





THE HIGHWAY TREE

SELECTION AND MAINTENANCE

By ROBERT A. BARTLETT

TREES represent practical values on the highway beyond aesthetic considerations. They offer the driver a sense of psychological ease. They help eliminate highway hypnosis, a cause of numerous accidents; they reduce driver tension.

Trees are our most dominant and important plant and must be conserved, preserved and maintained for a better environment and world. When planted along highways, they must possess certain qualities if their existence is to be economically and ecologically practical. First, the general growth pattern of the tree must not interfere with the functions or design of the highway. It should have a root development which does not damage shoulders, sidewalks and pavements. Its stem should be straight, clean and have a bark covering that is not easily damaged by abrasion. The foliage should be pleasing to the eye and not continually dropping. The tree should also be as free as possible of "being dirty" (fruit, leaves, bark, branches and other parts falling to the ground).

Secondly, it must be adaptable to the soil and environmental conditions in which it must grow, and

be resistant as possible to insects, diseases, windstorms, reflected road heat and drought.

Lastly, the species chosen should be one of long life and should improve as it ages. Those best able to endure conditions along highways include the Norway maple which has a compact crown, casts dense shade, is hardy and also quite beautiful.

The sycamore combines many of the features most desired from highway trees. It grows rapidly, is resistant to attacks by insects, and provides a medium shade cover.

The scarlet oak also possesses most of the features of the sycamore with the added benefit of providing a spectacular display in the fall.

The honeylocust is also suitable for highway planting, but should be used only when light shade is required.

Some species of Eucalyptus are very desirable highway trees, while others are brittle and have a tendency to snap off. Eugenia is often recommended as a street tree while many of our evergreens can and should be used for shade trees in

Pictures at left and above illustrate damage done to trees by the changing water level and drainage patterns resulting from highway construction, these resulting directly from cuts by blasting. Trees at top of cuts should have been removed since they will die anyway. In the meantime, they will require maintenance and are a hazard to highway below.



Trees nearest road are dying because of soil piled on top of root area during construction. These should have been removed.

areas where they have a tendency to grow well.

The shad bush, tung-oil tree and tupelo have done well along the highway right-of-ways. Also, existing trees along new highways often have the soil around their roots compacted during the road construction. Roots may also be cut or damaged. Such conditions may cause death of trees. Often, it is advisable to plant new trees in place of those whose survival or suitability is in question.

Much research should be done before using native trees for planting and maintaining along the highway right-of-ways. Also, existing trees along new highways often have the soil around their roots compacted during the road construction. Roots may also be cut or damaged. Such conditions may cause death of trees. Often, it is advisable to plant new trees in place of those whose survival or suitability is in question.

If a highway is to pass through a heavily wooded area, proper consideration must be given during design and construction phases. This will protect and conserve desirable trees so the road does not destroy the natural beauty of the scene, but becomes an integral part of the environment it serves.

Two considerations concern water. One is availability of water and the other is the problem of polluted runoff. Road runoff often contains oils, salts and other compounds that represent a potential threat to trees.

For this reason, road runoff should be prevented from collecting near the root zone of trees. If a storm sewer is used, the drainage system should direct the water away from the tree's roots. If drywells are used, they should be located in the clear areas between the trees so ground filtering can remove most of the pollutants.

It is often very difficult for highway trees to receive an adequate supply of water for their root system. The highway itself tends to act as a large waterproof ground cover which lowers the area water table. This situation imposes serious limitations on the flow and amounts of water necessary to support healthy tree growth, thus making it necessary to provide a greater space between trees in order to allow more ground area from which each tree can draw water. This space will also serve to make work on the trees a more easily accomplished task.

Economic Realities

For the past 35 or 40 years, highway departments have instituted tree planting programs, but they have generally failed to allocate the necessary maintenance funds. This

has resulted in the loss of many trees and a waste of dollars.

During the last 10 years, many states have contracted tree planting programs at a cost ranging from one-quarter of a million to \$2½ million per year. In most cases, a similar sum should have been appropriated to maintain these trees during the seven to 10-year period following planting.

Maintenance Factors

Once trees have been planted along the highway, an adequate maintenance program must be maintained if they are to endure and flourish.

A feeding program must be initiated to provide the tree with the nutrients it requires to insure its survival. Trees existing naturally in the forest are provided with the necessary nutrients as plant material decays. This process does not usually occur along the highways.

Also, trees should be sprayed whenever infection or infestation occurs or is imminent. Pruning must be done regularly to eliminate the danger of falling limbs and remove unwanted growth. In addition, tree

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Trimnings

GASES, combined in a mixture at low total concentrations may cause more plant damage than a single pollutant at a much higher concentration. Ohio State University researchers are studying this peculiar problem and another closely associated with it. In the second case, clues are being sought as to why pollutants make plants more susceptible to attack by insects and pathogens such as fungi and bacteria. Seems these seek out plants weakened by chronic pollution stress.

* * *

CONDEMNED ELMS in Stockholm, Sweden, failed to fall on schedule. Ax-wielding workmen were repelled by tree lovers and needed a police escort in order to retreat. Most serious threat, however, was a series of anonymous calls threatening to chop down fruit trees in the backyards of councilmen if the elms were destroyed.

* * *

OZITE known for the indoor-outdoor carpet craze has marketed a grasslike artificial turf. It's more carpet than turf and isn't meant to compete for the athletic field business. Company reps say that Lawn-scape (the new sale name) was created mostly for do-it-yourselfers on yards, balconies, basements, patios, around swimming pools and the like. The company, however, doesn't rule out its use in the commercial field.

* * *

RACEHORSE OWNERS have complained that Saf-T-Turf at the Calder Race Course (Fla.) is making their horses sore. Heavy investor in the Calder set-up, William L. McKnight, is not about to cover the artificial surface with sand, or whatever. He instead hopes to sell the 3-M company's product as the race-track of the future. Top stables may reconsider competing at Calder this winter.

* * *

MORE FERTILIZER USE, NOT LESS, is being promoted by Extension Professor R. Hunter Follett at Ohio State University. He says that greater use of fertilizers can reduce erosion and help prevent pollution. Instead of exposing more land to erosion and nutrient losses, Dr. Follett suggests increasing fertilizer use on better land where erosion hazards are low, and retiring more poor land to permanent cover.

Highway Tree (from page 14)

surgery should be performed if the situation necessitates.

Where utility lines are located along highways, it may be necessary to prune and control the growth of trees on a more regular basis. Yet, when the coexistence of trees and utilities is feasible mutual benefits are frequently possible. Trees help to hide some of the unpleasant visual qualities of utility lines and poles. They also provide a wind screen and protection from the elements for the utility lines. And, because proper functioning of the utilities necessitates regular pruning of trees to prevent service interruption, diseased and dead wood is eliminated which could prove to be a danger to motorists.

Today our trees are faced with many man-made problems. Chemical applications applied to our highways and off-highway maintenance areas, such as salts used as deicing compounds, herbicides and soil sterilants, oils, and other toxic materials which either wash or blow off the highway onto plants and under the trees and grounds surrounding them cause their death.

In many cases it would be advantageous to remove these trees which would have a tendency to die or be killed by unnatural surroundings. Many areas of our country have not been blessed with enough rainfall for a period of several years, therefore these trees have been weakened and are susceptible to insect and disease attack. Healthy trees need care and a maintenance program that stimulates growth through the application of nutrients, preventive sprays where known insects and disease are prevalent and tree sanitation are greatly needed.

Consideration must also be given



Robert A. Bartlett, president of the F. A. Bartlett Tree Expert Company.

to the effects of air and water pollution upon highway trees. Trees, like most living things in the environment today suffer from pollution. The effects of pollutants on trees are numerous and the most serious symptoms are clearly evident in urban areas. The ultimate solution to this problem lies with the polluters and legislators, although research is now going on in several parts of the country to determine which particular species of trees are most tolerant to pollution. When this research is completed, we will be best able to determine what trees should be planted in areas of high pollution.

Recommendations

1. Initiate a Comprehensive Highway Tree Census and Continuing Tree Inventory.

A highway tree census should be started. This census should be repeated at least every ten years.

Shocking!

We are dismayed at the d-CON ad in the July '71 issue of **Ladies Home Journal**, p. 146-147.

This ad by a reputable formulator shows a picture (taken by a National Audubon Society staffer) of 210 dead birds which are purported to have been killed by a "hard" pesticide.

There are no data to substantiate the claim. No data explain whether the birds were picked up along a highway or in a park, or whether there was an autopsy to indicate why they died. The so-called "hard" pesticide was not named.

Nor does d-Con mention that they market a rodenticide which would kill most anything.

We are shocked because this type of reporting is a disservice to the industry—an industry which is spending more money than ever before to monitor and research the effect of chemicals on the environment, including that on birds.

The census should determine the following:

- A. The severity of tree ills and those problems of immediate concern.
- B. The manpower and equipment necessary for an effective program.
- C. The money required.
- D. The suitability of tree species planted or to be planted.

2. Develop a Master Highway Tree Plan

This plan should integrate economic, aesthetic and ecological realities to form a practical program of landscape design. It should also develop immediate, intermediate and long range goals which are flexible enough to change if necessary.

3. Maintain Mulch Around Trees

A mulch around highway trees creates biological conditions which favor healthy growth.

All leaves, wood chips, grass clippings, and other suitable organic matter should be composted for use in the planting and maintenance of highway trees.

5. Establish a Program for Aerating and Adding Organic Matter to the Soil.

Highway trees should be fed each three or four years if maximum vigor is to be maintained. Where feasible, a combined operation of aerating and adding organic matter using a power-driven coring aerator is recommended.

Establish the following feeding priorities:

- A. Trees that have been weakened by insect or disease attack.
- B. Trees showing poor growth.

6. Establish a Three-Year Pruning Cycle.

A three-year pruning cycle should be the longest period allowed between prunings if highway trees are to endure the rigors of their environment. If this is a shorter period than usually allotted, it must be remembered that this will require less man hours and thus will be lower in cost.

7. Establish a Realistic Tree Removal Policy and Program.

The program should remove the following:

- A. Dead and/or dying trees.
- B. Unsightly trees which have no chance for future development.
- C. Trees that represent potential hazard due to growth habit, structural weakness or internal decay.
- D. Trees that have outgrown available space.

8. Water Trees During Period of Drought.

Priority should be given to trees planted within the past three years and water should be injected into the soil if possible.

9. Expand the Program for Controlling Insects and Disease.

Spray programs should not only be aimed at a specific pest or disease that threatens highway trees yearly, but should also be able to control sudden outbreaks of infestation. Since this might result in work loads beyond the capacity of exist-

ing crews, the following should be considered:

- A. Rent additional spray equipment for short periods.
- B. Contract some of the work with qualified tree expert companies.
- C. Evaluate new methods and techniques such as application by helicopter.

If we fail to follow through with these programs for the maintenance of our highway trees, we could eventually be left with highways resembling a concrete and asphalt wasteland.

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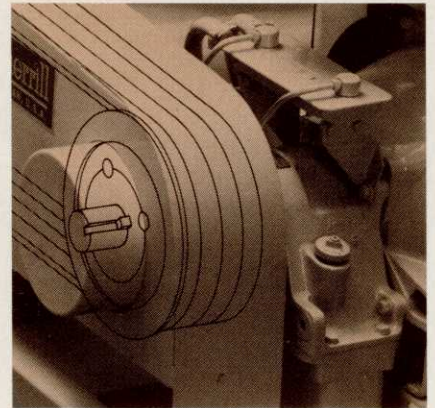


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