# An Improved Medium for the *In Vitro* Rooting of Harbrite Peach[1]

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ABSTRACT

Shoots derived from proliferating cultures of Harbrite peach and Stanley plum can be induced to form multiple roots and extensive shoot growth on a new rooting medium (MS-H). The MS-H medium is composed of Murashige and Skoog high mineral salts with (amounts per liter) myo-inositol (200 mg), casein hydrolysate (1000 mg), glycine (2.0 mg), Biotin (0.05 mg), thiamine-HCl (2.0 mg), choline chloride (1.0 mg), nicotinic acid (2.5 mg), pyridoxine-HCl (0.25 mg), para-aminobenzoic acid (1.0 mg), folic acid (0.25 mg), pantothenic acid (0.5 mg), indolebutyric acid (3.0 mg), naphthaleneacetic acid (1.0 mg), gibberellic acid ($GA_3$) (0.1 mg), kinetin (0.04 mg), 6-benzylaminopurine (0.01 mg), sucrose (20 g), and agar (6 g). Rooted shoots have been successfully transfered to soil.

Stone fruit (*Prunus* spp.) tissue cultures have yielded whole plants from callus (9, 17), meristem and shoot-tip cultures (2, 3, 4, 5, 6, 7, 10, 11, 13, 14, 15, 16, 19, 22, 23, 24), and by grafting (1, 8). However, most of the success reported in these studies has involved the use of explants from seedlings, easy-to-root species, and rootstocks. The *in vitro* propagation of difficult-to-root and scion-type cultivars has been less successful due to many factors which probably are related to the poor rooting ability of these plants.

In our laboratory we have proliferated shoots of peach (*Prunus persica* Batsch), sweet and sour cherry (*P. avium* L. and *P. cerasus* L., respectively) and plum (*P. domestica* L.) scion-type cultivars for over 4 years (18, 20, 21, 22). Until 1979, we sometimes observed rooted shoots within our experiments, but root emergence could not be correlated to the treatments. If root induction occurred, the shoot portion of the plant frequently died. None of our media were optimal for good rooting, therefore an entirely new medium was developed for rooting *Prunus*.

Our rooting medium (MS-H) was developed after a critical examination of the literature concerning *in vitro* rooting of all species of *Prunus* (19). The media were compared and certain constituents were extracted to develop an improved medium. The MS-H medium is composed of Murashige and Skoog high mineral salts (12) with (amounts per liter) myo-inositol (200 mg), casein hydrolysate (1000 mg), glycine (2.0 mg), biotin (0.05 mg), thiamine-HCl (2.0 mg), choline chloride (1.0 mg), nicotinic acid (2.5 mg), pyridoxine-HCl (0.25 mg), para-aminobenzoic acid (1.0 mg), folic acid (0.25 mg), pantothenic acid (0.5 mg), indolebutyric acid (3.0 mg), naphthaleneacetic acid (1.0 mg), gibberellic acid ($GA_3$) (0.1 mg), kinetin (0.04 mg), 6-benzylaminopurine (0.01 mg), sucrose (20 g), and agar (6 g). The pH of the medium was adjusted to 5.7 with KOH + HCl. The medium was autoclaved for 15 min. at 1 Kg/cm$^2$ and 120°C.

Single shoots of Harbrite peach, Stanley plum and Montmorency sour cherry were transferred from shoot proliferation medium (20, 21) [Murashige and Skoog high mineral salts supplemented with (in mg/liter) myo-inositol (100.0), 6-benzylaminopurine (BA) (2.0), naphthaleneacetic acid (NAA) (0.1) and Staba vitamins [(from E. J. Staba, University of Minnesota)

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Amounts per liter = cyanocobalmin, 1.5 $\mu$g; folic acid, 0.5 mg; riboflavin, 0.5 mg; biotin, 1 mg; choline chloride, 1 mg; Ca pantothenate, 1 mg; thiamine-HCl, 1 mg; nicotinic acid, 2 mg; pyridoxine-HCl, 2 mg; para-aminobenzoic acid, 0.5 mg.]] to the MS-H medium. The shoots were then grown at 22°C with 16-hr days at about 2.16 klx (cool-white fluorescent light).

Within 3-5 weeks 71 of 144 Harbrite peach shoots, 7 of 9 Stanley plum, and 2 of 51 Montmorency cherry shoots developed multiple roots on the MS-H medium. In contrast to other *Prunus* rooting media tested in our laboratory, we found that the MS-H medium also stimulated extensive shoot growth on all 3 cultivars (Fig. 1). We have continued to root Harbrite peach on MS-H for over 1 year and we have consistently observed about 50% rooting. Rooted shoots have been moved to soil (Fig. 2).

Although peach and plum rooted well on the medium, Montmorency cherry did not. It is obvious, therefore, that the MS-H medium is not suited to all *Prunus*. The species interaction could be due to certain medium ingredients that are either superfluous, at non-optimal levels, or detrimental. Miller et al. (10), for instance, reported that the complete elimination of vitamins from their medium stimulated good rooting of Nemagard peach rootstock.

The unique ability of the MS-H medium to stimulate both multiple roots and actively growing shoots will make it of value to persons interested in propagating *Prunus in vitro*.

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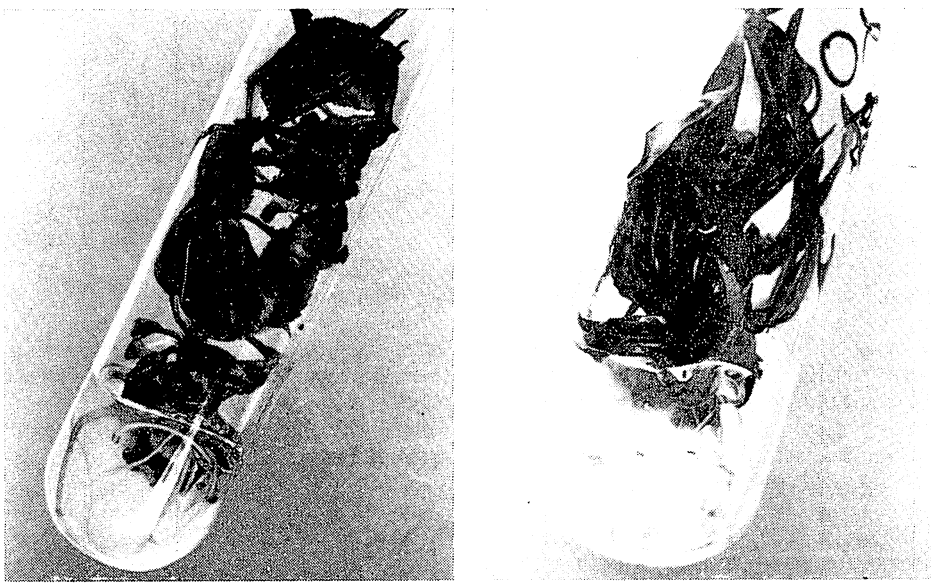

**Fig. 1. Rooted shoots of Stanley plum (left) and Harbrite peach (right) on MS-H medium. Notice the multiple roots and vigorously growing shoots.**

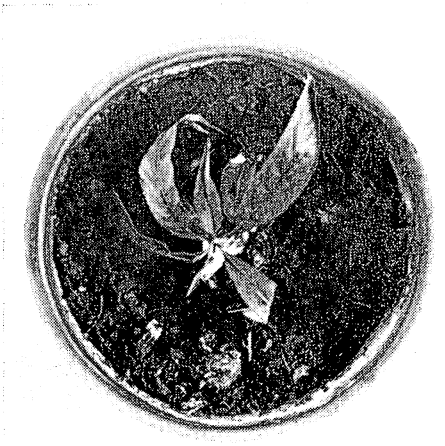

**Fig. 2. Rooted Harbrite peach shoot growing in soil.**


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