### AERI-BOY AERIFIER: Hahn-West Point, Evansville, Indiana

Simple flip over action allows transport of Aeri-Boy from one location to another. Designed to fill the gap between the small 30 inch and the wide 6 foot aerifiers, this unit has a 4 foot cultivating width and is equipped with nine 18 inch free wheeling discs for 90 aerifier spoons or slicing blades. A specially designed hitch permits the towing of three units for large areas. For more details, circle (709) on the reply card.



### DELA-FOAM A NOZZLE: Delavan Manufacturing Co., West Des Moines, Ia.

Cover a broader range of applications with this new foaming nozzle designed specifically for aerial application. It can reduce spray drift by as much as 60 percent. Available in brass or aluminum and in sizes up to 8.1 gpm at 40 psi, the nozzle has large passageways to prevent clogging. There is no need for a foam generator. The two fluid air aspirating nozzle delivers a straight stream pattern. Breakup of the pattern takes place within 3-4 feet of the nozzle orifice. For more details, circle (710) on the reply card.



FIBERGLASS TRUCK TOOL BOX: Hemco Corporation, Independence, Mo.

Travalite Tool Box with dimensions of  $73 \times 22 \times 17\frac{1}{2}$  inches provides a sliding tray available to either side. Concealed continuous piano hinge with self-locking stay-open braces and a built-in water drain. The color is molded-in white with a porcelain finish. Weight is 75 pounds. Ample space between tool box and truck floor is provided even though vision from rear truck window is not obstructed. Standard equipment includes locks and keys. For more details, circle (711) on the reply card.



TOP DRESSER: Cushman Motors, Lincoln, Nebraska

Apply dry or moist materials with this light cargo vehicle equipped with turf-saving 8.50 x 8 Terra Tires. The top dresser unit slides into the cargo space on the truck and is powered by the truck engine. The engine-ground speed governor keeps spreading at a precise speed to protect greens and delivers material in an even 36 inch pattern. For more details, circle (712) on the reply card.

### Agronomists Report New Use For Old Tires

Discarded rubber tires, may someday be put to work to aid crop growth. Research underway at Mississippi State University points to this possibility. The research is sponsored by the U. S. Rubber Reclaiming Company of Vicksburg, Mississippi, a leading rubber reclaiming company. The problem of what to do with discarded rubber waste, old tires particularly, has plagued environmental scientists.

Drs. Rollin C. Glenn and C. Y. Ward of the University's Agricultural Forestry Experiment Station have reported a series of experiments in which ground up rubber particles were mixed with soil in varying percentages. Soybeans, selected because earlier studies showed they were sensitive to toxic elements, were planted in the rubber and earth mixture. The agronomists tested the effects of rubber when mixed with soil in amounts of one to 10 percent by weight. Rubber particles were mixed into the soil in December of 1970; the soybeans



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were seeded the following May.

If the resulting phenomenon proves out in future experiments, it may be that old tires will help agriculture solve one of its most critical problems—how to get crops above ground as fast as possible to ensure a successful harvest.

The higher the percentage of rubber used, the scientists noted, the faster the plants came out of the ground. Those planted in soil with a five to 10 percent rubber mixture emerged "significantly faster" than the plants grown in soil with lesser percentages of rubber.

At harvest, plants grown in soil with the higher percentages of rubber were a couple of inches shorter than the others. This was seen as an advantage to farmers, the shorter plants being less susceptible to wind damage.

Most important, the plants showed no visible signs of abnormality. Previous experiments inside a greenhouse had disclosed toxicity from the zinc oxide content of rubber. Some plants were killed, others showed abnormalities.

Other potential benefits were also noted. Winter weeds died off soon after the rubber particles were mixed into the soil, during the period of greatest toxicity. And if put into widespread agricultural use, rubber might help maintain zinc oxide content of animal and food products.

A similar experiment with winter wheat is now being conducted at Mississippi State, Drs. Glenn and Ward reported.

Benjamin R. Wendrow, President of U. S. Rubber Reclaiming, explained that his company's sponsorship of the Mississippi State research is an effort to develop mass uses of reclaimed rubber. Some two billion old tires now litter the landscape, with another 200 million a year being added.

Nor can this refuse be recycled in the same way as paper, glass and metal. Or buried, or burned. Buried tires tend to wriggle their way back up to the surface. If burned, they give off an oily smoke which can pollute an entire area.

Up to now, the best long-range prospect for reclaimed rubber has been its use in highway and street paving. When mixed with asphalt, rubber produces paving surfaces which last longer and are free of some of the problems common to asphalt. "Rubber roads are gradually gaining consideration in highway construction," Mr. Wendrow states, "but their rate of use is far below their rate of discard."



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### WEED CONTROL (from page 26)

and grasses. "We've been experimenting with Princep for three years, and now we're going to use it more," he said. "It did a terrific job on a lot of annual bluegrass we had; we got good control, and since we keep cultivating all the time, once the early weeds are out, the rest is easy."

Kogut applies the granules at 40-50 pounds an acre ("We're going light with it") around junipers, yews, hemlock, and arborvitae. He won't use it on andromeda and broadleaves, and applies the chemical to a section of ground only every other concluded that combinations of herbicides applied in the fall at lower rates provide greater safety for low tolerance stock, and help reduce residual problems, Kogut's main concern.

Ahrens reports some nurseries have used the chemical for 10 years without any signs of injury to tolerant stock. His studies indicate that residue levels do not build up over a period of time.

In a 1965 report, he stated, "Newly planted yews and the relatively susceptible Eunonymus sarcoxi have been planted in soil treated five years previously, and treated again after planting the sixth year, with-



William Kreutzfeld, vice-president in charge of production at the D. Hill Nursery in Dundee, III., looks over the results of an application of herbicide to control weeds. Note that little unwanted vegetation exists.

year. In this way he feels he avoids residues in case he wants to change plant types there.

He doesn't mind if the light application lets some weeds through as long as he can keep the hoeing to 40-50 acres in the spring.

He still feels he's ahead at a cost of \$20-25 an acre, including labor. Says Kogut, "chemical weed control saves plenty on hoeing. We get better plant growth and have fewer insects."

August and winter (February and March) applications are normal procedure for the Kogut Nursery. The granules are broadcast with a handcrank spreader three rows at a time. Frank believes walking it on helps in gauging the wind better and adjusting the fall of the granules.

Having worked in this field since 1958, researcher John Ahrens has out serious injury at three pounds of simazine per acre per year."

After 10 years of treatment on the same soil, yews grew as well or better than a comparable untreated soil in his experiments, but the growth of Eunonymus was markedly depressed. Therefore, he suggests decreasing herbicide dosages as weeds are controlled and alternating and combining herbicides at lower rates to avoid injury to sensitive plants and the building of resistant weeds.

He advocates accurate applications of herbicides, and correct rates of chemical for the results nurseries want.

And those results, for Frank Kogut, at least, are when "a man can walk through 10 acres in an hour, and only hoe what few weeds come up here and there."

For More Details Circle (149) on Reply Card

For More Details on Preceding Page Circle (133) on Reply Card

### Environmental Safety Bulletin Available From Dow

Safety and Loss Prevention Services is the title of the first bulletin in a series on environmental health services published by Dow Chemical Company. The bulletin points up the company's capabilities in developing accident prevention programs aimed at producing a safer working environment for employees and minimizing losses to the employer. For more details circle (722) on the reader reply card.

## Encapsulated Chemicals Decrease Human Toxicity

Encapsulation, once the tool of the science-fiction writer, is now being proved as a method of dispersing highly toxic insecticides. Scientists at Pennwalt Corporation's Agchem-Decco Division are encapsulating methyl parathion as well as other insecticides.

Dr. E. E. Ivy of Pennwalt says that test data shows the encapsulated methyl parathion — tradenamed Pencap M — is more than 500 times less toxic by skin absorption and 40 to 100 times less toxic by ingestion than conventional methyl parathion concentrate formulations.

The encapsulation development program was initiated at Pennwalt in an attempt to improve residual performance of methyl parathion and similar products and, at the same time, increase the safety of these products to the user.

The process involves micro-encapsulation of the insecticide in a plastic capsule, 30 to 50 microns up to millimeter size. The rate of release of the capsule contents is correlated with the capsule wall-type and thickness, permitting regulation of release rate from the capsule. This allows a degree of flexibility in designing a capsule for a specific pest control application with a given insecticide.

Dr. Ivy's laboratory and field tests with various Pencap M solutions proved them to be more effective on initial contact, as well as in sustained residual activity, than the emulsifiable concentrates. His tests included such crop and tree pests as bollworms, boll weevils, spider mites, Japanese beetles and gypsy moth larvae.

Pencap M, the first encapsulated pesticide, contains two pounds of methyl parathion per gallon. It may be applied through conventional ground or air spray equipment.

Tests are also underway with encapsulated formulations of parathion, diazinon, malathion and several new experimental insecti-

### Turf Equipment Firms Sign Marketing Agreement

A reciprocal marketing agreement between a British manufacturer of turf care equipment and Hahn, Inc. of Evansville, Indiana has been reached.

Ransomes Sims & Jefferies Ltd. of Ipswich, England has been appointed the exclusive world-wide marketer for the complete line of Hahn products. The agreement excludes the marketing rights in North America and Japan. Hahn will have exclusive rights for the sale of Ransomes' turf products in the United States.

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### LETTERS TO THE EDITOR

### PERMISSION GRANTED

Dr. E. B. Himelick, Executive Director of I.S.T.C. (International Shade Tree Conference, Inc.) was particularly impressed with the list of "Don'ts and Do's in Client Relations" by Richard Stemm in the October 1971 issue of WEEDS TREES and TURF. May we have your permission to reproduce this list at some later date in Arborist's News. . . DR. DAN NEELY, editor, International Shade Tree Conference, Illinois Natural History Survey, Urbana, Ill.

### OUR MISTAKE

We at the Weed Science Center of the Crop Science Department of North Carolina State University receive WEEDS TREES AND TURF and enjoy this informative and interesting magazine very much. However, I would like to raise a question about the data given on losses



to agriculture from pests in "Trimmings" on page 42 of the January, 1972 issue.

Here it is stated that insects cause an estimated annual loss of \$4 billion, plant diseases at \$2.7 billion, and weeds at \$500 million. In the USDA bulletin, "Losses in Agriculture," 1965, estimated annual losses from insects was \$3.3 billion for insects, \$3.3 billion for plant diseases, and 2.5 billion for weeds. Adding the cost of controlling these pests, the total figure came to \$3.7 billion for insects, \$3.4 billion for diseases, and \$5.1 billion for weeds.

The USDA, ARS publication 34-23 "A Survey of Extent and Cost of Weed Control and Specific Weed Problems," 1965, states that, "Losses caused by weeds in the United States are believed to equal the combined losses from insects and diseases and to rank second only to those caused by soil erosion. Losses from weeds and costs of controlling them on agricultural lands are estimated to be about \$3.8 billion each year."

We would certainly like to think that increased use of herbicides (\$509 million dollars worth in 1971) and other weed control practices have reduced losses from weeds to the level reported in WEEDS TREES AND TURF, but really doubt it. Your figures would also indicate a lowering of losses for plant diseases and an increase in losses from insects. . . A. D. WOR-SHAM, Professor, Crop Science, North Carolina State University, Raleigh, N.C.

EDITOR'S NOTE: We stand corrected. Our source of information came from a speech presented last year. The speaker recognized that the size of the problem was large, but just didn't estimate the size correctly. Incidentally, the National Agricultural Chemicals Association says that loss in the United States from insects and diseases bas been estimated between nine and sixteen billion dollars annually. This represents one-third of the total food bill. Eightyeight million acres must be cultivated to offset this loss.



Trees in foreground were stripped of foliage by gypsy moth. Trees in background were treated with microbial insecticide Thuricide.

# **Biological Control For Gypsy Moth**

**R**ESULTS of a major cooperative research program by state, Federal, university and private industry researchers indicate that a biological insecticide can be used to prevent gypsy moth damage to foliage in forests.

Field trials in Pennsylvania and three other northeastern states, coordinated by Dr. Frank Lewis of the U. S. Forest Service, provided field results which may open the way to giving arborists and insecticide applicators an effective alternative to carbamate chemicals for prevention of gypsy moth defoliation

The gypsy moth was responsible for medium to heavy defoliation of more than 1.5 million acres of trees and shrubs last year, but applicators ran into increasing criticism on the use of effective but ecologically questioned chemical pesticides.

Subsequent analysis of field data confirms the efficacy of the biological insecticide. This offers an unusually high degree of safety to all but susceptible leaf-chewing worms. The test results give promise of solving the problem facing the applicator.

"The gypsy moth problem has become so complex that multi-agency, multi-disciplinary approaches are required for an adequate solution," according to one entomologist who has followed the pest's growth in recent years.

Last winter in the face of the pressing demand for a safer, selective, reliable method for controlling the gypsy moth a decision was made to accelerate the field studies needed to document the effectiveness of the biological pesticide called Thuricide.

Impetus for the biological tests was a growing attack against the chemical insecticide (carbaryl) most frequently used in gypsy moth spray programs. Critics had cited potential safety hazards and threats to the environment in opposing spraying chemicals for control of the pest by state and municipal agencies.

At the same time more exotic control approaches such as sex attractants were admitted to require years before achieving commercial status.

As a result chemical spray programs in many communities were delayed or dropped.

Researchers at International Minerals & Chemical Corporaton worked with state, Federal and university scientists to carry out the cooperative field study program. The purpose was to demonstrate that the biological pesticide could afford the combination of effectiveness and safety sought by homeowners, government agencies and conservationists.

IMC recently received Federal registration of its newest, most potent form of the insecticide Thuricide HPC. While it is still too early to determine just how many acres of forests will be treated with the

(continued on page 60)



# TURF INSECTS

(Asteromyia modesta)

FLORIDA: Adults reared from leaves of daisy fleabane (*Erigeron* sp.) at Miami, Dade County. This is a new county record.

### GRASSHOPPERS

NEVADA: Specimens of Opeia obscura collected at



Alamo, Lincoln County; and Cordillacris cinerea collected at Rocky Canyon, Pershing County. These are new county records.

# INSECTS OF ORNAMENTALS

(Pealius hibisci)

FLORIDA: Specimen collected from cassava in nursery at Samsula, Volusia County. This is a new record for Continental United States. This is a oriental species. Common in Hawaii on hibiscus and gardenia.

### TREE INSECTS SOUTHERN PINE BEETLE

(Dendroctonus frontalis)

LOUISIANA: Outbreak in about 4 million acres. During period September to December 10 million board feet salvaged. Estimated additional 10 million board feet need to be salvaged. Weather hindering salvage operations.

#### SPRUCE BUD SCALE (Physokermes piceae)

OREGON: Old scales and crawlers present on Alberta spruce, at Portland nursery, Multnomah County. Presence of crawler stage at this time of year is unusual.

#### WEEVIL (Hylobius aliradicis)

FLORIDA: Adult found on floor of house at Astor Park, Lake County. This is a new county record. Feeds on roots of slash pine.



- Maryland Sod Conference, 7th annual, Center of Adult Education, Univ. of Md., College Park, Md., March 6.
- Midwest Turf Conference, Memorial Center, Purdue University, West Lafayette, Ind., March 6-8.
- Royal Canadian Golf Association National Turfgrass Conference and Exposition, Skyline Hotel, Toronto, Canada, March 15-17.
- Hortus Club, State Univ. of New York Agricultural and Technical College at Alfred, Open House, March 18-19.
- Turf and Landscape Institute, Univ. of Calif. Irvine Campus, March 21-22.
- Northeastern Aerial Applicators Conference, Ballroom, Statler Inn, Cornell University, Ithaca, N.Y., March 21-23.
- Arizona Turfgrass Conference, Stardust Motor Hotel, Yuma, Ariz., April 5-6.
- Williamsburg Garden Symposium, Colonial Williamsburg Gardens, Va., Apr. 9-15.
- Canadian Chapter of the International Shade Tree Conference, Holiday Inn, Hamilton, Ont., Canada, Apr. 14-15.
- Florida Floriculture Short Course and Open House, 18th industry short course, Bradenton, Fla., April 25-27.
- Sub-Tropical Turfgrass Trade Show, Deauville Hotel, Miami Beach, Fla., May 7-10.
- Florida Nurserymen & Growers Association. Walt Disneyworld, Orlando, Fla., May 25-27.
- American Association of Nurserymen, Statler Hilton, Washington, D.C., July 16-19.

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### For More Details Circle (106) on Reply Card

### **BIOLOGICAL** (from page 57)

product, IMC told WEEDS TREES and TURF that predictions are "that more than 2 million acres will be hit to some significant degree by the gypsy moth in 1972 . . . with perhaps half of that acreage receiving some type of control program."

The Environmental Protection (EPA) registration also permits the use of Thuricide on other major forest pests. Included are the fruit tree leaf-roller, spring and fall cankerworm (inchworm), fall webworm, red humped caterpillar, tent caterpiller and California oakmoth larvae. The first step to testing the efficacy of this biogical compound was a midwinter laboratory test



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