STEM DECAY IN STREET TREES IN NEW JERSEY AND PARK TREES IN CENTRAL PARK, NEW YORK[1]

by Robert L. Tate

Abstract. Increment cores were taken from 1,014 trees along streets in central New Jersey and in Central Park, New York in 1983-84. Of the trees cored, 142 (14.4 percent) had stem decay. A greater number of park trees had stem decay than did street trees (16.2 vs. 12.6 percent, respectively). Honeylocust (*Gleditsia* sp.) was the least affected by decay. Linden (*Tilia* sp.) was the most affected. Ginkgo (*Ginkgo biloba*), considered to be highly tolerant to urban conditions was seriously affected with 17.8 percent of the stems sampled having decay. Stem decay and the potential hazard caused by it should be carefully considered by the urban tree manager.

As part of an ongoing study to determine the growth and longevity of commonly planted street trees in central New Jersey and park trees in Central Park, New York, increment cores were taken in 1983-1984 from a stratified random sample of 1,014 trees greater than six inches diameter at 4.5 feet (1.4m) above ground level. Seventeen tree species comprising 76 percent of the total tree population were included in the sample. One coring per tree at breast height was made into the pith. This was not a study to determine the causes and extent of urban tree decay. No attempt was made other than to report the presence of decay in the increment core. A substantial number of trees (16.2 percent) was reported by Tate in an earlier study (1984) to have stem decay in Central Park. Similar data were collected to assess the incidence of stem decay on 422 street trees and to compare these data to our park data. What follows are the results of both studies.

Trunk abnormalities consisting of bark wounds, longitudinal cracks, cavities, slime flux, seams, and structural damage were recorded. Fifty-nine percent of the sample trees in Central Park with trunk abnormalities had stem decay. About one-half of the street trees that had stem decay had similar trunk abnormalities. Clearly there is a high degree of association of stem decay and observable trunk abnormalities. Also, as tree diameter increased, the percentage of trees with stem decay increased.

The degree of stem decay varied by species in both samples (Table 1). All species sampled had decay. More park trees had decay than did street trees (16.2 vs. 12.6 percent, respectively). On the average nearly one in seven trees cored (14.4 percent) had decay. Of the 19 species sampled, honeylocust (*Gleditsia* sp.) was the least affected, only 2.2 percent. Of the trees sampled on both sites, London planetree (*Platanus x acerifolia*) had the lowest incidence of decay. It was the only park species sampled without decay. The decay in street-grown pin oaks (*Quercus palustris*) was greater than twice that of those grown in the park. The percentage of ash with decay fell between the oaks and the maples. Nearly 18 percent of the Norway maples (*Acer platanoides*) had stem decay. Silver maple (*Acer saccharinum*) had the greatest incidence (19.6 percent) of any of the street-grown maples. Nearly one in three individuals of hawthorn (*Crataegus* sp.) and cherry (*Prunus* sp.) were seriously affected with decay (30.0 percent vs. 34.3 percent, respectively).

While inconclusive, decay found in stems in urban trees in this study varied by species and its occurrence was frequent. Other factors not addressed were bark thickness and the time of the year when the wound occurred. These influence the tree's ability to respond effectively before decay-causing pathogens can infect. Because larger and older trees were more frequently found in this study to have stem decay, protection from wounding and proper pruning practices are tremendously important and should be exercised throughout the tree's life.

Each of the species in this study has assets and liabilities for use in the urban environment. The London planetree is considered by some to be too large and messy for urban use. Yet it had a low proportion of decay even though it is a thin-barked tree. Nearly one in five of the Norway and silver maples (considered by some to be too widely

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Table 1. Percent of stem decay by species in street trees in Central New Jersey and park trees in Central Park, New York.

Species	No. sampled NJ	No. sampled NY	% decay NJ	% decay NY
Honeylocust (*Gleditsia* sp.)	46	—	2.2	—
Planetree, London (*Platanus x acerifola*)	26	6	7.7	0
Ailanthus (*Ailanthus altissima*)	—	26	—	7.7
Oak (*Quercus*)				
Pin (*palustris*)	36	37	11.1	5.4
Red (*borealis*)	—	43	—	6.9
Turkey (*cerris*)	—	16	—	43.8
Weighted mean of oaks				12.5
Ash (*Fraxinus*)				
Green (*pennsylvanica*)	35	—	11.4	—
White (*americana*)	—	78	—	12.8
Locust, black (*Robinia pseudoacacia*)	—	74	—	16.2
Hackberry (*Celtis* sp.)	—	36	—	16.7
Maple (*Acer*)				
Sycamore (*pseudoplatanus*)	—	63	—	9.5
Red (*rubrum*)	59	—	10.2	—
Sugar (*saccharum*)	54	—	14.8	—
Norway (*platanoides*)	92	133	15.2	20.3
Silver (*saccharinum*)	51	—	19.6	—
Weighted means of maples	—	—	14.8	16.8
Ginkgo (*Ginkgo biloba*)	—	28	—	17.8
Hawthorn (*Crataegus* sp.)	—	20	—	30.0
Linden (*Tilia* sp.)	23	—	30.4	—
Cherry, ornamental (*Prunus* sp.)	—	32	—	34.3
Total	422	592		
Weighted mean of trees with stem decay			12.6	16.2

planted as street trees) had stem decay. This may be another reason to consider limiting their planting in the future. The ginkgo, supposedly impervious to the excesses of the urban environment, had the highest proportion of decay (17.8 percent) of any tree in the study, except linden.

Even when the incidence in the urban environment is low, because of the increased potential for hazard, stem decay should be a concern to any urban tree manager. The results of this study make it a much greater concern. Knowledge of the potential for stem decay is yet another item to consider when choosing a tree species for planting in the urban environment.

That nearly one in seven of the trees were found to have decay at breast height (below the bulk of the tree's weight) in two distinctly different urban sites where many people live, work, and play, should indicate that steps should be taken by all urban tree managers to identify and to monitor stem decay and to prevent its occurrence. This makes more important the use of correct pruning techniques, the protection of stems from wounding, and when damaged, the treatment of stems to promote rapid healing.

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Literature Cited

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