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Abstract. This study demonstrates a new method to assess the anchorage of urban trees by quantitative analysis of the relationship between root-plate inclination and regional wind data.

The load required for root failure correlates with loads required to achieve a specified inclination in the non-destructive range. Since load correlates with wind speed, researchers studied the reaction of urban trees in high-wind events. Specifically, researchers studied whether wind data from regional weather stations can be used to find the correlation between wind speed and root-plate inclination. More than 200 trees in 57 storms in three years were tested using tilt sensors, installed at their base.

The analyses show that wind-speed data can be taken from weather stations several kilometers away from the tree. The quality of the wind speed-tilt correlation does vary, depending on local conditions and topography.

The tree's reaction to wind can be extrapolated by 10 km/h beyond the measured maximum wind speed in many cases. The reliability of the extrapolation can be assessed statistically.

The shape of the curve fitted to the wind and tilt data allows differentiating safe from unsafe trees in wind events of 50 to 60 km/h. The curve of trees with signs of failure in high winds was significantly different from that of the remaining trees.

Based on techniques from static pulling tests, this approach can be used to estimate the wind speed at anchorage failure. While previous approaches using tilt sensors merely indicate whether a tree needs further monitoring, the result of this method is a likelihood of failure.

Key Words. Anchorage; Germany, Root-Plate Inclination; Tree Risk Assessment; Wind; Wind Load.

Abstract. A number of factors can influence successful street tree establishment, including inappropriate selection of stock, poor-quality stock, poor planting technique, insufficient irrigation, poor weed control, and inadequate maintenance. Urban tree managers need reliable, accurate, and practical indicators of whether street trees have successfully established to inform decisions about removing supporting stakes or continuing irrigation regimes. The establishment of street trees planted as large format stock was investigated using a survey of 510 trees from 21 species managed by three municipalities in Greater Melbourne, Australia.

A planted tree can only be considered established when the partial root system in the root ball or the confined root system in a container has developed into a spreading root system, utilizing moisture and available nutrients throughout a larger soil volume. Thus, an indicator of root expansion into soil of a greater volume is necessary, as are measures of canopy growth, such as shoot-tip growth or canopy dieback. The survey assessed six factors indicative of successful or poor establishment: whether trees had been planted too deeply, whether trees exhibited trunk movement at or below the soil surface, damage to the trunk, trunk sunscald injury, presence of epicormic shoots on the trunk, and whether there were co-dominant stems.

The results demonstrated that trunk damage (8%) and codominant stems (5%) occurred at low rates in the trees, but the presence of epicormic shoots (12%) and sunscald damage (12.5%) was more common, and 12% of trees had been planted too deeply and 42% of trees were unstable. Three criteria—shoot tip extension, trunk movement in the ground, and percentage of canopy dieback—provided useful measures of whether street trees were assessed as being well- or poorly-established. This is the first study to record a high incidence of sunscald injury to urban trees in Australia.

Key Words. Australia; Melbourne; Shoot-Tip Extension; Sunscald; Tree Stability; Trunk Movement; Urban Forestry.

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Abstract. Integrated vegetation management programs have successfully reduced the frequency and intensity of power line right-of-way management by promoting low-growing plant communities resistant to tree invasion. To examine whether these principles are transferable to northern ecosystems, researchers tested eight treatments at four sites in Yukon, Canada. Two herbicides, imazapyr and triclopyr, were applied by three methods, as well as a native grass seeding treatment and a mowing control. Vegetation cover was recorded prior to treatment and after one year along with herbicide damage assessments. Overall, treatments caused significant changes to vascular plant communities after one year. Short-term control of woody target species was greater in chemically-treated plots (66%–94%) than with mechanical methods (<55%). All treatments caused a minor reduction in non-target vegetation cover. In seeded plots, seedlings emerged but total non-target species cover was reduced by seedbed preparation. Triclopyr broadcast spray reduced non-target vegetation cover by <10%, but the common shrub, kinnickinnick (*Arctostaphylos uva-ursi*), was highly impacted. Selective application of triclopyr effectively controlled targets with minimal effects on non-target species. Imazapyr consistently caused more impacts to non-target plants than triclopyr. Both selective and non-selective imazapyr applications resulted in chlorosis, stunting, and deformity of shrubs and forbs one year after treatment. This suggests imazapyr can remain active in northern soils for at least 365 days as well as transfer to untreated plants. The range of sensitivities of boreal plant species to imazapyr and triclopyr and potential persistence in northern soils highlights the need for focused toxicity research in the North.

Key Words. Canada; Imazapyr; Integrated Vegetation Management; Right-of-Way; Succession; Triclopyr; Yukon.