

Shade Trees For Cities

A Community Forestry Program

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Community and urban forestry are here to stay. Earlier arboricultural practices coupled with forestry management expertise furnish the basis for a new branch of forestry that concerns itself with the effects of people on trees and more important, the impact of trees on people.

In essence, community and urban forestry services are socially oriented. Foresters now provide the general public with the multiple benefits offered by trees, shrubs and associated vegetation within an urbanizing environment.

Today and tomorrow there is and will be escalating public demand for better and more comprehensive management of our urbanized environment.^{10 15 19 21} In response, an increasing number of state forestry commissions, forestry divisions and extension services are developing new and innovative community and urban forestry assistance measures. Notable among them are programs in Florida,²⁰ Georgia,^{16 17} Kansas,^{1 19 11} Maryland,⁴ Michigan,³ and Missouri.^{5 6}

Encouraged by Congressional and Presidential approval of the Sikes Bill,

P.L. 92-288, in 1972, the foregoing agencies and their brother organizations throughout the U.S. have initiated or are planning cooperative assistance practices. State forestry leaders were cued by the language of P.L. 92-288 which specifically calls for "... the protection, improvement, and establishment of trees and shrubs in urban areas, communities, and open spaces."

As authorized, an annual Federal appropriation of \$5 million will be made available to state forestry organizations for community and urban forestry. To provide national coordination of programming and funding, the Act will be administered by the Secretary of Agriculture through the state and private forestry division of the Federal Forest Service. However, to make the total program work, continuing cooperation and reliable communication will be essential between state and private forestry, state forestry organizations, and leaders of local governments.

Kansas, in particular, has organized a state forestry division-state extension service program to encourage maximum participation by local community tree boards or commissions. By 1972, some 42 communities had created City Tree Boards,¹¹ with more added in 1973.

An earlier stimulus, however, was prompted by the unwelcomed appearance of the Dutch elm disease on the Kansas treescape. About 15 years ago,²²



Dutch Elm disease appeared on the Kansas treescape nearly fifteen years ago. As the disease spread, local governments became aware of the need to practice urban vegetation management.

as the disease began to infect an increasing number of trees, local governments became aware of the need to practice urban vegetation management. Cities and towns ill-prepared to control the disease lost most, if not all, of their American elms and had no plans to remove or replace the dead trees. More enlightened communities as Cottonwood Falls, with a population of 1000, even with a limited budget, have inventoried their trees to determine condition and values (Table 1). They also have forestry plans for the future.

Tree surveys are typical basic components of information upon which a city tree board bases its decisions. In Kansas, according to Grey,¹¹ the city tree board seems to be the best approach to initiate and instrument programs in individual communities. Grey also advises that action begins "... by explaining the program to the community governing body (usually the city commission or council) of towns and cities throughout the State, and recommending that each create some legal body to be responsible for a community forestry program." Thus, the overall Kansas community forestry program is composed of cooperating communities that sponsor a city tree board.

CITY TREE BOARD

A City Tree Board should be ap-

TABLE 1. Tree Survey Statistics for community of Cottonwood Falls, Kansas

Species	No. of Trees	Avg. Age	Avg. Dis.	Percent of Species Total				% of Total Trees	Value ¹
				Good ²	Fair ³	Poor ⁴	D&D ⁵		
American elm	496	45	17	24	29	28	19	30	\$137,808
Chinese elm	407	30	12	41	29	30	1	25	62,140
Red cedar	129	50	12	29	50	21	1	8	63,028
Green ash	100	40	13	49	30	20	1	6	57,326
Hackberry	92	45	12	72	21	8	0	6	59,933
Catalpa	79	45	16	18	42	41	0	5	24,019
Black walnut	56	15	6	84	14	2	0	3	10,383
Silver maple	44	20	9	55	18	25	2	3	7,656
Redbud	24	10	5	71	25	4	0	1	3,471
Red mulberry	24	35	15	46	25	29	0	1	10,992
Osage orange	22	45	17	50	50	0	0	1	18,877
"Fruit"	21	10	5	57	24	19	0	1	2,598
Pin oak	21	15	6	67	5	24	5	1	4,278
Hard maple	17	15	5	76	24	0	0	1	2,111
Bur oak	14	35	9	100	0	0	0	1	7,773
Sycamore	13	5	3	85	15	0	0	1	804
Pines	11	25	10	64	36	0	0	1	6,139
Miscellaneous ⁶	60							4	13,564
	1,632								\$494,012

¹GOOD: Healthy vigorous tree. No apparent signs of insect, disease or mechanical injury. Little or no corrective work required. Form representative of species.
²FAIR: Average condition and vigor for area. May be in need of some corrective pruning or repair. May lack desirable form characteristic of species. May show minor insect injury, disease or physiological problem.
³POOR: General state of decline. May show severe mechanical, insect or disease damage, but death not imminent. May require major repair or renovation.
⁴DLAD OR DYING: Dead, or death imminent from Dutch elm disease or other causes.
⁵Tree value calculations modified after current International Shade Tree Conference recommendations.
⁶Paper mulberry, Red oak, Black locust, Honeylocust, Hybrid elm, Kentucky coffeetree, Tree of Heaven, Sweetgum, Weeping willow, Per-simmon, Cottonwood, Baldcypress, Silver poplar, Tulip poplar, Ginkgo, Boxelder.

pointed by the Mayor or other appropriate official. The board is charged with responsibility to develop and administer a comprehensive community tree program. Selection of the board members is important to the effectiveness of the board. Ideally, the City Tree Board is composed of three to six informed, concerned and respected citizens. For example, individual members might be a city employee concerned with city maintenance, an arborist, the head of a civic service group, or a prominent business man.

CITY TREE ORDINANCE

Next, essential legislation should be enacted to give the City Tree Board authority to carry out a program. Codification used to provide authority for a street tree program is usually in the form of an Ordinance (as adopted in Kansas from Neely and Himelick¹⁸, which establishes the responsibility for street tree installation and maintenance.

The City Tree Ordinance should include: 1. Definitions of "street trees" and "park trees". 2. Creation and estab-

lishment of a City Tree Board. 3. Term of office. 4. Compensation. 5. Duties and responsibilities. 6. Operation. 7. Street tree species to be planted. 8. Spacing and distances from curbs, etc. 9. Trimming; corner clearance. 10. Dead or diseased tree removal on private property. 11. Authority of City Tree Board. 12. Arborists license and bond. 13. Review by City Commission. 14. Penalties for violation. 15. Repeal of conflicting ordinances and severance clause.

Kansas statutes¹³ grant to any Kansas municipality the authority to enact and enforce such as Ordinance and may serve as documentary guides for composing a valid code with adequate coverage to anticipate contingencies. It is important to study the local situation in depth and write the ordinance to accommodate immediate and future municipal objectives.


The enforcement of the local Tree Ordinance will be practicable only if: 1. The ordinance has the overwhelming support of the citizens of the community. 2. The ordinance was enacted as the result of an expressed desire of a majority of the citizens of the jurisdiction for a well ordered and maintained street tree program. 3. The ordinance provides some flexibility as to the species of street trees to be planted. 4. The ordinance grants authority to the enforcement equal to the responsibility placed on him to carry out the ordinance. 5. The ordinance protects the



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Improper location of street-side trees and short sighted planning can result in conditions like this.



An adequate street tree inventory should include: species names of trees, numbers of trees, age of the trees, diameter breast high and health condition of the trees.

constitutional rights of all the citizens of the jurisdiction. To be effective, it is necessary to convert the Ordinance contents into a set of operational policies and procedures.

TREE INVENTORY

After a City Tree Board is appointed and a Tree Ordinance enacted, one can be relatively sure that a community is serious about a street tree program. At this point, an inventory of all public trees should be taken. A Kansas extension forester familiar with tree species and conditions will assist in this inventory and it is suggested that at least one member of the Tree Board help.

An adequate street tree inventory should include: 1. Species names of trees. 2. Number of trees. 3. Age of the trees. 4. Diameter breast high (4 1/2 feet above ground level). 5. Condition of the trees (good, fair, poor, and dead or dying).

Tree inventory data will also help the Board determine the following: 1. Number of trees to be planted. 2. Species that should and should not be planted. 3. Number, species, and size of dead trees in need of removal. 4. Pruning and maintenance needs.

COMMUNITIES FORESTRY PRIORITIES

Based on the inventory information

and other factors, the board should define priorities, or a hierarchy of needs. In the eastern half of Kansas, the removal and disposal of dead and diseased elm trees would be a first priority item. This could be a very large undertaking in that the minimum cost of removing one tree is \$30.

Other communities might consider planting as a high priority, so long range goals should be determined. These goals should depend on the present situation and the anticipated growth and wealth of the community. This planning could be approached from the standpoint of "If the community's tree environment is to be adequately provided for, then so

(continued on page 65)

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Two federal job safety and health agencies will launch a joint project to speed the development and expansion of health standards to protect American workers from on-the-job hazards.

Over a 30-month period, the project will periodically issue completed rules and regulations governing approximately 400 toxic substances. An initial package of 40 standards is planned for the pilot program. At present, standards exist for the 400 substances but provide only threshold limit values for employee exposure.

Formal announcement of the \$3.5 million project was made by Assistant Secretary of Labor John H. Stender, head of the Occupational Safety and Health Administration (OSHA) at a meeting of the National Advisory Committee for Occupational Safety and Health (NACOSH) in mid-March.

OSHA and the National Institute for Occupational Safety and Health (NIOSH) of the Department of Health, Education, and Welfare, are the coordinating agencies. NIOSH is the research arm for OSHA, which enforces federal job safety and health laws.

During the past year, Stender has established as a high OSHA priority an increased emphasis on occupational health. In a current reorganization

within the job safety and health agency, he said he would substantially increase the number of health standards personnel. Additional compliance officers also are being recruited.

On Jan. 29, OSHA published 14 health standards to protect workers from cancer-producing substances used in industry. More recently, the agency began an investigation into the dangers of vinyl chloride following reports of deaths and illnesses among workers engaged in the use of this substance.

The completed standards would prescribe informing employees of hazardous substances, emergency treatment in the event of accidental exposure, and proper conditions and precautions for safe use of the substances.

The standards also would prescribe protective clothing and/or equipment, monitoring or measuring exposure conditions, recordkeeping requirements, and the type and frequency of medical surveillance for employees.

City Trees

(from page 30)

many trees will need to be planted, so many trees will need to be removed, and so much pruning will be needed during the next five or ten years." If planning is done systematically, it will be easier to budget and gain citizen participation.

A five-year planting plan would

segregate species of trees into small, medium, and large sizes. Recommended species by size class, would then be programmed by year of planting. Ideally, the medium and large long-lived trees should form the "core" of street trees. Some of the better trees in Kansas for this purpose are bur oak, hackberry, London plane, and honeylocust. These trees should be complemented with small flowering trees such as redbud, flowering crab, and hawthorn.³

Unless a particular, declining tree has sentimental or historical value, it would not be economical to try to save it. The most expeditious plan, especially for smaller communities, would be removal or replacement.

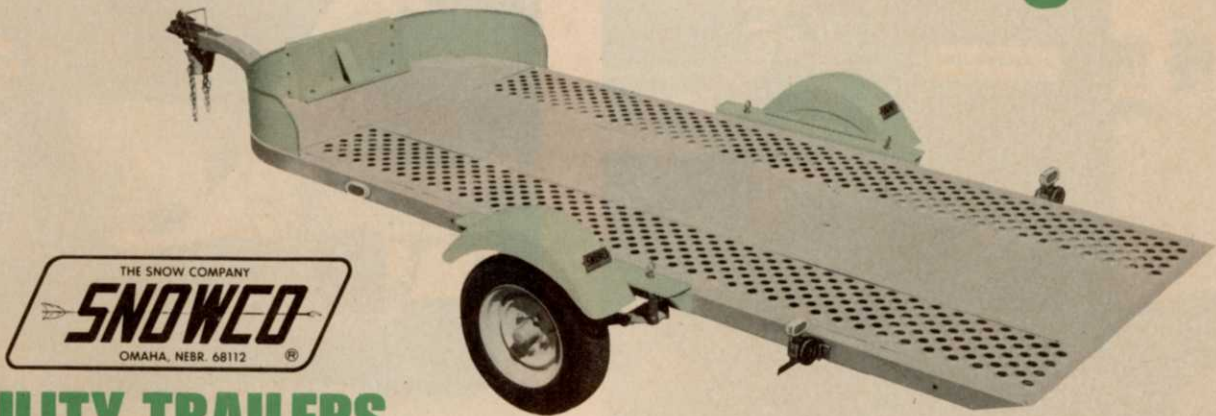
TREE PLANTING WORK PLANS

Annual work plans necessary to accomplish long-range goals should be carefully prepared and specified to complete immediate tasks. One alternative is to have municipal government assume total responsibility for the planting program. This includes purchase of trees, planting, site location, and actual planting.

Another alternative incorporates projects that can be developed and coordinated by the City Tree Board or another equivalent body. Garden clubs, Lions, Rotary, or Scouts are several of the organizations that could contribute

(continued on page 68)

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City Trees

(from page 65)

to a tree planting project.

A planting project can be divided into eight components. It would be a community choice to take the optimum combination of the parts for its own project.⁹

Order Taking: a. Contact property owners personally and take orders. b. Mail tree order forms to property owners. This can be done by direct mail or included with utility statements. c. Print cut-out form in newspaper. d. Publicize project by newspaper and radio and take telephone and/or personal orders.

Payment: a. Take advance payment from property owners and only order trees for which money has been received. b. Purchase trees from city funds and bill property owners later. c. Purchase trees from city funds and provide free to property owners. d. Solicit donations to establish tree planting fund. e. Take short-term low or no-interest loan from bank to establish tree planting fund.

Purchase: a. Purchase trees direct from local nursery. b. Purchase direct from wholesale nursery. c. Solicit bids from two or more nurseries. d. City owned nursery.

Receipt and distribution of trees: Receipt: a. Specify that nursery deliver to a central location. b. Arrange to pick up trees at nursery. Distribution: a. Have property owners pick up trees at central point. b. Deliver to individuals.

Planting site locations: a. Locate and stake individual planting spots (this should be done in advance of ordering in order to fit trees to sites). b. Enact city ordinance providing for street tree planting. c. A combination of a and b.

Planting: a. Have property owners do complete planting job. b. Arrange to have holes dug by utility company or other organization as public service and have property owners plant trees. c. Arrange for Scouts, 4-H club or other youth organizations to plant trees. d. Arrange for local students or other individuals to plant trees upon request. (Property owners could contact them if they wanted their trees planted). e. Arrange for city crews to plant trees.

Immediate maintenance: a. Have property owners maintain trees (watering, pruning, weeding, etc.). b. Arrange for city crews to water and maintain trees. c. Add a maintenance charge to purchase price of trees to provide a fund to hire a student or other individual to maintain trees throughout the spring and summer.

Ceremonies: a. Arbor Day (14) is traditionally set aside for planting trees and is an ideal occasion to have a planting ceremony.

MAINTENANCE

Programmed maintenance, both

public and private including citizen participation, is essential to the prolonged success of a community forestry program. The City Tree Board should establish routine maintenance schedules and invite the general populace to share in some of the activities. Maintenance workshops for concerned townspeople could be conducted by the Board or a consultant expert.

Instructors could be Kansas Extension Personnel, commercial arborists, or a member of the community experienced in tree maintenance. State and extension foresters of Kansas, on a regular basis, hold day-long regional workshops in the winter for City Tree Board members and other city officials. These workshops concentrate on identification of common community forestry problems, alternative solutions, and development of individual work plans. A follow-up series of summer meetings is held in the participating communities with on-site demonstrations. The following topics are among those included: 1. Pruning. 2. Tree disease and insect damage diagnosis, with controls. 3. Cavity work. 4. Cabling and bracing. 5. Transplanting. 6. The right tree for the site.

COOPERATION IS ESSENTIAL

It should be emphasized that private enterprise as practiced by landscape gardeners, commercial arborists, nurserymen, groundsmen, and urban vegetation maintenance firms should and must be relied upon to conduct the majority of the tree growing, planting, and maintenance functions in communities both large and small.

As a point of historical reference, the Kansas Arborists Association, in 1962²³ supported the notion that "Urban Agriculture" activities be expanded and strengthened within the United States Department of Agriculture. The Association further resolved that similar pro-

grams not be incorporated within the, then proposed, Department of Urban Affairs. (Incidentally, the Department of Housing and Urban Development does engage in some academically stimulating duplication of programs especially in the area of landscape horticulture.)

In a very affirmative statement concerning cooperative urban forestry, Barber² stressed that "In all cases the facilities and services of private enterprises would be used to fullest extent possible. Contractors, tree repair experts, commercial nurseries, these and others would find important roles in cooperation with the responsible State agency." The Sikes Bill of 1972 further reads that "... provisioning of this Act ... encourage the utilization of private agencies and individuals furnishing services of the type described (urban vegetation management) ..."

Very often, municipalities believe they can save money by operating their own tree nursery, but more have failed than succeeded. Commercial arborists can solve tree problems in small communities lacking funds to employ a full-time municipal arborist.

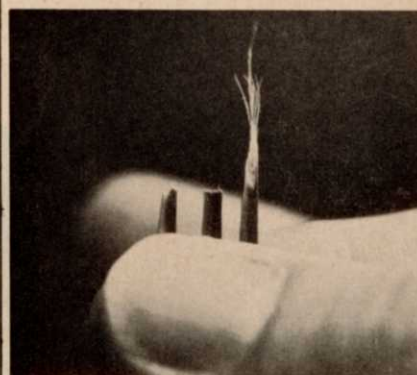
The key to a successful Community Tree Program is to blend the resources of the municipality, its citizens, public agencies, and private industry. In Kansas, the combination pays off! □

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A monoculture of city trees — American elms lining a street in Manhattan, Kansas.



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These American elms, planted in a "tree monoculture," are dying from the combined forces of Dutch Elm disease and phloem necrosis, another disease. Photo courtesy of Illinois Natural History Survey.

DED (from page 17)

elimination from the vascular conduits through which the infecting fungus moves. Time is critical here and its significance depends on whether the treatment is designed to be preventive or curative.

If preventive, the chemical must be applied in early spring (late May or early June in most places) and remain effective over a period of 4-6 weeks (into July in most places).

If curative, initial strength and rapid mobility might be decisive factors to achieve rapid and complete toxicity to the fungus. But in postinfection application, complete toxicity to all fungus elements of an established infection is unresolved.

5. *Is Benlate phytotoxic?* In concentrations necessary to be effectively fungicidal, does it cause side effects damaging to plant tissues into which it must move as a systemic?

All reports indicate little or no phytotoxicity at levels well above those required. However, some damage is reported at unusually high dosages in applications both of emulsified and solubilized forms. Probably because the initial evidence of lack of significant phytotoxicity is so encouraging, this point has not yet been evaluated critically.

To the extent that foliar application by spraying continues to show promise for preventive control, a critical study here to establish threshold levels of phytotoxicity is essential. Also, in flushing of Benlate emulsions into drilled holes in bark and wood, with resulting encrustation of exposed tissue surface by precipitated particulate matter, there is some possibility of localized toxicity.

However, it may be difficult, to separate apparent toxicity from wound-tissue reactions and subsequent microbial colonization. Many such wounds in 1972 healed quickly; thus, localized tissue damage by chemical toxicity or trauma is not considered serious. In effect, Benlate appears to satisfy the requirement for relative non-phytotoxicity.

USE AND RESULTS

One of the most hopeful signs that a satisfactory systemic chemical may now be at hand, is the wide variety of research being done. Many pathologists are testing new techniques to put Benlate into vessels of elm, the main sites of initial infections and ultimate spread of the causal fungus throughout the tree.

When first used against Dutch elm disease, Benlate was incorporated into the soil to be absorbed by the root system of the tree. Its effectiveness by this method was based on sustained presence of the fungicide over long periods of time, in some cases exceeding a year, as well as on uniformity of distribution throughout the vascular systems of the trees. However, soil application is disadvantageous for many practical and economic reasons.

Foliar spray by mist blower at the rate of 8 pounds per hundred gallons of water was effective in preventing new infections both in Wisconsin and Michigan,^{4,5} but is not considered to have value against established infections.

Systemic fungicides applied to foliage have limited ability to move downward in woody tissues, where the causal pathogen becomes deeply established. Therefore it is not likely that infection could be arrested, unless the