

Planting Date and Nitrogen Fertilization Recommendations for ‘Florida Brilliance’

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Summary

Planting date × nitrogen (N) rate experiments conducted on ‘Florida Brilliance’ in the previous season were repeated, and similar results were obtained. Delaying the planting date from Sep 26 to Oct 17 reduced early (Nov-Dec) and total marketable yield by 36% and 46%, respectively. Using a high N rate (2 lb/acre/d) during the establishment period increased early and total marketable yield by up to 18% and 11%, respectively for the Sep 26 planting, and by up to 38% and 22%, respectively, for the Oct 17 planting. For both planting dates, early marketable yield was maximized when the high N rate was used for 6 weeks, whereas total marketable yield showed almost no differences when the high N rate was extended for more than 3 weeks. The results obtained for the 2018-2019 and 2019-2020 seasons suggest that the optimum planting window for ‘Florida Brilliance’ is between Sep 25 and Oct 5. We recommend using the initial high N rate for at least 3 weeks, but the optimum rate and duration of N fertilization may need to be adjusted based on soil properties, particularly soil organic matter.

Nitrogen Fertilization

Strawberry growers in Florida typically apply N at high doses of 2-3 lbs/acre/d during establishment and gradually lower the rate to 0.75-1 lb/acre/d. Initial high-dose fertilization can be beneficial for improving the establishment of strawberry transplants, but this practice must be tailored for each cultivar based on its growth characteristics and nutrient requirements.

Methods

Fertilization treatments described in Table 1 were tested for ‘Florida Brilliance’ during the 2019–2020 season at GCREC. Bare-root transplants were planted on Sep. 26 and Oct 17, 2019. Transplants used for the early and late planting were shipped from Crown nursery (Red Bluff, CA) to GCREC on Sep 25 and Oct 5, 2019, respectively. Transplants were stored at 2 °C until transplanting. Commercial production and pest management practices were followed. Harvests were performed 26 times between Nov. 7, 2019 and Feb. 27, 2020 for the early planting, and 22 times between Dec 5, 2019 and Feb 27, 2020 for the late planting.

Table 1. Nitrogen (N) fertilization treatments tested during the 2019-2020 season at GCREC.

Duration of 2 lb N	Daily N application rate (lb/acre/d)							Total N rate* ² (lb/acre)
	Week 1-2* ¹	Week 3	Week 4	Week 5	Week 6	Week 7-8	Week 9-22	
0 wk	0	1	1	1	1	1	1	119-140
1 wk	0	2	1	1	1	1	1	126-147
2 wk	0	2	2	1	1	1	1	133-154
3 wk	0	2	2	2	1	1	1	140-161
4 wk	0	2	2	2	2	1	1	147-168
6 wk	0	2	2	2	2	2	1	161-182

*¹No fertigation during sprinkler irrigation.

*²Total N rate varied depending on the planting date.

Results

Planting date

Planting date affected not only total marketable yield but also yield distribution (Table 2). In this study, delaying the planting date by 21 days from Sep 26 reduced marketable yield in Nov-Dec, Jan, and Feb by 36%, 11%, and 39%, respectively. As a result, total yield was reduced by 46%.

Table 2. Marketable yield of ‘Florida Brilliance’ strawberry as affected by planting dates.

Planting date	Marketable yield (lb/acre)			
	Nov-Dec	Jan	Feb	Total
Sep 26	5,528 a	5,637	20,230 a	31,395 a
Oct 17	3,512 b	5,005	8,394 b	16,911 b

Tukey-Kramer test at $P < 0.05$.

N fertilization

Initial high N fertilization (2 lb/acre/d for 1-6 weeks) increased early and total marketable yield by up to 18% and 11%, respectively for the Sep 26 planting, and by up to 38% and 22%, respectively, for the Oct 17 planting (Table 3). These increases were described as significant linear trends, except for the total marketable yield of the Sep 26 planting. For both planting dates, early marketable yield was maximized when the high N rate was used for 6 weeks, whereas total marketable yield showed almost no differences when the high N rate was extended for more than 3 weeks. In some treatments, increasing the yield in Nov-Dec resulted in yield reductions in Jan, suggesting the shift of the first fruit production peak. Marketable and unmarketable yield proportions were minimally affected by planting dates and N treatments (Table 4).

Initial canopy growth improved proportionally to the duration of initial high N fertilization (data not shown). Although no significant negative impact of increased canopy size was observed in this study, precautions should be taken to avoid excessive N fertilization. Excessive vegetative growth can have negative impacts on the balance between vegetative and reproductive growth and on the effectiveness of pesticide application.

Recommendations for ‘Florida Brilliance’

- Planting date: Sept 25 – Oct 5
- Initial high N fertilization: 3 weeks
- The rate and duration of initial high N fertilization need to be adjusted based on soil properties, particularly organic matter.
- Initial high N fertilization is more important for late planting (after Oct 10).

Table 3. Marketable yield of ‘Florida Brilliance’ strawberry as affected by planting dates and nitrogen (N) fertilization treatments.

Planting date	Duration of 2 lb N/acre/d	Marketable yield (lb/acre)			
		Nov-Dec	Jan	Feb	Total
Sep 26	0 wk	4,985	5,397	19,218	29,601
	1 wk	5,515	4,870	20,370	30,754
	2 wk	5,850	6,119	19,807	31,776
	3 wk	5,323	6,352	20,294	31,969
	4 wk	5,623	5,913	21,423	32,959
	6 wk	5,870	5,173	20,266	31,309
Significance (linear trend)		*	NS	NS	NS
Oct 17	0 wk	3,109	5,207	6,576	14,892
	1 wk	3,103	5,604	7,167	15,874
	2 wk	3,071	4,323	8,846	16,240
	3 wk	3,576	4,965	9,605	18,147
	4 wk	3,931	4,935	9,243	18,110
	6 wk	4,281	4,996	8,926	18,203
Significance (linear trend)		**	NS	NS	**

* = significant at $P < 0.1$

** = significant at $P < 0.05$

NS = non-significant

Table 4. Marketable and unmarketable yield proportions of ‘Florida Brilliance’ strawberry as affected by planting dates and nitrogen (N) fertilization treatments.

Planting date	Duration of 2 lb N/acre/d	% total yield (###)				
		Marketable yield	Unmarketable yield			
			Small	Thrips	Disease	Culls
Sep 26		78.6	1.9	2.5	1.0	13.0
Oct 17		79.0	3.6	2.1	0.8	12.1
	0 wk	78.9	3.1	2.8	1.3	11.0
	1 wk	77.7	3.9	2.2	0.9	12.4
	2 wk	78.8	2.6	2.6	0.5	12.8
	3 wk	78.9	2.7	2.2	1.0	13.0
	4 wk	78.9	2.2	2.0	0.9	13.8
	6 wk	79.6	2.2	2.1	0.7	12.2

Data are pooled by each main effect.

Small = small fruit (<10 g/berry)

Thrips = fruit damaged by thrips

Disease = anthracnose, botrytis, or powdery mildew fruit rot

Culls = misshapen, decay, animal damage, etc.

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