

# Effects of Transplant Digging Date on the Field Performance of Strawberry Bare-root Transplants

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## Summary

This study evaluated the importance of transplant digging date or winter chilling at nursery fields on quality and performance of strawberry bare-root transplants. We tested four digging dates (9/20, 9/27, 10/4, and 10/10) on three cultivars (Sensation®, 'Florida Brilliance', and Medallion®). Delaying the digging date from 9/20 to 10/10 increased the exposure of strawberry transplants to winter chilling in the nursery field from 99 to 241 hr. Although delaying the digging date caused minimum differences in transplant phenotypes such as crown diameter and leaf number, it significantly delayed canopy establishment. Furthermore, delaying the digging date reduced marketable yield of Sensation® and 'Florida Brilliance' by 51% and 37%, respectively but had no significant effect on Medallion®. This study will be repeated for another season to account for seasonal weather variations and to validate the findings.

## Background

The importance of transplant digging date or winter chilling at nursery fields on quality and performance of strawberry bare-root transplants is unknown. There are two hypotheses concerning the role of winter chilling in improving transplant performance. The first hypothesis is that winter chilling promotes carbohydrate translocation into the crown, enabling transplants to be established in the field quicker. The second hypothesis is that winter chilling acts as hardening and improves stress tolerance of transplants. The objective of this experiment was to determine the importance of winter chilling for strawberry bare-root transplants and to determine the optimum transplant digging date. This study

began in the 2022-23 season, and the data presented in this report pertain to the second season.

## Methods

A replicated field experiment was conducted during the 2023-2024 season at the UF/IFAS GCREC in Balm, FL. Transplants grown at the Cedar Point Nursery (Dorris, CA) were used in this study. Treatments included three cultivars (Sensation®, 'Florida Brilliance', and Medallion®) and five digging dates (9/20, 9/27, 10/4, and 10/10) in a factorial combination (Table 1). Digging dates were determined based on the cumulative winter chill hours at the nursery field: 99, 148, 214, and 241 hours below 45°F. Transplants were shipped to the GCREC using a refrigerated truck. Transplants were planted in the field within 2 days after they were delivered. Commercial production and pest management practices were followed. Strawberries were harvested twice a week from November through February.

## Results

### Growth characteristics of bare-root transplants

The overall quality of bare-root transplants was good for all tested strawberry cultivars (Fig. 1). All measured phenotypes, such as crown diameter and leaf number, remained similar from the first to last digging date, regardless of cultivars.



**Figure 1.** Bare-root transplants of three strawberry cultivars from the first digging date (9/20/23) used for this study. Transplants received 99 chill hours at the nursery field prior to digging.

### Canopy growth

Delaying the digging date reduced canopy area in all three tested cultivars (Table 1). The impact was most significant during establishment and became smaller over time. Canopy area reductions by delaying the digging date ranged from 71% to 85% at 48 days after transplanting (DAT) and from 23% to 44% at 160 DAT.

**Table 1.** Canopy growth of three strawberry cultivars as affected by the digging date of transplants.

Cultivar	Digging date (chill hours)	Canopy projected area (cm <sup>2</sup> /plant)				
		48 DAT	69 DAT	93 DAT	126 DAT	160 DAT
Sensation	9/20 (99 hr)	617	851	1,042	1,187	1,161
	9/27 (148 hr)	218	490	714	991	1,015
	10/4 (214 hr)	248	558	799	1,089	1,082
	10/10 (241 hr)	128	385	529	689	684
			79%↓	55%↓	49%↓	42%↓
Brilliance	9/20 (99 hr)	542	799	917	1,098	1,057
	9/27 (148 hr)	295	550	715	1,011	1,034
	10/4 (214 hr)	136	388	561	932	935
	10/10 (241 hr)	80	269	400	582	597
			85%↓	66%↓	56%↓	47%↓
Medallion	9/20 (99 hr)	437	525	593	701	708
	9/27 (148 hr)	158	303	403	592	617
	10/4 (214 hr)	154	310	395	528	557
	10/10 (241 hr)	127	290	381	549	549
			71%↓	45%↓	36%↓	22%↓

DAT = days after transplanting.

### Marketable yield

Digging date effects on marketable yield were cultivar-dependent (Table 2). In Sensation® and 'Florida Brilliance', yield reductions by delaying the digging date ranged from 95% to 99% in Nov-Dec, 43% to 57% in Jan, and 18% to 47% in Feb. Yield reductions over the entire season were 51% for Sensation® and 37% for 'Florida Brilliance'. By

contrast, marketable yield of Medallion® was unaffected by the digging date throughout the season. Contrary to our expectation, the results suggest that winter chilling does not play an important role in improving transplant quality or field performance of UF strawberry cultivars.

**Table 2.** Marketable yield of three strawberry cultivars as affected by the digging date of transplants.

Cultivar	Digging date (chill hours)	Marketable yield (lb/acre)			
		Nov-Dec	Jan	Feb	Total
Sensation	9/20 (99 hr)	846	1,383	1,317	3,546
	9/27 (148 hr)	291	700	1,656	2,647
	10/4 (214 hr)	597	1,065	1,410	3,072
	10/10 (241 hr)	436	607	710	1,752
			99%↓	57%↓	47%↓
Brilliance	9/20 (99 hr)	992	1,077	1,563	3,632
	9/27 (148 hr)	638	836	1,833	3,308
	10/4 (214 hr)	452	801	2,070	3,323
	10/10 (241 hr)	399	611	1,323	2,334
			95%↓	43%↓	18%↓
Medallion	9/20 (99 hr)	421	517	830	1,768
	9/27 (148 hr)	336	381	1,054	1,771
	10/4 (214 hr)	399	509	714	1,622
	10/10 (241 hr)	437	496	885	1,818
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### Takeaways

- Delaying the digging date reduced marketable yield of Sensation® and 'Florida Brilliance' by 51% and 37%, respectively but had no significant effect on Medallion®.
- The results suggest that winter chilling does not play an important role in improving transplant quality or field performance of UF strawberry cultivars.
- This study will be repeated for another season to account for seasonal weather variations and to validate the findings.

### Contact

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