Greenhouse Production of Strawberries During the Winter

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Introduction

Strawberries are one of America's favorite fruits and are available in grocery stores year round. Given increased shipping and other associated costs as well as the opportunity to provide a fresh, nutritious, local product, our research team is exploring the feasibility of growing strawberries during the winter in Nebraska.

Figure 1. Flowering plants in early October. Pots are situated directly on capillary mats.

Materials and Methods

Six strawberry cultivars plus 2 that were obtained also as A+ grade were grown from September through mid April. Plants were potted in a soil-lite mix in 6-inch pots and grown on capillary mats in a double poly greenhouse. The experiment was set up as a randomized complete block design with two benches each with six replications for a total of 12 replications for up to 48 plants per cultivar. Plants were potted in mid-September and started flowering 8 days later (September 23), but by October 31 four cultivars showed fruit phylloidy. At that time, all plants showing fruit phylloidy were discarded (22 pots of 'Portola', 8 pots of 'Seascape', 4 pots of 'Chandler', 1 pot of 'Albion') leaving 299 pots total in the experiment. Data taken included: date of first flower, total fruit number and berry weight per plant per week. 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 Colour Chart* (Red Group 46). Bees (*Bombus impatiens*) were introduced when the first flowers started to open. For 5 weeks in spring, after harvesting and weighing, 50 g of berries from at least 32 replications were sampled immediately for ºBrix. Fifty grams were also frozen at -18º C for 6 weeks and then sampled.

Figure 2. Cultivar Evie-2 +

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Figure 3. Berries harvested in November.

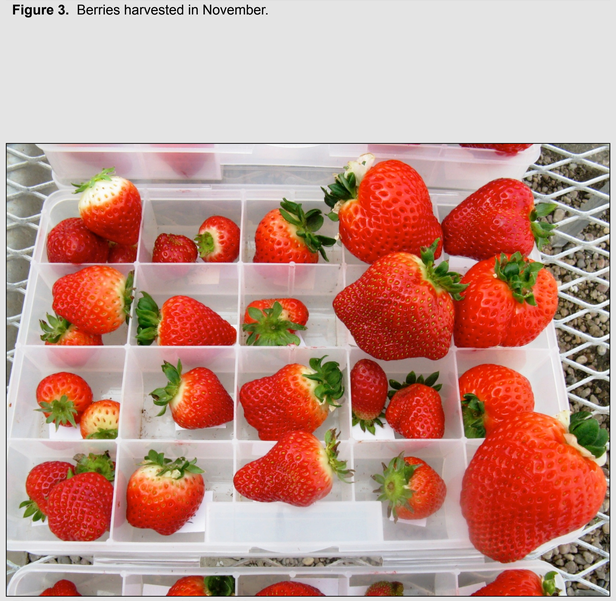

Figure 4. Berries harvested in early March.

Cultivars grown for this project included: Albion*, Cavendish, Chandler, Evie-2*, Evie-2 A+*, Portola*, Seascape*, Seascape A+*
**indicates day neutral cultivars*

Table 1. Range of ºBrix for Each Cultivar

		Week				
	Cultivar	1	2	4	5	6
Fresh	**Albion**	7.6-10.3	7.7-8.1	5.8-7.8	7.1-9.2	7.6-9.5
Frozen	**Albion**	7.5-9.3	7.0-8.3	5.8-8.4	6.1-8.2	5.7-8.6
Fresh	**Seascape**	6.4-10.4	6.4-8.1	5.9-7.7	7.3	8.5
Frozen	**Seascape**	9.4*	6.7-8.3	5.5-7.7	5.9-7.9	8.2-9.1*
Fresh	**Chandler**	6.8-8.8	6.6-7.5	4.8-6.9	7.3	0
Frozen	**Chandler**	6.5-8.7	5.6-7.4	5.4-6.5	6.2-7.0	6.3-7.3
Fresh	**Seascape +**	8.4-9.0*	7.0-7.9*	5.8-6.6*	8.2	0
Frozen	**Seascape +**	0	7.2-8.4	4.0-8.3	5.9-8.5	9.0-9.5*
Fresh	**Evie-2 +**	5.4-8.8	5.4-7.9	5.0-6.2	5.0-6.7	5.8-7.1
Frozen	**Evie-2 +**	5.7-7.4	5.4-7.1	4.6-6.0	5.4-6.2	5.6-7.2
Fresh	**Cavendish**	5.2-8.5	5.0-7.0	5.4-5.8	0	0
Frozen	**Cavendish**	4.7-7.3	5.1-6.5	5.0-5.5*	0	0
Fresh	**Evie-2**	6.1-7.8	5.1-7.1	4.8-6.3	4.6-6.6	5.7-7.3
Frozen	**Evie-2**	6.5-8.5	6.0-6.6	4.7-5.6	5.4-6.0	5.7-6.4

* only 2 replications
0 = not enough berries available
Week 3: no berries collected

Results

On average, all cultivars produced less than 3 berries and 1 ounce mass per plant per week during December (Figures 5, 6). In January, also a prime price time, 'Albion' peaked at 2 ounces and 2 berries per plant per week. In November and December only 'Evie-2'+ produced more than 2 berries per week per plant. The A+ grade of both 'Evie-2' and 'Seascape' produced more berries and more mass of berries than the standard cultivar over the season. In March production peaked for 'Chandler', 'Evie-2', Evie-2+, 'Seascape' and 'Seascape"+, reaching 3-10 berries per plant per week and weighing 1-4 ounces. The ºBrix for all cultivars ranged from 4.4-9.5 with 'Cavendish' at the lower end (Table 1). We anticipated that upon freezing the ºBrix would increase due to water loss. While in general this did occur, the change was neither dramatic nor consistent.

Figure 5. Average Number of Berries Harvested per Plant
2011 - 2012

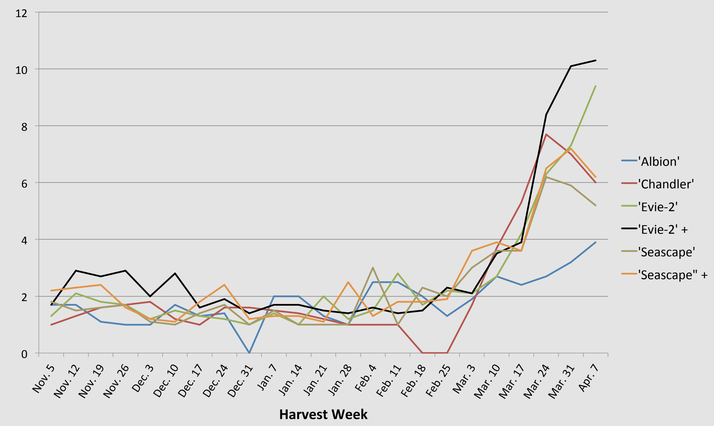

Figure 6. Average Mass of Berries Harvested per Plant
2011 - 2012