



Effects of Planting Depth on Landscape Tree Survival and Girdling Root Formation

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Abstract. Landscape trees are frequently planted with their root collars below grade, a practice that may predispose them to transplant failure and girdling root formation. The objective of the present research was to examine the effect of planting depth on the health, survival, and root development of two popular landscape trees, red maple (*Acer rubrum*) and Yoshino cherry (*Prunus x yedoensis*). Trees were transplanted with their root flares at grade, 15 cm (6 in) below grade, or 31 cm (12 in) below grade. Deep planting reduced the survival Yoshino cherries: 2 years after transplant, 50% of the 15 cm (6 in) and 31 cm (12 in) deep-planted cherries had died, whereas all the cherries planted at grade had survived. Survival of maples was not affected by planting depth. Deep planting also influenced the development of girdling roots. Three years after transplant, maples planted at a grade had 14% of their trunk circumference encircled by girdling or potentially girdling roots; this number rose to 48% and 71% for 15 cm (6 in) and 31 cm (12 in) deep-planted maples, respectively. There were no treatment-related differences in girdling root development in the cherries. These results are consistent with arborists' observations that deep planting is a significant source of stress in landscape trees.

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