Vegetable transplant production for organic cropping systems.

Background.

Elm Farm Research Centre has been pivotal in researching and developing vegetable transplant production systems to comply with organic standards. The research started ahead of the removal of the derogation on the use of conventionally produced transplants at the end of 1997.

Objective.

To produce vegetable transplants throughout the year that comply with current and address possible future developments in organic standards for organic vegetable production systems in the UK.

Approaches.

A series of experiments were undertaken over a eight year period (1994 – 2002) that addressed a range of issues including initially whether organic transplants could even be produced; overwinter production; disease management and the use of non-animal based nutrient sources. A range factors were investigated including; species of vegetables (cabbage, cauliflower, calabrese, leek, onion, lettuce, fennel and celery), growing media, supplementary feeding, cell and block size.

Results.

It was surprisingly easy to develop protocols for organic transplant production during the optimal time of the year (spring) for a range of crops (lettuce, brassica, allium). The work then continued to further develop protocols for overwinter production. Again it was relatively easy to develop these protocols and for a range of crops production systems were developed, described and validated in commercial systems for both spring (Table 1) and overwinter production (Table 2)

Table 1. Organic transplant production systems – conclusions of trials 1994-1997.

	Brassica				
	Cabbage	Cauliflower	Calabrese	Leek	Lettuce
Cell/block sizes	308, 150	126, 216, 345	216	216	3.2cm^2 4.3cm^2
Growing medium[1]	S, B	S,	SLow, VLow	S, K, V, VVeg	S, K
Feeding	Nu-Gro , Fish emulsion	Nu-Gro	Nu-Gro	Nu-Gro	Not required
Species/variety	Only one variety tested	Similar requirements	Only one variety tested	Only one variety tested	Set and Little Gem similar
Propagation period (days)	55	123 -159	132	68	24-38

[1]Growing media: B = Bullrush Peat Free, K = Klasmann Organic; S = Sinclair Organic; SLow = Sinclair Low Nutrient; V = Vapo-Gro Organic; VLow = Vapo-Gro Low nutrient; VVeg = Vapo-Gro Organic Veg-based.

During the overwinter period there was concern that disease (particularly mildew) would be a threat to the system although, during the above trials mildew was not a serious concern. However to address this valid concern a range of experiments were undertaken to investigate different control and management methods. Spacing, block/cell size and the use of spectral filters were found not to be effective in controlling mildew. A range of organically acceptable biocides was also assayed for their effectiveness in controlling mildew. From these trials four were identified as possible control agents (mint extract, mycosin, clove and fennel oils), however, they would require pesticide approval before

use and there are real questions about whether organic production systems should include the use of such inputs.

The development of the protocols was all undertaken using nutrient sources derived from animal by-products. However, the use of animal based nutrient sources has also become an issue in the EU and so we undertook work investigating the availability and effectiveness of non-animal based nutrient sources for plant raising. There were found to be a wide range of non-animal based feeds available (about 20) and when trialled (both as supplementary feeds and/or incorporated as a base feed suitable transplants could be produced.

Table 2: Overwinter organic transplant propagation systems – conclusions of trials 1997 – 2000.

	Cabbage	Cauliflower	Calabrese	Leek	Lettuce
Cell/block sizes.	308 (15ml), 150 (30ml).	126 (35ml), 216 (25ml), 345 (10ml).	216 (35ml).	216 (35ml).	3.2cm^3 4.3cm^3
Growing medium[1]	S, B	S	SLow, VLow	S, K, V, VVeg	S, K
Feeding	Nu-Gro , Fish emulsion	Nu-Gro	Nu-Gro	Nu-Gro	Not required
Species/ Variety	Only 1 variety tested	Similar requirements	Only one variety tested	Only 1 variety tested	Set & Little Gem similar
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