

## INFLUENCE OF PROPAGATION SITE ON THE FRUITING OF THREE STRAWBERRY CLONES GROWN IN A FLORIDA WINTER PRODUCTION SYSTEM

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**Abstract.** In 1988-89 field experiments, Canadian propagated strawberry (*Fragaria X ananassa* Duch.) plants of 'Dover', FL 79-1126, and FL 82-1452 produced ripe fruit 2 to 3 weeks before Florida propagated plants. Interactions between clone and propagation site were significant for total marketable yield and average fruit weight. In 1 experiment, Canadian propagated plants at the end of the fruiting season were smaller than Florida propagated plants.

Strawberry plants are propagated asexually by allowing specialized stems called runners to root during the summer months. The rooted runners become "daughter" plants. Daughter plants of most cultivars begin to initiate flower buds when the days become sufficiently short (11 to 13 hours) (2, 4) and temperatures are between 55 and 75F (V. Voth, personal communication). The exact daylength and temperature requirement for flower bud initiation varies with cultivar (1).

Many of the strawberry plants purchased by Florida growers are California cultivars propagated by Canadian nurseries. The authors have observed that these plants usually start fruit production sooner than plants of the same cultivars obtained from local (Florida) nurseries. The purpose of this experiment was to determine if Florida clones were similar to California cultivars in their response to propagation site.

### Materials and Methods

*Experiment 1.* Plants of 'Dover' and 2 advanced selections from the IFAS strawberry breeding program, FL 79-1126 and FL 82-1452, propagated either in Ontario (Simcoe) or in Florida (Dover) were planted at AREC-Dover on 17 Oct. 1988. Plants were set through black polyethylene mulch on a standard 2-row raised bed, and spaced 30 cm apart in the row, with 30 cm between rows. Four plots of each clone-propagation site combination were planted in a randomized complete block (RCB) design. Plots contained 10 plants. Fruit were harvested, graded, and weighed twice a week from Dec. through Mar. The dry weight of leaves

and crowns from 1 plant in each plot was determined at the end of the experiment.

*Experiment 2.* Plants of 'Dover', FL 79-1126, and FL 82-1452 propagated either in Nova Scotia (Kentville) or in Florida (Dover) were planted at AREC-Dover on 24 Oct. 1988. The same bed system and spacing as in Experiment 1 was used. Treatments were arranged in a randomized complete block design with 5 replications. Plots contained 14 plants. Fruit and plant data were collected as in Experiment 1.

### Results and Discussion

The Ontario and Nova Scotia propagated plants started producing ripe fruit in early to mid Dec., 2 to 3 weeks before the Florida propagated plants (Figs. 1 and 2). This phenomenon of earlier fruit production from plants propagated at northern latitude nurseries has also been observed in southern California (5). The earlier yields on Ontario and Nova Scotia propagated plants were probably due to earlier flower bud formation initiated in response to the cooler weather that occurred at these propagation sites during Sept. and the first 2 weeks of Oct. (Table 1).

In a controlled environment experiment with 6 strawberry cultivars, Durner et al. (3) observed no flowering under short day conditions when temperatures were 79F day/72F night or above. At Dover, only 3 out of 30 days in Sept. 1988 had a maximum temperature lower than 79F, and only 7 out of 30 days had a minimum temperature lower than 72F. At Simcoe, 26 out of 30 days had a maximum temperature lower than 79F, and 30 out of 30 days had a minimum temperature lower than 72F. At Kentville, 30 out of 30 days had a maximum and minimum temperature lower than 79F and 72F respectively.

It is less likely that differences in daylength could have caused the earlier yields on Canadian plants since daylengths in Canada are actually longer than in Florida up to the autumnal equinox (about 22 Sept.).

The influence of propagation site on total marketable yield varied with clone (Table 2). In Experiment 1 propagation site had a detectable effect on 'Dover' but not on FL 79-1126 or FL 82-1452. Ontario propagated 'Dover' plants outyielded Florida propagated 'Dover' plants. In Experiment 2 propagation site had a detectable effect on FL 79-1126 and FL 82-1452, but not on 'Dover'. Nova Scotia propagated FL 79-1126 had a lower total marketable yield than Florida propagated FL 79-1126, while Nova Scotia propagated FL 82-1452 had a higher total marketable yield than Florida propagated FL 82-1452.

Ontario propagated plants had smaller fruit than Florida propagated plants (15.1g vs 16.7g, significant at the 1% level). However, in Experiment 2 the influence of propagation site on average fruit weight varied with clone (Table 2). Nova Scotia propagated 'Dover' had a lower average fruit weight than Florida propagated 'Dover' while Nova Scotia propagated FL 82-1452 had a higher average fruit weight than Florida propagated FL 82-1452.

Propagation site had an effect on mature plant size in Experiment 1 but not in Experiment 2. The average dry

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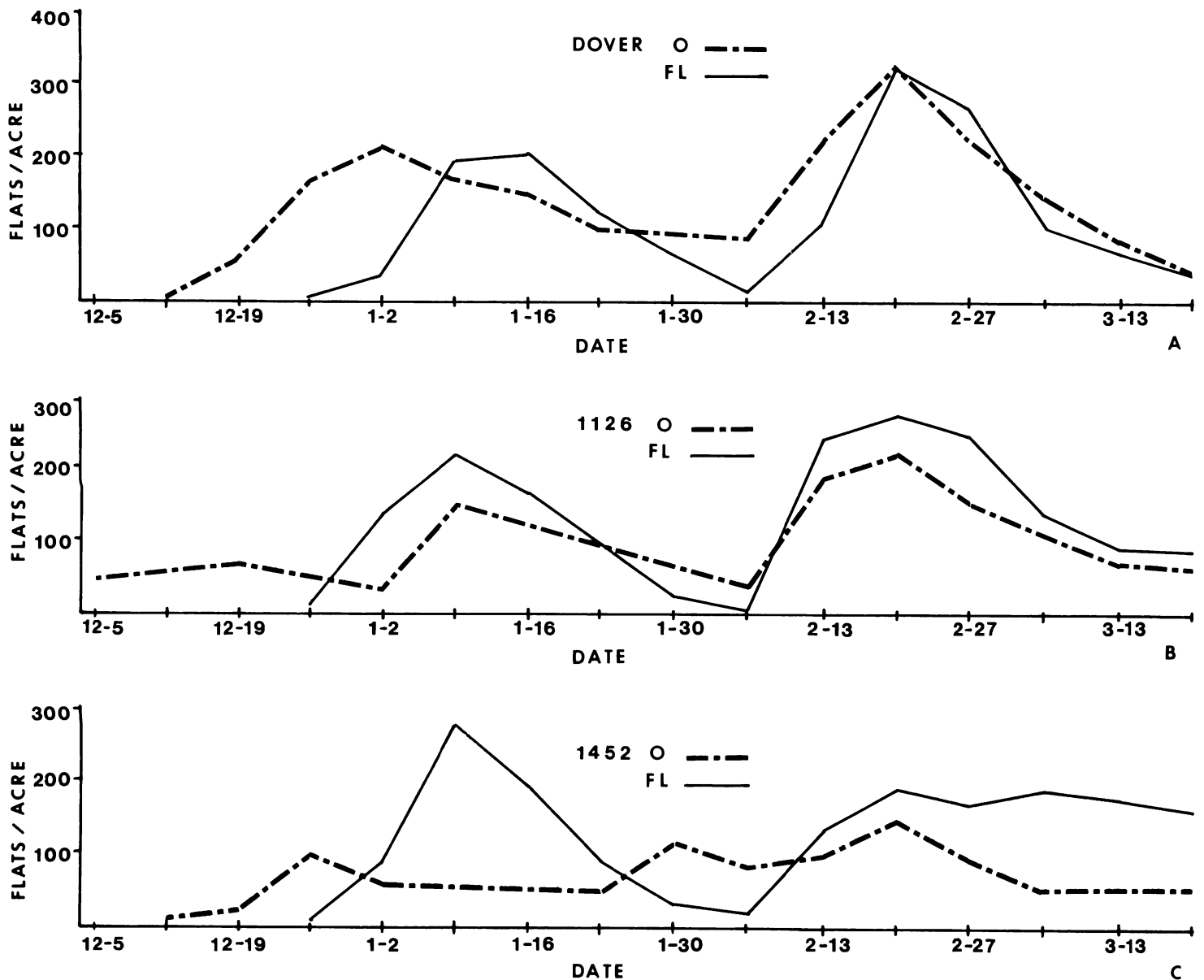


Fig. 1. Yield of 'Dover' (A), FL-79-1126 (B), and FL-82-1452 (C) over the 1988-89 season (Experiment 1), Agricultural Research & Education Center, Dover. O = Ontario propagated; FL = Florida propagated. One flat = 4.65 kg.

weight of Florida propagated plants was 40g compared to 31g (significant at the 1% level) for Ontario propagated plants. The cause of this effect on plant size was not clear. The cause of the interaction between clone and propagation site for total marketable yield and fruit size was also

Table 1. Average maximum and minimum temperatures at Dover, Florida, Simcoe, Ontario, and Kentville, Nova Scotia for September and the first 15 days of October 1988.

Propagation site	Avg daily temp (F)			
	Sept.		Oct. (day 1-15)	
	Max	Min	Max	Min
Dover (28° N latitude)	89	73	83	62
Simcoe (43° N latitude)	72	54	57	42
Kentville (44° N latitude)	64	47	54	42

unknown, but may be related to a differential response to photoperiod and temperature.

Table 2. Interaction of clone and location on total marketable yield and average fruit weight of 3 strawberry clones propagated in Florida or Canada and grown at AREC-Dover, FL during the 1988-89 fruiting season.

Clone	Yield (g/plant)		Avg fruit weight (g)
	Expt. 1	Expt. 2	Expt. 2
Dover - F <sup>z</sup>	326 bc <sup>y</sup>	485 a	15.7 c
Dover - C	438 a	502 a	14.9 d
FL 79-1126 - F	380 bc	496 a	15.2 cd
FL 79-1126 - C	318 bc	416 b	14.9 d
FL 82-1452 - F	273 cd	347 c	17.2 b
FL 82-1452 - C	223 d	406 b	18.0 a

<sup>z</sup>F = Florida propagated plants; C = Canadian propagated plants.

<sup>y</sup>Mean separation in columns by Fisher's LSD, 5% level.

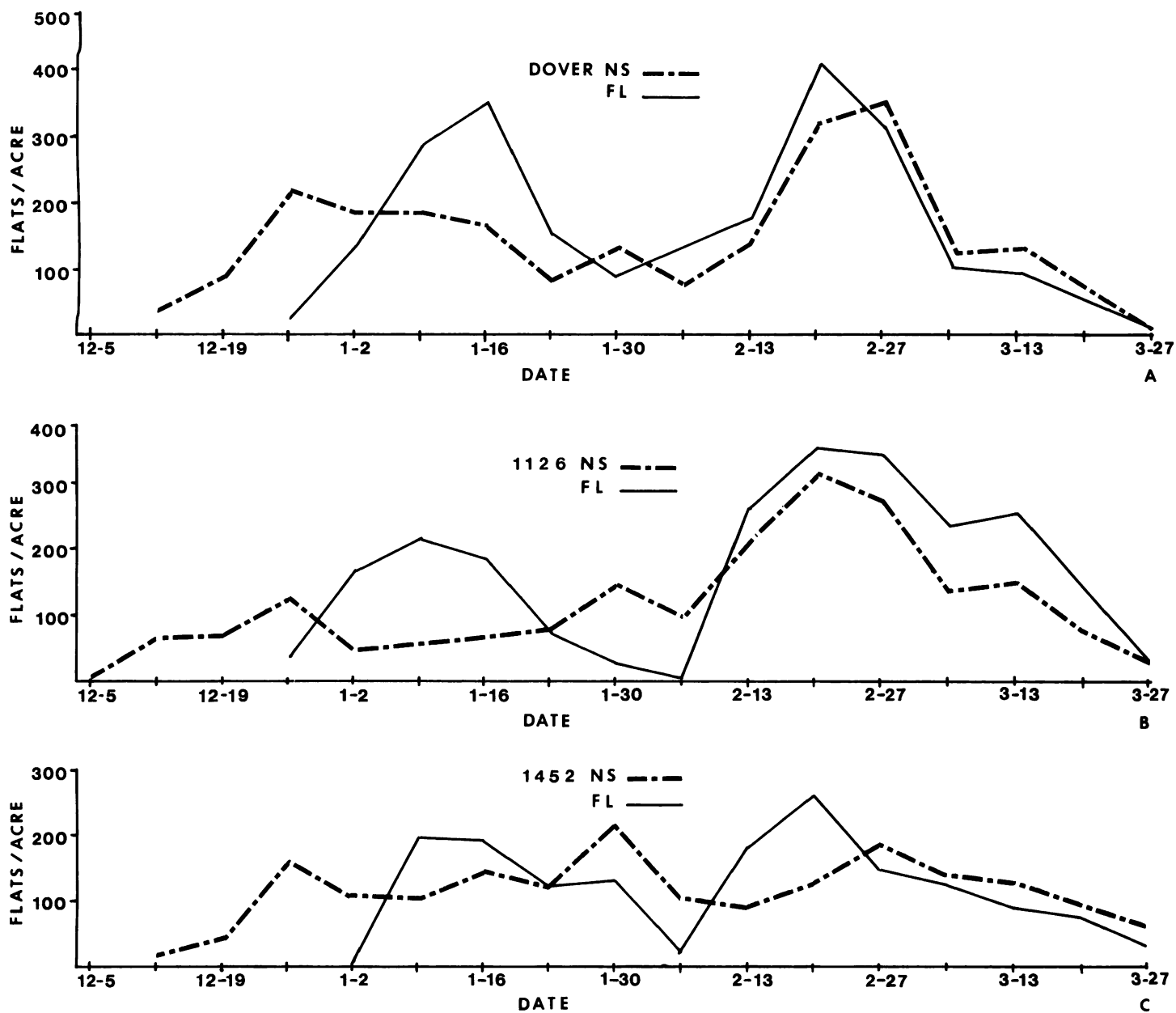


Fig. 2. Yield of 'Dover' (A), FL-79-1126 (B), and FL-82-1452 (C) over the 1988-89 season (Experiment 2), Agricultural Research & Education Center, Dover. NS = Nova Scotia propagated; FL = Florida propagated. One flat = 4.65 kg.

The results presented must be considered preliminary since they are for 1 season, but 2 important inferences can be made: 1) To assess an advanced selection's true potential, the selection should be propagated in both northern and southern locations, and 2) if the fruiting patterns in Figs. 1 and 2 are typical of what can be expected for Florida clones, then it may be beneficial for Central Florida strawberry growers to obtain plants of future Florida cultivars from both northern and southern latitude nurseries, and use them in combination. This could lengthen the fruit production period and reduce production peaks. Early fruit production is usually advantageous, since fruit prices are often greatest at the beginning of the harvest season.

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