

# Tree Leaves and Kentucky Bluegrass Growth and Quality

**I**t is a common turf maintenance practice in temperate climate zones to collect and remove fallen deciduous tree leaves from turfgrass sites in the late fall into the spring. Without tree leaf removal, turfgrasses can sustain severe damage due to light exclusion and high temperature buildup under the tree leaves during warm weather. The collection and tree leaf removal processes are very labor intensive and costly, and sites for disposal are becoming very limited.

Yard waste management in the 1990s has become a major issue for many municipalities. The US EPA estimated in 1991 that in the US more than 31 million tons of waste is grass clippings, 20 per cent tree leaves and five per cent brush. In 1993 there were 15 states that had banned all yard wastes from landfills and 10 more are considering bans.

Mulching mowers, that distribute the grass clipping back on the turf site, have been widely recommended and utilized to reduce the amount of yard waste generated. The advantages of returning grass clippings include: a reduction in the time and energy associated with removal of the clipping either to landfills or composting facility, and the recycling of nutrients from the clippings back to the growing turf.

Depositing deciduous tree leaves into the turfgrass ecosystem might modify the soil environment with the addition of nutrients and acidifying organic material and contribute to greater thatch accumulation due to the influx of more lignin into the system from deciduous trees than cool-season turfgrass species. The net effect of tree leaf deposition may be an alteration of the plant growth, where less growth would occur if soil pH dropped below an adequate level or an increase in growth if nutrients were released during the decomposition phase.

The hypothesis we tested in this study was that yearly tree

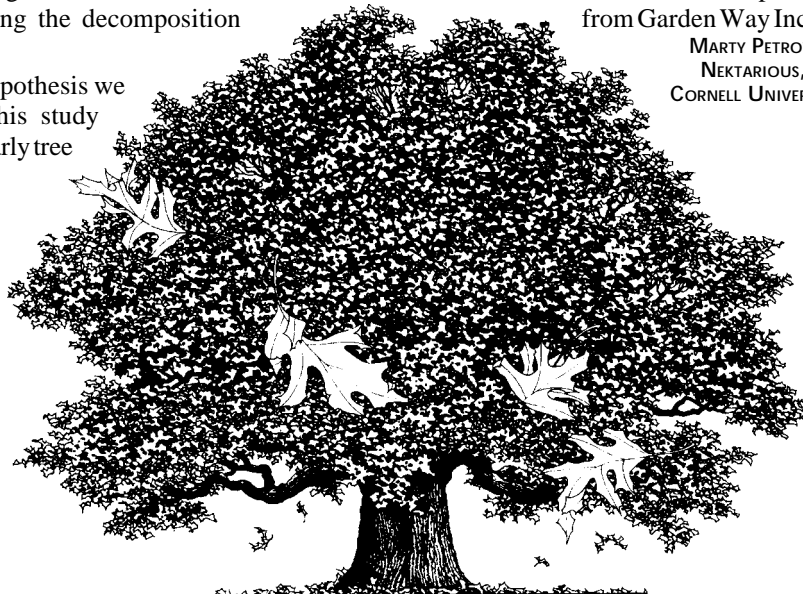
leaf deposition had no effect on Kentucky bluegrass shoot growth, visual quality, soil pH, and thatch accumulation, thus, would be a suitable landscape/solid waste disposal method.

The study was conducted at the Cornell Turfgrass Research and Education Center in Ithaca. The site was a 10 year old stand of Adelphi Kentucky bluegrass grown on a fine sandy loam soil. Three treatments were evaluated: red oak leaves, Norway maple leaves and a plot not treated. Fallen leaves of red oak and Norway maple were air-dried, deposited on the turf surface at a thickness of 5 inches once or twice per year (rate of 0.54 Kg of dry leaves/m<sup>2</sup>), and mowed with a mulching mower. Turfgrass clipping yields were collected weekly and at least monthly visual quality rating was determined. Thatch thickness and soil pH levels were determined at the end of the second and third years of the study.

We found that mulching mower-deposited tree leaves, of either species, had no effect on visual quality, shoot growth, thatch accumulation, and soil pH during the three years of this study. Therefore, using mulching mowers to finely grind and deposit fallen tree leaves on turf provides an alternative tree leaf disposal method while having no effect on the health and vigor of lawn turf. However, results from a laboratory study in Wisconsin indicated that phosphorus in turf clippings and from tree leaves are likely to leach out when dried or frozen and could be part of the increase in phosphorus levels in landscape watersheds observed in late fall through spring. We are planning to study the impact of turf clippings and tree leaves on phosphorus runoff from mixed landscapes (trees and turf).

This work was funded in part from a grant from Garden Way Inc., Troy, NY.

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## Program Update

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# 11