Vegetable Transplant Container Trial

John McGrady and Phil Tilt

INTRODUCTION

In Arizona, using vegetable transplants to establish commercially grown vegetable crops is increasing. Much of the acreage is planted to cauliflower, but many acres of broccoli, cabbage, celery, napa, leaf lettuce and watermelons also are transplanted each year. As more growers diversify, many become interested in producing their own transplants, either in an open-field nursery or in containers under more controlled conditions.

A major consideration is the type of container to use; many kinds are available commercially, each with its advantages and disadvantages. The purpose of this trial was to evaluate selected containers for vegetable transplant production.

MATERIALS AND METHODS

Thirteen transplant containers were selected for this study. Broccoli (Brassica oleracea var italica cv Arcadia) was seeded in 50:50 peat: vermiculite on 10/5/88. The flats were watered as needed and fertilized with Peter's 20-20-20 with added trace elements. Transplants were set in the field on November 30 on one row on the edge of a standard vegetable bed using a Mechanical Transplanter; 200 ml 9-45-15 starter solution was applied to each plant.

RESULTS

Much larger transplants which grew rapidly and yielded well were grown in the Jiffy 106 and Jiffy 126 extruded plastic containers. These two containers have large cell volumes and are the common "6-pacs" at retail nursery outlets. They are not generally used for commercial vegetable production, but they were in this trial for comparison. The Plastomer ST 150, Speedling 100A and Lannen VS305 produced high quality transplants which yielded well. The latter two and the Growtech 200 produced plants with the largest root-shoot ratio which aids in stand establishment.

Speedling's styrofoam trays with the inverted pyramid cell design and Growtech's unique round slightly tapered cell both promoted downward root development and air pruning. Transplants were most easily removed from the Growtech container. The molded plastic Plastomer containers are durable and allow air circulation around each cell, promoting uniform germination. The most uniform plants were grown in the Speedling 080A and the Lannen VS305.

The 080A plants were very small and slightly immature at harvest; this container is better for production of cabbage, celery and leaf lettuce. The Lannen 'paperpot' is an expandable honeycomb of biodigradable paper which retains its shape after it is filled with media. The cells are easily separated after moistening and there is little transplant shock since the roots are not exposed when transplanted.

The Williames hexpac is a production module that is part of an automatic transplanter out of Australia. The hexpac is a series of hinged rows of hexagonal cells which unfold allowing for rapid single file procession through a transplanter. The least uniform and lowest yielding transplants were grown in nursery flats. The low root-shoot ratio approximates that of bare-root transplants and transplant shock slows growth.

The best transplant container produces the most high quality transplants in the least amount of space and time.

Table 1. Transplant container effects on seedling fresh weight, leaf area, root-shoot ration, stem growth and yield of broccoli (Brassica oleracea var italica cv. Arcadia) transplanted 11/30/88 and harvested 2/28/89 at Yuma, Az.

Container	Cells (no.)	Fresh wt. (g)	Leaf area (cm^2)	Root/ Shoot (dwt)	Stem growth (mm)	Head wt. (g)
Growtech	200	0.8	3.8	0.41	6.3	283
Jiffy 106	60	1.8	9.2	0.32	7.1	323
Jiffy 126	72	1.5	8.1	0.31	6.9	306
Jiffy 144	144	0.9	5.5	0.37	5.8	282
Jiffy 196	196	1.1	5.8	0.35	5.6	265
Lannen VS305	224	1.0	5.5	0.30	5.4	294
Nursery flat	--	0.6	4.3	0.10	4.3	214
Plastomer ST150	150	0.9	4.8	0.40	5.9	309
Plastomer ST200	200	1.2	6.5	0.34	5.6	286
Speedling 150	128	1.0	5.3	0.33	5.8	292
Speedling 100A	200	0.9	4.6	0.42	5.7	299
Speedling 080A	338	0.5	2.5	0.38	5.7	262
Williames Hexpac	140	0.7	4.1	0.35	4.4	257