Severe Root Pruning of Strawberry Bare Root Transplants Is Yield Neutral

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In Florida annual hill strawberry (*Fragaria ×ananassa* Duch.) production, bare-rooted transplants are hand-planted for establishment. Northern latitude or high-elevation nurseries produce these transplants during the summer months and begin digging plants in September for winter production areas. The green-topped bare-root transplants arrive in Florida with varying amounts of root development and number of mature leaves. These plants are planted on raised, black polyethylene mulch beds. Commonly, the root mass exceeds the size of the planting hole, requiring a folding of the roots (J rooting). The objective of this study was to determine if mechanical root pruning has an effect on early or total season fruit yield of strawberry bare-root transplants in a winter production system.

Rapid growth of the root system is critical for transplant establishment, and the strawberry root system should be well established within 2 to 3 months after transplanting (Galletta and Himelrick, 1990). Rapid growth ensures the delivery of water and nutrients essential for flower and fruit development. The strawberry root system consists of two types of roots: large adventitious roots, which differentiate slowly from the crown, and fibrous branch roots, which differentiate from the large roots (White, 1927). Rapid development of fibrous branch roots is vital to transplant health, as strawberry roots rarely have plant hairs instead they possess many-branched feeder rootlets with fascicles, which appear like root hairs (Wilhelm and Nelson, 1970). Feeder rootlets have no cambium, are composed only of primary tissue, have a life expectancy of a few

days to a few weeks, and are concerned primarily with water and nutrient absorption. Dead fascicles are constantly replaced by new rootlets.

‘Sweet Charlie’ strawberry plants, produced in Nova Scotia, Canada, and then shipped to Dover, Fla., were graded so that all plants tested were of about equal size and apportioned into three groups, with each group containing 64 transplants. The plant roots in the first and

second group were pruned to 5 and 9 cm, respectively, and the third group, which served as the unpruned control, had roots that were not trimmed and measured 12 to 20 cm. Severed roots were placed in a drying oven for 48 h at 60 °C. Pruning to 9 cm removed an average of 26% of the total root mass of a typical transplant. Pruning to 5 cm removed 60% of the root mass. The plants from each treatment group were divided among four 16-plant plots arranged in a randomized block design. Immediately after pruning the roots, transplants were planted in a double row spaced 35 cm apart with 35 cm in row spacing on a plastic mulched bed. Planting holes were 7.5 cm long, 4 cm wide, and 10 cm deep. All plants were set with the crown at the soil level. This required that control plants be “J” rooted in the hole. Following industry standards, the plots were irrigated for 10 h a day for 10 d for establishment. Planting dates were 22 Oct. (1999–2000 season) and 18 Oct. (2000–01

season) at the GCREC–Dover on a Seffner fine sand. First harvest was 17 Dec. and 19 Dec. for the 1999–2000 and 2000–01 seasons, respectively. Thereafter, strawberries were harvested twice weekly until 9 Mar. both seasons. The number and weight of marketable fruit harvested were recorded and data analyzed using SAS statistical software (SAS Institute, Cary, N.C.).

Root pruning had no detectable effect on early or total marketable weight (Table 1) or fruit number (data not presented) either season. Seasonal differences in early yields were lower during the 2000–01 season because of unseasonable cold in the Dec. and Jan. months. While root mass at planting had no effect on marketable yields at planting, smaller root masses were much easier to plant. Excessive amounts of roots must be forced into small planting holes, resulting in “J” rooting, which requires extra time and effort. Commercial growers in Florida do not currently root prune

Table 1. Effect of root pruning on the yield of bare root strawberry transplants.

Season	Early yield (g/plant) ²		Total yield (g/plant)	
	1999–2000	2000–01	1999–2000	2000–01
Control	136.1 ³	97.4	343.9	462.0
Roots pruned to 5 cm	136.5	107.0	408.0	471.7
Roots pruned to 9 cm	133.4	95.3	407.5	508.7

²Early yield includes December and January harvest.

³No significant differences among treatment means were detected by Fischer’s least significant difference ($P < 0.05$).

to facilitate planting but the practice probably has utility. The development of an efficient method to decrease the length of roots during transplant harvest thus, reducing difficulties with planting transplants with large roots systems requires investigation.

Literature Cited

- Darrow, G.M. 1966. The strawberry: History, breeding, and physiology. Holt, Rinehart and Winston, New York.
- Galletta, G.J. and D.G. Himelrick (eds.). Small fruit crop management. Chapter 3. Strawberry management. 1990. Prentice Hall, Englewood Cliffs, N.J.
- White, P.R. 1927. Studies of the physiological anatomy of strawberry. J. Agr. Res. 35:481–492
- Wilhelm, S. and P.E. Nelson. 1970. A concept of rootlet health of strawberries in pathogen-free field soil achieved by fumigation, p. 208–215. In: T.A. Toussoun, R.V. Bega, and P.E. Nelson (eds.). Root diseases and soil-borne pathogens. Univ. California Press, Berkeley.

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