

COLD HARDINESS OF PYRUS *calleryana* CULTIVARS NOT AFFECTED BY FALL TRANSPLANTING

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Callery pears transplanted in the fall sometimes are adversely affected in the next growing season. Symptoms such as sparse foliage, twig dieback, patches of dead bark, or death of the entire tree are suggestive of winter injury. So we investigated the possibility that severing roots during the period of acclimation might interfere with the development of normal cold hardiness.

Three cultivars of callery pear, 'Aristocrat', 'Redspire', and 'Stone Hill', growing in a nursery in central Pennsylvania were transplanted at different times. Five trees of each cultivar were lifted on each of three dates: as fall coloration started, during peak coloration, and after leaf drop; a fourth group of each cultivar remained in place as a control. The 2- to 3-inch caliper trees were dug by a 40-inch tree spade, burlapped in wire baskets, stored and watered temporarily, then replanted in the same nursery.

Cold hardiness was evaluated at monthly intervals from October, before the first trees were lifted, until March. Twig samples were frozen to various temperatures from -5°C to -40°C . Using the diffusate conductivity method, the relative conductivity of electrolytes from each sample was determined and the critical temperatures at which cold injury could be detected were calculated from analyses of variance.

Hardiness increased from -20°C in October to -31°C in December, then decreased gradually until March. 'Aristocrat' was about 2°C more hardy than 'Redspire' or 'Stone Hill'. There were no differences among trees lifted at the three dates, nor were they different from the unlifted control trees. No visual symptoms of winter injury were evident on the pears after a rather severe winter which damaged some other species. In late April the trees flowered profusely and leaves were emerging normally. The growth of transplanted trees was delayed a few days compared to the controls, which is a normal occurrence.

The study showed that transplanting callery pears in the fall after leaf coloration begins does not affect their cold hardiness, regardless of the date. No explanation was found for injuries that sometimes result from fall transplanting, which did not occur in this experiment. The main conclusion is that callery pears may be lifted during a period of about six weeks in the fall without increasing the likelihood of winter injury. Another useful finding is that 'Aristocrat' can withstand colder climates than 'Redspire' or 'Stone Hill'; the latter is regarded as the same cultivar as 'Chanticleer' and 'Cleveland Select'.