sandholme, Brough,
East Yorkshire
HU15 2XS.

Report Author

Julian Davies

23 September 2020

Stockbridge Technology Centre Ltd., Cawood, Selby, North Yorkshire YO8 3TZ
Telephone: +44(0)1757 268275 Facsimile: +44(0)1757 268996 Website: www.stockbridgeonline.co.uk
Company registered in UK No. 4175440 VAT No. 8565972 70

Authentication

The results and conclusions in this report are based on one trial. The conditions under which the work 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.

A copy of the final report and the raw data will be archived at the STC for a minimum of 5 years.

I declare that this work was done under my supervision according to the procedures described herein and that this report represents a true and accurate record of the results obtained.

Signature J S Davies Date 23/9/20

Julian Davies
Agronomist
Agronomy Services
Stockbridge Technology Centre Ltd

Summary

Iceberg lettuce plants propagated in peat blocks (38mm) and Ellepots (30mm) with or without additional feed were supplied by Crystal Heart Salad Company Ltd to compare their performance and particularly the effects on plant growth and head quality at maturity. The iceberg lettuce plants were planted on 24 July 2020 and grown with standard fertiliser and pesticide inputs.

Plant establishment was initially excellent for all three propagation methods.

Peat block plants looked larger and were slightly heavier at 10 days post-planting as they had a taller wrapper leaf. By 28 days post-planting plants were similar in size and had similar ground cover.

Plant loss was higher for the lettuces propagated in peat blocks mainly due to plants rotting at the base of the plants. Overall plant loss was low.

There was no obvious difference in maturity between the peat blocks and Ellepots with similar number of plants harvested at the first harvest on 14 September. Most heads were harvested at the first harvest date.

Trimmed head weights and marketability were generally similar for the plants propagated in peat blocks and Ellepots.

There did appear to be any obvious benefit from applying the feed treatment to the plants grown in Ellepots.

Overall, the results are encouraging for the Ellepots, particularly due to similar trimmed head weights and a higher plant stand as plants appeared less susceptible to basal rotting.

Objectives

To compare plants grown in peat blocks and Ellepots on plant growth, performance, plant stand uniformity, crop yield and quality at maturity.

Details

Site: Field L, Stockbridge Technology Centre

Treatments

A. Peat block (38mm)
B. Ellepot (30mm)
C. Ellepot (30mm) + feed

Details

Iceberg lettuce plants were planted on 24 July 2020 with 4 rows at 35cm per 1.83m bed and 30cm between plants. There were four replicates of each treatment arranged in a randomised block design. Each plot had 4 rows and 27 plants in each row.

Assessments

1. Plant size at weekly intervals using a scoring scale of 1-10 (where 1 = very small and 10 = very large)
2. Plant colour at weekly intervals using a scoring scale of 1-10 (where 1 = very poor and 10 = excellent)
3. Weight of heads at 10 and 28 days after planting (10 heads per plot)
4. Trimmed head weights and marketability at harvest (20 heads per plot)
5. Photographs of main treatment effects

Key dates

24 July	Base fertiliser applied (100kg/ha N)
24 July	Trial planted and irrigated (25mm)
3 August	Plants cut at 10 days post planting
14 August	Top dressed (30kg/ha N)
14 August	Irrigated (25mm)
24 August	Plants cut at 28 days post planting
14 September	First harvest
17 September	Final harvest

Results and discussion

Plant establishment was very good.

Plant size results are presented in Table 1.

Table 1: Plant size (1-10) at weekly intervals after planting.

Treatment	31 July	7 Aug	14 Aug	21 Aug	28 Aug	4 Sept
Peat blocks	10	10	10	10	10	10
Ellepots	10	9.0	10	10	10	10
Ellepots + feed	10	9.0	9.8	10	10	10

Plant size was excellent with no obvious differences between the three propagation systems.

Plant colour results are presented in Table 2.

Table 2: Plant colour (1-10) at weekly intervals after planting.

Treatment	31 July	7 Aug	14 Aug	21 Aug	28 Aug	4 Sept
Peat blocks	10	10	10	10	10	10
Ellepots	10	10	10	10	10	10
Ellepots + feed	10	10	10	10	10	10

Plant colour remained excellent throughout the growing period.

Table 3: Plant weights (g) at 10 and 28 days after planting.

Treatment	10 days		28 days	
	Mean	Range	Mean	Range
Peat blocks	15.2	13.7 – 17.5	232.3	206.5 – 251.9
Ellepots	12.1	11.3 – 13.3	239.5	198.9 – 277.0
Ellepots + feed	11.6	10.8 – 12.5	235.0	212.4 – 253.4

Plant weights at 10 days were slightly higher for the plants grown in peat blocks.

Plant weights at 28 days were similar for all three propagation methods, with a similar range in plant weights between the four replicates for each treatment.

The number of missing, rotten and poor plants/heads was assessed commencing in mid-August. The results are presented in Table 4.

Table 4: Number of missing, rotten and poor plants/heads per plot.

Treatment	21 August (4 weeks after planting)			4 September (6 weeks after planting)		
	Missing	Poor	Rotten	Missing	Poor	Rotten
Peat blocks	2.8	3.8	3	3.0	2.0	3.5
Ellepots	0.5	0.8	0	0.5	0.5	1.5
Ellepots + feed	0	1.5	0	0.3	0.8	1.0

Note – direct comparisons cannot be made between the two assessment dates as the number of plants per plot was higher on 21 August as this was before the plants for the 28 days post-planting assessment were cut

By 21 August the plant stand was poorer for the peat blocks with more missing and plants that had rotted at the base of the plant.

By 4 September, when each plot contained 100 plants, the plant stand continued to be lower for the peat block plants.

Plants were assessed individually and then harvested when they had reached the required density. When heads were dense they were cut and trimmed to remove the outer leaves and weighed. The majority of heads were harvested on the first harvest date. The head weights are presented in Tables 5 and 6.

Table 5: Number of heads (%) in each size grade.

Treatment	<299g	300 – 349g	350 – 399g	400 – 449g	450-499g	500-549g	550 – 599g	600-649g	>650g
Peat blocks	1	5	5	14	15	21	19	9	4
Ellepots	0	4	3	9	25	23	23	10	5
Ellepots + feed	0	1	6	21	21	28	18	5	0

Table 6: Number of heads (%) in each size grade.

Treatment	>300g	>350g	>400g	>450g	>500g	>550g	>600g	>650g
Peat blocks	98	93	84	69	53	31	13	4
Ellepots	100	96	94	85	60	38	15	5
Ellepots + feed	100	99	93	71	50	23	5	0

Most heads were within the range of 300-600g, with good quality dense heads produced.

Overall the number of heads over 500g was similar for the three propagation methods. The mean head weights and marketability are presented in Table 7.

Table 7: Mean trimmed head weights (g) and marketability.

Treatment	Mean head weight (g)	Range	>400g	>450g	>500g	>550g
Peat blocks	492.6	452.7 – 539.3	81	68	53	31
Ellepots	523.6	469.8 – 552.8	85	78	59	38
Ellepots + feed	494.0	439.4 – 527.0	85	68	48	23

Mean trimmed weights were similar for all three propagation methods.

Head quality was excellent with a low number of loose or misshapen heads for all three propagation methods.

Conclusions

1. Plant establishment was initially excellent for all three propagation methods.

2. Peat block plants looked larger and were slightly heavier at 10 days post-planting as they had a taller wrapper leaf. By 28 days post-planting plants were similar in size and had similar ground cover.

3. Plant loss was higher for the lettuces propagated in peat blocks mainly due to plants rotting at the base of the plants.

4. There was no obvious difference in maturity between the peat blocks and Ellepots with similar number of plants harvested at the first harvest on 14 September.

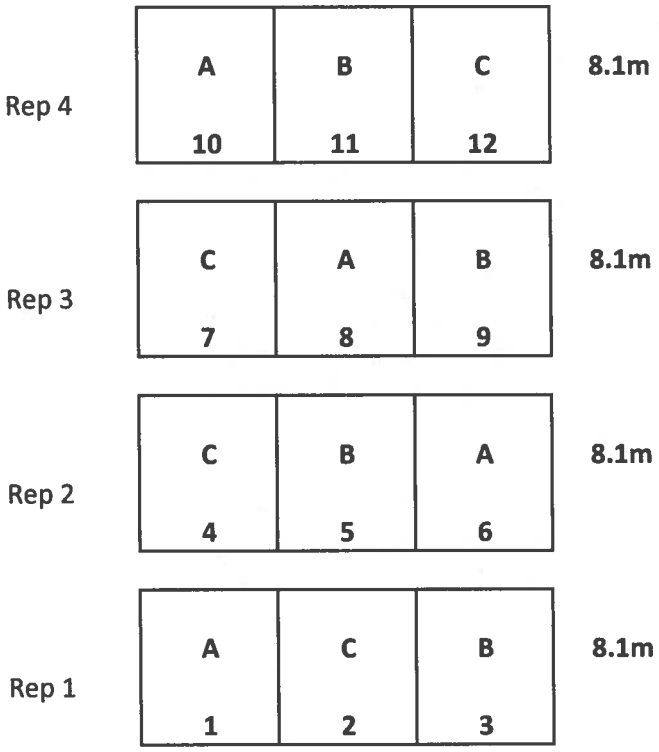
5. Head weights and marketability were generally similar for the plants propagated in peat blocks and Ellepots.

6. There did appear to be any obvious benefit from applying the feed treatment to the plants grown in Ellepots.

APPENDIX I: TRIAL PLAN

Lettuce block propagation trial **2020**

Field L **CRYSTAL HEART**



Treatments

A	3.8 cm peat blocks
B	30mm Ellepots
C	30mm Ellepots + Feed

Plots

27 plants @ 30cm
4 rows @ 35cm

Assessments

10 days - fresh weight (10 plants/plot)
28 days - fresh weight (10 plants/plot)
Harvest - 20 plants/plot

APPENDIX II: PHOTOGRAPHS DURING THE GROWING PERIOD.

2 weeks post-planting

Peat block Ellepots + feed Ellepots

4 weeks post-planting

Peat block Ellepots + feed Ellepots

6 weeks post-planting

Peat block Ellepots + feed Ellepots

APPENDIX III: PHOTOGRAPHS AT ONE WEEK BEFORE HARVEST.

Peat block

Ellepots

Ellepots + feed