Bucket Rescue!

11 Steps To Safety

By ROBERT E. JONES
Administrative Assistant
Commonwealth Edison Co.

The two most basic requirements for rescuing a workman in a one-man bucket are to get the man down to the ground and out of the bucket so he can be cared for properly. He may be injured, unconscious, or impaired in some manner. His life depends on the actions of those nearby or his fellow workers.

The real problem in man rescue from single buckets exists when there is not several people present to assist in resuscitation efforts. If enough help were available on the ground, there would be no difficulty. In many cases, however, crews consist of only two men. The bucket they use is generally equipped with a mechanical, constant bucket-leveling system. Thus, the purpose of this article is to show how rescue is possible under these circumstances.

There are many different types of single bucket trucks in common use. The individual or firm contemplating the purchase of a bucket must consider the possible complications in retrieving a man from the selected aerial device should the need arise. If you are a user of a bucket, it may be necessary at some point and place for one man to rescue another. Full knowledge and understanding of the problems is important in making a quick rescue. Further, if the elements do not presently exist for easy rescue in your equipment, it would be my wish, to stimulate thought and action on the parts of manufacturers and users, to incorporate or "build in" those features necessary to provide for quick and effective rescue.

Let's look at a few situations involving single bucket equipment using machines with mechanical leveling. Here are some reasonable possibilities that might lead to problems in rescue.

- The worker could be having a physical seizure of some kind, a heart problem, a stroke, or loss of consciousness, etc.
- The unfortunate fellow may have been injured seriously with a power saw; he is in pain and bleeding. He is incapable of operating the controls from his location.
- The tree trimmer may have sustained an electrical shock. He has lost consciousness. He may or may not be breathing; his heart may be in fibrilation. We don't know what his problems are, but we do know that we must get him down.

In the event of any emergency, the other crew member will have to get to the master controls and commence the lowering procedure. Seldom is there difficulty in bringing the man down because he can usually be brought down by the same route he went up.

However, as in the case with some buckets, the machine does not have the capability to set the bucket on the ground. Unless the bucket has been modified by opening one side, it will be difficult to excise the wounded man. One possibility might be to bring the bucket down to the level of the cab shield, but the problem still remains. Perhaps the man could be pulled up on to the pro-

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Figure 1: A treeman has sustained an electrical shock. He is unconscious. His heart may be in fibrilation. He must be brought down.
Figure 2: One possibility might be to bring the bucket down to the level of the cab shield. Perhaps the man could be pulled up onto the shield.
Figure 3: Here again the workman is injured and needs help. The other crewman is in the process of lowering the bucket to the ground. It is impairative that the master controls always be readily accessible.
Figure 4: The bucket has been lowered to the ground so the injured can be easily reached. Perhaps his partner could lift or pull him out or get help.
Figure 5: The injured man may have heart and respiratory problems. He must be removed from the bucket so proper resusitation procedures can be applied.
Figure 6: The rescuer pulls the victim through the side opening feet first. This modified bucket approach requires the man in the bucket to wear a safety belt and strap whenever aloft. This must be detached before rescue can be completed.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

tective cab shield, but what would be done with him them?

Even if the unit has the ability to lower the bucket to the ground, the injured man may be too weak to climb out on his own power. His partner must either lift or pull him out or obtain help to accomplish the job.

Similarly, a lineman or tree trimmer who accidentally receives an electrical shock, will be slumped down in the bucket. He may have heart and respiratory problems. He must be removed from that bucket so proper resuscitation procedures can be applied. It would seem logical to simply reach in and pull him out. But he's too heavy.

True, but in emergencies of this kind, the rescuer can develop superhuman strength and is able to perform great deeds and unbelievable feats. Don't rely on this superhuman capability, though. It's better to be "for real" because sometimes it just isn't possible to develop this strength. Consider this example.

We have a two man single bucket crew. The big man is the boss; the little fellow is the bucket man. They've been busy with their daily work and suddenly the man in the bucket is in trouble. Something has happened and he is unable to function. He can't operate the controls and must be brought down and removed from the bucket. In this instance, the boss because of his size is able to grab hold and lift the 135 pound tiger right out of the bucket. No problem exists here.

However, suppose the situation is turned around. The little fella is the boss, as is sometimes the case. The big man is in the bucket. He's in trouble and he needs help. Can the little man develop enough superhuman strength to lift the big man out of the bucket? It is practically a physical impossibility for the small man to lift those 240 pounds of dead weight out of the bucket.

There has to be a better way, and there is.

In my company, this situation has been recognized as a potential safety problem. And it was established that a method should be developed to expidite rescue in all two man single bucket crews.

While looking at all the factors involved, we concluded that the real problem in retrieving a man from a single bucket was the size of the man himself. Therefore the rescue methods would have to provide for the "big man" especially, who could not normally be lifted or manhandled out of the bucket by his co-worker.

Two obvious possibilities seem to exist for getting the big fellow out, other than lifting him upward. The bucket could be tipped so he would practically fall out, or at least so he could be pulled out horizontally. Or one side of the bucket could be modified, so the man could be removed out the side.

On units that do not reach the ground, "manufacturer approved" modification of the bucket by opening one side seem to be a practical approach to the problem. The crewman on the ground can get into the bucket behind the injured, lift him slightly, then push his feet and body out through the opening and lower him to the ground.

Another variation of this approach is where the rescuer pulls the feet of the victim through the opening first, then partially lifts and pulls the man out bodily.

A note of caution: This "modified bucket" approach requires the man in the bucket to wear a safety belt and strap whenever aloft. It must be detached before rescue can be completed. *(Editor's Note: American National Standard Z133.1 specifies that "aerial buckets, platforms, or booms of such equipment shall be provided with some means of anchorage to which a safety belt or lanyard can be secured.")*

The other method of man rescue involves "tipping the bucket." Some buckets have this feature built into the system. There would be no problem getting a man out in this case, even if he were unconscious. However, most single bucket units do not have the capability of tipping; they come from the assembly lines with the mechanical leveling systems "built in."

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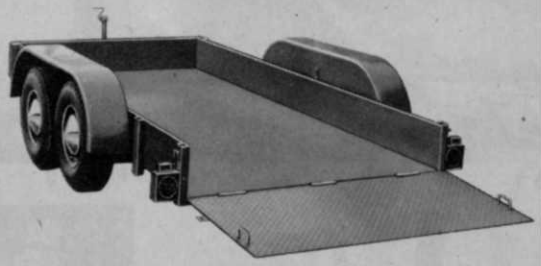

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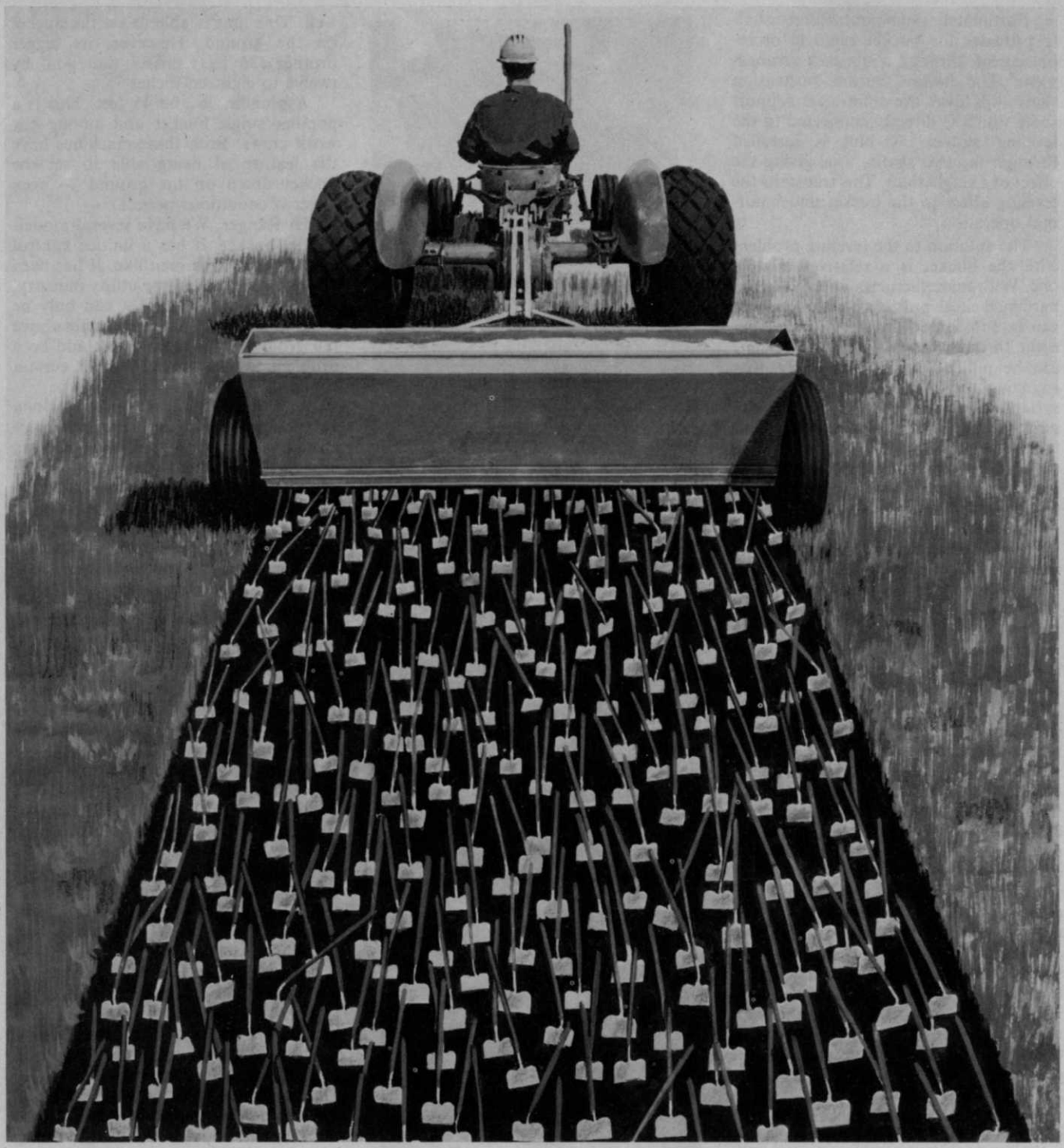

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Fortunately the manufacturer usually provides for bucket removal or replacement, through a slipshaft arrangement. The hollow bucket suspension shaft slips over the solid steel support shaft which is directly connected to the leveling system. A bolt is installed through the two shafts, thus giving the effect of a single shaft. This transmits the leveling effect to the bucket under normal operation.

The solution to the leveling problem with the bucket is a relatively simple one. With manufacturers approval, case hardened steel pull pins with retainers can be substituted for the bolt arrangement through the two shafts. The pins can be pulled quickly and easily, disengaging the bucket from the leveling system. To insure ease in pulling, the pins should be removed, cleaned and lubricated weekly.

In event of emergency, the second man pulls the pin and the bucket tips readily to facilitate removal.

At the beginning, I stated that there were two basic requirements for man rescue involving single bucket trucks. First, it's necessary to get the man down to the ground; second, he must be removed from the bucket.

The only way the second requirement can be accomplished is by another crew member operating the master boom controls in the lowering procedure. For the man on the ground to perform effectively, he must be familiar with the lower control of the particular unit to which he is assigned. The controls should be clean, workable, and clearly identified so that no mistaken moves will be made at the time of an emergency.

The lower controls should have the ability to stop any unwanted boom movement caused by an injured person at the bucket controls. Further, they should have the ability to override and take control away from those at the bucket. It is important too that the master controls be accessible and easy to reach quickly. Tools, equipment, work area protection signs, etc. clutter the area and make it inaccessible.

Many single bucket trucks are available. All are built for the purpose of getting a man up in the air, safely, easily and quickly, and in a position to perform his work. At Commonwealth Edison, we use six different makes. The following is a review of these machines and their capabilities for rescue:

McCabe-Powers, 35 feet. This machine does have the flexibility to set the bucket on the ground, in back of the truck.

Pitman Hotstick, 46 feet. We use this bucket in overhead line construction. It is essentially a double bucket unit, with only a single bucket installed. It can be lowered to the ground if necessary.

Holan, 27 feet. This is a little hand model for the speedy troublemen, or to facilitate overhead line construction as well. This unit is able to set the bucket on the ground. However, its bigger brother (36 feet) misses that goal by twelve to eighteen inches.

Asplundh, 36 and 45 feet. This is a popular single bucket unit among our work crews. Both these machines have the feature of being able to set the bucket down on the ground — even lower if conditions permit.

Hi Ranger. We have several models of this bucket. It has a unique control system which tree men like. It has been doing a good job in the utility industry, too. However, the bucket can only be lowered to a point about 30 inches above the ground. This limitation could be a problem in man rescue, under certain conditions.

Hi Arm. This bucket doesn't belong in the same class as those above. It is not an articulating boom type. Rather, it has a telescoping boom. It seems to be well adapted to light line construction in tight places. The bucket can be lowered to the ground, and it comes equipped with a power, bucket tipping feature. This can be of great benefit in removing an injured or unconscious person. □

Figure 7

Figure 8

Figure 9

Figure 10

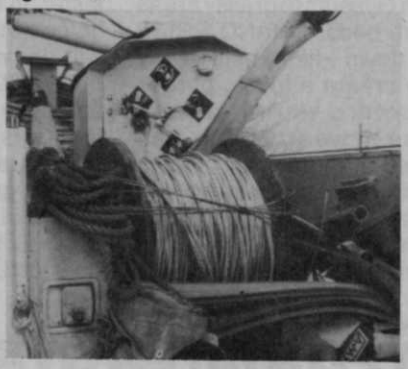

Figure 11

Figure 7: Most single bucket units are equipped with mechanical leveling systems. In the event of an emergency where it is desirable to tip the bucket to remove the injured worker, the leveling system presents quite a problem. One solution was to replace the slip-shaft bolt arrangement with case hardened steel pull-pins with retainers. Then, all the second man has to do is pull the pin and the bucket will tip readily. All equipment modifications should be cleared with the manufacturer.

Figure 8: The pins can be pulled quickly and easily, disengaging the bucket from the leveling system. To insure ease in pulling the pins, they should be removed, cleaned and lubricated weekly. After the bucket has been tipped, the injured treeman can be carefully removed.

Figure 9: In a situation where a small man might be slumped down in the bucket, with most of the weight being low, this machine can be operated from the upper controls to further lower and tip the bucket to a near horizontal position.

Figure 10: The quick-tip pull pin arrangements on all the various machines employ the principle of freeing the hollow bucket suspension shaft from the solid steel support shaft. This unit shows the use of a double pull-pin. Only ½ inch holes were provided in the shafts and the manufacturer felt the use of only one pin would be inadequate.

Figure 11: This is an example of what to avoid. In case of emergency these master controls would be difficult to reach and operate effectively.

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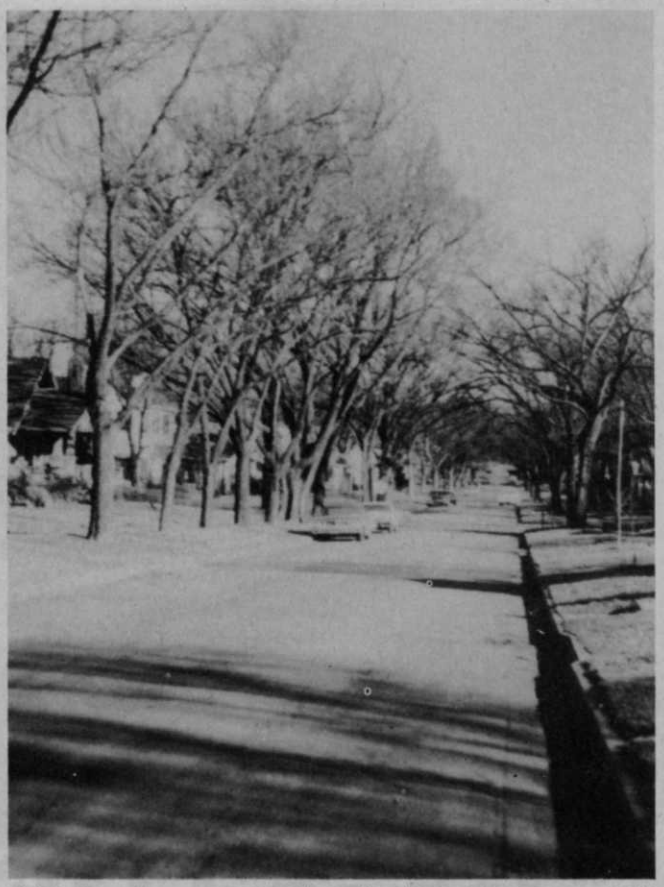
A Community Forestry Program



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.

By DR. JOHN W. ANDRESEN
Professor of Urban Forestry
University of Toronto
and
PHILIP R. DOLBERG
Montana Div. of Forestry

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 invironment.[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] 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-

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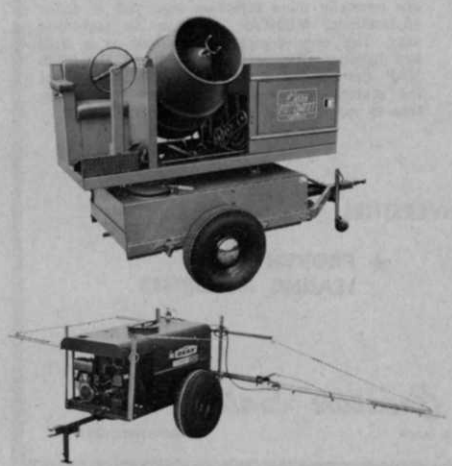

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TABLE 1. Tree Survey Statistics for community of Cottonwood Falls, Kansas

Species	No. of Trees	Avg. Age	Avg. Dia.	Percent of Species Total Good[1]	Fair[2]	Poor[3]	D&D[4]	% of Total Trees	Value[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

[1] GOOD: Healthy vigorous tree. No apparent signs of insect, disease or mechanical injury. Little or no corrective work required. Form representative of species.
[2] FAIR: 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.
[3] POOR: General state of decline. May show severe mechanical, insect or disease damage, but death not imminent. May require major repair or renovation.
[4] DEAD OR DYING: Dead, or death imminent from Dutch elm disease or other causes.
[5] Tree value calculations modified after current International Shade Tree Conference recommendations.
[6] Paper mulberry, Red oak, Black locust, Honeylocust, Hybrid elm, Kentucky coffeetree, Tree of Heaven, Sweetgum, Weeping willow, Persimmon, 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 Himelick[18], 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 establishment 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 statutes[13] 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[9]: 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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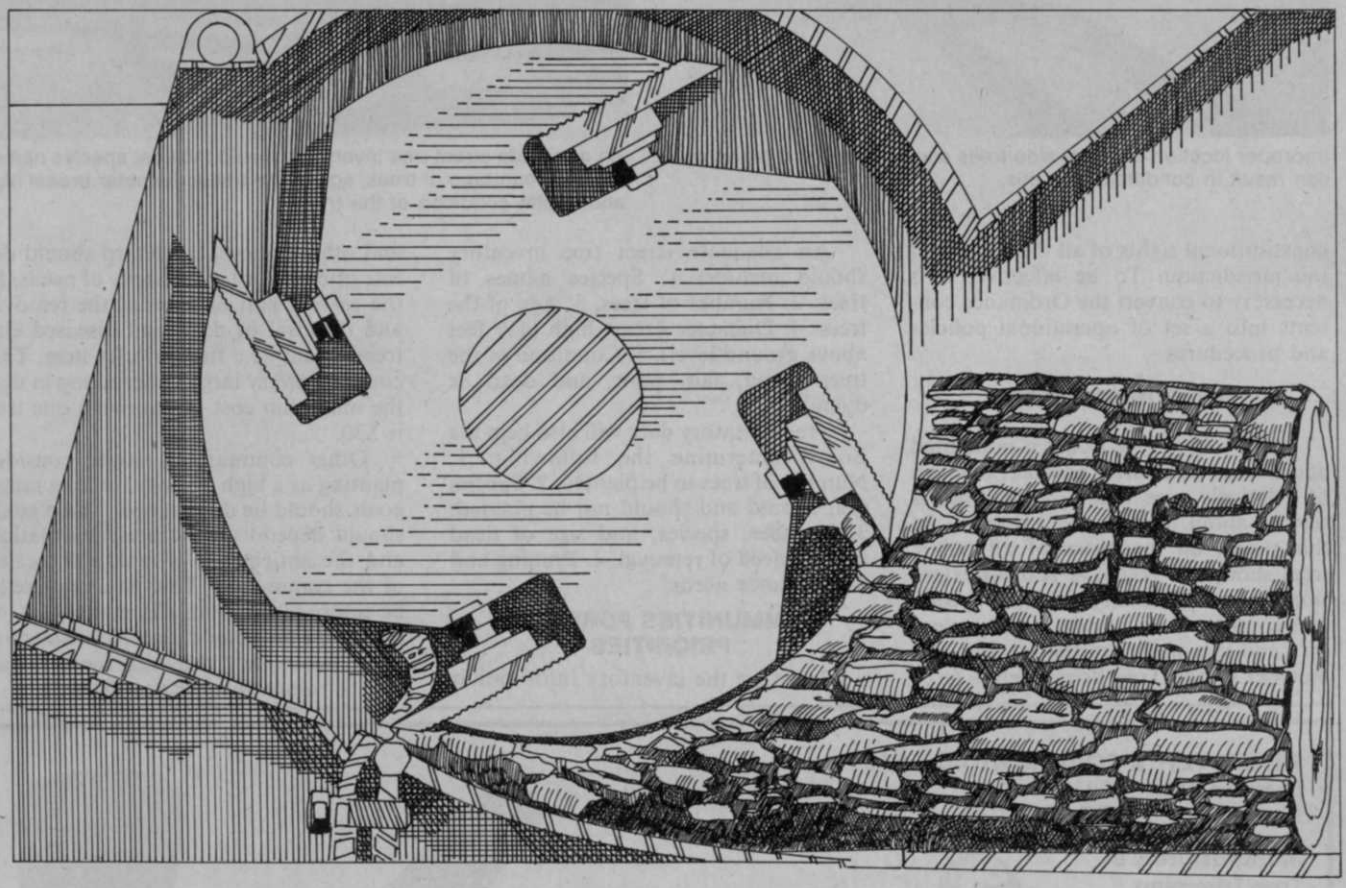

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Improper location of street-side trees and short sighted planning can result in conditions like this.

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 (4½ 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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#20 HEAD and SAW

#103-D SAW SCABBARD

Equipment meets O.S.H.A. standards