

JULY, 1968

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The Cover

Michigan's Department of State Highways has been doing an excellent job in maintaining newly planted trees on the

state's highway rights-of-way.

This particular operation is on Interstate-96 near Lansing. Once the landscape contractor's guarantee period of 90 days expires, tree survival becomes the responsibility of the Department.

Trees on this 11-mile segment were watered continuously for 3 months beginning July 1, 1967. Each tree received about 10 gallons monthly. Work was done by regular road maintenance forces, augmented by seasonal workers. A 1000-gallon truck mounted tank with pressure pump and 1½-inch fire hose with fog nozzle proved to be a practical approach for watering the young plants.

District Maintenance Engineer Joseph Badaluco reports that, "We use a 1½-inch hose because a 1-inch garden hose would be too slow. Pressure on our pump is kept to a minimum and the fog nozzle breaks up or disperses the heavy stream of water we would get with a regular nozzle on a 1½-inch hose."

Besides watering, trees were sprayed with insecticide and fungicide. Spray work was handled by a specially trained district forestry crew, using a Roto-Mist sprayer.

This year plants are being handled by this specialized crew. Maintenance includes fertilizing, watering, spraying, and some cultivating during this second year. Badaluco anticipates that trees will need only limited maintenance during 1969 which will be the third growing season on the site. In the cover picture is Dan Stump, Lansing, a student doing summer work with the Department.



WEEDS TREES and TURF

FORMERLY WEEDS AND TURF

July 1968

Volume 7, No. 7

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The horticultural student training program of Cleveland Public School System, featured this month in WTT, is an eye-opener. It is the only major attempt we know of where local industry members in the vegetation care field have helped sell a comprehensive training program for their future help.

Some 350 high school students are now being exposed to the vast scope of non-crop horticulture, and the opportunities it offers for careers. Further, they are getting practical vocational training, and they are getting the chance to earn money on part-time jobs within the industry. The Cleveland program goes beyond the 3-year high school vegetation care curriculum and offers a 2-year technical school for post-high schoolers. This is a step beyond what can be expected of many metropolitan school systems.

But the vocational high school training is within the scope of more than half the high school districts of the nation. Even though only a small

percent of high school students who take these courses go on to college or enter the horticultural industry's labor market, the effort will be of countless value to the vegetation care industry.

Among these values is the fact that more young adults will have an appreciation of efforts to add and maintain green areas in our cities. They will understand the value of the non-crop horticultural industry. And they will have some technical knowledge in caring for their own future home lawns. This, in itself, is a plus for the industry.

For many young people, high school training will help them find a vocation. Some will be choosing careers in an area in which they had little interest or background prior to their vocational high school training in the field.

Funding for many schools will be a problem. But federal and state monies for such training are available. Only impetus for such a program is needed. Vegetation care industry businessmen can get this job done. It can do much to aid the future help problem which the industry will surely face.



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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.

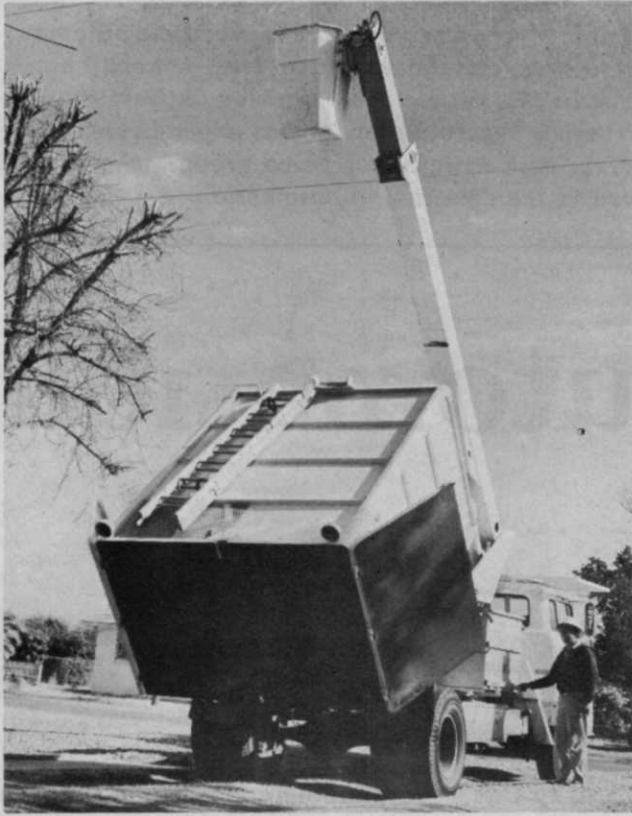
Moments after arriving at the job site, a 2-man crew is airborne and ready to trim. Aiding their efficiency is the aerial unit, which has all but eliminated non-productive set up time. Moreover, these innovations are adding safety to a once hazardous occupation.

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.

(Continued on page 32)

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.*



Technician student, George Baker, mows tee at Cleveland Metropolitan Park golf course.



Students in technical school which is post-high school gain experience with equipment.



Technician student, John Healy, makes lab tissue tests for foliar nutrient analyses.



Technical school group gets practical as well as classroom experience such as sod installation.

Formal Training and Recruitment

A PROGRAM, set up and run at the local level, appears the best answer to date in supplying trained help for the horticultural industry.

Men in every phase of the industry—arborists, nurserymen, golf course superintendents, spraymen, landscapers, sod growers, park managers, and others—decry the fact that enough competent help is not available.

Today, one of the few local programs of any size which is attempting this job—recruiting students for formal training in this field is that of the Cleveland Public School System, Cleveland, O. This is a local school system program which trains students in horticulture during their final 3 years of high school. The program also includes a 2-year technician school for post-high school students, aimed at training foremen for the vegetation care industry. The program was started in 1962 with 17 high school students. Enrollment is now 349. The 1969 classes will involve 375 students, 25 of whom will be in the 2-year advanced technician program.

Vince Feck, a teacher with

can help meet the industry's labor needs

agricultural education training heads the Horticultural and Technical Vocational Division. Because of the scope of the program, and the important job of recruitment, he finds little time for teaching. Feck headquarters at the Cleveland Board of Education building in downtown Cleveland and administers the program which is carried at 9 of the city's high schools. The technician program, because of the need for field work, is handled at a number of the schools plus nurseries and various field sites in the area.

The overall program has the single purpose of training non-college students for industry jobs. Student guidance counselors agree that many students who do not succeed in academic subjects do much better if provided with vocational programs. The Cleveland program in the horticultural area is aimed at giving trade school or vocational training to the high schooler who is interested in the vegetation field. Such high school students naturally will start in industry as hourly employees. By contrast, the technical program

which offers 2 years of post-high school training plus required work in the industry during this

period, provides qualified employees with definite potential as foremen. Some of the techni-

Cleveland Board of Education Horticultural Technical School

Enrollment Details:

Eligibility: High school graduate or equivalent
Residence: None required (out-of-state students pay same fee as local enrollees).

Interest and Experience: Students accepted who are interested in non-crop horticultural training including training as arborists, spraymen, turf specialists, golf course superintendents, nurserymen, park management, municipal operations, and similar vegetation care positions.

Draft Status: Students enrolled full time receive the same draft status as regularly enrolled university students.

Schedule: A 2-year school beginning September and/or January.

Cost: \$145 per semester for tuition plus books and laboratory fees.

Information: Contact Vince Feck, Coordinator
Horticultural Technical School
Cleveland School Board
1380 E. Sixth St.
Cleveland, Ohio 44114



Technical school at Cleveland, O., gets young men ready for full-time careers in the broad range of jobs available in non-crop horticulture field. On the left is Bill Fry, manager at Forest City Tree Protection Company, Cleveland. Fry devotes time to teaching in technical school and at present has 2 students in the employ of his company. Next to Fry is Vince Feck, coordinator for the School. Student on the truck with spray gun is Angelo Cammarata and at right is Student Nick Costello.

cian students find and fill foreman jobs during their period of schooling.

School Credits Given

The Cleveland program should not be confused with work-study and similar Federal government programs which subsidize young, unemployed prospects. The Cleveland school program is a vocational type training for which formal school credits are given as is true with other types of vocational school programs.

For example, high school students from the sophomore through senior years can take a specified curriculum in the horticultural field. This major course of study is aimed at preparing students for both semi-skilled and skilled positions. Courses for the high school student include identification and culture of ornamentals and turf, seeding, sodding and renovation of lawns, control of weeds, insects and diseases, watering, fertilizing, mowing, spraying,

mixing soils for top-dressing, aerifying, and dethatching. Related skills are also taught in small engine maintenance, landscape planning and some soil science, botany, and physiology.

Students beyond the high school level in the 2-year technician program can specialize in either a turf management program or in ornamental horticulture. Their courses are more technical in nature and they are taught by instructors from the industry who teach only on a part-time basis. Courses are planned on an 18-week semester basis. Students are scheduled for 25 hours of class work weekly. Many work an equal number of hours as paid labor in metropolitan Cleveland companies specializing in the student's major subject matter area. Currently, the technical students are working for arborists, golf course superintendents, and landscapers. In the classroom and field laboratory sessions, they get practical

instruction direct from teachers who are in the vegetation care industry. Besides horticultural subject matter, technicians also receive training in business principles, communications, and mathematics.

Program Is Needed

Need for a program such as this at Cleveland need not be argued. In Ohio, which is typical of many other states, only about 19% of all high school students are engaged in some type of vocational education. A whopping 81% are enrolled in a general or college prep course, yet less than 22% or only about one in five has some type of definite plan for either college or post-high school training.

For a school system contemplating a program of this type, funds for operating will be a big factor. Feck says the cost of the program is high, partly because of the low enrollment per teacher (about 30) and because of the facilities and equipment which are essential to provide adequate instruction.

Available funds include both federal and state monies. The Smith Hughes Act, the George Barden Act, and the Vocational Education Act, 1963, combined to provide some \$225 million nationally in federal funds for the year ending June 30, 1967. Ohio's share of these funds amounted to almost \$10 million. Such federal money may be and is used for vocational education for those attending school, for post high school instruction, and for training and retraining people already in the labor market. Among other things, money can also be used for construction of vocational facilities, and teacher training and supervision. States and local school systems also have provisions in most areas for some type support for such training. The 2-year technicians in the Cleveland program also pay a \$145 per semester fee. They

are recruited from areas throughout Ohio.

Facilities in the Cleveland school system for horticultural training are extensive. For example, at the West Tech school, facilities include 7000 square feet of greenhouse space plus a classroom, built at a cost of \$200,000. Other facilities are less extensive. Currently being built is a greenhouse along with teaching and outdoor planting facilities on top of the 2-story South High building. This is slated for use during the fall, 1968 season. Additional plans call for a new horticultural educational center facility with extensive acreage for work experience.

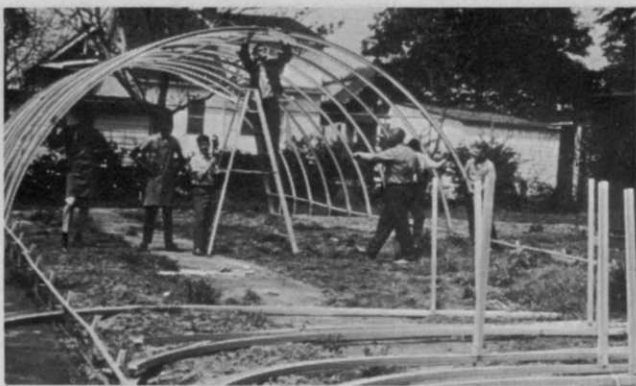
Problem Areas Exist

Naturally, a program as extensive as this must be questioned as to its effectiveness. It must deliver qualified employees for the industry, and it must attract students who have potential to become the type employee the industry demands.

Feck, who is directly responsible for the program, is the first to admit that many problems, both those on the surface and some which are deeply sociological, exist.

Cleveland, by the nature of its population make-up, has an inter-city youth problem, part of which hinges on poverty and part on race. The problem in many vocational training programs and in government sponsored work-study programs is that many of these young people are what are commonly referred to as unemployables. The question as it reverts back to the high school and technical horticultural training programs is the potential ability of the students being trained. Employers in the vegetation care industry, if they are to be competitive, have to have better educated help, employees capable of management, and more sophisticated equipment. They can not, and will not, trust their business and equipment to questionable em-

Plastic greenhouses such as this have been constructed by high school students at 3 schools.



West Tech High School has been beautified by borders planted by high school horticulture classes.



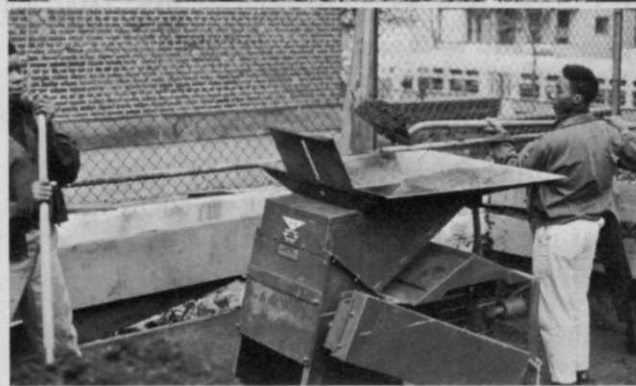
Golf green is constructed one year by high schoolers during their 3-year course.

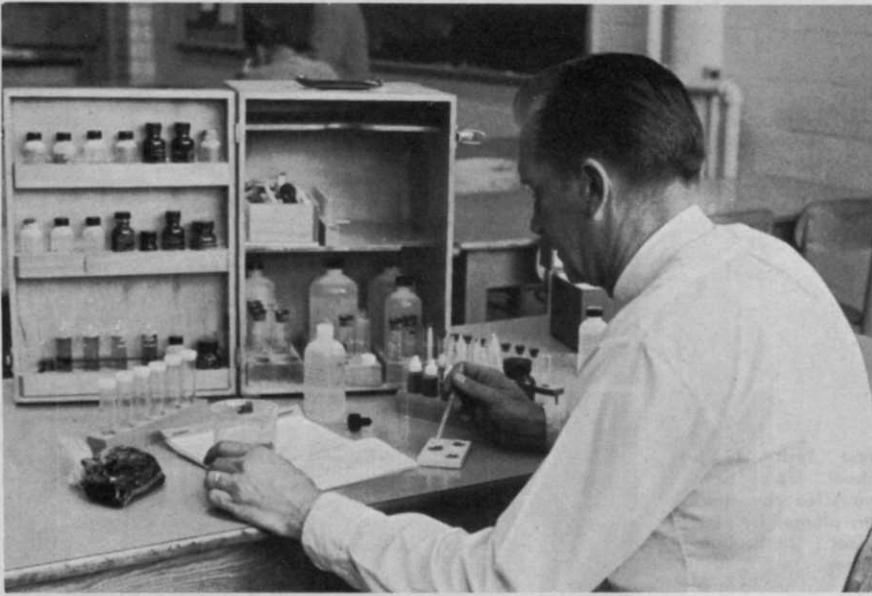


Annual garden at West Tech is planted seasonally by high school classes at that location.



High school students at Thomas A. Edison school operate soil shredder and other equipment.





Technician student, William Kilmer, in his second year of the technician course, uses a soil test kit for soil nutrient analysis.

ployees, however knowledgeable they may be in the subject.

The Cleveland experience is a matter of public record. There have been some failures but many have found a vocation in which they can and are succeeding. Frederic L. Witt, landscape architect for 50 Catholic cemeteries in the area, regularly hires trainee students. He reports finding a number of young men who have found a vocation and way of life and are working at it. Witt has high hopes for the program.

Top Students Attracted

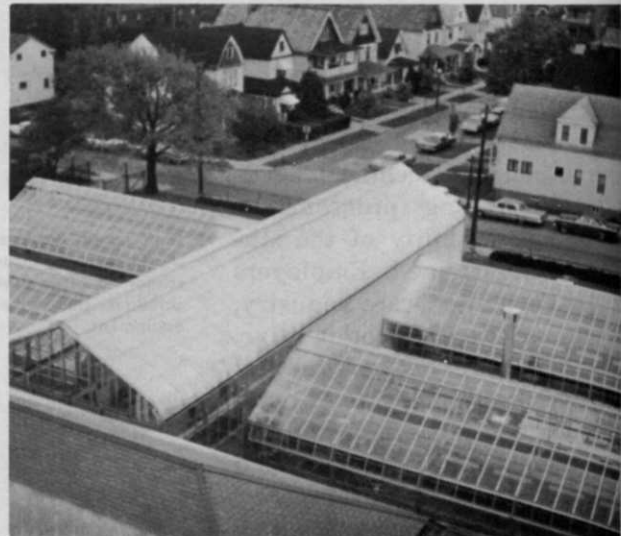
Because the horticultural training curriculum has been planned, as is typical for vocational training, for the student who does not plan for college, does not mean that only academically poor students are attracted. Feck says the opposite is more likely to be true. Many top students who do well academically, are taking the high school courses. A number, as a result of their high school experience, are majoring in related fields in college. Each semester, a number of the post-high school class of technicians are lost because they find that they want to pursue the training on a full-time college basis. This is not a pro-

gram loss, Feck states, but an overall gain for the industry.

Feck's belief is that more people in the vegetation care industry need to help in actively recruiting young people for training, both at the high school and post-high school levels. Feck emphasizes that the program is an industry conceived program. It operates with an advisory committee of industry, university, vocational, and educational leaders. Industry leaders are mostly those in the metropolitan Cleveland area who are hiring students on a regular basis.

The Cleveland program, though still relatively new, of-

Greenhouse complex, right, comprises more than 7000 square feet of facilities at West Tech High School.

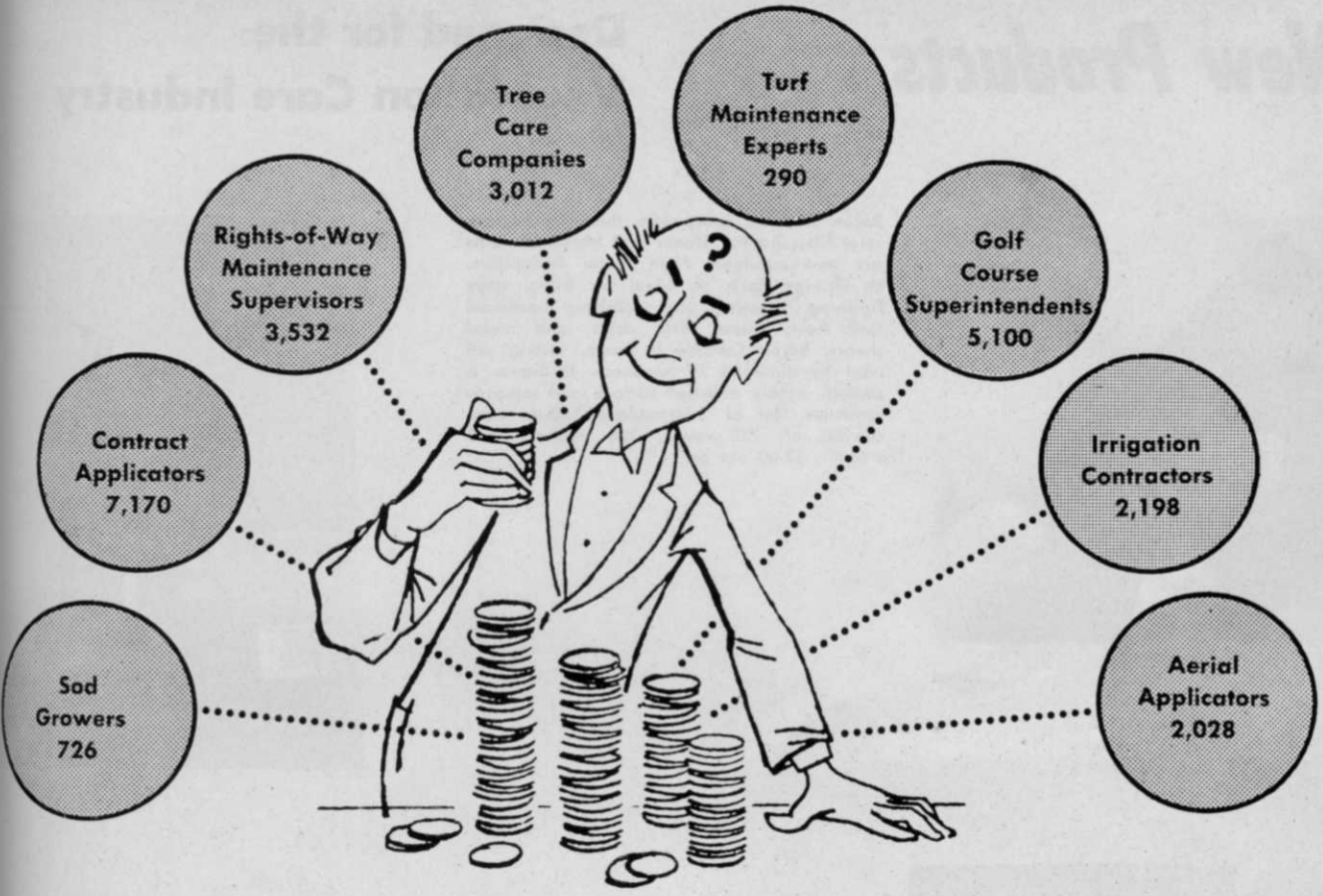


Student in technical post-high school curriculum repairs divots on Cleveland Metropolitan Park golf green.

fers an example of a major effort to attract and supply qualified employees for the non-crop horticultural industry. It has attracted national attention, with numerous visitors from other areas of the nation. Toledo, O., and Los Angeles, Calif., representatives have visited the program and are developing similar training programs. If the system is sound, many more of the same type are needed.

Then it becomes industry's responsibility to this and similar programs to offer the competitive wages necessary to secure and maintain such qualified personnel.

Puzzled ?



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sponsible for state and county weed and brush control, turf management and tree service; superintendents of large grounds (estates, industrial parks, military establishments, cemeteries, etc.); and the nation's prosperous sod growers. These buyers and users subscribe to *this*, their how-to-do-it, where-to-buy-it magazine, now in its 7th year, because WTT talks their language. Your advertising dollars sell harder and go farther in WEEDS TREES AND TURF. If you'd like full details, write us today and we'll send you one of our information-packed Market Fact Files by return mail.

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Boron Carbide Sharpeners that can replace steel files, honing stones and abrasive cloths are now available from Foster Enterprises, La Grange Park, Ill. Ideal for filing, edge finishing, dressing and polishing hardened tool steel, knives, bits, drills, and metal shears. Boron Carbide is tough, testing out next to diamond in hardness. It leaves a smooth, highly polished surface and removes scratches. Set of 3 (standard 1x8-in. size) consists of: 120 rough, 220 medium, 320 smooth. \$3.00 per set.

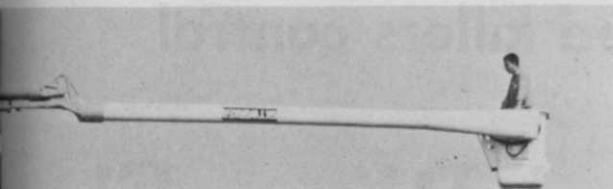


Spreadability is yours with the new Larson Broad-Caster, Model 400, according to the L. L. Larson Machine Co., Inc., Princeville, Ill. The single-belt drive unit spreads $4\frac{1}{2}$ times more area in 1 trip than ordinary spreaders, says Larson. Covering up to 20 acres per hour, it gives you an even flow of material (milorganite, fertilizer or seed) with uniform spreading—on curves, too! Ideal for close work around greens, tees, parkways and clubhouses, the spreader offers easy finger-tip control with no need to change application rates.

Martin Tire & Supply, Inc. has introduced a new flotation tire—the Martin Ultra-Flo 19.75-20. With an all-nylon, 18-ply construction, the tire has an extra wide tread for greater contact with sand and soft ground conditions and over-the-road use with a capacity of 11,750 lbs. Standard truck wheel and rim dimensions. Write the company, 154 N. Emporia, Wichita, Kansas 67202.



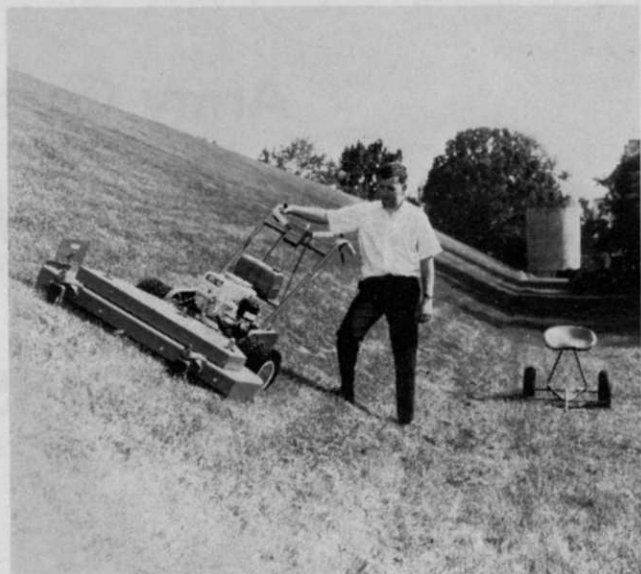
Black & Decker Mfg. Co., Towson, Md., has made available its versatile #982 Sabre Saw. While trimming branches, the saw makes a smooth, clean cut flush with the tree and can easily handle 6" to 9" limbs. Its light, compact construction enables you to get at those higher limbs: as you steady yourself with one hand, you can reach up and cut with the other—up, down or sideways. Available with 17 blades for every kind of material, the Sabre Saw can be used in a great number of ways on wood, metal, plastic, etc., says the company.



Transairco, Inc. has made available a new hydraulic aerial lift offering a work height of 55 ft. yet utilizing only 2 booms and stowing into a compact unit. The SKYWORKER ALPINE 55 can be positioned at any point between clear up and clear down and still provide absolute lift stability, says the company. A special safety valve locks the platform into position in case of power failure. Operated from an elevated or a ground position, the unit does not require mounting on a heavy truck. For details, write: Skyworker Div., Transairco, Inc., P.O. Box 360, Delaware, Ohio.



Heavy-duty polyethylene drum liners for the packaging and storing of bulk fertilizers are available from Polaris Plastics, Inc., 364 North Ave. East, Cranford, N. J. 07016. Available in rolls that can be used in automated filling of drums, the moisture-proof liners won't contaminate active ingredients.



Bunton Co.'s new 52-in., heavy-duty "Lawn Lark" rotary power mower handles like a lightweight unit with finger-tip power steering, according to the company. Powered with an 8 h.p. engine, the unit features a 6-qt. fuel tank, 7 forward speeds, independent blade control, dual traction wheels and brakes, adjustable front guard, and a hinged discharge chute guard. An optional rider attachment allows the operator to ride open areas and medium grades, detaches easily for use on steep grades and uneven terrain. For further information, contact the Bunton Co., Inc., 4303 Poplar Level Rd., Louisville, Ky. 40213.



A complete line of Teflon-S[®] coated shears has been introduced by the O. Ames Co., Parkersburg, W. Va. Hedge, grass and pruning shears with this harder-than-ever Teflon coating resist rusting, peeling, scratching and corroding. Even tree saps and grass juices won't stick, says Ames. The branch at left was cut with Teflon-S coated pruning shears that stay sharper longer and give crisp, clean cutting action—even on heavy branches.

Smithco, Inc. has introduced its "Red Ranger" carrier vehicle, designed specifically for "stop and go" service. Its separate driver's compartment enables the driver to get into and out of the vehicle easily. Capable of providing years of trouble-free service, it is ideal for the most rugged work, says Smithco. Of particular interest to golf course superintendents is its simplicity of operation and maintenance. Having neither transmission nor differential, it can be easily adjusted with a screwdriver or a wrench, according to the company. The "Red Ranger" can carry up to 7 men or 1000 lbs. For more information, write Smithco, Inc., Wayne, Pa. 19087.

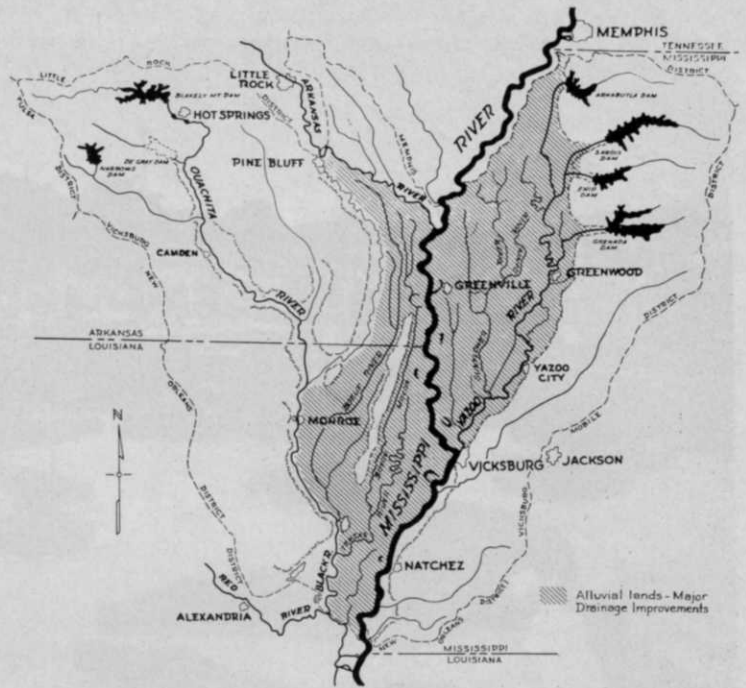
Army Corps engineers
and brush/weed killers control

Mississippi River Flood



Spraying of vegetation along the Yazoo keeps fast-growing willows in check. Barge can spray 6 miles of riverbank daily.

Channels



U.S. ARMY ENGINEER DISTRICT, VICKSBURG

FLOOD CONTROL on the Mississippi River is no longer a sandbag operation where levees and stopgap methods are used only in emergencies.

Today, army engineers believe they have developed a system which will control the super-flood, the kind such as the 1927 disaster that comes along every 100 years or so. They are using a combination of holding areas, floodways, canals, levees, and emergency backwater areas. The general idea is to be able to move a heavy volume of water when flooding occurs.

A major phase of this control program is keeping the floodways and canals open. Mechanical methods have become dated. Switch willows which choke water outlets cannot be kept back by clearing with handtools along the 2000-mile system. After cutting, switch willows capture debris and silt and in as little as 5 years can clog channels and practically choke off the outlet. Further, hand cutting costs today are prohibitive.

By contrast, herbicides will do the job. A spray boat can cover 6 miles of riverbank in a day,

and within a few hours brush and trees will be dying. "Am-mate" X weed and brush killer is now being used to kill woody growth, and control the plant down through the root system to prevent regrowth. Big plus is that this chemical kills the willows, yet permits stabilizing grasses which reduce erosion to thrive.

Corps Responsibility

The Army Corps of Engineers is charged with responsibility for a flood control program. Following Congressional authorization in 1928, the Corps developed a Waterways Experiment Station at Vicksburg, Miss. Many programs and methods have been developed through the years, but none has had to withstand the onslaught of flood waters as great as the flood of 1927. At that time, 28,000 square miles of land was inundated and more than 700,000 persons in a 9-state area made homeless. An esti-

mated 300,000 head of livestock was lost and 313 persons lost their lives.

Speaking of this disaster, John W. Anderson, technical liaison Corps officer at the Vicksburg office, says this 1927 flood was the once-in-a-hundred years event. Planning and construction today, he says, is aimed at controlling a superflood which might occur only once in 500 years.

The Corps has developed a hydraulic scale model of the Mississippi basin. It serves as a design aid in planning new levees, floodways and general control measures. The Vicksburg district office will serve as an intelligence command post during any coming emergency.

Should a new major flood occur, trouble is expected first at Cairo, Ill., where the Ohio and Mississippi rivers join. On the model can be seen the floodway across the river at New Madrid, Mo., where much of the flow



Scale model of Mississippi River and its tributaries shows visitors at the Waterways Experiment Station how the flood control operation works.

would be diverted to a holding pool. This pool site exists between the old river levee and a new protective rise constructed 5 miles inland.

Holding areas are located further downstream. These are actually lakes left behind when the engineers eliminated 170 miles of horseshoe bends from the river and provided it with a more straight, deeper, and generally more efficient channel.

Tributary Streams Vital

Besides the Mississippi itself, tributary streams are a vital part of the overall control system. The lower basin of the Yazoo River is planned to serve as an emergency backwater area. During earlier floods, this area between Memphis, Tenn., and Vicksburg often became a 65-mile wide lake. Anderson has reason to believe that with the present control plans which include 4 dams, that this area may be the most trouble-free spot along the entire river, should a major flood emergency occur.

Engineers and others who are expert in the field believe the climax of any flood on the lower Mississippi will come below the Delta. They propose to split the flow into 3 channel areas in moving the heavy volume of water into the Gulf of Mexico. Estimated volume is expected to be almost 3 million cubic feet per second, which is more than 10 times the average flow at Niagara Falls.

Delta Seems Secure

The question, of course, is how well will the defenses work during a major flood. Corps officials say that installations built prior to the floods of 1937, 1945, and 1952 proved adequate, but they have not had to withstand the so-called superflood as yet. One problem which engineers foresee is the hazard to new urban areas which have been building up more and more in the flood plains of rivers and streams. This trend points to big flood losses in areas which are not

included in federal or state programs for flood control.

Security of the Delta area hinges on towering levees and a full-scale effort to provide the flood plain with an efficient rainfall runoff system. Key to accelerated runoff is control of the fast-growing vegetation which without control quickly chokes off canals, streams and ditches which drain more than a million acres in the area. This is the assignment being handled by a regular schedule of spraying with an herbicide.

The 2000-mile drainage network is sprayed by teams working from a barge, via boat, and on foot. Assistant operations chief W. W. Gray reports that the Yazoo basin was once largely overgrown with switch willows which for practical purposes eliminated stream flow. Gray now uses a barge for spraying the main riverbanks, treating up to 6 miles daily. Boats are used on small streams and foot crews in further inaccessible areas.

Pelucia Creek is an example of mechanical clearing and regrowth, pointed out by Gray to show the futility of doing the job without benefit of weed and brush killers. Gray states that this area was cleared with machetes and axes some 12 years ago and now is so overgrown and filled with silt that even a canoe could not operate.

Formerly, Gray continues, gangs of 50 men or more literally hacked their way through swampy stands of willow and cottonwood. Work was slow, hazardous, and expensive. Once vegetation was cut, willows sprouted from the stumps and roots. Stumps and regrowth then captured islands of debris and silt. Within a few years the outlet system disappeared. This led the Corps of Engineers to turn to chemical control.

The Corps has been using DuPont's "Ammate" X because it gives the kill needed, yet does not create toxicity problems for

men applying it or to fish and wildlife. Neither are windborne vapors a problem to farm crops which are a major economic factor of this area.

Water Spray Common

This particular chemical is nonflammable, dissolves easily in water, and may be sprayed in either a water solution or in an oil-water emulsion. Or it may be applied in crystalline form to stumps or notched trees. Normally, for riverbank spraying, the Corps uses it in the form of a water spray.

Gray, who supervises the riverbank crew operations mixes "Ammate" in large quantities. For each 100-gallon batch, a 60-pound bag of herbicide is poured into a deck-mounted, 500-gallon tank and mixed with water which is drawn directly from the river. A quart of DuPont surfactant WK is usually added to ensure complete wetting of foliage. Pumps which produce nozzle pressures up to 800 psi permit boat teams to spray 30- to 40-foot wide bands of vegetation along the stream bank.

Cost for initial clearance, where full-grown trees and brush must be thoroughly wet down for control, averages \$400 per mile, or about \$100 per acre. This compares with mechanical clearing costs which are 2½ times greater or about \$250 per acre. Maintenance after the initial clearing runs \$135 per mile, or about \$30 to \$35 per acre per year.

Most of these costs are based on spraying from barges or boats. Where these cannot operate, such as on the BoBo Bayou operation last year, a tractor-drawn tank rig is used alongside the stream. Roadway or path for the tank rig in this instance was opened up by a bulldozer. "Gunmen" carrying spray hoses from the tank then penetrated to the stream bank on foot and sprayed vegetation.

Research and trials are now

being carried out using the new "Hyvar" X-P bromacil brush killer, also made by DuPont. Pellets of this herbicide are applied at the base of trees and after being carried into the soil by rain, attack the root system. This is a slower process than spraying, but it can prove helpful where men and equipment

cannot effectively operate.

Value of the entire operation will become readily apparent in the event of a major or super type flood. Should this happen, chemical control of streambank vegetation may prove to be the factor which made protection possible for homes in the flood plains area.

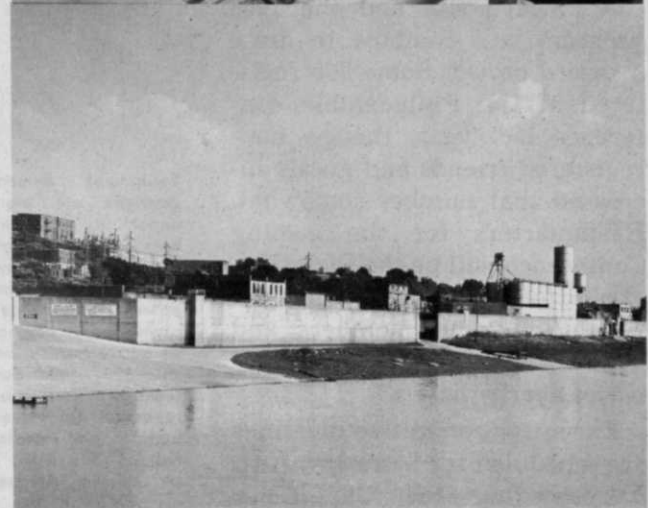
Flood gate and pumping plant at Yazoo City remove collection of interior drainage.



Barge from which 500-gal. batches of chemical-water mixture are sprayed can cover 6 miles a day.



Flood wall protects an industrial area and railroad yard in Vicksburg against flooding.





Buffet luncheons are traditional with ISTC members. This scene at Fairmount Park last year will be repeated for the 1968 Conference at Morton Arboretum, Lisle, Ill.

Pick-Congress Hotel Site of 44th ISTC

International Shade Tree Conference members are meeting at Chicago early next month. Election year and the accompanying demand for political convention space in the windy city, forced ISTC'ers to set their Conference dates ahead to Aug. 4-9.

The switch in dates seems to have had little effect on progress of the ISTC program which promises to be one of the outstanding events for the group in recent years. Executive Director L. C. "Chad" Chadwick believes the Chicago site and the 1968 program will combine to draw a record crowd. Some 795 registered at the Philadelphia conference last year, though non-registered friends and guests increased that number somewhat. Headquarters for the coming Conference will be the Pick-Congress Hotel on North Michigan Avenue, though members and guests will be staying at a number of nearby hotels.

Executive committee meetings are scheduled for Saturday, Aug. 3, preceding the Conference

which officially opens with registration beginning at 9:00 a.m., Sunday, Aug. 4.

Formal Opening Aug. 5

International President Freeman L. Parr, Hicksville, N. Y., will formally open the 44th ISTC at 9:00 a.m., Monday, Aug. 5. The Honorable Richard J. Daley, mayor of Chicago, will welcome guests to the city. First formal subject of the Conference will

Equipment demonstrations are more important to members every year. Rising costs of hand labor and manpower shortages place more emphasis on mechanization. This 1967 field day scene promises to be repeated in even bigger and better fashion this Aug. 7 at Morton Arboretum.



be "Gaining an Appreciation of Trees" by Professor Clarence E. Lewis, Michigan State University, East Lansing, Mich. He will be followed by a discussion of new and coming fertilizers by Hartl Lucks, Smith-Douglas Div., The Borden Co. Also on this first morning program will be the tree planting ceremony at Grant Park at 11:30 a.m.

Tuesday, as always, will be an important day for members. The keynote luncheon is scheduled along with a full day of intensive programming aimed largely at municipal and utility arborists. Hyland R. Johns, vice-president of Asplundh Tree Expert Company, Jenkintown, Pa., who was one of the co-chairmen of last year's ISTC event, will moderate a panel on the relationships between municipal, commercial and utility arborists. On this panel will be William T. Bell, superintendent of street trees at Long Beach, Calif.; James P. Brogan, system forester, Niagara Mohawk Power Corporation, Syracuse, N. Y.; Raymond Bruns, forester, Union Electric Company, St. Louis, Mo.; Joseph A. Dietrich, superintendent of parks and trees, Greenwich, Conn.; Theodore J. Haskell, department of parks and recreation, Lansing, Mich.; Byron T. Johnson, mana-

ger, Bartlett Tree Expert Company, Danberry, Conn.; and Frank J. Wagner, forester, West Pennsylvania Power Company, Greensburg, Pa.

Equipment Demonstrations

Wednesday, Aug. 7, features the annual commercial equipment demonstrations. For many arborists, this is the key event of the entire Conference. This year, exhibitors will operate their equipment at the Morton Arboretum. Buses are scheduled to leave the headquarters hotel at 9:45 a.m. This follows the conclusion of an "Early Bird" breakfast featuring Marion Hall, director of the Morton Arboretum at Lisle, Ill. A buffet luncheon will be served at the Arboretum and buses return to the hotel at 4:00 p.m.

The Board of Governors business session, which is open to members, is set for Thursday morning and will include election of new officers. The annual banquet is also scheduled for Thursday, at 7:30 p.m. Entertainment and dancing follow. Friday,

Aug. 9, is the final wind-up of the Conference and includes an executive committee breakfast and meeting followed by a post convention trip to Great Lakes Naval Station.

Besides the regular program for members, a full program is scheduled for ladies, teen-agers, and youngsters. These programs are varied and include tours of many of Chicago's outstanding historical and cultural centers, with special time slots for shopping.

Detailed information for exhibitors and members is available from Executive Director L. C. Chadwick at 3634 Olen-tangy Blvd., Columbus, O.

National Arborists Meet At Chicago, Aug. 4-8

Headquarters for members of the National Arborists Association summer session will be the Pick-Congress Hotel, Chicago, Ill., Aug. 4-8. Arborists are holding this mid-year meeting in conjunction with the International

Shade Tree Conference annual convention.

Prior to this year, NAA members staged their regular annual meeting at this time. A change made at the past NAA winter meeting calls for each February to be the month for their annual meeting.

Clarke W. Davis, NAA executive-secretary, reports the group's program committee has developed sessions for this mid-year meeting which are closely associated with efficiency of operation and business management.

Of special interest to operating arborists will be a 9:00 a.m. session, Aug. 6, on installing lighting protection systems. Moderator will be Robert Crites, Independent Protection Co., Goshen, Ind. Panel members for this subject will be A. Winslow Dodge, Dodge Associates, Westwood, Mass.; John Z. Duling, Duling Tree Expert Co., Muncie, Ind.; and H. M. Van Wormer, Van Wormer Tree Service, Richmond, Va.

Dr. John A. Weidhaas, Virginia Polytechnic Institute, Blacksburg, Va. will discuss the subject, "Effect of Chemicals on Insect Systems." He will be followed by Dr. Harold Davidson, Michigan State University, East Lansing, Mich., on Davidson's research regarding time studies for large tree moving.

A second subject on tree moving is also scheduled for the afternoon of Aug. 6. This will be a panel centered on how to move large trees by the frozen ball method. Another topic on the same day concerns the cost-profit relation of trees in landscape contracting.

Directors of NAA will meet Sunday, Aug. 4, at 9:00 a.m. The formal mid-year association report will be at 4:00 p.m., Aug. 6, followed by a cocktail party at 6:45 p.m., and the annual NAA dinner at 7:30 p.m. The past-presidents' breakfast is scheduled for Monday, Aug. 5, at 7:30 a.m.



"YOU SURE YOU HAVE THE RIGHT ADDRESS?"

Amchem Solves Brush Killer Shortage

With the war in Vietnam requiring our country's entire supply of 2,4,5-T chemical brush killer to defoliate and kill jungle growth, this year's domestic brush control programs appeared to be in trouble. Even if some of the material were to become available, the domestic market would have to wait for its supply until large industrial needs were met.

Enter Amchem Products, Inc., Ambler, Pa., to the rescue! A 2,4-DP material proved to be the chemical to solve the shortage problem. Amchem's development of a new product—BRUSH-KILLER 170—will not only serve as a substitute for 2,4,5-T but is destined to become an accepted chemical in its own right, a situation not originally anticipated, says the company.

BRUSHKILLER 170 is to be used for stump, frill, basal, mod-

ified basal or foliage spray in water, oil-water or oil carriers. Available to the local market, it brightens the brush control situation and should prove to be a solid working partner with WEEDONE BRUSHKILLER 32, already on the market.

Both chemicals can be used in a variety of ways at any time of the year to control a large variety of woody plants.

Animal Repellent Offers Long-lasting Results

Repel, a new animal repellent especially effective against rabbits and deer, is now available from Leffingwell Chemical Co.

The long-lasting repellent, safe to use on all plants, does not harm animals because its potency is due to odor and not to toxicity or taste, says Leffingwell.

Diluted with the proper amount of water, Repel may be

applied by power rig or hand sprayer on plants, shrubs or crops. Painted on tree trunks, it helps eliminate girdling, according to the company.

For further information write: Leffingwell Chemical Co., P.O. Box 188, Brea, Calif. 92621.

Brochure on Surfactants and Wetting Agents

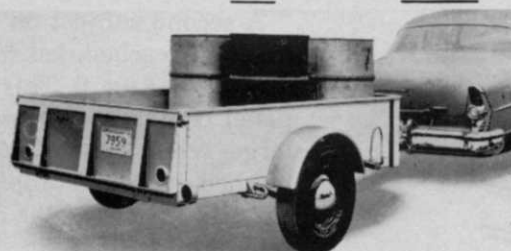
"WATER-IN," Inc. has announced the publication of a new brochure describing the uses and application rates for its wetting agents and surfactants.

The illustrated booklet discusses practical uses not commonly associated with these substances as they apply to soils plus a new "dry" surfactant that eliminates pre-wetting of soils and mulch prior to planting.

A copy of the brochure is yours by contacting "WATER-IN," Inc., P.O. Box 421, Altadena, Calif. 91001.



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Scene from the first ASPA national field day demonstration in July, 1967, at Halmich Sod Nurseries, Lansing, Mich. Action is expected to be repeated this year with more equipment and a bigger percent of the nation's sod producers on hand.

American Sod Producers Association To Stage 2nd Nat'l. Field Day On July 30

"Calling all sod growers!" That's the gist of efforts this month by George B. Hammond, executive-secretary of the American Sod Producers Association. Hammond who lives at Columbus, O., and operates Paint Valley Bluegrass Farm has spent most of the last few weeks lining up exhibitors and making arrangements for the second national field day of the ASPA.

This year a major field demonstration, expected to attract a high percentage of the nation's growers, is being held at Shamrock Turf Nursery, Hanna, Indiana, on July 30.

Growers will see practically every type of sod harvesting and handling equipment on the job. Don Morrill, owner of Shamrock Turf Nursery, and host for the big day, has set aside a sod field for equipment to work. This is an area just beyond a stationary exhibit booth area. All makers of sod producing, harvesting,

maintenance, and handling equipment are expected to exhibit. Most will also demonstrate their equipment.

ASPA's first field day last summer at Lansing, Mich., brought together the greatest array of equipment designed for the sod grower ever seen at any one location. Growers attending were astounded at the variety. This is logical since growers had just organized as a national group and the industry is relatively new. More equipment is expected this second year.

Ben O. Warren, Warren Turf Nurseries, Palos Park, Ill., president of ASPA, stresses that all growers are invited, and urged to attend, regardless of whether or not they are members of the association. No registration fee will be charged and a box lunch will be available at the noon hour.

Two tours of Shamrock Turf Nursery are scheduled for the

morning of July 31, one at 10:00 a.m. and the second at 11:00 a.m. Host Don Morrill will conduct these and growers will see his 200 acres of Merion bluegrass plus a small acreage of the new Fylking which he is growing at this location. Registration will precede these tours and is scheduled to begin at 9:30 a.m. However, late arrivals may register until noon.

Following the lunch hour, equipment field demonstrations will be held from 1:30 p.m. until 4:30 p.m. Each manufacturer

*Event: ASPA Field Day
Where: Shamrock Turf Nursery, Hanna, Indiana
When: July 30, 1968
Sponsor: American Sod Producers Association
Host: Don Morrill, Shamrock Turf Nursery*

or distributor will be allotted a time slot for operating equipment. Agronomist William Daniel, Purdue University, will serve as master of ceremonies.

The ASPA Field Day follows, by a day, the Purdue University Summer Turf Day, scheduled for Lafayette, Ind., July 29. For growers who are driving, Hanna, Ind., is located about 80 miles north of Lafayette, Ind., on US Hiway 30 between Plymouth and Valparaiso. Shamrock Turf Nursery is one-half mile north of US Hiway 30 on Indiana Route 39, and 15 miles south of the Indiana toll road, when using the exit for Route 39. For those growers who may be flying private planes, the nearest airport is at South Bend, Ind., some 35 miles north of Hanna. Midway Airport at Chicago, Ill., is approximately 65 miles from Hanna. Motels are available at Plymouth and Valparaiso for overnight visitors. A small motel is also located at Hanna.

Close-up of shielded rotary mower in operation under Green Valley irrigation pipe.



Rotary mower in tilted position showing mounting of the three 18-inch turbo cones.



Special Type Mower For Irrigation Pipe

Green Valley Turf Company, Littleton, Colo., has solved the common problem of mowing under irrigation pipe. Manager of the 400-acre sod farm, J. R. "Rusty" Wilkins, and K. C. Ensor, president, designed a shielded irrigation pipe line mower to supplement the gang mower.

Basically the unit is made up with three 18-inch Jacobson turbo cones. Mounted on a regular tractor it can be used to mow at any time without moving irrigation pipe.

Green Valley irrigates at a rate approaching 2 million gallons daily from wells. Irrigation pipe of 1 1/4" and 2" sizes are used. Wilkins says the system consists of 5500 heads of 1 1/4" size on as many pieces of pipe, and 2500 additional heads of 2" size. Rainbird sprinklers are automatically sequenced by time-control valves.

Beck's **LAWN-O-MATIC PLUGGER-SPRIGGER**



Revolutionary **NEW
GRASS-PLANTING
MACHINE**

\$795.00
f.o.b.

- Plants plugs or sprigs.
- Cuts labor by 90 percent or more.
- Plants Zoysia, Bermuda, Centipede or St. Augustine.
- Plants up to 3 acres per day.
- Rugged, trouble-free design.
- Self-propelled . . . easy to maneuver and load.
- Leaves lawn smoother—firmly rolled.
- 1, 2 or 3 row models available.

For further information write:

BECK MANUFACTURING CO.

Box 752 E

Some Distributorships Available.

Auburn, Ala.



Longtime employee Tony Nickerson does most of mowing for Green Valley. Equipment consists of a diesel-powered 7-gang mower with this supplemental custom-built rotary unit.

Room For Both Merion And New Fylking Variety

Fylking Kentucky bluegrass seed is now readily available for the first season since its introduction into this country. According to Doyle Jacklin, Jacklin Seed Co., Inc., it is the first new bluegrass candidate to challenge Merion in 20 years. Jacklin, whose company distributes Fylking, says the grass shouldn't really be considered a "challenger" to Merion, as such, since there is ample room in the field for both Merion and Fylking. Each, Jacklin says, has its own special characteristics.

Fylking originated in Svalof, Sweden, and was tested as 0217[®] in North America. The 0217[®] brand Fylking has proven to be a superior performer throughout the cool season area of America, Southern California, and Mexico.

Most unusual feature of Fylking is ability to withstand close mowing—clipping close enough to be an abuse even for a relatively low variety like Merion. Fylking resists weeds, Jacklin states, better at 1 inch than at 1/2 inch, but it persists

when mowed even so close as a golf green.

Of less interest is the ability of Fylking to withstand diseases that frequently blemish lesser varieties. Widespread testing shows it to be resistant to leaf-spot, stripe smut, and other afflictions that beset many of its widely advertised peers.

Fylking is luxuriantly dense, and of outstanding color, the latter partly because it is so free of disease. Unusual density of the sod is due to an abundance of constantly renewed tillers or side shoots, which make a carpet both resistant to wear and quick to recuperate. Compared to Merion, Fylking is of a slightly finer texture and not quite so stiff underfoot, Jacklin continues. Many experts who have noted Fylking research trials rate its color as second to none.

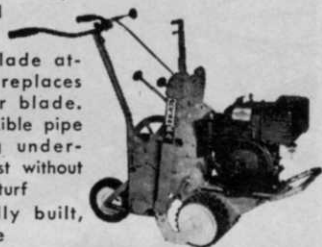
This "junior" queen among fine bluegrasses is becoming generally available this year for the first time, both as sod and as seed. Seed is economical to use because the seeds are large and plump for a bluegrass; and germinate both quickly and abundantly.

Take the high-speed Ryan
Route to beautiful turf...

Cut it...Roll it...
Core it...Rake it...
with
specialized power
equipment

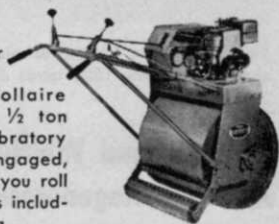
RYAN JR SOD CUTTER

- Cuts over 11 sq. yds. of sod per min.
- Mole blade attachment replaces sod cutter blade. Installs flexible pipe or tubing underground fast without disturbing turf
- Ruggedly built, easy to use



RYAN ROLLAIRE

- Handy back-and-forth power rolling
- Vibrating Rollaire provides over 1/2 ton compaction. Vibratory action can be engaged, disengaged as you roll
- Has many uses including blacktopping



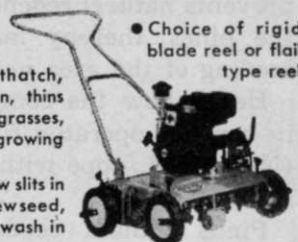
RYAN MOTORAIRE

- Self-propelled coring aerator
- Pulls uniform, deep cores on 5" centers
- Covers up to 10,000 sq. ft. per hour
- Promotes deeper root growth—builds thicker, healthier turf



RYAN REN-O-THIN

- Power raking
- Removes thatch, controls grain, thins running stem grasses, cuts out low growing weeds
- Cuts narrow slits in soil to catch new seed, let fertilizer wash in
- Choice of rigid blade reel or flail type reel



Mechanize your maintenance work—
write for complete information!

Ryan EQUIPMENT COMPANY

2055 White Bear Ave., St. Paul, Minn. 55109



This Bell 47G-4 helicopter aids unsuccessful pine regeneration by distributing specially treated seeds over some 1500 acres of New Zealand forest-area.

New Zealand Whirly-birds Aid Pine Regeneration

In the space of 2 days each year, a single helicopter does a reseeded job that would require the efforts of 750 men, according to officials of N. Z. Forest Products, Ltd., New Zealand.

Each spring (September in New Zealand), a huge bird population feasts on pine cone seeds from 1500 acres of trees that were felled the preceding winter. This seed destruction prevents natural regeneration of the pines, thereby making reseeded of the area necessary.

Here's how the company and its contract operator, Helicopters (N. Z.) Ltd., cope with the situation.

Pinus radiata seeds treated with Arasan 425, which irritates membranes in birds' nostrils and eyes, are sown via helicopter over the 1500-acre area each spring. Two pounds of the bird-

repellent seeds are distributed per acre at a rate of 8 acres a minute.

Taking only 10 hours of actual operating time, company officials say this is a fast and effective method of insuring an abundant growth of seedlings for forests of the future, much to the dismay of the seed-loving birds.

GE and URI Join Forces in Turf Heating Studies

Other professional football teams may follow the example of the Green Bay Packers in heating their playing fields with electric cable, predict researchers from both the University of Rhode Island and General Electric.

URI turf researchers have been studying soil heating in cooperation with GE, the company that wired the Green Bay field,

since 1965. Their new experimental area at the URI's College of Agriculture is a large 30'x75' turf section wired to test the performance of 3 types of cable, each made of different insulating material and each carrying different wattage.

Other questions for which GE and the URI's agronomy dept. are seeking answers include the effects of different temperatures on turf in terms of diseases and physiological functions and the results of using various kinds of tarpaulins on heated turf.

Both URI turf researchers and GE engineers believe that heated turf has endless possibilities for extending through Christmas the season for many kinds of recreational playing fields.

New Jersey Promotes Certified Seed Program

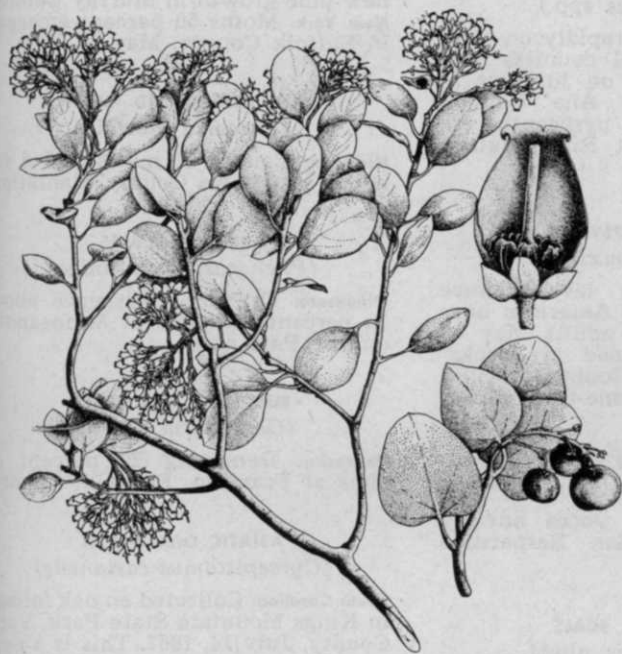
A limited lawn seed certification program is being promoted in New Jersey. A quantity of a blend of 40% each of Kentucky and Merion bluegrasses, and 20% creeping red fescue is being packaged and distributed under the state's seed certification tag. Rutgers University College of Agriculture has approved the blend and certification is by the state's Department of Agriculture.

Blending is being done by a North Jersey seedsman who is cooperating in the program. He is using seed from Oregon and South Dakota to make up the blend, which is packaged and retailed in 2-pound units. The New Jersey Department of Agriculture analyzes each lot and requires that each 2-pound package carry a serial number issued by the Department.

About 100,000 pounds of seed is expected to be marketed for home owners in the area this season. This should be enough to seed the equivalent of 1250 acres of lawn area. Seed is being distributed largely through 2 major food chains in the state.

GREENLEAF MANZANITA

(*Arctostaphylos patula*)



Drawing from: California Range Brushlands and Browse Plants, by Arthur W. Sampson and Beryl S. Jespersen. Calif. Agric. Expt. Sta. Ext. Ser. Manual 33.

Prepared by: O. A. Leonard, Botanist, assisted by B. J. McCaskill, Senior Herbarium Botanist, Botany Department, University of California, Davis, California.

Greenleaf manzanita (*Arctostaphylos patula*) is one of the approximately 70 species of manzanitas that are distributed in western North and Central America. Of these—close to 40 species—several varieties and numerous forms are native to California. The genus *Arctostaphylos* is a member of the Heather Family (*Ericaceae*), which includes cranberries, blueberries, and rhododendrons.

In both the chaparral and forest lands of California, southern Oregon, and the eastern slopes of the Cascade mountains of Oregon, the manzanitas are common plants varying from prostrate groundcovers to small trees. They can be problems on ranges, especially when brushlands are being converted into grasslands, and in forested areas following fires, when they are capable of springing from sprouts or seeds and out-competing small coniferous trees. Since manzanitas are not browsed much by either domestic livestock or large animals, they can out-compete other species which are desired by such animals. The manzanitas are either sprouters or non-sprouters, the former being the

most difficult to control because they can quickly occupy an area after a fire. Greenleaf manzanita is one of the important sprouting forms. The discussion on this species applies generally to the others which also sprout, and control measures are similar.

Greenleaf manzanita is an erect, much-branched shrub, 3 to 7 feet high, with several stout stems arising from a swollen base. The bark is reddish-brown on old stems and branches and may become shreddy with age. The branchlets are finely glandular-puberulent with yellowish-green glands or with a white downy covering. The leaves are fairly thick, rigid, ovate or nearly round, 1 to 1¼ inches long, bright green or yellow-green and smooth, with petioles about ½ inch long. The small deep pink flowers are about ¼ inch long, in dense terminal clusters, and bloom from April through June. The fruit is globose or depressed, ¼ to ½ inch in diameter, dark chestnut-brown to nearly black, and glabrous. They were, incidentally, commonly ground by the Indians for use as a porridge or drink.

This species usually occurs in the open yellow pine and red fir forests of the northern Coast Ranges, Sierra Nevada, Cascade mountains of California and southern Oregon, and east to Nevada and Utah, at elevations from 2000 to 9000 feet. It forms an enlarged burl or root-crown just below the ground surface which sends up new shoots after fires or cutting, thus enabling it to occupy areas following forest fires. Consequently, extensive brushfields occupied by Greenleaf manzanita will occur in some areas.

This plant is most easily killed when its sprouts are sprayed following a fire. The best time to make the applications varies with the objective. If the land is to be planted to pine, it is important to make the applications as soon as possible after the fire to stop the invasion of grasses which are highly detrimental to young pine. If the land has not been planted to pine, spraying should commence in July of the year following the fire. Although Greenleaf manzanita is more sensitive to 2,4-D than to 2,4,5-T, mixed species usually require the use of brush killer mixtures of 2,4-D and 2,4,5-T applied at 4 pounds per acre. After the area has been planted, the spraying should be delayed until late August or September, using only 2,4,5-T. In order to achieve good control, 2 or 3 applications applied at yearly intervals are required.

On rights-of-way and non-forest sites, kills can be improved by adding picloram to the phenoxy sprays. Picloram generally enhances the kill obtained on old, unburned bushes but has less effect on young resprouts.

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

(Continued from page 11)

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.

Suppliers Personnel Changes

Vistron Corp., Lima, O., a subsidiary of Standard Oil Co., has promoted John F. Murray to manager of retail marketing for Vistron's Agricultural Chemicals Division. He will be responsible for retail sales and related support groups for Solar Nitrogen Chemicals, Inc., a joint venture between Standard Oil and Atlas Chemicals Industries, Inc.

Jefferson Chemical Co., Inc., Houston, Tex., has named Allen M. Brandt its Cleveland district manager. Brandt was previously sales representative, transportation chemicals, midwest region.

Landscapers Northwest, Inc., Tacoma, Wash., announces executive appointments in its recent reorganization. George Harrison will be president of the new corporation and will serve as public relations director and business manager. William Detering becomes vice president and is to be in charge of all field operations. Landscape Maintenance Division will be headed by James Ely.

Victor Forzley has been appointed Senior Consultant to the Consulting Div. staff of Chemical Construction Corp. (Chemico). His assignment will involve market and industry surveys, budget analyses, feasibility studies, and operation research.

The new agricultural equipment sales manager of Ford Motor Co.'s Overseas Tractor Operations is John J. Connor. He joined the company in 1961 and has more than 20 years' experience in his field.

Andrews Industries, Dayton, N. J., announces that Richard C. Slawinski has been elected vice president of Marketing and Engineering.

Ralph Keidel has joined Koehring Co., Milwaukee, as manager of welding engineering and will be responsible for establishing and maintaining welding standards for each of the company's divisions.

Classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: "Position Wanted" 10c per word, minimum \$3.00. All other classifications 20c per word, minimum \$4.00. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment. Bold-face rule box: \$25.00 per column inch, two inch minimum.

FOR SALE

80 ACRE sod farm on peat. 70 acres of Merion ready to cut. Metal barn, deep well for irrigating. Near Lansing, Michigan. Phone Ann Arbor 313 662-9398.

SPRAYERS, USED, all sizes and makes, at large savings. Send your requirements. Equipment Sales Co., 4742 Sunrise Highway, Massapequa Park, N. Y. 11762.

USED EQUIPMENT

WANTED—Used chipper. Give size, age, condition and price. Write Westville Tree and Saw Service, 141 Adams, Westville, Illinois 61883.

HELP WANTED

SPRAY FOREMAN—Man wanted for year-round salaried position to operate sprayer for private shade tree spraying and other specialized shade tree insect control procedures. Should be interested in repair of machinery and equipment during winter months. Background in entomology or pathology preferable. Fringe benefits. Box 34, Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

FIELD SUPERVISOR Industrial Weed Control firm in eastern Pennsylvania is looking for a field supervisor. Degree in one of the agricultural sciences is desirable but not necessary. Write Box 30, Weeds, Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

ASSISTANT Course Superintendent for 18 hole golf course. Write K. W. Stover, Sr., Supt., 6200 Gathright Ave., Norfolk, Va. 23502.

RUBBER STAMPS

LANDSCAPE DESIGN Rubber Stamps. Over 125 designs and sizes. Free illustrated brochure on request. Write: T-Gordon's Landscape Stamps, P.O. Box 741C, Reseda, California 91335.

Turf Days Cancelled At Rutgers University

Rutgers University, New Brunswick, N. J., has announced that Turf Research Field Days for 1968 are being cancelled.

According to Professor Ralph E. Engel the Lawn and Utility

Advertisers

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Turf Growers Field Day and the Golf and Fine Turf Growers Field Day, both of which were originally set for late this month, will not be held.

However, Engel does report that the 1969 events will be held and will be announced later.

Prior to the announcement, WEEDS TREES AND TURF magazine carried the now cancelled dates in the "Meeting Dates" department of the June issue.

NYSU Agricultural College Honored by AAN Award

The American Assn. of Nurserymen presented the New York State University's Agricultural and Technical College with a special citation for outstanding work in horticultural education.

The AAN applauded the college's Dept. of Ornamental Horticulture for its development of a model technical horticultural curriculum, a program that can be used as a guide by other technical colleges.

According to F. Raymond Brush, AAN corporate secretary, the nursery industry is faced with the critical problem of attracting well-trained technical personnel and depends heavily upon the college at Farmingdale for personnel recruits.

This marks the first time in the AAN's 93-year history that such a citation has been awarded.

New National Golf Group Has HQs in N. Carolina

A national golf group, known as the American Golf Assn., has recently been formed in Morganton, N. C. Operating as a service organization to individual golfers throughout the states, the AGA will devote its efforts toward making the game a more enjoyable sport for all golfers.

Offering its members advantages such as a computed point handicap system, tournaments, contests, and the official monthly publication, the AGA intends to promote fellowship, good sportsmanship, and course etiquette.

AGA officers point out that their organization is not in competition with any existing golf association and will extend its co-operation to all golf groups. Currently serving as Executive Director is Edward L. Poteat and as President, P. N. De Vere.

National HQs are at 206 S. Green St., Morganton, N. C. 28655.

Control of Illinois Pond Weeds Proves Complicated

Attempts to control "water weeds" in Illinois ponds and small lakes are bringing to light some interesting information concerning aquatic vegetation.

In his 10 years of studying the effects of various herbicides on unwanted aquatic plants, Survey biochemist R. C. Hiltbran has noted that changes in one component may set the stage for the spread of other species.

For example, in 1960 northern milfoil covered 95% of 5-acre Miller Pond in central Illinois, while only a few plants of sago pondweed were present. The following year found that a mixture of these 2 species had infested about 70% of the pond, while later that summer 2 other species — slender naiad and southern naiad — made an ap-

pearance. From 1962 through 1966, sago pondweed and southern naiad had become the predominant plants in the pond.

Efforts to control curlyleaf pondweed in another pond reduced that species drastically but enabled the previously minor component, water horsetail or chara, to practically take over the pond.

Observations reveal that, although it is understood that all plant species do not react in the same way to control chemicals and do not reach maximum growth at the same time of year, much additional information and experimentation will be necessary to come up with satisfactory year-round and year-to-year control of unwanted pond vegetation.

Even Grass Seed Can Be Pretty "Corny"

William M. Cranstoun, a New Jersey Dept. of Agriculture seed inspector, recently purchased a 5-lb. bag of "grass seed" and discovered that almost half of the bag's contents proved to be ground-up corn cobs.

Although obviously intending to defraud the consumer, the distributor did not break the state seed law, explained Cranstoun, as the package does bear a statement that 46.50% of the contents is "inert material."

Cautioning buyers of lawn seed to read labels carefully before completing a purchase, Cranstoun reported that a good grass mixture may contain some inert material but that the proportion would be extremely small.

Dept. of Agriculture seed inspectors regularly make the rounds of retail outlets where seed is sold and check to see that the "truth in labeling" law is being maintained. Checking the list of materials contained in a package, however, is the buyer's responsibility.

Trimmings

Wise Men Will Still Practice Safety. Findings of the Maryland State Board of Agriculture that workers face no danger in exposure to malathion and Dibrom-14 is good news. But it doesn't lessen the need for caution in handling pesticides. Nevertheless, the study reported by Jerry Mallack, MSBA, did show that there is no hazard for workers who follow recommended procedures in space spraying. Workers studied handled diluted mist sprays and concentrated materials used in preparing them for a period of 12 weeks during which they were exposed a total of 420 hours. The extensive test and the favorable results bode only good for the sprayman.

* * *

Another Synthetic Turf. A new one, known as saran evergreen, has been developed in Japan. The so-called textile turf is being made of polypropylene base cloth and saran or vinylidene chloride yarns. The maker, a joint venture by Asahi Chemical Co., and Dow, reports the yarns to be resistant to water and flame, and to hold their color. Domestic market price is expected to be \$7 per yard.

* * *

A Million Acres By 1973? Will golf courses cover a million acres in the next 5 years? Could be. Present acreage for almost 9400 courses in the country is 850,000. Capital investment is more than \$2 billion, based on National Golf Foundation estimates. Cost for maintaining courses across the country ran \$255 million last year. Courses were busier than ever, with more than 10 million golfers playing 190 million rounds, according to the NGF.

* * *

Keeping It Natural. Natural landscape beauty is often destroyed when new highways are built. Florida officials are seeking ways to preserve more of the natural vegetation growth along new highway rights-of-way. A \$35,000 grant from the Florida State Road Department is helping support such a study project at the University of Florida. Idea is to take the best which a piece of land has to offer and combine it with the most economical way of preserving and conserving its natural vegetation during highway building.



Meeting Dates

Landscape Seminar, Associated Landscape Contractors of America, Inc., for Michigan and Ohio, Dearborn Inn, Dearborn, Mich., July 13.

American Association of Nurserymen, Annual Convention and Trade Show, Chase-Park Plaza Hotel, St. Louis, Mo., July 13-17.

Georgia Seedsmen's Association, Annual Convention, Stuckey's Carriage Inn, Jekyll Island, Ga., July 14-15.

National Fertilizer Solutions Association, 1968 NFSA Round-Up, Regency Hyatt House, Atlanta, Ga., July 25-26.

Summer Turf Day, Purdue University, Lafayette, Ind., July 29.

American Sod Producers Association Field Day, Shamrock Turf Nursery, Hanna, Ind., July 30.

Southern Nurserymen's Association, Convention and Trade Show, includes nur-

serymen's associations of Alabama, Kentucky, North Carolina, and Tennessee. Marriott Motor Hotel, Atlanta, Ga., Aug. 4-6.

Indiana Association of Nurserymen, Summer Meeting, Imperial House Motel, Columbus, Ind., Aug. 7-8.

Commercial Turf Maintenance Field Day, Orange County Extension Service, N. Y., New Orange County Park Golf Course, Montgomery, N. Y., Aug. 8.

Illinois Turfgrass Field Day, University of Illinois Turf Research Plots, Urbana, Ill., Aug. 9.

Miss Lark Convention and Trade Show, Heidelberg Hotel, Jackson, Miss., Aug. 10-13.

Midwestern Nurserymen's Summer Meeting, Zelenka Evergreen Nursery, Grand Haven, Mich., August 13-14.

Third International Peat Congress, Laval University, Que-

bec City, Canada. Aug. 19-23.

1968 Turfgrass Field Day, Pennsylvania State University, Joseph Valentine Turfgrass Research Center, Campus, noon August 21-noon August 22.

Hawaii 4th Annual Turfgrass Management Conference, Punahou School Campus, Honolulu, Hawaii, August 21-24.

Turfgrass Field Days, Virginia Polytechnic Institute, V.P.I. Turf Plots, Blacksburg, Va., noon Sept. 4-noon Sept. 5.

Maryland Lawn and Turf Show, University of Maryland Campus, College Park, Md., Sept. 7.

Western Street Tree Symposium, 11th Annual, University of California, Santa Cruz, Calif., Sept. 11.

Industrial Weed Control Conference, 3rd Annual, Texas A&M University, Memorial Student Center, College Station, Tex., Oct. 20-22.

Ready to START?

Locke's New Highwheel Mowers are cutting commercial mowing costs all over the country!

MANCO
Locke

rotary mowers—from 22" to 26"—boast swivel head and swivel wheels for easier handling.

Push or self-propelled cutters are perfect companion machines to heavier-duty Locke reel or Devere-Locke rotary mowers . . .

Call your Locke dealer for free demonstration of these light yet rugged machines!



WRITE FOR FREE BOOKLET
Complete line of heavy-duty reel and rotary mowers for commercial use.

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South Charleston, W. Va.

FLAILS FLAILS FLAILS

There is a difference!



. . . and you'd better believe it! Mott flails, with their edgewise cutting action, are by far superior to the grass beaters, the mashers and the bashers.

20 YEARS of know-how . . . makes the Mott for 1968 greater in cutting ability . . . better cutting with less power! Mott is the only Hammer Knife Flail mower — none can compare! It isn't built to beat a price line. It's engineered for longer life, greater safety and better performance for a wide range of job applications.

The patented MOTT "hammer-knife" flail blades are made in six different styles—to meet every mowing need—fine lawns, weeds, leaves or renovating. The self cleaning feature insures continued peak performance in the most adverse mowing conditions. The lightweight construction minimizes throwing of struck objects — provides greater safety.

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 Keeping an acre of someone's
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 And for all your work,
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Balan's the one effective pre-emergence herbicide that goes easy on a grounds maintenance budget . . . and goes all out against crabgrass. Weatherproof Balan clings to soil, resists leaching. It's highly active, yet contains no poisonous arsenic, mercury, or lead. Gives a wide safety margin when applied as directed . . . and is priced for all-over use. Balan costs as little as \$15 an acre on northern (cool season) turfs. On southern (warm season) turfs, a heavier and a second yearly application may be needed. It's still a bargain. Order Balan Granular now. Then watch it go all out . . . all over . . . all season.



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