

Selecting Strawberry Cultivars for Winter Greenhouse Production

Ellen T. Papparozzi*, Stacy A. Adams, George E. Meyer, M. Elizabeth Conley,

Vicki L. Schlegel, Erin E. Blankenship, and Paul E. Read

University of Nebraska-Lincoln, Nebraska



Introduction

Costs of transportation and food safety concerns have spawned an increase in public support of locally grown vegetables and fruit. With this in mind, a two-phase investigation was planned with the goal of combining low start up costs for sustainable greenhouse production with selection of strawberry cultivars that would provide the greatest number and largest size of berries. Additionally, berries from each cultivar will be analyzed for their beneficial nutraceutical properties to determine if there is a difference among cultivars.

Materials and Methods

Twelve strawberry cultivars, some day neutral and some short day responsive, were grown from September through late April. In phase I, all plants were potted in a soil-lite mix in 6-inch pots, watered as needed and grown in a glass greenhouse as part of a student laboratory experience. In phase II, 24 plants of each cultivar were selected based on similar leaf number and uniform plant size. All runners, flowers and fruit were removed, and plants were replanted in new soil-lite mix and placed across two benches in a poly-covered greenhouse. The phase II experiment was set up as a randomized complete block design with 6 replications of four plants per cultivar, 3 replications running north-south on each bench. Data taken included: date of first flower, total fruit number, and berry weight per plant. Berries were deemed ripe based on color comparison between berries purchased from the grocery store and those on the bench. This was standardized by using the RHS color chart. Bees (*Bombus impatiens*) were introduced when the first flowers started to open.



Figure 2. Plants were grown on a capillary mat covered by white plastic in order to increase reflected light.

Results

Over the 7-week period, 'Albion' and 'Seascape' produced the most berries (Table 1). The average berry weight for 'Albion' was also very consistent. 'Strawberry Festival' (July or August), 'Honeoye' and 'Evie-2' also produced over 150 berries in less than two months. A total of 1777 berries were harvested over the 3-month period that plants were grown in the double poly greenhouse.

Table 1. Total number of berries harvested each week.

	AC W	Alb	Cav	Ch	Dar	E2	Ho	K10	Sea	SbF J	SbF A	SwC A	Tri
Week 1		36		3						29	4	6	1
Week 2	8	22		17					1	39	24	23	6
Week 3	11	42	12	29		3	3		18	35	45	17	33
Week 4	31	54	27	45	13	24	28		67	32	45	7	37
Week 5	25	35	28	24	32	57	61	9	56	14	27	1	24
Week 6	42	11	36	6	47	52	67	35	39	12	10	11	20
Week 7	12	3	10	1	17	17	11	10	15	6	2	3	12
Cv Totals	129	203	113	125	109	153	170	54	196	167	157	68	133

Table 2. Average weight (grams) of berries harvested each week.

	AC W	Alb	Cav	Ch	Dar	E2	Ho	K10	Sea	SbF J	SbF A	SwC A	Tri
Week 1		12.83		13.33						13.52	17.00	13.33	14.00
Week 2	14.50	12.55		9.65					10.00	13.33	13.50	11.39	11.33
Week 3	21.09	12.90	26.83	7.31		21.33	16.67		14.67	12.11	10.53	7.29	9.70
Week 4	15.18	10.11	18.05	5.95	13.66	19.89	13.33		10.97	8.76	8.37	5.43	7.47
Week 5	11.97	10.90	15.16	4.72	12.94	18.37	9.12	23.51	4.58	8.11	6.26	7.20	8.76
Week 6	11.72	10.95	8.33	4.85	8.62	12.20	6.30	20.83	6.56	8.11	6.90	11.74	5.43
Week 7	9.83	11.51	12.44	13.30	6.87	9.76	4.37	17.50	5.89	10.90	9.65	12.22	6.70

Cultivars grown for this project included:

AC Wendy (AC W), Albion* (Alb), Cavendish (Cav), Chandler (Ch), Darselect (Dar), Evie-2* (E2), Honeoye (Ho), KRS-10 (K 10), Seascape* (Sea), Strawberry Festival – July (SbF J) and August (SbF A), Sweet Charlie – August (SwC A), and Tribute* (Tri).
* indicates day neutral cultivars



Figure 3. Cultivar AC Wendy.

Visual observations

Some cultivars such as 'Sweet Charlie' and 'Albion' were highly susceptible to spider mite infestation, but still flowered and fruited. 'Albion', 'Strawberry Festival' – July and August, and 'Sweet Charlie' were the first to bear harvestable fruit (3/3/10). This was approximately 7 weeks after repotting. Berry color as gauged on the RHS color chart was generally at 46, 45, 44 (dark red group) and/or 34 (dark orange-red group). Often one berry would have two colors depending on which side you viewed. Upon harvest, all cultivars, at some point, produced berries that still had white flesh around the calyx.



Figure 4. Example of harvested berries.



Figure 1. Benches were 6 feet wide by 60 feet long and held 156 plants per bench.

Special thanks to: Nate Nourse of Nourse Nurseries, Barclay Poling (NC State University), and Fumiomi Takeda (Appalachian Fruit Research Station, W. Va) for providing the plant material used in this project.



This research was funded in part from Nebraska Department of Agriculture Specialty Crop Block Grant Program and the USDA/CSREES Multistate project NE-1035 "Commercial greenhouse production: Component and System Development".