

Vermeer's 604 log chipper is designed to take tree sections six feet long and up to 4 ft. in diameter.

our standard chipper blades."

The high-speed Chiparvestor is working hand in glove with Chicago's speeded up system of tree removal, said Garvey.

Under the old system, Garvey explained, everything was cut down into "man-handling size." meaning one or two men could load the typical 2½-ton city truck. Now, the city has leased trailor transport trucks from commercial tree companies, including units equipped with clam-type loaders. The larger trucks, Garvey said, "have 10 times the capacity."

Formerly, the tree-removal crew consisted of the driver of the $2\frac{1}{2}$ -ton truck, foreman, and three men. Some of the trucks had a 1,000-lb. hoist. The removal task force now consists of a clam bucket loading truck, two heavy-duty dump trucks, the clam operator, six men, and a supervisor.

On the day of interview, by 2 p.m., a task force had felled and transported away nine typical-size street trees.

You have to be aware of the enormity of the tree-removal task that Forestry General Superintendent Robert Zralek faces in Chicago to appreciate the value of machines like the Chiparvestor. His bureau has a backlog of 23,000 dead trees to remove. "We expect 40,000 more to die this year and each succeeding year," said Garvey. "Tree removal goal this year is 50,000. Through August we're about 300 ahead of schedule." That means crews have removed about 34,000 trees.

But tree removal is only half of the Chicago story. "We've planted

The Vermeer chip.

12,000 trees so far and will reach 30,000 before the end of the year," said Garvey.

Trees that are going in are silver maple, Norway maple, green ash, honey locust, pin oaks, sycamores, and others. "The problem is getting

The Chiparvestor chip.





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So you are responsible for cleaning up parks, industrial plants, colleges, golf courses, schools, cemeteries or what? Well then, decide on 4 or 6 H.P. Lindell 722-30 vacuum power sweepers. Easy to handle, roll and operate. Height adjustments from 0" to 4". Picks up leaves, paper, wrappers, sticks, etc., easily, quickly. Optional vacuum hose available. Think Lindell for ease—and profit.





Some Mfg. Rep. Territories Available.

The City of Chicago has purchased a 100-ton model of the Chiparvestor, shown in action above. District Tree Foreman Jim Garvey, left, discusses its operation with Ray Toren, who's directly responsible for keeping the chipper running. A hazard, Toren says, are embedded metal objects, such as this old cable brace.

big enough quantities—we have to take what we can get," he said. The goals projected for 1971 are:

The goals projected for 1971 are: To remove 60,000 trees; spray to control Dutch elm disease on 40,000; plant 30,000; and trim 20,000.

Chicago has been selling some chips to a firm that utilizes the fibers in making paper siding material and roofing material. "We've sent some loads of chips to our incinerators," Garvey said. "They're tickled to get them. The chips provide good combustion to aid the elimination of wet garbage. We have three incinerators and are getting one more in 1971."

Markets for Wood Chips

Bob Peterson offered an idea of what kind of wood chip products might be developed and what markets could be tapped.

"Our best is a premium chip that has less than 1% bark. It goes to paper companies, and they take all we can give them. Our No. 1 chip is a high quality chip with bark material screened. This goes as mulch around homes, commercial buildings, playgrounds and trails. We also sell a bark mulch for the same places plus bedding for animals. We have a byproduct we call fines that's being offered as kitty litter and for mulching plants such as raspberries and strawberries."

Peterson said his rate to the public for chips was \$10 per cubic yard for the premium chip; \$8 for No. 1; \$7 for bedding material; and \$3 for bark.

He estimated a ton of wood would produce about 4-5 cu. yds. of chips.

Incineration vs. Utilization

David L. Phillips, superintendent of forestry, Lansing, Mich., discussed waste wood disposal—incineration vs. utilization, at the August International Shade Tree Conference. "Of the two solutions," he concluded, "I favor wood utilization because it uses the recycling principle." But he added that more research is needed on both methods before either could be considered permanent answers to the waste wood disposal problem.

Phillips talked about both big tree chippers and about the arrangement the city has with Peterson Wood Chip Producers. Problems that remain when using the chippers are: the need for additional markets for chips, disposal of logs with metal objects, stump disposal, and more efficient handling and preparation of brush and log mixtures for the chippers.

He described the incinerators the City of Detroit built for waste wood disposal as even more costly than the chippers. The two, built in 1963 and 1965 each cost about \$250,000. About 100 feet long and 20 feet high, they're constructed of brick with a refractory lining.

Charging is done through two 14-ft. doors. Brush and limbwood goes in one at the end and logs through the other a midpoint. Forced draft is used, but no supplemental fuel. Temperatures are maintained between 1,800 and 2,000 degrees F. A 20-inch log burns in about four hours.

But during peak removal periods, Phillips reported, the burners are unable to keep up.

Exhaust gases are passed over a series of baffles and a water spray scrub chamber to remove fly ash before venting to the atmosphere via a 120-foot stack.

Emission is exceptionally clean,



Chicago has expedited its tree removal operations by using clam-type loaders and trailer transport trucks leased from area commercial tree companies. This truck is owned by Jackson Tree Service.

consisting entirely of carbon dioxide and water vapor, plus atmospheric nitrogen," Phillips said.

Disadvantages aside from initial and maintenance cost, he said, are that no useful product is produced, modifications are sometimes necessary as pollution codes change, and stationary location means costly travel time.



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Don't take our word. Ask for the specifications brochure "Asplundh Chippers to Fit Your Need" and for a free, no-obligation demonstration. You'll see why an Asplundh Chipper is best for you . . . and as good as you'd expect from the world's largest tree expert company.



Florida Engineer Patents HYDRIONIC METHOD For Controlling Weeds in Running Water

A METHOD OF killing elodea with commercial sulfuric acid has been patented by Robert W. Hyde of Crystal River, Fla. The president of Hyde Engineering Company says the technique will also eliminate other aquatic weed species without harming fish and other wildlife.

Extensive tests were conducted under the supervision of the state Game and Fresh Water Commission during 1965 and 1966, said Hyde, in the spring-fed water in and around Crystal River.

"The system is effective on both hydrilla and milfoil, and most of the waterways and canals in the area were brought into weedless condition in all boat channels during these two years."

Traditional mechanical and chemical approaches to aquatic weed control in the area were complete failures, Hyde contended. The result, he said, was "killing nearly all of our game fish without seriously affecting the weed growth."

"The most important factors of our treatment method," Hyde explained, "are that there is virtually no fish kill, weed eradication is nearly complete, regrowth does not take place within the next six to nine months, and treatment can be done at an average cost of from \$10 to \$20 per acre."

Crystal River presented some rather unique water conditions that contributed to weed growth and at the same time rendered weed control methods ineffective.

"Our tremendous spring flow more than two million gallons per hour—plus tide action were just too much water movement to allow chemicals to do their work," said Hyde.

In addition, the water was highly alkaline (pH of about 8.5), having traveled through miles of lime rock before emerging. Aquatic weeds flourish in alkaline water.

The conditions are so unique that one fishery biologist, C. L. Phillippy, suggests that the use of sulfuric acid as a herbicide for control of submersed aquatic vegetation "may be limited to water areas similar to the conditions on Crystal River.

"Neutralization and dilution by

the waters of the many springs, tidal effect, and extensive deposits of calcium carbonate combine to contain the action of the acid within an area in proportion to the magnitude of the problem.

"Its use in static water situations, such as lakes, ponds, reservoirs, and canals with deep cut gliding channels, may create more problems than it solves.

In the Crystal River situation, Phillippy said, "Sulfuric acid did effectively remove elodea from the main channels apparently causing little damage to the fish population. The amount of damage varies from application to application, depending on tidal effects, proximity of springs, and escape route available to fish in the area."



A \$150-test using commercial sulfuric acid and the hydrionic method produced this result in 10 days, says discoverer Robert W. Hyde.

Hydrilla and watermilfoil brought boat traffic to a dead end in fast-flowing Crystal River and canals leading into it. Conventional weed control efforts failed completely.



Hyde, an electro-mechanical engineer and avid bass fisherman and water explorer, turned to a different approach to solving a problem that developed in 10 years after Crystal River had been true to its name for thousands of years. The problem developed from three factors, said Hyde: commercial development of the river banks and the construction of miles of lateral canals, an aquarium nursery venture that got out of hand, and mechanical harvesters ("They might better be called cultivator and spreader," he said).

He was critical of harvesters in this situation because the aquatic varieties being mowed propagate from fragments.

Hydrilla was planted in Crystal River about 20 years ago, Hyde said, by people dealing in the plants and furnishing them to the aquarium trade. The plant is an excellent oxygenator, he said, and grows well in aquariums. As the demand for plants grew, he continued, someone thought of planting hydrilla in the natural spring waters.

Normally, the plant spreads only about six feet a year, Hyde estimated, so planting was not, in itself, a wrong doing. Commercial development, however, brought great numbers of small boats that churned through patches of Elodea. These floated around the bay and canals and finally took root. The purchase of a mower by the county commissioners, said Hyde, "really finished the job of solidly seeding all the other canals, and, in fact, the whole bay."

Beginning his testing with glass jars and weed fragments, Hyde discovered that by lowering the pH level to 6, the plants died rapidly. Further tests showed that short term contact at higher concentrations of acid also killed the plants.

"Actually, several methods of complete control of elodea and other similar weeds are now practical through the hydrionic method. Most aquatic weeds are extremely sensitive to sudden pH changes, and a change of little more than two points will generally kill all weeds. Lowering the pH of a lake to six will not only kill all present growth but if slight amounts of acid are added from time to time to keep the pH around 6 no regrowth will occur. This is very significant because no fish are affected at this pH. Most game fish are quite comfortable at a pH of 5.

"Canals can be cleaned out very economically by simply dumping in quantities of acid necessary to lower the pH more than two points, even if only on the bottom few inches. Sulfuric is so heavy (nearly twice the weight of water) that it sinks immediately to the bottom and spreads out contacting the stems at the root joints where they soon rot off and float out. If not disturbed by wind or tide, complete decay is always evident in less than two months. This method works equally well on Eurasion milfoil.

"Most Florida waters are so heavily alkaline that the acid is completely buffered out in 24 hours."

Some members of a committee from the War on Weeds Society, Inc., told the Ocala Star-Banner, after evaluating tests, that because the acid had the effect of creating large floating masses, harvesting of the treated weeds might be a necessary part of the treatment.

In one test, the floating mass of elodea was trapped against a bridge and took two months before it completely disintegrated. Where tidal action is present, the masses are carried to sea and destroyed by the salt water.

"Patent rights are available to anyone interested on a modest basis," Hyde said. Hyde Engineering Company, he said, is concerned with developing electro-mechanical products and has "no intention of entering into weed eradication business other than in an advisory capacity."



HI-RANGER

TREEmen tell US!

Owners and operators of HI-RANGER tree service equipment "wrote the book" that lists the features exclusive with HI-RANGER . . . _______ single hand 3-D bucket control, _______ automatic "deadman" safety system, ________ stronger, tapered upper boom, _________ power-reserve accumulator system, _________ constant-angle upper boom movement with straight-line bucket travel, _______ selfleveling bucket, and _______ maximum safety with faster, easier operation for more work at low cost.





Sonoma County Water Agency got this kind of weed control along multiple-use irrigation ditches with Princep. The picture at right shows the difference where a test application ended.

How California Water Agency Is Tackling Irrigation Ditch Weed Control



Weeds had harbored rodents, obstructed water flow, and created a fire hazard.

SONOMA COUNTY Water Agency, north of San Francisco. is a prime example of a non-agricultural industry now recognizing the need for a safe, economical and effective weed control program.

Before adopting their new herbicide plan, Chief Engineer Gordon Miller and Superintendent of Maintenance Al Williams conducted exhaustive comparative weed control experiments.

"Weeds mean nothing but problems," says Maintenance Foreman Dave Hillendahl. "If weeds along a channel bank are heavy, they will conceal erosion problems until they become major.

"If local farmers are using the channels for irrigation, as is the case in Sonoma County, weed-free banks are an important requirement. Seeds from weeds can get into the water and be carried into the fields. Suddenly the farmer has a problem he never had before.

"Excessive weeds anywhere can harbor rodents and insects. By eliminating the weeds, you cut down the places where pests can survive and multiply."

Esthetically, most weed species are a detriment. "During the winter, when they are green, it's not too bad, but in summer when everything turns brown, weeds are a definite eyesore and a fire hazard."

When it comes to controlling weeds, Hillendahl is a firm believer in herbicides for ease of application, cost, labor efficiency and selectivity in weed and grass control.

"We have some areas that would be impossible to maintain if we had to disc or mow for weed control. With a chemical program, per acre cost is decreased considerably, and the use of the labor forces is more efficient."

In selecting a herbicide, Hillendahl says, "We choose a material that will fit a variety of needs, including landscaping, cover crops, and channel maintenance." Last year the agency treated most of its system with Princep (simazine).

"With some materials, we have observed photo-decomposition and resulting less than desired weed control. This is not the case with Princep. Therefore, we can apply Princep as we do as early as August with good results.

"This was learned during the early years of the program through practical application and experimentation with many products.

"Other difficulties encountered at this time included excessive leaking of some materials and hazard to adjacent desirable plantings through lateral movement.

"A large number of our channels are near or actually border subdivisions, orchards, vineyards, landscaped areas, etc. Princep had none of these problems."

"Princep gives us year-long weed control. It controls all of our annual weed and grass problems plus many perennials," Hillendahl says.

"With Princep we are using a material we know will do the job—we know just what it will and will not do. Our crews all know the capability of the product and how to use it so they won't contaminate irrigation, drinking water, lakes and streams. This is a must for any public agency. With this understanding, the crew can answer any pertinent questions from adjacent property owners or other concerned citizens who should inquire about the material or program."

Another factor Hillendahl must

consider is that the entire network takes several months to cover completely.

"In order to get the chemical on by the time the rains begin in November, we must begin application in August. Princep will remain on the soil surface until the rainfall moves it into the soil. Often that is as long as three months."

Princep also was chosen because it can be used as a selective herbicide around certain ornamental plantings.

Instead of using a boom for spraying, Hillendahl designed his own equipment. He affixed two OC flood jet nozzles to the back corners of his 1,000-gallon tank truck.

"We get better coverage with this set-up," says Hillendahl, "and our nozzles don't plug up as they did with a boom. This operation is just better all the way around."

Rates were 10 pounds per acre in all areas except landscape areas where reduced rates are used per label recommendations.

This water agency is supported by the county tax structure plus some state and federal monies for certain projects.



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cess. SISCO helps you avoid the waiting game because we stock everything you might need and lots of it. We now maintain complete stocks in the Chicago area as well as in Royal Oak, Michigan. Also, waiting can mean that a job will cost more than was estimated, and lost revenue for a course out-of-play longer. These are two good reasons why you should call SISCO . . .

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Turf Irrigation and Fertilization

WHAT'S GOING ON UNDERGROUND



Nylon insert orifice projects into halfinch plastic pipe.



A filter and fertilizer applicator can be integral part of the system.



SUBSURFACE IRRIGATION sounds like the ideal way to add moisture to soil. The hangup has been the conception of a workable system that could be installed and maintained at a reasonable cost.

A firm in Lubbock, Tex., Submatic, Inc., thinks it has developed an efficient and profitable answer. The system has been applied to pastures, lawns, parks, highway median strips, orchards, and so on.

The new Submatic system employs a nylon insert orifice that is placed in one-half-inch-diameter polyethylene plastic pipe, either by machine or hand tool. The inserts placed by machine are spaced in the pipe every 36 inches. The pipe is installed below ground from two to six feet apart with a small vibrating machine, chisel or trencher. Depth is determined by soil type, root structure and other factors.

Application rates, say Submatic engineers, are low, ranging from one-twentieth to one-fifth of an inch per hour; and the system is operated at low pressures of from one to five psi at the orifice. A filter



A small vibratory plow pulls pipe below ground. The Dick Park residence, left, has been irrigated the past two seasons. A non-irrigated strip of bermudagrass pasture on the Ted Wood farm shows what a difference a little water can make. Allen Forkner of Lubbock is watering 18,000 sq. ft. with only 4 gpm of water available. system is necessary, and a sand trap may be required.

The nylon insert orifices are uniform in size, low in cost and available with the pipe, or may be purchased separately. A simple hand tool may be used to place the inserts into existing pipe.

"Prescription-placing" of orifices was used in the system recently installed in an orchard of 1,500 apples and 500 pecan trees in Knox County, Tex., owned by Dr. James F. Harber of Odessa, Tex. Because the trees were young and required only small amounts of water to get them established, only two Submatic insert orifices were used at each tree.

Dairyman Ted J. Wood of New Deal, Tex., is currently grazing 35 head of cows and 35 calves on five acres of subsurface irrigated pasture. Wood has indicated he intends to add 20 acres more. He performed the installation work himself, purchasing a small trencher. Having tried the pipe with a drilled orifice, he new plans to use only the insert orifice. He has obtained better results and a more uniform distribution of water with it.

Dick Park of Lubbock attributes the excellence of his lawn to the below-ground system, citing the advantage of placing the right amount of water at the right time and at the right place; also, that fertilizer can be applied through the system. He believes that because the root zone is kept moist while the top soil is kept dry, a healthier plant results.

Recently, the City of Lubbock Parks and Recreation Department installed the Submatic system in a median strip of turf along heavily traveled Indiana Ave. The idea was to save water and also to prevent the spraying of passing cars.

Although the system can be automated, say Submatic engineers, most users find that since large areas can be irrigated at one time—depending only upon the amount of water available—it is an easy matter to open and close valves. If additional information is desired, circle (721) on the reply card.

Enzyme Stops Growth Of Bent on Hot Day

A Michigan State University scientist believes he's found why golf course greens and bentgrass lawns stop growing when surface temperatures go above 95 degrees.

The reason could be an enzyme called nitrate reductase. By selecting grasses with stabilizing levels of this enzyme, golfers and homeowners might have a little less to moan about during hot days.

Speaking at the annual meeting of the American Society of Agronomy, John E. Kaufmann, MSU turfgrass researcher, reported that growth and nitrate reductase induction in bentgrass ceased at 95 degrees. But both growth and the enzyme were still going strong in bermudagrass at 104 degrees.

So Kaufmann isolated the enzymes from the two grasses grown at 77 degrees and tested them again. This time, the bentgrass stopped functioning at 104 degrees, but the bermudagrass kept on going.

"We concluded that the stoppage of bentgrass growth was related to this enzyme, which changes nitrate to nitrite," he said.

Kaufmann and Drs. James Beard and Donald Penner, MSU crop scientists, made their findings after studying enzymes of Tifgreen bermudagrass and Toronto bentgrass. Bentgrass, commonly used on northern golf greens, will quit growing during hot days, forcing greenskeepers to cool the greens to encourage enough growth to recover from the wear and tear of golfers.



Added to your regular mixture, Terra-Green Special Top-Dressing ventilates the soil, reduces compaction, balances water intake and retention. The dustfree granules wet rapidly, absorbing their own weight in water, which they release to the surrounding soil and grass roots.

Containing over 5 million particles per pound, the small particles of calcined montmorillonite provide a greater surface area to aid water infiltration. The miniature size of the granules also permits top-dressing without aerifying, and avoids mower pickup, even immediately after application.

Terra-Green Special Top-Dressing is free-flowing for easy spreader application, non-toxic, non-caustic and will not burn grass or roots. Send for a free demonstration sample and make your own test of the remarkable absorbency that makes it No. 1 for golf courses, parks, athletic fields, home lawns, etc.





Error in Bucket Rescue

I wish to call your attention to an error in your article "Bucket Operator Rescue" in the August issue. Paragraph 13 should read: "Steps 8 and 9 will be practiced at least once each month. Steps 10 and 11 will be explained in conjunction with practice. Each new employee will become proficient in mounting the truck and lowering the bucket, steps 8 and 9, on the first day of employment."

EDITOR'S NOTE. Sorry about that one. We juggled the paragraphs but forgot to change the references. Because those paragraphs are so important, we're repeating them:

8. To gain quick access to the controls and minimize personal danger in lowering the victim, take a running start and jump onto the running board of the truck from at least six feet away, grasping the west coast mirror frame with your hands. Make certain you do not touch the truck and ground at the same time.

Where it is not practical to jump on a running board, jump on the chipper from at least six feet away and move over the truck body to the controls.

9. Once on the truck, move quickly to the controls, lower the bucket and victim away from the energized wires and to the ground (as an alternative, remain on the truck and manipulate an outrigger).

10. Remove the victim from the bucket and lay him on his back in a position to administer mouthto-mouth resuscitation and closed chest heart massage. Clear the victim's mouth and tilt his head back to clear the air passages. If the victim does not breathe, seal his mouth with your lips, hold his nostrils closed and blow in breaths strong enough to cause his chest to rise, at the rate of 12 times per minute. If for any reason it is not possible to remove the victim from the bucket immediately, mouth-to-mouth resuscitation should not be delayed but should be administered while the victim is being removed.

11. Check the victim's pulse for a heartbeat by pressing two fingers lightly along the windpipe. If the victim has no pulse, it will be necessary to administer heart massage in conjunction with mouth-to-mouth resuscitation. To administer closed chest heartmassage, locate and place the heel of one hand on the lower half of the breastbone. With the other hand on top, apply sufficient pressure to depress the lower half of the breastbone 21/2" at the rate of 60 times per minute or five times between breath blown into the victim's lungs.

Additionally, the pictures with the article show an operator in an open-sided bucket. Farrens Tree Surgeons does not use, nor do we advocate, the use of the open-sided buckets in tree work. —N. I. JOHNSON, training and development director, Farrens Tree Surgeons, Jacksonville, Fla.

Liked August Editorial

I compliment you on your fine editorial contained in the August issue. I concur wholeheartedly with your thoughts and compliment you on the manner in which you put them forth. — DOYLE JACKLIN, Jacklin Seed Co., Inc., Dishman, Wash.

More Like Markstein's

Let us have more articles like David Markstein's on inflation in the July issue. This is one of the most effective and informative articles on this subject I have read. — L. B. HAWKINS, The Best Fertilizers Co., Lathrop, Calif.

Thanks for August Issue

We would like to express our appreciation of the August issue, particularly the article referring to the experiences of the Asplundh Tree Expert Company and the maintenance article by Ray Gustin, Jr. We sincerely appreciate receiving your monthly magazine and look forward each month to its arrival. — JAS. T. TURNER, Turner Tree Service, Atlanta, Ga.

Right Helicopter; Wrong Name

Just a word to express our appreciation of your featuring one of our fine customers, Asplundh Aviation, Inc. Your article was informative and well written.

Unfortunately, you have incorrectly labeled a picture of our turbine-powered JetRanger with the name of a competitor's helicopter.—B. C. CRYER, supervisor of commercial marketing, Bell Helicopter Co., Fort Worth, Tex.

