Table 3. Rooting percentage for expanded nodal cuttings of peach* collected Apr. 1985 as a function of cultivar and rooting medium.

Cultivar (C)	Rooting medium (M)			Mean ^x	Significance
	PPV ^y	Rootcube	Hortcube		
			Rooting percentage		
Sunglo-Nectarine	37	50	77	54 a	M ^{NS}
Loring	50	37	20	36 a	C ^{***}
Redhaven	27	43	33	34 a	M × C [*]
Comp Redhaven	6.7	6.7	14	9.0 b	
Surecrop	3.3	3.3	6.7	4.4 b	
Mean ^x	25 a	28 a	30 a		

*Cutting 2.5 cm long with hardwood heel.

^y1 Peat : 1 perlite : 1 vermiculite (by volume).

^xMean separation using Duncan's multiple range test, $P = 0.05$. Mean represents the average of three replicates of 10 cuttings.

^{NS,***}Nonsignificant or significant at $P = 0.001$, respectively, for the effect of M, C, or the interaction M × C.

'Loring', 'Redhaven', 'Compact Redhaven', and 'Sunglo' were basally wounded, dipped for 1 min in 1 g IBA/liter, dissolved in 50% ethanol, and stuck directly in a prepared nursery bed with a control treatment and three mulch treatments: fresh sawdust, cotton gin trash, and hay. There were 125 cuttings in each cultivar/treatment combination but no replication. In-field rooting even under mulch resulted in poor rooting percentages (5% to 30%) at this location, most likely due to extreme variations in air and soil temperatures in the 40 days after placement. In Oct. 1983, the experiment was repeated with 25 cuttings in each cultivar/treatment and two replications using the same four cultivars but with a bare-ground control and fresh sawdust and 25.4-μm-thick black plastic mulch treatments. Again rooting percentages were poor (8% to 34%). In each case, the lowest rooting percentage was obtained with the control (no mulch).

Summary and conclusions. Some of the success of the foam cubes as a medium for rooting cuttings, particularly semihardwood cuttings, may be related to better aeration within the medium relative to the peat-based media. Both foam cubes evaluated are capable of absorbing more than 30 times their weight in water when saturated. When excess water is allowed to drain for 35 to 40 min after being saturated, Rootcubes have 36% and Hortcubes 55% free air (B. Waltz, personal communication). In contrast, saturating the PPV medium and allowing it to drain for 40 min resulted in a free air value of only 18%. The porosity of Jiffy Plus, the other peat-based medium evaluated, ranges from 20% to 30% (J. Kampen, personal communication).

Foam cubes are a satisfactory medium for the propagation of own-rooted peach trees, giving rooting percentages and root quality similar to conventional peat-based media.

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Early and Late-season Blossom-end Rot of Tomato following Mulching

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Abstract. Paper mulch and black plastic mulch were compared with no mulch on tomatoes (*Lycopersicon esculentum* Mill. 'Better Boy' and 'San Marzano') for incidence of blossom-end rot (BER) in the field during 1988-90. Early season (late July to late August) harvest had more BER than in later pickings. Black plastic mulch significantly increased early season BER in 'Better Boy' relative to paper or no mulch. Late-season BER in 'San Marzano' was decreased with paper or black plastic mulch relative to no mulch.

Blossom-end rot (BER) of tomato is a Ca disorder in early fruit development (Geraldson, 1957). Mulching is commonly used to help conserve and maintain soil moisture, but impermeable plastic mulches have actually been associated with an increase in BER (Rutgers Univ., 1990). We have noticed that the incidence of BER frequently is higher on fruit harvested early in the season than in later pickings. We found no information comparing mulches for BER on early harvests vs. late harvest. This study compares the effect of paper and black plastic mulch with bare ground on the incidence of early and late-season BER of tomato.

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The trials were conducted during 1988-90 on a Cheshire fine sandy loam soil (57% sand, 33% silt, and 10% clay) that was amended with 500 kg of dolomitic limestone/ha during the fall of each year. Fertility in the soil at the time of planting was: (μg·g⁻¹) 25 to 37 NO₃-N, 12 to 25 NH₄-N, 70 PO₄, (meq/g) 160 soil exchangeable K, 800 Ca, and 67 Mg at pH of 5.8-6.1, as determined according to Lunt et al. (1950).

Seedlings of 'San Marzano' and 'Better Boy' were germinated and grown in the greenhouse (18 to 30C) in 36-cell plastic trays filled with potting mix (Promix BX, Premier Brand, New Rochelle, N.Y.). In week 2, seedlings received 40 ml of Peter's soluble 20N-8P-16K (5 g·liter⁻¹). In week 4, seedlings were transplanted into 1-liter plastic pots filled with Promix BX and grown for an additional month. Plants in the larger pots received ≈100 ml of Peter's 20N-8P-16K soluble solution weekly. Seedlings 25 to 30 cm tall with 10 to 13 nodes were transplanted

Table 1. Influence of mulching on early and late blossom end rot (BER) in 'Better Boy' and 'San Marzano' tomatoes.

Cultivar	Year	Time of harvest	Mulch			Mean
			None	Paper	Black plastic	
BER (%) ^z						
Better Boy	1988	Early	6.1 ^{NS}	8.9*	14.3*	9.7*
		Late	2.4	0.0	3.0	1.8
	1989	Early	10.3*	1.3*	18.8**	10.1 ^{NS}
		Late	3.7	8.2	3.3	5.1
Avg		Early	8.2 ^{NS}	5.1 ^{NS}	16.6**	10.0**
		Late	3.1	4.1	3.1	3.6
San Marzano	1989	Early	24.5*	27.3*	38.3**	30.0***
		Late	11.3	13.0	11.3	11.8
	1990	Early	42.5**	57.6***	47.4***	52.5***
		Late	17.0	0.0	0.0	5.7
Avg		Early	33.5**	42.5***	42.9***	39.6***
		Late	14.2	6.5	5.7	8.8
Single degree of freedom tests						
			Better Boy		San Marzano	
			Early	Late	Early	Late
No mulch vs. paper			NS	NS	NS	*
No mulch vs. black plastic			*	NS	NS	*
Paper vs. black plastic			*	NS	NS	NS

^zBER data (% by number) were transformed to arcsin of the square root before analysis.

NS,*,**,***Pairwise comparisons nonsignificant or significant at $P = 0.05, 0.01, \text{ or } 0.001$, respectively.

into the field to the depth of the third node (10 to 13 cm above the root ball). They were left unmulched or mulched with unwaxed (Horto-Paper, Fresno, Calif.), or with black plastic (0.01 mm thick). Each treatment contained four plants, each supported by a wire cage (1.2 × 0.4 m in diameter) spaced 0.9 m apart in a square array. The mulch extended 0.5 m away from the plant and plots were spaced 1.8 m apart. Treatments on 'Better Boy' were replicated twice in 1988 and four times in 1989, and on 'San Marzano' four times in 1989 and three times in 1990. Plants received NH_4NO_3 (112 kg N/ha) in July. Plants were not suckered and no irrigation was provided, as is common in commercial tomato culture in Connecticut. Leaf diseases were controlled with Manzate 200 [(ethylene-bis-dithiocarbamate) E.I. du Pont de Nemours, Wilmington, Del.], while insects and weeds were removed by hand.

Mature-green fruits were counted, weighed, and scored for BER about every 5 days from late July to late September each year. Early yield (late July to late August) comprised ≈15% of final yield. Data were expressed as a percentage by number of the fruit affected with BER. Homogeneity of variance was established by arcsin transformation and analyzed by two-tail Student's t test with unequal variances (Steel and Torrie, 1980).

Final yields for 'Better Boy' and 'San Marzano' averaged 10.7 and 6.5 kg/plant, respectively, and were not significantly affected by mulching. Mean overall incidence of BER for no, paper, or black plastic mulch was 4%, 6%, or 5% for 'Better Boy', and 18%, 21%, or 23% for 'San Marzano', respectively; however, BER incidence was significantly higher on early harvested than in later harvested tomatoes of both cultivars (Table 1). Black plastic mulch significantly

increased early season BER of 'Better Boy' when compared with no mulch or with paper, whereas late-season BER of 'Better Boy' was not affected by mulching. Early season BER of 'San Marzano' did not differ among mulch treatments, but late-season BER was significantly decreased by mulching.

Because large fluctuations in soil water deficits are conducive to development of BER (Pill and Lambeth, 1980; Shaykewich et al., 1971), mulching should decrease BER by reducing soil moisture losses. Our observations suggest mulching altered the onset of BER without significantly affecting the seasonal average. Assuming that the interval from flowering to harvest was between 25 and 35 days (unpublished data), these early fruits were set during late June to mid-July. Soil moisture in Connecticut during this period of flowering has large variation due to infrequent heavy rains (unpublished). Mulches may impede the direct penetration of water into the soil during heavy rains and explain the enhancement of early season BER.

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