AQUATIC WEED CONTROL

(from page 18)

cause the tiny leaves have a waxy coating which makes herbicide penetration difficult.

2. Emerged Plants usually grow in water or moist soil with roots attached in the bottom mud. They may spread by means of an underground root system. Leaves and stems of these plants extend above the water surface. Common examples of this type include cattails, arrowhead, water willow, water primrose, bulrush, spatterdock and waterlilies.

3. Submersed Plants are usually, but not always, rooted to the bot- Duckweed is difficult to control be- tom, and their stems and leaves may fill the water to the surface. Submersed plants have three distinct types of leaf attachments. Whorled leaf attachments are those that have more than two leaves attached at the same point on the main stem. Examples are coontail, watermilfoil and American elodea. Opposite leaf attachments are those with two leaves attached at the same point on the main stem but opposite from each other. Examples of this type are horned pondweed, waterstargrass, southern naiad and brittle naiad. Alternate leaf attachments are those which have one leaf attached singly at different heights on the stem. Examples include leafy pondweed, Sago pondweed, small pondweed. Some alternate leafed weeds have leaves large enough to float. These would include American pondweed, Floatingleaf pondweed, Largeleaf pondweed, and waterthread pondweed.

Miscellaneous submersed plants include water buttercup and bladderwort.

4. Ditchbank or Marginal Plants are those found principally along the water's edge. They are not truly aquatic nor terrestrial. Examples include southern cutgrass, knotgrass, paragrass, torpedograss, water paspalum, southern watergrass and common reed. It is often difficult to identify ditchbank plants when mixed with woody plants.

5. Ditchbank Woody Plants can usually be distinguished from other ditchbank plants by a fibrous or woody plant structure. Trees and brush commonly found along ditches, ponds and other water areas include willow, castorbean, common guava, Australian pine, seamyrtle, tai-tai, and others.

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aquatic weed control in any body of water it is essential to know the species and amount of algae and aquatic weeds present. A moderate to heavy infestation of aquatic weeds with any algae problem is an important consideration in determining the recommendation to be made for algae treatment, for aquatic weed treatment, or for both. The greater the aquatic weed infestation, the more essential it becomes to treat the water either for both algae and aquatic weeds or to increase the dosage used for algae control.

Most all registered algaecides and aquatic herbicides are absorbed equally rapidly by algae and aquatic weeds. Thus, a chemical added to a body of water which is heavily infested with weeds and algae and is being treated only for algae, may fail entirely because much of the algaecide is being absorbed and detoxified by the aquatic weeds.

Other than the kinds and amounts of algae and weeds present, it is essential to know vegetation location in the water, and whether the algae and weeds are young and actively growing.

All plants and algae are easier to kill in their earlier growing stage than when they are mature.

Temperature of water is also important. Treat for algae and weeds in late spring or early summer after water temperatures have reached 62-65° F. and before the aquatic plants have gone to seed.

The physical condition of the water is equally important in assuring successful control of algae and plants. Muddy water rapidly deactivates most of the known algaecides and aquatic herbicides. Thus, a pond should never be treated after a rain when the water may be muddy. Environmental protection chemicals will be rapidly deactivated and performance will not be effective. Be sure not to stir up the shallow water with oars, paddles, motors, or other equipment.

Time of application especially for algae control is important. The best time of the day to treat for algae is in the middle of the day in a bright sun when the algae are growing rapidly. They are much easier to kill when in an active metabolic state. Postpone the treatment if conditions are not right.

Checklist For Algae Control

1. List types and number of bodies of water to be treated. .....
   .....
   .....
   .....
2. For each body of water give the following general information:
   a. Size in acre-feet $\frac{\text{(length x width x average depth)} = \text{No. of acre-feet}}{43{,}500}$
   .....
   b. Kinds of algae present:

(free floating)	(unattached)	(branching)
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

   c. Amount and location of algae:
   Is entire body of water covered? Yes..... No..... Where: .....
   .....
   Is algae present on bottom? Yes..... No..... Where: .....
   .....
   Are algae present only near shoreline? Yes..... No.....
   Where: .....
   d. Are algae in an actively growing state? Yes..... No.....
   (presence of bright green color and gas bubbles suggest active algae growth)
   e. Are other aquatic weeds also present? Yes..... No.....
   If yes, describe their abundance .....
   State of growth: vegetative ..... mature (seed) .....
   f. Physical condition of water. Is it clear? Yes..... No.....
   Are dirt, clay, organic matter (leaves, etc.) present? Yes..... No.....
   g. Is the water used for irrigation? Yes..... No.....
   h. What is the source of water? Drainage....., Spring.....
   River or creek....., Other.....
3. What has been done in the past to control algae and weeds? List chemicals or other treatment used. .....
   .....
   .....
   .....

Will one treatment control weeds and algae all year? This question is often raised. Usually aquatic weeds can be controlled with one application. It is sometimes necessary to spot treat a week or two later to take care of weeds which may have been missed by the initial application. For algae control it is usually necessary to treat more than once a season, followed by periodic spot treating when new growth appears.

Algae are better controlled if the algaecide is applied directly on the algae. If a pond has filamentous algae concentrated primarily near the shore or on the bottom in the shallow areas, use the recommended amount of algaecide to treat the entire pond but apply it only where the algae are growing. Never add algaecide to clear algae-free water, It probably will be wasted.

Finally, if the weed and algae growth are moderate to heavy, don't treat the entire body of water at one time. Treat half of it one week and half a week or ten days later. This will insure that the dead weeds and algae will not rapidly and completely deplete the dissolved oxygen. A great number of fish kills result not from any toxic property of the chemical used but from a lack of oxygen caused by decaying dead algae and weeds.

Algae and aquatic weeds can usually be controlled satisfactorily in most bodies of water. To obtain satisfactory control, however, it is necessary to survey the body of water, to determine the kinds of weeds and algae present, the area, and the flow of water through the pond or lake. On the basis of this and other information a sound and successful recommendation for treatment of the body of water can be made. □

Man Major Agent In Seed Dispersal

Man is the most important agent in seed dissemination reports Frieda Wertman of Central Seed Laboratory in Hopkins, Minn.

The distribution of agricultural and garden seeds is the prime source of weed seeds. Almost every crop includes some seed which resembles the desirable kind in size-shape-weight and even color so well that even the best cleaning equipment does not do a perfect job.

The actual spread of species varies. A large number of plants remain confined to the area where they were introduced; others spread rapidly even though they had been introduced but once.

Significant though man's role is, Ms. Wertman noted, plants, fruit and seeds have natural means of dispersal. Wind, water, animals and structual features of the seeds help in seed dispersal.

Minute seeds like witchweed, paint-brush and orchids can be borne aloft like dust for miles. The wind also carries heavy seeds that are plumed like the milkweeds, thistles, dandelions and willows or with wings like maple, poplar and dock. Gusts of wind may blow seeds across the surface of snow and ice or hasten their progress downstream.

The winged fruits of common dock have corky protuberances which permit them to float. These seeds also provide food for rodents and birds or if dropped in mud along with other seeds that occur in wet areas, they adhere to the feathers, feet or fur of other animals.

Burred fruits and seeds like cocklebur, buffalobur, sticktight may help in the dispersal of the plant but they are more than a nuisance.

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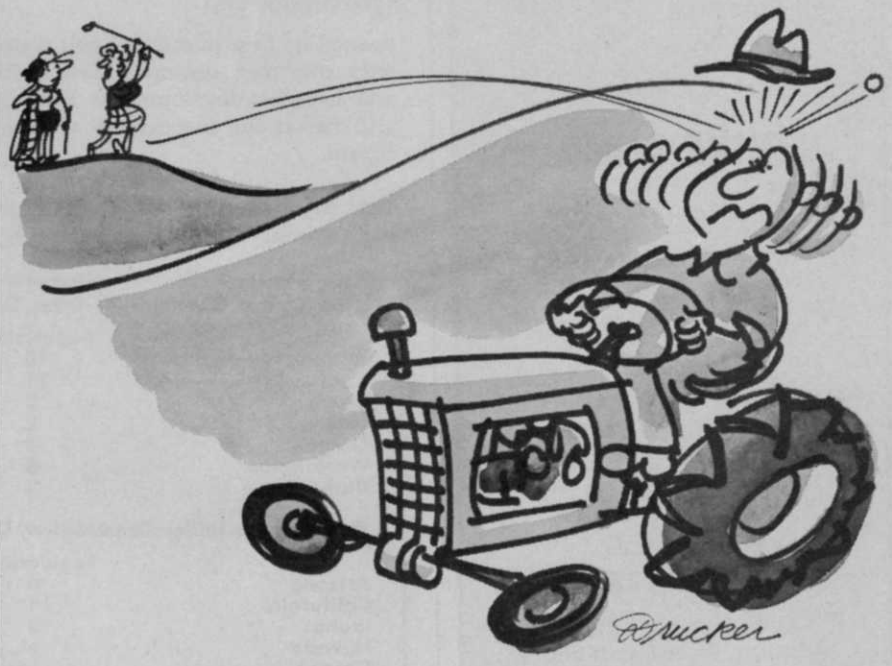

Motivation— Is The $ Enough

The speaker, Donald C. Zick, and his audience at the Midwest Regional Turf Conference agreed: accomplishment or achievement is one of the best motivators of employees.

Zick, manager of employee training and development at the University of Missouri, asked an audience of 734 at Purdue University recently to sum up in one word "what really motivates your people more than anything else."

Among the responses he received were recognition, accomplishment, dollars, satisfaction, desire, pride, responsibility, ability, security, involvement and appreciation. A show of hands decided that accomplishment and recognition were probably the most important.

Accomplishment is number one in motivational importance, he said. An employee must feel that his job is a challenge and that his is really accomplishing something.

"Accomplishment or achievement is the start of a sequence or cycle. Once an employee has a sense of achievement, he will have recognition, desire to do more, more appreciation for his job and from his employer, more job security and perhaps more responsibility and more money," he said.

Zick cautioned that it is "the individual and not the general principal that applies." Employers need to go through the sequence for each employee following the sequence until they find the one element that is lacking and then build from there.

Accomplishment as the primary motivator also gives the employer something to work with. The employer can "get the roadblocks out of the employee's way"—eliminate the obstacles that impede the employee's chance to feel that he is accomplishing something.

Although accomplishment or achievement is the most important motivator, other factors can also affect employee performance. Security, for example, can be both a "motivator and a demotivator. "An employee must have a certain amount of security in order to achieve or accomplish," stated Zick, "but too much security can be a demotivator. The employee will get the attitude that no matter what he does, he won't get fired."

Another motivator, expectation, can be very effective in employer-employee relations. Zick emphasized that an employer "must let his people see that he expects a lot from them" for studies have shown that people will live up to the expectations that employers have of them whether good or bad.

Fear, although a great short term motivator, is definitely not a good long term motivator. If fear is present as a motivator for a long time, the employee will not have high standards of achievement or will look for a new job.

According to Zick, money, often though to be the most important motivator, is not a continual one. If the employee has money, he has the ability to be happy, but the money alone may not make this so. If he doesn't have what he considers to be a just wage, other things cannot make him happy. In addition, although an employee may be satisfied with his pay now, he may not be satisfied with this same wage in the future.

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WEST COAST GOLF COURSE

(from page 28)

opened its first municipal golf course only this past summer. New resort and housing developments however will be on the increase in the near future.

Golf will continue to be a major recreational outlet for westerners. Judging from the number of people who vacation and retire in our states, golf courses will continue to multiply in order to meet the demand.

In addition, a number of existing courses have begun new additions to their facilities. Prospects include: Arizona — 11; Idaho — 5; Nevada — 2; Utah — 4; California — 23; Oregon — 4; Washington — 7. □

New Course Openings By Type, Oct. 1, 1971 — Sept. 30, 1972

	Regulation	Executive	Par-3
Arizona	10	2	..
California	11	6	1
Idaho	2	..	..
Nevada	2	..	..
Oregon	2	..	1
Washington	8	..	1
Utah	3	..	..

Golf Courses Under Construction, Oct. 1, 1971 — Sept. 30, 1972

	Regulation	Executive	Par-3
Arizona	8	1	..
California	12	4	2
Idaho	2	..	..
Nevada	1	..	..
Oregon	1	1	1
Washington	9	..	..
Utah	4	1	1

A GROWING BUSINESS
(from page 20)

at servicing smaller businesses after the firm's formation in 1970. Clients now include electric companies, used car lots, and several manufacturing plants, among others. Hoover figures his charges on the basis of the number of square feet treated.

"We usually start treating toward the end of March and work through November," he says. "Our work day during the application season may run from 6 a.m. until 10 p.m. We feel we have to generate $500 to $700 daily during this season. The aquatic treatments start in May and run through September."

The "we" of Control Services includes Hoover; his father, Herbert O. Hoover, Sr.; Larry Maher, former chemical salesman and, as of June, 1973, Charles Madson.

Madson and Hoover were fellow teachers in northern Iowa, and Madson now has a master's degree in aquatic biology.

"He has helped us part-time, explains Hoover, "but he'll be full time in June. Larry and I have the aquatic weed control know-how and Chuck will provide the over-all picture—he'll be concerned with the aquatic balance of nature, the relationship of plant life to fish, etc."

Hoover expects to add a fifth person in the near future. Selling is done during the winter and early spring, and the summer and fall are taken up with application work. He feels another man would provide year-round selling directly or through relief of others during the busy season.

"At present each of us is an employee of the corporation and rather autonomous," says Hoover. "Each has a pickup with a skid-mounted sprayer in the truck. All the clean ground chemical work is based on the use of triazines and is done through hand guns. Most of the equipment is something we've designed and then gone out and bought the components for."

All four men are located in different parts of the state and radiate out from there to cover the area and neighboring states. Hoover is licensed in Iowa, Minnesota and Illinois and registered in Wisconsin.

What's ahead for Control Services? "Both the aquatic and industrial segments are expanding as we sell more contracts," Hoover says, "and they may end up separate divisions. As of now, I want the business to grow only to the point where we can get the work done."□

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—meeting dates—

Florida Nurserymen and Growers Association, The Breakers Hotel, Palm Beach, Fla., May 17-19.

Rutgers Turfgrass Research Day, Dudley and College Farm Roads, College of Agriculture and Environmental Science, Rutgers University, New Brunswick, N.J., June 12.

Western Chapter, International Shade Tree Conference, annual meeting, Hotel Utah, Salt Lake City, Utah, June 17-20.

International Turfgrass Conference, 2nd annual, Virginia Polytechnic Institute and State University, Blacksburg, Va. June 19-21.

Texas Turfgrass Field Day, Texas A&M University, agronomy field lab, College Station, Tex., June 27.

South Carolina Turfgrass Conference, 4th annual, Clemson House, Clemson, S.C., July 10-11.

American Association of Nurserymen, Radisson Hotel, Minneapolis, Minn., July 14-18.

Hyacinth Control Society, Hotel Monteleon, New Orleans, July 15-18.

American Sod Producers Association, annual meeting, Denver, Colo., July 16-19.

Plant Science Day of the Connecticut Agricultural Experiment Station, Lockwood Farm, Hamden, Conn., Aug. 8.

International Shade Tree Conference, 49th annual meeting, Sheraton-Boston Hotel, Boston, Mass., Aug. 13-16.

International Pesticide Applicators Association, annual meeting, Marriott Inn, Berkeley Marina, Berkeley, Calif., Aug. 15-18.

North Dakota State Horticultural Society, annual meeting, Canada Department of Agriculture Research Station, Morden, Manitoba, Aug. 21-22.

Turf and Landscape Day, Ohio Agricultural Research and Development Center (OARDC), Wooster, Ohio, Sept. 11.

Course for Licensing of Tree Pruners, Agricultural Extension Centre, Brandon, Manitoba, Canada, Oct. 1-5.

Society of Municipal Arborists, 9th annual meeting, Flint, Mich., Oct. 3-5.

Southwest Turfgrass Conference, Albuquerque, N.M., Oct. 11-12.

Industrial Weed Control Conference, 8th annual, Texas A&M University, College Station, Tex., Oct. 15-17.

Turfgrass Equipment & Materials Educational Exposition, 13th annual, sponsored by Southern California Turfgrass Council, Orange County Fairgrounds, Costa Mesa, Calif., Oct. 17-18.

Central Plains Turfgrass Conference, Manhattan, Kans., Oct. 17-19.

California Weed Conference, Woodlake Inn, Sacramento, Calif., Jan. 21-23.

Southern Weed Science Society, Sheraton Biltmore Hotel, Atlanta, Ga., Jan. 22-24.

Weed Eating Insects Can Be Beneficial

Weed-eating insects can have an important role in the non-chemical suppression of weeds. About 70 weed species are under study throughout the world for such biological control, according to a U. S. Department of Agriculture entomologist.

Dr. Lloyd A. Andres of USDA's Agricultural Research Service (ARS), Albany, Calif., says that the weed-eaters are well adapted for the role because they multiply so fast and because they pick out only certain specific weeds to feed on.

"When a specifc weed is suppressed, the particular insect feeding on it decreases in numbers, and if the weed "takes hold" again, the insects increase in numbers," Andres says.

"The successful control of Klamath weed on Northwestern ranges in the 1950's, the control of pricklypear cactus on Santa Cruz island off the coast of California, and the partial suppression of alligatorweed in the Southeastern United States, are but three examples of the use of insects for weed control."

The entomologist says that while insects do not completely eliminate weeds they keep them within manageable limits with minimal environmental disturbance and at comparatively little cost.

There are some disadvantages to this type of control, he notes, including the slow rate of control—it may take from 3 to 10 years for suppression to be noticeable; and conflicting interests. As an example, conflicts may come when a plant is considered a weed by farmers in one part of the country and of value by wildlife enthusiasts in another part.

U. of Cal. Frank Robinson Given S. I. A. Award

Dr. Frank E. Robinson, associate water scientist at the University of California, was named 1973 recipient of the "SIA Man of the Year Award" at the recent Sprinkler Irrigation Association Technical Conference.

The award was presented at the Annual Banquet of the organization during the meeting in Dallas, Texas, and is the highest recognition given by the Association and the industry. It is presented annually to university or government personnel "for significant contributions in the field of sprinkler irrigation."

Robinson, whose major interest is in irrigation management and soil salinity control, has been with the University of California since 1964.

Professional Turf Manual Released By DuPont Co.

A Professional Turf Manual which highlights the causes and symptoms and control of most turfgrass diseases has been released by the Du Pont Company. The manual also features fertilization and weed control recommendations.

The 34 page manual includes large full color pictures showing diseases as well as life cycles. Du Pont says that this is the first time a manual of this nature has been published in this country with such a large number of full color illustrations.

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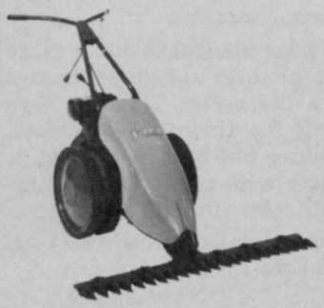

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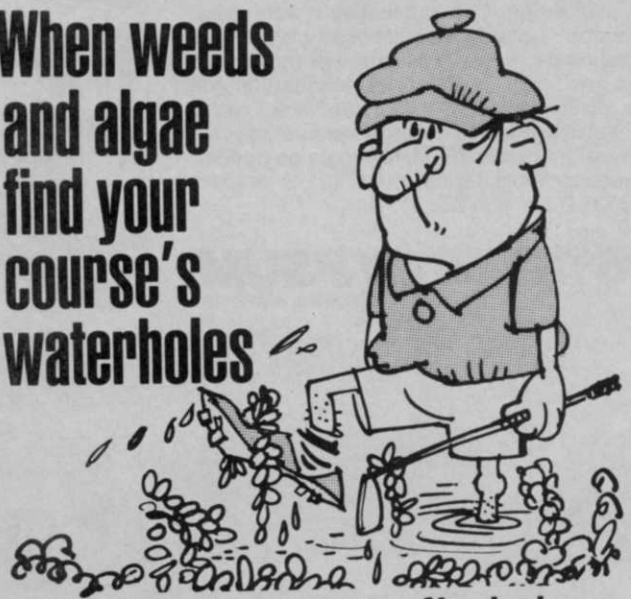

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industry people on the move

LEONARD R. SWARTZ, named technical sales representative for the agricultural division of ICI America Inc.

* * *

JOHN HASTINGS appointed sales manager at Oseco Ltd. He will be responsible for market development for the company's full range of products.

* * *

DR. STEPHEN J. NELSON, named research associate in the TUCO plant health research and development division of The Upjohn Company. He will be involved in synthesizing new insecticides and fungicides.

* * *

MARION A. EGGLETON, appointed market research manager, a newly created position for Amchem Products, Inc.

* * *

DR. JAMES FRELICH, joins O. M. Scott & Sons research division. He has been assigned to the special projects section at the company's headquarters in Marysville, Ohio.

* * *

KEN FINDEN, to the new position of director of environmental affairs for The Toro Company. He was director of engineering services and product safety.

* * *

BILL TATRO, CLYDE KENGREY and GERALD TAYLOR, to head up a new branch sales and service outlet for Lockwood Corporation. New firm will be located in Idaho Falls, Idaho and will specialize exclusively in center pivot irrigation systems.

* * *

H. RICHARD SCHNEIDER named field specialist for the crop aid products department of International Minerals & Chemical Corporation.

* * *

J. E. THOMPSON appointed sales development manager for agricultural chemicals by Rohm and Haas Company. He was formerly manager of the Texas district.

* * *

ARTHUR L. STEVENS, joined Thompson-Hayward Chemical Company as an agricultural sales representative. He will be located in New Orleans, La.

* * *

RICHARD A. LANG, named district sales manager for Bolens Division, FMC Corporation. He will be responsible for sales in the northern half of Illinois.

* * *

BERNARD BERENGARD becomes director of sales and marketing for Melnor Industries.

* * *

FREDERICK J. CLOSE, elected a director of American Garden Products, Inc. He has been active in the American Horticultural Society of which he is an officer.

* * *

E. J. CARNINO, appointed project accounting coordinator for Agrico Chemical Company. He will be responsible for the accounting procedures related to the company's construction projects at Donaldsonville, La. and Tulsa's Port of Catoosa.

* * *

RALPH W. GEBHARDT, becomes director of marketing for Grass Growers, Inc. He has helped develop the techniques and methods covering all phases of hydrograssing and mulching. Company location is in Dallas.

For More Details Circle (129) on Reply Card

Irrigation Consultants Elect New Officers

The American Society Of Irrigation Consultants has announced new officers for the 1973 term.

George Bell was installed as president, Richard Kirby, vice president, and Ron Sherman Secretary-Treasurer.

ASIC is starting its third year. The purpose of ASIC is for the advancement of education and skill in the art of irrigation design and consultation as an instrument of service in the public welfare, and to promote honest and ethical professional practices.

Lyle R. Heath (1) of West Lafayette, Ind. discusses turf studies with Kenneth R. Griepentrog, Tulsa, Okla. and James W. Uptgraft, West Lafayette, Ind. All were scholarship winners at the Midwest Regional Turf Conference.

Purdue Turf Students Receive Scholarships

Three Purdue University students majoring in turf studies received scholarships at the Midwest Regional Turf Conference recently.

Recipient of the Golf Course Superintendents' Association scholarship worth $500 was Lyle R. Heath, West Lafayette, Ind.

Other scholarship winners were James W. Uptgraft, West Lafayette, and Kenneth R. Griepentrog, Tulsa, Okla. Uptgraft received $250 and Griepentrog, $150.

These scholarships—given for the first time—were from a fund established by former Purdue turf students as a tribute to Dr. W. H. Daniel, Purdue turf specialist.

Elected 1973-74 officers of the Midwest Regional Turf Foundation, sponsors of the conference along with Purdue's department of agronomy, were Dudley Smith, superintendent, Silver Lake Country Club, Orland Park, Ill., president; James Timmerman superintendent, Orchard Lake Country Club, Orchard Lake, Mich., vice-president; and W. H. Daniel, Purdue turf specialist, executive secretary (re-elected).

New directors are David S. Ralston, Miller-Wihry-Sabak-Wilson & Lee, Louisville, Ky.; John Spodnik, Westfield Country Club, Westfield Center, Ohio; and Donald Clemans, superintendent, Wabeek Development Co., Bloomfield Hills, Mich.

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—insect report—

TURF INSECTS

CINCH BUG
(Blissus leucopterus leucopterus)

KANSAS: Annual winter survey, including 57 counties, completed March 9. Total of 219 bunch grass samples taken. Samples generally indicated non-economic infestations. Moderate to near severe populations found in at least one sample in McPherson and Montgomery Counties. Heaviest count, 914 per square foot, taken in little bluestem from Montgomery County. Number of bugs surviving until early March 1973 generally lower than 1971 and 1972 in north-central and central districts. Counts in 1973 remained about same as 1972 in northeast and south-central districts, counts slighly higher in east-central and southeast districts.

ANTHOCORID BUG
(Orius tristicolor)

IDAHO: Collected from bluegrass at Post Falls, Kootenai County, July 1, 1970. This is a new county record.

INSECTS OF ORNAMENTALS

NATIVE HOLLY LEAFMINER
(Phytomyza ilicicola)

TENNESSEE: Larvae observed tunneling in holly leaves in eastern and middle areas. Larvae apparently overwintered in leaves, unusual for the State.

OYSTERSHELL SCALE
(Lepidosaphes ulmi)

OREGON: Heavy on *Pachysandra* sp. in Salem, Marion County, many parasitized. Occurrence on ornamentals, particularly in heavy numbers, uncommon in State. This is first record on this host in State.

TREE INSECTS

SOUTHERN PINE BEETLE
(Dendroctonus frontalis)

ALABAMA: Additional groups of 2-10 pine trees observed dying along highway in Cleburne, Randolph, Chambers, and Lee Counties. Nature of recent mortality indicates *D. frontalis* and *Ips* spp. (engraver beetles) active. Woodpeckers very active on several recently dead trees feeding on larvae, pupae, and adults.

ELM LEAF BEETLE
(Pyrrhalta luteola)

KENTUCKY: Adults emerged from hibernation and nuisance to homeowners in Washington County. COLORADO: Overwintering adults active in Loveland area, Larimer County.

NATIVE ELM BARK BEETLE
(Hylurgopinus rufipes)

MINNESOTA: Survey of elm along St. Croix River north of Stillwater, Washington County, and along Crow River in Hennepin and Wright Counties revealed that only galleries of this species were numerous especially in areas where Dutch elm disease had killed many trees.

SAN JOSE SCALE
(Quadraspidiotus perniciosus)

OKLAHOMA: Damaged live oak trees in Stephens and Kiowa Counties.

BENEFICIAL INSECTS

LADY BEETLES

MISSISSIPPI: Vacuum samples indicate heavy populations of *Coleomegilla maculta* in Bolivar County alfalfa; estimated 27,500 adults per acre. Probably feeding on heavy population of *Acyrthosiphon pisum* (pea aphid) *C. maculata* first-generation eggs noted. ARIZONA: *Hippodamia convergens* (convergent lady beetle) very heavy in plum, apricot, and peach trees at Queen Creek, Maricopa County.

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