

Optimal Plant Spacing and Nitrogen Fertilization for ‘Florida Beauty’

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Summary

Because ‘Florida Beauty’ has a more compact canopy structure than other cultivars it can be adapted to narrow plant spacing. Implementing 12” in-row spacing can increase yield by 18% compared to the standard spacing of 15”. In addition, increasing the N fertilization rate during the establishment period can increase yield. Based on this trial, the recommendation for ‘Florida Beauty’ is to use 12” spacing and to apply a high N rate up to 2 lb/acre/d during the establishment period and gradually decrease the rate to 1 lb/acre/d.

Nitrogen Fertilization

In strawberry leaf tissue, N is the most abundant mineral nutrient, with the optimal concentration ranging from 1.9% to 2.8%. Because N is a major component of chlorophyll, application of nitrogen fertilizers promotes growth of healthy green leaves, increases photosynthetic activity and accelerates establishment of strawberry plants. Strawberry growers typically apply N at high doses of 2-3 lbs/acre/d during the establishment and gradually lower the rate to 0.75-1 lb/acre/d. Our study also supports the importance of early N fertilization. Optimal N application rate, however, depends on cultivars. It is important to take into account the differences among cultivars in canopy size and structure, sensitivity to N fertilization and the optimal balance of vegetative growth and fruit production.

Methods

Treatments described in Table 1 were tested in a field trial during the 2016–2017 winter season at GCREC.

Bare-root transplants of ‘Florida Beauty’ were transplanted on October 3, 2016. Commercial production and pest management practices were followed. Harvests were performed 32 times between November 15, 2016 and March 6, 2017.

Table 1. Nitrogen fertilization programs tested during the 2016-2017 season at GCREC.

#	Daily N application rate (lb/acre/d)				Total N rate (lb/acre)
	Wk 1-2	Wk 3-5	Wk 6-13	Wk 14-22	
1	0	1.0	1.0	1.0	140
2	0	1.5	1.0	1.0	151
3	0	2.0	1.0	1.0	161
4	0	1.5	1.5	1.0	179
5	0	2.0	1.5	1.0	189
6	0	2.0	2.0	1.0	217

Results

Averaging across N application rates, decreasing plant spacing from 15” to 12” did not affect the average fruit size but decreased fruit number per plant by 9% (Table 2). Despite the reduction in fruit number on a per-plant basis, higher planting density at 12” spacing compared to 15” resulted in 18% higher yield (Table 3). Marketable yield increased with increasing N rate and maximized at the N rate of 189 lb/acre. Further increases in N rate to 217 lb/acre had a negative impact on yield, suggesting that N application rate should be maintained below 2 lb/acre/d after Wk 5. There was no significant interaction between plant spacing and N fertilization.

Table 2. Fruit set and average fruit size of 'Florida Beauty' as affected by plant spacing and N fertilization.

Plant spacing	Total N rate (lb/acre)	Total marketable yield	
		(no./plant)	(g/fruit)
12"	140	28.7	16.1
	151	27.5	16.8
	161	29.4	16.1
	179	28.7	16.3
	189	29.7	16.9
	217	27.7	17.0
	Average	28.6	16.5
15"	140	29.8	16.1
	151	29.5	17.3
	161	29.7	17.3
	179	31.6	16.8
	189	33.6	16.8
	217	32.7	16.1
	Average	31.2	16.8

Table 3. Strawberry yield of 'Florida Beauty' as affected by plant spacing and N fertilization.

Plant spacing	Total N rate (lb/acre)	Yield (8-lb flat/acre)		
		Nov-Jan	Feb-Mar	Total
12"	140	1185	1591	2776
	151	1286	1493	2778
	161	1360	1541	2850
	179	1285	1512	2797
	189	1393	1612	3005
	217	1358	1464	2822
	Average	1311	1535	2838
15"	140	1037	1271	2307
	151	1030	1422	2452
	161	1219	1240	2459
	179	1138	1416	2553
	189	1287	1416	2702
	217	1150	1381	2531
	Average	1143	1358	2501

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