



In Brief: Mechanization today is providing automation to tree maintenance and tree removal programs. In this article John Buckley outlines views of arborists regarding equipment expenditures. He presents case histories of three groups who have moved in the direction of automation.

Automation

Modern Tree Trimmers Ride to Work . . . all the way to the tree top

BY JOHN R. BUCKLEY

Pitman Manufacturing Company

LIKE roots of the sturdy Oak, the roots of automation likewise have journeyed many an

avenue before reaching the tree trimming industry. It was inevitable, however, that new methods would prevail to economically expedite tree maintenance and tree removal programs within park departments, municipalities, utilities and similar areas.

Today's modern trimming crew, usually three men instead of the former complement of six or more rides all the way to the job, right up to tree-top heights, in modern, truck-mounted aerial units equipped with hydraulic and/or pneumatic power at the bucket(s) for operating cutting and pruning tools.

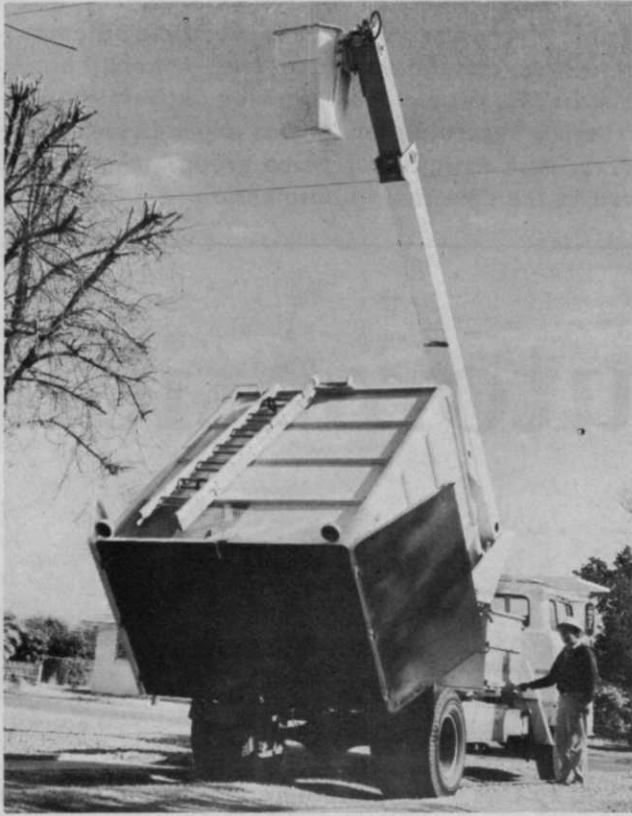
Moments after arriving at the job site, a 2-man crew is airborne and ready to trim. Aiding their efficiency is the aerial unit, which has all but eliminated non-productive set up time. Moreover, these innovations are adding safety to a once hazardous occupation.

Today's tree trimming crew requires a sizeable investment in modern equipment. Progressive departments have made this investment in order to meet rising workloads with basic work forces. The few hundred dollars



Progressive utility on west coast is using 40 units such as this mechanized package, above. Two-man unit includes aerial lift mounted on standard truck chassis, 41-foot Pitman Hotstik aerial unit with insulated aerial device. Chipper, mounted on truckbed, blows chips directly into special trailer.

With trimming completed, left, crewman uses aerial device to go aloft and apply coating to freshly cut boughs.



Easy to operate, this Salt River Project-designed chip box eliminates 6 to 8 trips per day to unload brush.

once sufficient to outfit a crew with a pickup truck loaded with saws, shovels, ropes and axes, has multiplied into several thousands of dollars for an aerial unit with a full complement of labor-saving accessories. However, the results of these totally mechanized crews, more than justify the expenditures.

Units Replace Climbing

The machine credited with mechanizing the tree trimming industry is the aerial device. Although there are many types, the 2 most acceptable for tree trimming seem to be the truck-mounted, hydraulically-operated, articulating (elbow) boom type with one or 2 personnel buckets at the tip of the boom; and the telescoping boom, also truck-mounted and with a similar personnel carrier. Most popular working heights of aerial units for tree trimming range from 35 to 50 feet. Being safety conscious, the majority of tree trimming officials insist on insulated booms when writing specifications for a unit. This insula-

tion, (or non-conductive feature of the boom and buckets) isolates the trimmer from a phase to truck ground should the boom accidentally come into contact with a live power line. Other fail-safe features of these units

include safety valves, commonly known as check valves, which prevent the boom from dropping should a break occur in a hydraulic line. In such instances (which are extremely rare) oil is trapped in the lift cylinder and the boom cannot drop.

Once the truck has been positioned and the trimmer has raised himself to working height by using boom function controls located at the bucket, he simply removes a power saw or pruner from a holder at the side of the personnel bucket and begins to trim. The cutting tools, chain saws, long-reach pruners and power knives, are kept in specially designed holders on the boom and in scabbards on the bucket. All are within easy reach.

Although the most acceptable power source for tools is the hydraulic power of the unit itself, many users have equipped their units with pneumatic power as well. Their argument in favor of the dual power source is that productivity is not lost should a malfunction occur in one of the systems. The power source for the pneumatic tools is found in

Salt River Project group incorporated telescoping aerial device, dumpbox, and brush chipper into one unit to provide crews with total mechanization.



a compressor usually mounted on the truck deck.

Brush Disposal Automated

As with trimming, automation has found a firm foothold in the area of brush disposal. It has done so in the form of brush chippers which are small, compact machines usually no larger than a mobile air compressor. Innocent looking as they are, when in operation they become screaming monsters with an insatiable appetite for limbs and branches.

Today, 2 methods have gained acceptance when brush chippers are used in trimming programs. The first includes a chipper as an integral part of the trimming crew. In this arrangement, the chipper is mounted onto the aerial unit truck or is towed behind it. The chips are blown into a dump box (also mounted on the truck) or into a separate chip box truck that serves one or more crews. This method, generally accepted as the most efficient, allows brush to be chipped while the trimming is in progress.

The alternate system provides a separate disposal crew with chipper and chip truck. When this system is used, the trimming crew piles brush at curbside for a disposal crew, which often serves as many as 4 or more trimming crews.

Studies supplied by various chipper manufacturers show that the modern chipper reduces brush to 1/15 of its original volume. This eliminates as many as a dozen trips to the disposal area. This is a common daily practice when brush has to be loaded upon trucks. Most chippers can accommodate logs up to eight inches in diameter.

The Why of Mechanization

With today's tree trimming industry aiming at total mechanization, many cost-conscious tree men are finding that results justify expenditures. Their reasons

can be summed up in the following points:

- (1) With labor demanding a premium wage in today's market, productivity must increase. It is impossible to increase efficiency with antiquated tools.
- (2) Paying a premium wage does not overcome the general shortage of qualified workers. Modern equipment enables 3-man crews to obtain the same

systematic trimming programs scheduled on a continuing basis.

- (5) Safer work methods, a by-product of mechanized equipment, have lowered accident rates in most areas.

Case No. 1

What was once a three-unit fleet of related equipment required for normal tree trimming jobs has been integrated into one



Whittier, Calif., municipality automated municipal tree trimming program by eliminating climbing. In operation is 46' insulated aerial device.

productivity obtained by the 6- to 8-man crews of yesterday's operations.

- (3) In areas requiring physical effort, a worker's productivity decreases with age. Aerial units equipped with tools are resulting in 15 to 20 years of productivity from experienced men who otherwise would be retired to jobs requiring less physical effort.
- (4) Mechanized equipment has eliminated the catch-as-catch-can method of trimming, replacing it with

unit by Arizona's Salt River Project. The former equipment consisted of a trailer-mounted chipper, a brush dump truck and a boom truck, with a crew of 4 men assigned to the operation. SRP found that the independent machines resulted in a variety of problems: (1) the open top chipper truck was responsible for debris being blown into the streets during chipper operation; and, (2) when trimming and chipping were required in congested areas, the limited maneuverability of 3 machines often interrupted traffic flow.



Relocating trees is but one of many jobs handled with Hydra-Lift crane used by Beverly Hills, Calif., Park Department.

To relieve these problems and add efficiency to its trimming operation, SRP, working with Pitman Manufacturing Company, designed a combination chipper-chipbox-and aerial device, all mounted on one vehicle. The 3-in-1 tree trimming package was installed on a standard tilt-type chassis. The aerial unit, a Pitman PELICAN II telescoping boom, was mounted directly behind the cab followed by a brush chipper on the curbside of the chassis. A discharge chute was installed between the chipper and a dump type chipbox was mounted on the rear half of the truck. In the road travel position, the boom stows over the chipbox and is supported by boom rest on the top side of the box. The throat of the chipper blower fits into grooves on the chip box, detaching automatically as the box is raised. A single power-take-off operates both the boom and the chipper.

SRP is achieving its objectives with the new unit. Furthermore it has reduced crew size from 4 men to 2 and has replaced 3 vehicles with one. Economy is obvious.

Case No. 2

Noted for its warm, year-round sunshine, Southern California's

envious climate is not so enviable to local arborists, whose job is keeping park and street trees trimmed. Such is the case at Whittier, California, located a few miles south east of metropolitan Los Angeles. Here, two 3-man trimming crews handle a large percentage of all tree maintenance in the city's 10 parks (60 acres in all) besides maintaining 40,000 to 50,000 parkway trees. These trees, more than 120 varieties, include maple, flowering pears, and canary palms.

As a supplement to their trimming assignments, Whittier's city crews are also assigned to town and park department tree rehabilitation programs, which dictate the removal of diseased and problem trees. Some 500 or more trees are removed yearly, many 100 feet tall.

Mechanization is aiding Whittier crews in expediting tree trimming and tree removal programs with a minimum of manpower. A fully equipped truck-mounted aerial unit complemented by a mobile 16" chipper with a hydraulically raised chip box, has increased productivity of each crew by more than 1/2 the amount realized when conventional methods were used. Key to their successful operation is versatility of equipment.

Whittier's truck-mounted aerial device is a 46 ft. Pitman MO HOTSTIK with an insulated upper boom made of EPOXIGLAS, and an insulating insert in the lower boom which includes a specially designed utility body for housing all tools needed in trimming operations. These tools have specific storage areas in the compartments of the body. Other compartments house safety cones, flags, caution signs, ropes and other related trimming aids.

An auxiliary engine is located on the truck bed for operating the aerial unit and cutting tools. This represents a dual safety feature since the HOTSTIK can also be operated off the truck PTO, providing an optional power source should one system fail.

The EPOXIGLAS boom provides isolation from a phase to truck ground to the trimmer should he accidentally bring the booms into an energized conductor. However, Whittier crews stay clear of distribution lines whenever possible, since the local electric utility has the responsibility of line clearing jobs. Holders on the boom, and a Whittier-designed scabbard on the fiberglass bucket of the aerial unit, keep cutting tools within easy reach of the trimmer during aerial trimming jobs. Once work has been completed, tools are stored in the utility body. Radio-controlled, the aerial unit and crew can be routed to trouble spots on a moment's notice.

While trimming is in progress, 2 groundmen, using a mobile chipper towed by a chip truck, dispose of limbs as they fall. The chip box easily accommodates a day's trimming and without it and the chipper, according to the crew, 6 or more truckloads of brush would result. Serving a useful purpose as a ground conditioner, mulch for hill sides and flower beds, and bridal paths, the chips are considered to be an extra dividend realized from trimming. The aerial unit, when

not being used for trimming, is used on various other municipal jobs. These include lighting maintenance, painting, and even hanging the city's Christmas decorations.

All told, Whittier municipal officials state that had they not taken the mechanized approach to keep abreast of their tree maintenance program, 3 times as many men would be required today.

Case No. 3

A new star has appeared in the Beverly Hills, Calif., Park Department. Starring in the Department's cast of sophisticated equipment for tree maintenance, the newcomer is breaking box office records in crew efficiency and productivity. Its noteworthy appearance has added mechanization to the non-specialized jobs of tree removal, replanting and material handling.

The new unit, which made its debut at the Park Department less than a year ago, consists of a 6-man crew cab chassis with a hydraulically-operated, telescoping crane, a utility body and a flatbed. All are incorporated into one integral package. This unit provides versatility which enables the machine to play the role of what otherwise would be 3 separate pieces. The combination truck crane and material carrier is a direct result of the Department's determination to retire its conventional "A" frame unit which was mounted on an antiquated army surplus chassis. The conventional unit was used to handle young trees weighing as much as 3000 pounds, and in replanting and rehabilitation programs. Although the older unit had ample capacity for these lifting assignments, its lack of bed space (the "A" frame required a majority of the truck deck) necessitated a second vehicle for hauling trees to the job site. On larger jobs requiring 5 or 6 men, a pickup truck had to be requisitioned in addition to the flat-

bed truck to transport the remainder of the crew to the job site. The crane unit would accommodate the crane driver and one man at the most. Due to its fixed, non-rotating boom, the truck always had to be positioned exactly when spotting trees into holes or loading logs onto the truck. Consequently, planting in congested areas often resulted in the truck being non-functional thus necessitating manpower in its place.

The limited versatility and age of the conventional unit dictated that it be retired in favor of a modern unit which could be employed in additional areas of the Department's work. In designing a replacement vehicle, the Department was determined to incorporate into one unit all of the functions that were provided by the 3 separate units. Their objective was to make tree planting and tree removal crews self-sufficient, with a minimum investment in mechanized equipment.

In doing so, standard crew cab chassis with a 157" wheel base and a GVW of 25,000 lbs. was purchased. Replacing the "A"

frame crane is a hydraulically-operated Pitman HYDRA-LIFT with a telescoping and rotating boom. Its mounted position, 26 inches directly behind the crew cab, does not sacrifice load space. A 10' deck, complete with a utility tool compartment, finalized the package.

The integrated unit has proven to be a time saver and its versatility enables it to do many jobs. On planting jobs, the unit is driven to the arboretum and positioned at the trees to be loaded. Its outriggers are extended for stability and the boom rotated to pick up and spot each tree onto the truckbed. At the job site, the procedure is reversed, as the trees are spotted into holes. The rotating and telescoping features of the boom permit the truck to be parked at curbside when parkway trees are being planted. This eliminates driving over curbs or interrupting the flow of traffic, a common occurrence when the older unit was employed.

All tools needed for the job are stored in a tool compartment built into the deck of the unit.

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Tree Planting Tips

Poor tree planting practices can lead to heavy initial mortality and poor growth and form, reports Douglas Bryant, horticulturist with the Cooperative Extension Service of New Mexico State University.

Following are Bryant's suggestions for successful tree development:

- (1) Keep the roots moist until planted*
- (2) Guard against freezing injury to the roots*
- (3) Provide a space both deep and wide enough for the whole root system so that the roots aren't bent or folded*
- (4) Place the tree straight in the hole, never slanting it forward, backward, or to the side*
- (5) Plant the tree to a depth just slightly deeper than that at the nursery*
- (6) Water thoroughly to make sure the roots are in close contact with the soil and check often to see that soil is firmly compacted around the tree roots.*

Insect Report

WTT's compilation of insect problems occurring in turfgrasses, trees, and ornamentals throughout the country.

TURF INSECTS

MAY BEETLES

(*Phyllophaga* spp.)

Michigan: Increasing in blacklight traps in Lenawee and Livingston Counties since April 23.

CHINCH BUG

(*Blissus Leucopterus*)

Rhode Island: Present in lawns in State.

A MEALYBUG

(*Chorizococcus roestellum*)

Arizona: Moderate in Bermuda grass in Gila and Roll areas, Yuma County.

CLOVER MITE

(*Bryobia praetiosa*)

Maryland: Ranged 500-700 per 10 sweeps on Kentucky bluegrass on turf farm near Ashton, Montgomery County.

SOD WEBWORMS

South Dakota: Present in western and eastern areas; some lawns damaged earlier this year. Nebraska: damaging lawns in Lancaster County; 35 per square yard at one location.

INSECTS OF ORNAMENTALS

APHIDS

(*Macrosiphoniella sanborni*)

Oklahoma: Decreased sharply past week due to lady beetles and syrphid fly larvae; predator-aphid ratio 1:10.

(*Myzocallis arundinariae*)

California: Heavy on bamboo nursery stock and *Neophyllaphis podocarpi* heavy on podocarpus nursery stock at Fresno, Fresno County. *Myzus cerasi* heavy on *Prunus avium* at Sacramento, Sacramento County.

(*Cinara tujafilina*)

Nevada: Heavy on arborvitae at Reno and Sparks area, Washoe County; honeydew heavy.

BAGWORM

(*Thyridopteryx ephemeraeformis*)

Ohio: Nearly all overwintering eggs hatched; larvae out in Scioto County.

SPIDER MITES

(*Tetranychus* spp.)

Nebraska: Increasing rapidly on juniper in south-central counties. New Mexico: Building up on junipers at Las Cruces, Dona Ana County. Arizona: Heavy on pyracantha in many areas of Salt River Valley, Maricopa County.

BOXWOOD PSYLLID

(*Psylla buxi*)

Maryland: Infestation levels above normal this year on American boxwood. Virginia: First adults May 12 on American boxwood at Blacksburg, Montgomery County; populations approximately one-third adults.

AN ARMORED SCALE

(*Hemiberlesia lataniae*)

California: Heavy on yucca nursery stock in Chino, San Bernardino County.

OYSTERSHELL SCALE

(*Lepidosaphes ulmi*)

Ohio: Hatching; crawlers in central area. Lilac most severely damaged; but poplar, grape, pachysandra, and peony occasional hosts. Iowa: Heavy on lilac in Sioux City, Woodbury County. Minnesota: First crawlers May 15 at St. Paul.

PRIVET THRIPS

(*Dendrothrips ornatus*)

California: Light on privet at Cloverdale, Sonoma County. Collected by S. Bradbury, May 8, 1968. This is a new state record.

BLACK VINE WEEVIL

(*Brachyrhinus sulcatus*)

Ohio: Pupation just beginning in Lake County. Mostly late instars and pupae collected in upper inch of soil around bases of *Taxus* plants.

TREE INSECTS

BALSAM TWIG APHID

(*Mindarus abietinus*)

Pennsylvania: Heavy on new terminal growth of Concolor fir in Centre County.

EUROPEAN PINE SHOOT MOTH

(*Rhyacionia buoliana*)

New York: Larvae feeding in Suffolk County. Ohio: Late instars infested 5-10 percent of new shoots in stand of about 200 red pines in Ashland County. Infested 60-80 percent of shoots on some trees. No pupae. Michigan: Larvae moved from overwintering quarters; active within new candles.

NANTUCKET PINE TIP MOTH

(*Rhyacionia frustrana*)

Alabama: First-generation larvae pupated in tips of new growth on isolated young pine plantings in central and southern areas. Oklahoma: First-generation larvae in tips of new pine growth in Murray County. New York: Moths 50 percent emerged in Suffolk County, May 13.

AN OLETHREUTID MOTH

(*Eucosma gloriola*)

Michigan: Caught 11 males and 6 females in Ottawa County plantation.

ARMORED SCALES

(*Phenacaspis pinifoliae*)

Minnesota: Crawler emergence about 75 percent complete at Minneapolis and St. Paul area.

EUROPEAN ELM SCALE

(*Gossyparia spuria*)

Nebraska: Damaging 20 percent of elms at Franklin, Franklin County.

ASIATIC OAK WEEVIL

(*Cyrtipistomus castaneus*)

South Carolina: Collected on oak foliage in Kings Mountain State Park, York County, July 14, 1967. This is a new county record.

Compiled from information furnished by the U. S. Department of Agriculture, university staffs, and WTT readers. Turf and tree specialists are urged to send reports of insect problems noted in their areas to: Insect Reports, WEEDS TREES AND TURF, 9800 Detroit Ave., Cleveland, Ohio 44102.

Automation

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These include axes, shovels, ropes, stakes, etc.

Beverly Hills' truck crane, personnel and material carrier unit, has increased tree planting activity 2-fold. When not being used for planting jobs, it can be found on tree removal jobs or carrying men and maintenance tools to various job sites. For example, at the beginning of a work day, the HYDRA-LIFT may be used to load rotary mowers, power rollers, renovators, or hammer knife mowers on the truck deck, then distribute the men and the machines at various locations throughout the city. This procedure is reversed at the end of the day.