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## Letters

*(from page 10)*

case Secretary Butz, to add noxious weeds to the current Federal noxious weed list without any public hearing. Now this, in itself, sounds very innocuous, however, it means that he can put any number at any time on the list without any due consulting with sod growers, seed growers, or any type of farmer/producers or even the prople of a certain state who produce a commodity that might have that weed in it and which may not be a problem in a different state.

Again, the fact that the Federal government can maintain such direct control over this list without any public hearing, without any consultation with anybody whatsoever, makes this proposal unfair, unwarranted, and undesirable.

**It is my belief that any Federal Noxious Weed Act, if adopted:**

**(1) should exempt seeds intended for planting purposes;**

**(2) should be limited to the importation of noxious weeds which are new to the United States and are, or if imported are reasonably anticipated to be, of economic importance;**

**(3) should include provisions adequate to insure that the act will not be administered in a manner which would create an unreasonable non-tarrif trade barrter;**

**(4) should provide for the necessary eradication of new weeds inadvertently introduced into the US and established in a small area; and**

**(5) should provide for a reasonable period for comments by interested persons, and for a public hearing if deemed necessary by the Secretary, or if requested by any person before any rule or regulation is promulgated.**

Again, I don't disagree with your basic concept of the law, however, I disagree violently with the manner in which the proposal was put forth, that there would be no hearings allowed as is the case now and that the Secretary of Agriculture could, at his discretion at any time, put a weed or many weeds on this list. **Doyle W. Jacklin, Jacklin Seed Company.**



Robert Felix

## NAA's Robert Felix Named Exec. Secretary

The National Arborists Association, Inc. (NAA) recently appointed Robert Felix as executive secretary.

Felix, Wantagh, New York, has been active in NAA affairs as an officer and director. For over twenty years he was associated with Harder Services, Inc., Hempstead, N.Y.

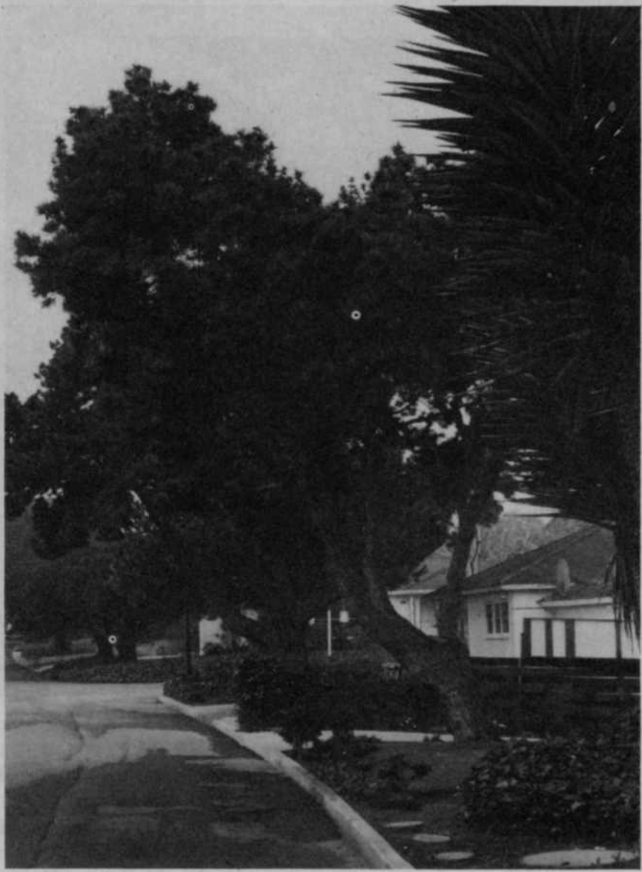
"My plan is to initiate an aggressive program for the NAA which has members spanning the U.S. in the fields of utility and commercial agriculture, membership development, education, safety programs and a broad public relations program," said Felix.

The NAA moved its headquarters from Washington, D.C. to Long Island, N.Y. in early March.




◆ For More Details on Preceding Page Circle (141) on Reply Card

# Torrance Recovers From Pine Tip Moth



A typical residential street scene in Torrance, Calif. A Monterey Pine stands in the middle foreground.

Torrance is the third largest city in Los Angeles county, outstripping in population such better known names as beautiful downtown Burbank, Pasadena, Santa Monica and Pomona.

One need only review previous census figures to see the explosive pattern of growth that has been common to the southern coastal areas of California. Torrance was incorporated in 1921 and its population was 7,280 in 1930, had risen to 22,241 in 1950, expanded dramatically to 100,991 in 1960, and is now estimated at 140,000.

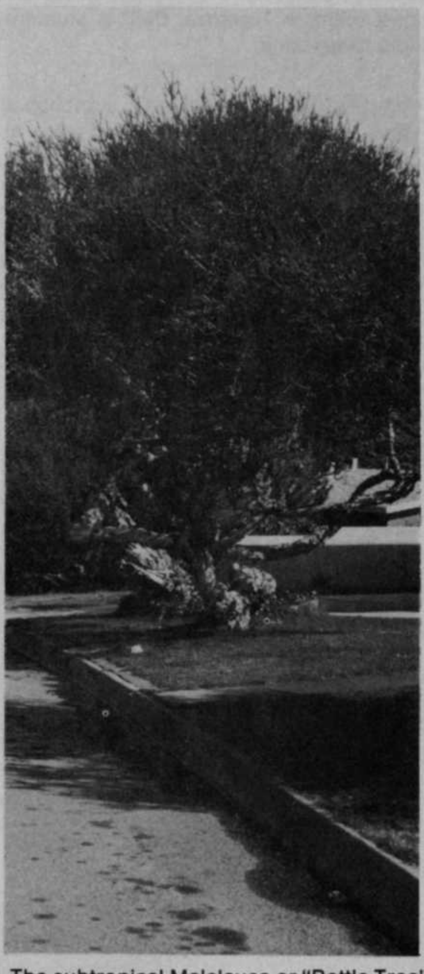
As a city, it is an unusual mix of industrial and residential areas. There are within its boundaries a steel mill, chemical plants, and oil refineries. There is also more than a mile of beachfront and many distinguished residential districts.

Trees can do much to make any city more livable and attractive, and, as early as the 1920s, Torrance developers were planting Monterey Pines and other beautiful conifers and some subtropical trees such as the "Bottle Tree" or Melaleuca (an Australian import). Then, at the time of its fastest growth during the '50s and '60s, the city of Torrance began an active program of planting trees on its street sides and median strips. That program is still continuing with the most common plantings being of Italian Stone Pine and Monterey Pine. Most go into the ground in 15 quart size.

Afflicted pine needles appear light color against the darker, healthy shoots. A pine tip moth infestation can cause the needles to prematurely drop off the tree, clogging the center of the tree and cluttering sidewalks and lawns.

Dean Leedham (left) and Robert Schrauben look over Monterey Pines. Schrauben, tree supervisor of the Torrance street department, works at giving tender loving care to the street-side trees.

The Monterey Pine is so thick with limbs, needles and cones that it is necessary to apply Zectran 2E under 350 to 400 psi to assure adequate penetration.



The subtropical Maleleuca or "Bottle Tree" was originally imported from Australia. It is now common to the southern California area.

Over the past quarter-century of civic expansion, Bob Schrauben, who is tree supervisor of the City of Torrance street department, has worked at giving tender loving care to the street side trees of his city. It is fair to say that he knows them all, by location and name.

Among his favorites are the 45 year old Monterey Pines *pinus radiata* that were planted by a developer in an older district of Spanish Style homes. They were relatively uncared for during the first thirty years of their life, but have now been nurtured and shaped to where they soften and frame the landscape of the quiet residential streets.

A relatively low growing, contorted tree, heavy with cones in certain years, the Monterey Pine is often planted to hold back the movement of southern California coastal dunes. It casts a massive cone of shade and is a typically dark blue green in color when healthy.

When attacked by an infestation of the pine tip moth, which is what happened a few years ago, the needles turn brown and become very unsightly. Prematurely dead needles drop off, clogging up the center of the tree and cluttering sidewalks and lawns. Afflicted trees can be severely stunted or die if the infestation is not stopped.

When it became obvious that the infestation of pine tip moth was a real problem, Schrauben consulted with entomologist Dean Leedham of Target Chemical Company, who advised him to use Zectran 2E in water as a method of control.

The applications are being made from a 600 gallon hydraulic spray rig owned by the City of Torrance street department, with instructions to the operators to thoroughly drench the affected trees from the top down. It is necessary to do this under 350 to 400 lb. psi to make sure of adequate penetration. The Monterey Pine is so thick with limbs, needles and cones that it can effectively mask the spray if not applied at these high pressures.

Applications have been made three to six times a year, beginning in May. They have proved to be very effective and what were once brown and bedraggled trees are resuming their former healthy colors.

Since most of the street side trees are actually on front lawns, the householders have been watching the progress of the battle against the pine tip moth with great interest. They frequently come out to query Schrauben when he is making inspection trips of the area. There have been extremely few complaints about the spraying, with the great majority of the residents voicing approval of the program to save their trees.

To maintain this approval and to protect the safety of workers, Schrauben makes certain that adequate precautions are taken during each spray job. A sea breeze usually springs up each morning during the late spring and summer months at the time that spraying is under way, and the crews quit spraying when the wind reaches 5 mph, to minimize drift.

Torrance has an average rainfall of 12 plus inches and an annual mean temperature of 61° fahrenheit. The highest monthly mean temperature is in August when a peak of only 68.5° is reached. This means that it is an ideal climate for the growth of trees that flourish in moderate temperatures.

With the assistance of Bob Schrauben and his crews, Torrance will continue to be a good place to grow trees, population growth and pine tip moth not withstanding. ☐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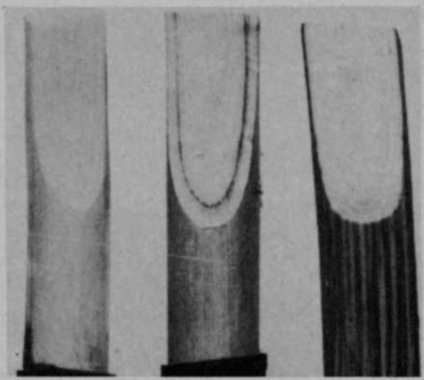
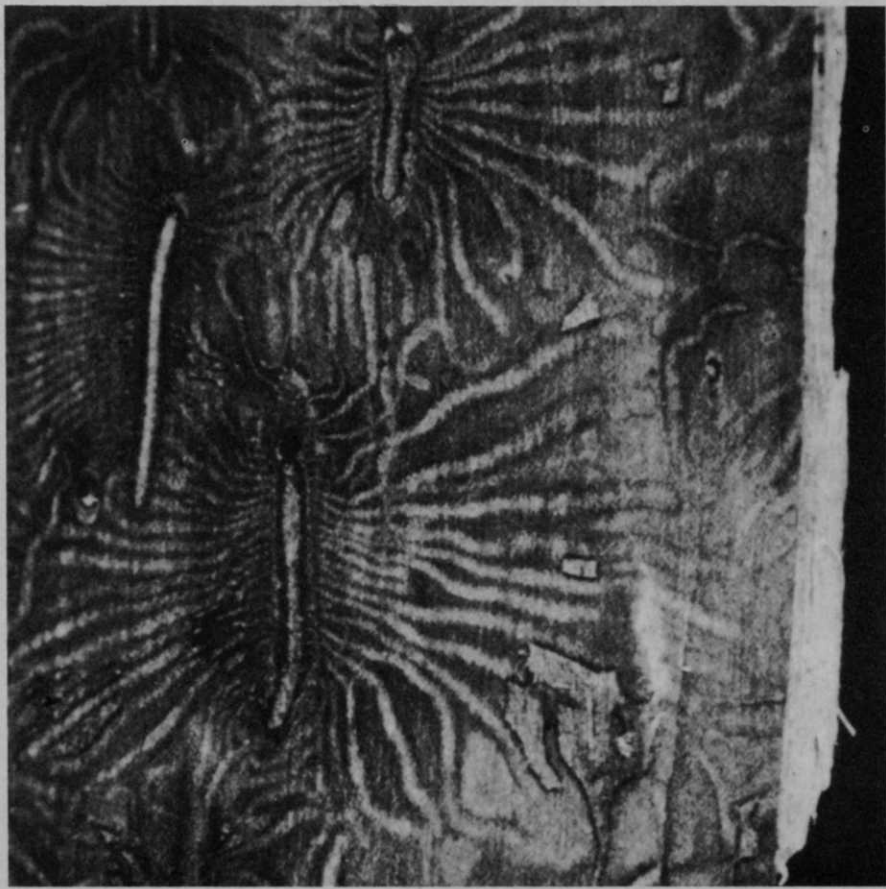
For More Details Circle (135) on Reply Card

One part of an integrated control method for important specimens is the dormant spraying of methoxyclor. Photos courtesy of Illinois Natural History Survey.



Dutch Elm Disease on twigs. The twig on the left is normal. The wood of the two on the right is typically discolored.



Dutch Elm Disease is carried from tree to tree by bark beetles. These are the brood chambers of one of them.

# DED Controls: Will Systemics Work?

By RICHARD J. CAMPANA
Dept. of Botany and Plant Pathology
University of Maine

From its history of spread and development in Europe and North America, there is nothing to indicate that the Dutch elm disease can be contained. The ecological forces at work are such that is is clearly beyond the capacity of man to prevent massive and often accelerating rates of infection in populous elm stands.

These forces involve balances in population dynamics among at least three living species: (1) the elm (usually *Ulmus americana* L.); (2) at least one, and sometimes two, insect vectors (the introduced smaller European elm bark beetle, *Scolytus multistriatus* (Marsh.), or the Native elm bark beetle, *Hylurgopinus rufipes* (Eichh.); and (3) the casual fungus (*Deratocystis ulmi* (C. Buisman) Moreau). In a broad sense Dutch Elm disease is a man-made problem.

Once sporadically distributed mostly along streams, the American elm was planted extensively as pure stands in cities and towns throughout eastern North America as an urban or suburban "tree monoculture." Having established the elm as "the" urban tree over all others, inadvertently we next introduced from Europe (*circa* 1905) the European elm bark beetle, and later (*circa* 1930) at least one virulent strain of the casual fungus.

Thus, the basic factors involved in this devastating epidemic of elm populations are: (1) extensive stands of closely spaced, highly susceptible trees often connected by root grafts; (2) an insect vector capacity enhanced by addition of the European beetle; and (3) presence of the causal fungus. These were combined under climatic conditions favorable to the proliferation and development of both the pathogen and its vectors.

The disease is not restricted to urban elm stands; most native elms of field, stream and forest are highly susceptible and just as badly affected. The difference is that volunteer elms on open land develop naturally from seeds cast annually, whereas groups of elms lining streets, or used as specimen trees were usually established through plantings of colnal stocks, and most often at one specific time.

Thus, there are significant differences between natural and horticultural elm populations with respect to site, spacing, numbers, age, variation in susceptibility, etc.

Therefore, for various reasons, most urban elm populations may be reduced beyond restoration, whereas natural ones will be replaced in part by natural seeding. The new natural populations will be reduced in size, with little or no regularity of spacing in spite of what man does or does not do in attempts at disease control. Thus, whatever we do is seen either as a delay of disease incidence in relatively small selected elm populations, or as the treatment of individual trees of sufficient value to warrant intensive control efforts.

In 1956,[1] I tried to design a blueprint for "community-wide control" of the disease with only two control methods (both indirect). But now I see little prospect that satisfactory disease control (saving most of the elms) will be achieved very often or for very long throughout extensive elm populations. Such control now appears possible only with complete and intensive application of at least five control methods on limited numbers of highly valued trees.[2]

These methods are: sanitation; dormant spraying; severance of root grafts; early removal of single-branch infections; and fungicide applications for internal action. At least two of these methods, (early surgery, and use of systemic chemicals) are direct.

The concept of integrated control is still valid even where systemic chemicals can be used effectively to help prevent infection, because no single control measure has been demonstrated to be completely successful. Even if the application of systemic chemicals to diseased trees could result in complete recovery, re-infection might well nullify original curative efforts. At least with present knowledge and in the absence of greater certainty in the efficacy of chemical treatment, an integrated control approach has the merit of enhanced security.

Based on early field tests, the two highly promising chemicals for the control of Dutch elm disease at the present time are Benlate benomyl fungicide and an antibiotic known as Nystatin.

## IS BENLATE SUITABLE?

For at least the past thirty years plant pathologists have sought in vain a suitable systemic chemical to prevent or arrest Dutch elm disease. Hundreds of chemicals highly toxic in the laboratory against *C. ulmi*, failed to arrest the fungus in inoculated elms. Some of the reasons explaining such failures were reviewed in an earlier paper[3] on the requirements for a suitable systemic fungicide.

Within the past five years Benlate was found to be effective in preventing Dutch elm disease with applications by soil amendments, trunk injections or foliar sprays. A use permit issued by the U.S. Environmental Protection Agency in March of 1972 for the control of Dutch elm disease, was restricted to applications by trained and licensed arborists using specific methods of application. How well does Benlate meet requirements for a suitable systemic fungicide?

1. *Is it toxic to the fungus in elm tissue?* The chemical is quite effective in preventing infection, but most results indicate only partial success or failure in arresting the fungus after infection is well established.

Post-infection treatment with Benlate applied by Maujet injection is often not recommended if more than five percent of the crown is visibly wilted before treatment. However, most published data are based on use of the chemical in an aqueous suspension, in which only a minor fraction of the fungicide is in the dissolved state! The particulate matter in the suspension clogs vessels through which the solubilized fraction must move to get where it can be most effective. Thus, Benlate in suspension appears to have a low capacity for being widely systemic. *(Editor's Note: Research conducted by Dr. T. C. Ryker and others indicates that the xylem vessels appear to be about 11 microns in diameter. The particle size of Benlate is about two to four microns in diameter. Thus, it would appear that the chemical could move through the xylem tissues without clogging.)*

But the degree of fungitoxicity in elm tissue is still unresolved, since there are no carefully designed studies to answer this question.

Tests on a new, solubilized Benlate, especially those involving pressure injection, have been initiated too recently to provide an answer here. My experiments in using solubilized Benlate with pressure injection in 1972 produced evidence that the fungus may not be killed completely with post-infection treatment. With good distribution, it is easy to visualize death of fungus spores as they are exposed in open vessels; however, it is also easy to visualize impacted hyphae of the causal fungus deep in cellulose layers of wall tissue of cells not contiguous to open vessels.

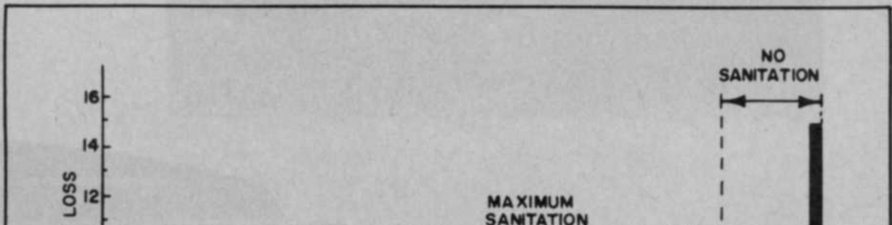
Can we be certain that such hyphal structures will be killed? Is it possible for the fungus to "ride out" the Benlate "storm" in such tissues until the chemical loses its punch, and then emerge from the "woodwork" to continue the infection process? Will the disease symptoms so visibly arrested in July and August appear, or fail to appear in the following June? These and many other questions have yet to be answered. We can say with confidence at present that fungitoxicity in elm tissue has been demonstrated beyond question only before an infection is well established.

2. *Is Benlate stable; does it or its derivatives retain toxicity?* All of the evidence points to its early transition to MBC (methyl-2-benzimidazole carbamate) reported to be fully as toxic as Benlate *per se*. On this point, the fungicide clearly meets the requirement.

3. *Is Benlate mobile?* There seems little question here that it is; certainly in upward mobility, reliable bioassay tests show that fungitoxicity can be detected in strength far from points of injection. However, as noted above, mobility can be impared by clogging of vessels, and there is evidence that this happens often with non-solubilized material. But even though mobility is now assured in the new solubilized form, can we be certain that Benlate will get into all of the branches where infection could be present? Unfortunately, even with pressure injection of the solubilized form, bioassay tests indicate difficulty in detection of fungitoxcity in many small branches where infection is possible.

4. *Is Benlate residual? Does it remain long enough in the plant system to be effective?* There is no body of reliable data on effective longevity of toxicity in elm tissue, even though it is reported to persist in some plant tissues up to 18 weeks. Unfortunately, the same physical factors that favor mobility may favor

*(continued on page 71)*




Sanitation is still one of the most important elements of an integrated control program. Much greater losses may be expected if it is abandoned. Photo courtesy of R.J. Campana.

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Flymo® is a revolutionary concept in rotary lawn care machines. Flymo floats along on its own cushion of air at exactly the height you want for healthy turf. The same air cushion that supports Flymo also pulls the grass up into the tempered steel blade for even cutting.

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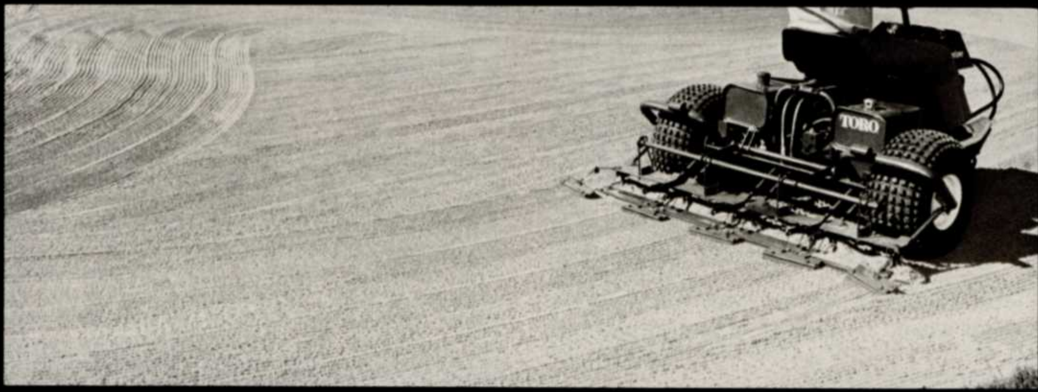


## It earned its fame by giving sand traps a whole new look.

## Now the Sand Pro turns all-pro as a spiker and finish-grader, too.


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**GRADES SEEDBEDS**

Now look at what the Sand Pro can do for you! It can dress up your entire course with distinctive, uniformly beautiful traps that consistently play as well as they look. It can do a better job of spiking your greens than any specialty spiker on the market (and we'd like to prove it on your own greens). It can take the drag out of pulling a drag-mat over the greens. And, with the new Finish-Grader it can handle fine grading, scarifying, shaping and contouring of seedbeds. All this in a highly maneuverable, low maintenance unit with hydrostatic drive to all three extra-low-pressure tires. It's another classic from Toro—backed by the Toro parts and service system. Look over the features and benefits, in detail, on the next page.

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TORO® SAND PRO™

# Any way you put it together, you can't beat the features and benefits of the Sand Pro!

## PRIME MOVER

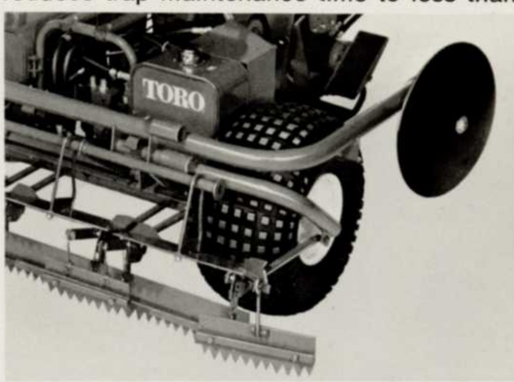
Heavy-duty industrial quality hydrostatic drive to all three wheels gives excellent torque with no gears to change, no clutch to slip. Single foot pedal gives infinitely variable ground-speed control — as well as forward to reverse in one smooth, continuous motion. Short-wheelbase tricycle design, low center of gravity and midship-mounted engine combine to give machine maximum maneuverability, stability and traction. Special ATV tires carry only 4 psi for excellent traction in sand, good flotation on greens. Automotive-type steering to front wheel turns machine on zero radius to left or right for superior handling ease. Simplified operator control area reduces learning time and operator fatigue, increases safety.

### SPECIFICATIONS*

**FRAME:** All welded tubular-steel construction.
**WHEELS:** Standard demountable — interchangeable for three positions. 21 x 11:00-8 tires. Extra low-pressure, 4 psi compass tread.
**ENGINE:** Kohler 8 hp Model 181 SP. Cast iron block, dry element air filter, fuel pump. Rubber mounted.
**STARTER:** 12 v. Bendix-drive electric starter is standard. Key switch controlled from dash.
**DRIVE:** 3-wheel hydraulic. Engine-mounted variable-displacement piston pump through flexible coupling to 3 Ross Torqmotors® on wheels.
**STEERING:** Automotive-type steering wheel. 6:1 reduction ratio.
**SEAT:** One piece molded with back support. Adjustable forward and back.
**OPERATOR CONTROLS:** Key start, hand throttle, hand choke, ammeter and hour meter on dashboard. Foot pedal controls forward/reverse and speed. Hand-operated hydraulic control lifts and lowers rake, spiker or grader. Valve disengages pump for towing or pushing.
**FUEL TANK:** 2.7 gallons.
**HYDRAULIC RESERVOIR:** 1½ gal.
**HYDRAULIC OIL FILTER SYSTEM:** 10 micron replaceable element.
**SPEED RANGE:** Infinitely variable to 5½ m.p.h. maximum.
**TURNING RADIUS:** Machine turns on zero radius to the left or right.
**REFUSE CONTAINER:** Removable and located within easy reach of operator.
**DIMENSIONS:** Width — 58½". Overall length — 62½". Wheel base — 40". Height — 42". Weight — approx. 650 lbs. with fluids.

## SAND RAKE (with Prime Mover)

Four independent cultivator bars and nine free-floating finish rake sections hug banks and contours to give continuous coverage over entire trap surface. Adjustable weights on free-floating rake sections for best finished appearance under various sand conditions. Hydraulically raised and lowered rake and cultivator bar can be held at proper depth of penetration for best mechanical cultivation, weeding and finish combing — eliminating chance of green damage by herbicides. Wide 68-inch rake combined with exceptional maneuverability of prime mover reduces trap maintenance time to less than half that of hand raking an average trap. Optional maintenance edger (model No. 08822) is a hydraulically raised and lowered coulter blade that trims vegetation around edge of trap, leaves a clean, tailored appearance and eliminates slow hand maintenance.



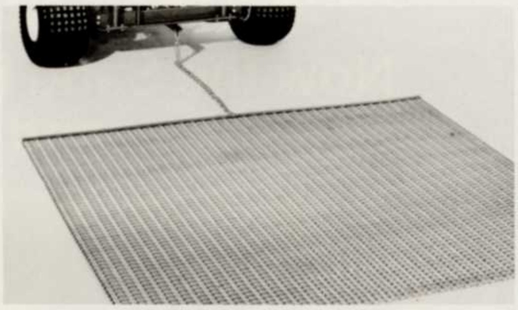

OPTIONAL MAINTENANCE EDGER

### SPECIFICATIONS*

Model No. 08875
Hydraulically raised and lowered. Four forward conditioning sections utilizing subsurface bar for breaking crust. Nine finishing sections. Angle of conditioning bar adjustable for depth of penetration. Finishing sections have adjustable weights. Width: 68".

## SPIKER

Special Toro profile-tooth blade spikes cleanly without ruffling turf (hold-down fingers prevent lifting turf, too, so greens are immediately playable after spiking — no rolling or cutting needed). Extra large tires provide flotation equal to the Greensmaster® 3, and the transfer spring puts up to 22 lbs. per blade across the 58 inch spiking reel width for maximum 1¼ inch penetration. 3-point hitch makes spiker simple and quick to attach and detach. Optional drag mat (model No. 08844) and hitch kit (model No. 08833) turns incorporation of top dressing into an easy job, and crushes and crumbles aerifier cores.



OPTIONAL DRAG MAT

### SPECIFICATIONS*

Model No. 08855 without hydraulic cylinder.
Model No. 08866 with hydraulic cylinder.
**WEIGHT:** 280 lbs.
**UNIT WORKING WIDTH:** 58".
**WORKING DEPTH OF SPIKER:** 1¼" maximum.
**SPACING OF BLADES:** 2⅜".
**NUMBER OF SPIKE HOLES:** 21 holes per square foot.
**SPIKER BLADES:** High carbon steel — .105 inch thick. Special profile design for minimum disturbance of soil surface when spiking. 8 points per blade, 24 blades. 7¾" dia. blade point to point.
**POWER:** Ground driven.

## FINISH-GRADER

Spring-loaded Finish-Grader has closed ends to prevent windrows, is automatically self-relieving across entire width of scraper as machine travels forward to leave a smooth, even surface. Hydraulically controlled up and down for ease of operation and control of grading and scarifying depth. Heavy-duty steel teeth can be dropped out of transport position for soil conditioning and scarifying loosened soil. Hi-flotation tires and balanced weight distribution of Prime Mover means less compaction than with a heavy tractor when fine grading, shaping and contouring seedbeds. Rugged construction, simple design means long life, low maintenance.

### SPECIFICATIONS*

**WEIGHT:** 200 lbs.
**DIMENSIONS:** Length: 10 inches. Width: 66 inches. Height: 10 inches.
**LIFT:** Hydraulic.
**DESCRIPTION:** The Sand Pro Finish-Grader accessory consists of a box plow and scarifier designed to quick mount to the Sand Pro. The unit is capable of light ground maintenance and grooming, replacing hand shoveling and raking on ball diamonds, on golf courses, and for landscaping in small areas where use of larger machinery is not feasible.

*Specifications and design subject to change without notice. The Toro Company, Bloomington, Minnesota. Printed in U.S.A.

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