Exhalt800, the Winter Coat.

It's only a thin film. But it wraps your turf up safely for the Winter. Helps keep it healthy, all through the dormant season.

Keeps Fungicide On Won't Wear Off.

Exhalt 800 is a Sticker-Extender. It encapsulates the fungicide. Keeps it in place, so it can do its work.

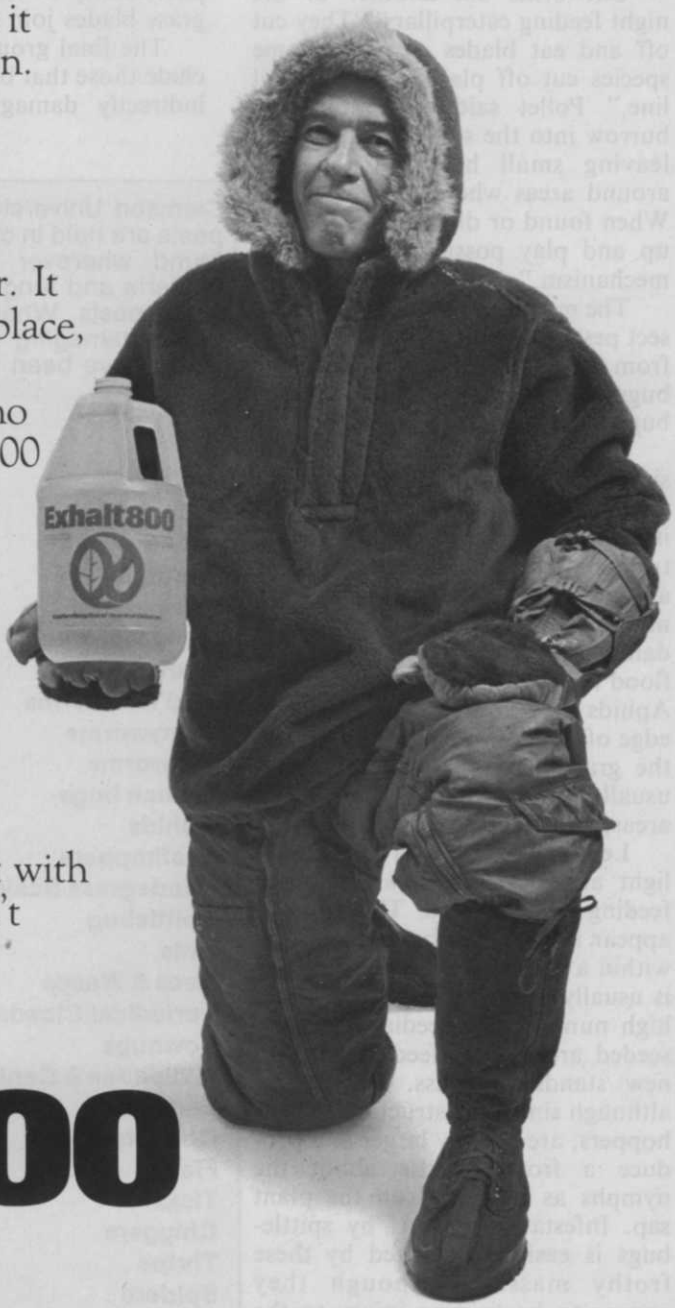
No matter how cold or windy, no matter how much rain or snow, Exhalt 800 lasts until active turf growth begins.

Your investment in fungicides won't get washed away!

Easy and Economical

Only 1 pint per 100 gallons of fungicide solution. Spray it on. It dries within an hour.

After spraying, rinse equipment with water while it is still wet. Residue won't damage equipment — or clog it when next used.



Exhalt®800

Sticker-Extender

Crop Protection Division, Kay-Fries Chemicals, Inc., Stony Point, N.Y. 10980

TURF PEST CONTROL *(from page 20)*

areas usually turn brown and enlarge rapidly if uncontrolled. The worms may be found by separating the dry sod.

Armyworms are named because of their habits, Pollet said. They move across the lawn or turf in large numbers and eat everything. The two common armyworms are the fall and true armyworms, both of which can do serious damage to turf. Infestations noted early may appear as a small webbed area in the turf. As they develop the turf may be eaten to the soil.

Cutworms are another of the night feeding caterpillars. "They cut off and eat blades of grass, some species cut off plants near the soil line," Pollet said. "They usually burrow into the soil during the day leaving small holes in the turf around areas where they have fed. When found or disturbed, they curl up and play possum as a defense mechanism."

The most varied group of turf insect pests are those that suck the life from the grass. These include chinch bugs, aphids, leafhoppers, spittlebugs and scales.

Chinch bugs and aphids cause similar damage to turf leaving large circular patches of yellowing or dying grass. Chinch bugs feeding in the turf may cause extensive damage and never be observed. To determine if chinch bugs are causing damage, it is often necessary to flood them out of their feeding sites. Aphids may be found on the outer edge of the damage area, massed on the grass leaves. Aphid damage is usually more common in shaded areas, like under trees.

Leafhoppers cause a mottling of light and dark green areas where feeding has occurred. They usually appear in high numbers in turf and within a few days are gone. Control is usually unnecessary except where high numbers are feeding in newly seeded areas. This feeding can kill new stands of grass. Spittlebugs, although similar in structure to leafhoppers, are slightly larger and produce a frothy spittle about the nymphs as they feed on the plant sap. Infestation of turf by spittlebugs is easily recognized by these frothy masses. Although they appear to be causing injury to the lawn or turf, control is seldom necessary except to remove the unsightly masses.

Rhodesgrass scale attacks the crown of the grass plants, causing them to wither and die. High infestations can cause large dead areas and are very damaging on greens. Scales are hard to detect because of their ability to camouflage themselves and the fact that they are not very active on the crowns of the plants. Heavy infestations can be mistaken for over fertilization or caked fertilizer on the grass plants, particularly in the areas where the grass blades join the stems.

The final group of turf pests include those that burrow into the soil indirectly damaging the turf and other anthropods which may be considered nuisances. The former includes ants, bees, wasps and periodical cicadas.

"These insects live in the soil," Pollet said. "The damage they cause is the result of them setting up housekeeping. Their digging and tunneling causes the soil to become soft, spongy and to dry out quickly." The nuisance turf pest includes sowbugs, millipedes, centipedes, earwigs, crickets, fleas, ticks, chiggers, thrips and spiders. Some of these cause no problem except for their occasional high populations. Fleas, ticks, chiggers and thrips can be a nuisance and a problem. Their bites can cause irritation, itching and rashes. Occasionally, fleas and ticks can be associated with the transmission of disease organisms.□

Clemson University entomologist Professor D. K. Pollet said many turf pests are held in check by other insects. Predators and parasites may be found wherever pest populations occur. Endemic populations of bacteria and fungi are also effective in controlling or helping to control these pests. Where these natural controls cannot maintain the pests below damaging population, the following table shows the chemicals which have been found effective against these pests:

	Diazinon	Malathion	Sevin	Baygon	Proxol	Chlordane	Dursban	Aspon	Dylox
White Grubs	X				X	X	X		X
Billbugs	X		X						
Wireworms	X					X			
Mole Crickets	X			X			X		
Ground Pearls	No effective control								
Sod webworms	X		X	X	X		X	X	X
Armyworms	X		X		X				X
Cutworms	X		X		X				X
Chinch bugs	X		X	X	X		X	X	
Aphids	X	X							
Leafhoppers	X	X	X						
Rhodegrass Scale	X	X	X						
Spittlebug	X		X				X		
Ants	X					X	X		
Bees & Wasps	X		X						
Periodical Cicada			X						
Sowbugs	X						X		
Millipedes & Centipedes	X		X			X	X		
Earwigs	X		X				X		
Crickets	X			X		X	X		
Fleas		X	X	X			X		
Ticks	X	X	X						
Chiggers	X	X							
Thrips	X	X							
Spiders						X			

Cut the cost of expensive horsepower and expensive manpower.

Bolens® HT-20 Tractor.

Jobs too small for big specialized equipment can add up to a punishing expense in manpower. Hauling. Mowing. Tilling. Grading. Loading. Trenching. Backfilling.

The intermediate size Bolens HT-20 Tractor can cut that expense by quickly adapting to over a dozen custom matched attachments including mower, tiller, bucket loader, back hoe, rakes, blades and brooms.

The foot operated hydrostatic transmission goes from forward to reverse without clutching or changing gears. Perfect for close-quarters work. Allows optimum power/speed combinations with hands free to operate hydraulics.

More than just a lawn and garden tractor, the HT-20 is powered by a 19.5 hp twin cylinder Kohler engine. The channeled steel frame, massive rear axle/differential and heavy duty front axle give a full day's work. Day after day.

Get more value from your big horsepower and expensive manpower. With the rugged HT-20. It fits right in-between. To save money on both ends.

Bolens Mulching Mowers.™

They cut the grass and the workload. In one pass. When a Bolens Mulching Mower cuts the grass, it also cuts and recuts the clippings into tiny particles that are blown down into the turf. There, they disappear and quickly decompose. No clippings. No clean-up. No thatch build-up. The fine mulch actually feeds the turf while the crew moves on to other jobs.*

3, 4 and 5 hp models are specially built for commercial and institutional use. Straight-thru steel axles, rugged all-steel deck, tough one-piece handle and positive cutting height adjustment. Bolens Mulching Mowers. Tough, economical answers to your continuing turf maintenance program.

*For a free copy of a University study on nitrogen return, contact FMC Corporation, Port Washington, Wisconsin 53074.

See the complete line of Bolens commercial power equipment at your nearest dealer. For his name and address, call 800-447-4700 toll-free anytime (in Illinois, call 800-322-4400). FMC Corporation, Port Washington, Wis. 53074.

FMC
Consumer
Products

Circle 107 on free information card

FUTURE *(from page 30)*

cal to regulate nutrient availability in the soil. Fritted fertilizers that will release nutrients, especially micronutrients, over a period of 10 to 20 years or more may become widely used for turf. And, because of the evolution of more sophisticated irrigation equipment and higher quality fertilizers aqueous fertilization will become commonplace.

In the future legumes such as improved white and strawberry clover, because of their nitrogen fixing abilities, may again become widely used for turf. More and more attention will be given to the use of organic wastes as nutrient sources. And, fertilizer use will be well planned, with major consideration given to long term effects, and not just to tomorrow.

Highly selective chemicals are now available for the control of virtually any turf pest problem. Only a few years ago there was no satisfactory selective chemical control for annual grasses in new seedings of Kentucky bluegrass, nor Pythium blight in bentgrass. Today, however, because of available pesticides, grasses are grown well beyond their accepted range of a few years ago.

The effects that certain pesticides may have on the turfgrass system have been and are currently under investigation. Research findings to date indicate that certain pesticides may materially reduce root systems, increase thatch, etc. Also, research and observations have indicated a wide variability in varietal tolerance to specific herbicides and to fungicide-resistant strains of fungi. Thus, future pesticides will be subjected to even more rigorous testing. And, the turf manager will be concerned with much more than immediate pesticide effects.

There will always be a need for better pesticides. However, the current availability of outstanding products will likely restrict efforts for and the introduction of new pesticides. For several years activated charcoal has been used to inactivate specific pesticides. Future significant developments in inactivation of pesticides would open a new era for pesticide use in turf management. Pesticides of the future are likely to become much more specific, and the turf manager will have to become more knowledgeable about pests and pesticides.

In the future pest problems will be greatly restricted through the introduction and use of improved varieties. The future turfgrasses will have combined resistance to most common insect and disease pests.

Turfgrass management practices are continually changing, and many factors will influence turfgrass management decisions. Successful management programs are developed through an in-depth understanding of the turfgrass system and its many complexities. The future of the turfgrass industry depends upon the professional's ability to supply and utilize technical information. The turfgrass manager's job is not going to get any easier. □

Davey is ready to give you a "fifth season" head start on 1976 tree service.

The fifth season is "Davey Season." It's going on now, and it runs into the first budding of spring. Right now is the low-cost season for you to get needed tree work done promptly, efficiently, and a jump ahead of busy spring and summer months.

Our carefully trained crews are ready to put their knowledge, experience, and specialized equipment to work for you now. To prune deadwood, open up vistas, remove dangerous trees, and schedule new plantings. To grind stumps and clear away unwanted brush. And give you a head start on 1976.

We'll survey your tree needs, provide cost estimates, and set up a tree maintenance program for you with no obligation. And if you wish, we'll do what work is needed immediately to preserve the beauty and value of your trees, to ensure public safety, and to help you avoid emergencies and costly overtime later.

For estimates without obligation on fifth-season work, check the Yellow Pages for the Davey representative nearest you. He's fully equipped and ready to consult with you—or go to work for you right now.

DAVEY TREE

KENT, OHIO 44240
Coast to Coast and Canada

The Stately Elm Returns

Stately elm trees that once adorned America's streets, parks and lawns in large numbers from the Great Plains to the Atlantic coast may be on their way to making a comeback. A hybrid, named "urban elm" will be available in limited supply in about three years. It is resistant to Dutch elm disease which has spread throughout the American elm's natural range since the 1930s.

Scientists from the Shade Trees and Ornamental Plants Laboratory, Delaware, Ohio, developed urban elm from a cross between an elm from the Netherlands and a Siberian elm. The new tree is expected to grow to moderate size making it more suitable for urban planting than the American elm, according to plant pathologist Dr. Charles L. Wilson. Wilson told WEEDS, TREES & TURF that like the American elm, the new hybrid grows fast in various soil types, has dark green foliage, and is tolerant to drought, pollution, soil compaction and restricted root space.

In the fall, urban elm offers the promise of a striking appearance, because in locations where it is adapted, the tree retains its foliage and dark green color longer than other trees. The new hybrid has a profuse upright branching habit and its dense foliage produces a compact crown.

The team began developing urban elm in 1956, crossing parent trees to obtain seedlings that proved capable of withstanding inoculations of the fungus, *Ceratocystis ulmi,* which causes Dutch elm disease. Then came years of propagation and seasonal susceptibility trials in which plants grown from cuttings were inoculated with strains of fungi at various times of the year. For the past two years wholesale nurserymen have been testing the tree further for adaptability to various climatic conditions. An agreement has prescribed that the nurserymen propagate the elms in sufficient numbers to insure they will be available to other nurserymen before commercial trade begins. Plant scientists at the Delaware laboratory are developing more hybrid elms that may be released within a few years. About six different elm selections including two American elms have moderate to high resistance to Dutch elm disease, according to plant pathologist Dr. Lawrence R. Schreiber.

Plant geneticist Dr. Alden M. Townsend claims physical characteristics vary substantially among elms in the breeding program. Some could be made into shrubs. Others may grow from seed to heights of 15 feet within three years. A Chinese elm, with a deep red coloration, and a columnar shape elm have been developed. This tree might be used to replace Lombardi poplar which is susceptible to cankers.

Buying, Selling Standards Suggested for Nurseries

A joint committee of selected representatives from the Wholesale Nursery Growers of America, National Landscape Association and Garden Centers of America has recently adopted operating standards of practice between buyers and sellers of nursery stock.

The standards, judged by the committee to be fair and ethical agreements between two parties, were developed to encourage greater cooperation between all phases of the nursery industry and to aid in achieving common industry goals.

The committee is presenting the standards to the industry as a suggestion. They are not intended to be binding upon any firm of persons, nor to constitute an agreement on the part of any member firm to adhere to the suggested standards.

For buyers:

- All buyers should specify the date order is expected to be delivered or picked up, with the understanding of a week's tolerance, including circumstances of unusual weather conditions or crop failure.

Then the seller should notify the buyer immediately upon becoming aware of his inability to comply with the above, at which time the two parties should determine substitutions or other alternate causes of action.

- The buyers of plant materials will be responsible for notifying seller of discrepancies in the order. This notification should be made within 10 days of receipt of the order and failure to do so will constitute acceptance of order as received.
- Length of time for payment of order will be determined by parties involved.

For sellers:

- All stock sent to the buyer shall be true to name as ordered to the best of seller's knowledge; except that a buyer may be notified of necessary substitutions upon seller's acceptance of order a month prior to shipping date requested.
- All stock shipped, or delivered, shall be of the size, grade, quality and quantity specified in the order unless buyers are advised of the unavailability of the exact item or items ordered and agree to accept a different size, grade or quality with proper price adjustments, when notified at time of ordering or a month before shipping date.

Exceptions are unforeseen circumstances and/or acts of God within the 30-day notification period. Minimum ball size will be that set forth in the most current issue of the American Standards for Nursery Stock.

- All stock sent to buyer will be correctly labeled or adequately identified to the best of the seller's knowledge. All labeling will be agree on by buyer and seller at the time of purchase.
- Sellers, upon request, will provide information to buyer on plant material which requires special care to maintain saleable quality.
- Payment of shipping charges accrued through errors in orders should be determined by the parties involved. Errors as to kind, quantity and quality of plant material tagged by buyers in the field should be assumed by the buyers.

Sellers should assume responsibility for shipping and reasonable handling charges accrued as a result of errors in the shipment by the seller, which includes substitution of kind and/or quality of plant material ordered without prior notification and agreement by the buyer.

GCSAA Set for Minneapolis

Back in 1936, superintendents belonged to what was called the National Association of Greenkeepers of America.

The annual show and conference was held in Cleveland that year — it had about 40 exhibitors and over 400 attendees including visitors. But some things have not changed much. In the magazine of the association one of the editors expressed concern that only 150 members of the association bothered to attend the conference at all.

Some other things also have not changed much. Some of the companies represented at that show of 40 years ago were Buckner Manufacturing Co., International Harvester Co., Jacobsen Manufacturing Co., Mallinckrodt Chemical Co., Milwaukee Sewerage Commission Standard Manufacturing Co. (now Standard Golf Co.), O. M. Scott & Sons Co., and Toro Co.

1936 Cleveland Show

These and other companies have created an early sell-out of exhibit space for the Golf Course Superintendent's Association of America's 47th Annual International Turfgrass Conference and Show Feb. 8-13 in Minneapolis.

A total of 125 firms have made commitments on the 100,000-square-foot exhibit hall of the Minneapolis Convention Center.

Officially opening Feb. 10 by the GCSAA's executive committee, the three-day show will offer the expected 5,000 conference registrants close-up viewing of nearly $8 million worth of maintenance equipment and services used on today's golf courses. Many firms will introduce additions to their product lines.

1975 New Orleans Show

The show is held in conjunction with the GCSAA's week-long educational conference, which this year will offer more than 45 hours of educational programs, featuring 65 speakers.

Four preconference seminars will also be offered this year, beginning Feb. 7. The two-day courses, specifically designed for golf course superintendents, will cover landscape design, personnel management, pesticide usage and turf nutrition.

"Bad Green Syndrome" Cause Cited

It seems every golf course has a bad green that has to have custom care. Causes of the loss of greens are complex and can seldom be ascribed to a single factor. However, the most frequent factor that predisposes a green to death is poor construction, according to University of Maryland turf specialist John R. Hall.

"The loss of a green can often be ascribed to disease, scaled or drying out, but these are only the harbingers of death that strike when the stage has been set and more often than not, the necessary conditions are created by improper golf green construction," Hall said.

Hall said the bad green always exhibits high bulk density, heat conductivity and mechanical resistance to root penetration. It is the green that retains more moisture than is necessary and has low air porosity, slow water infiltration and percolation rates. The solutions available to the golf course superintendent are: (1) reconstruct the green removing the existing topsoil; (2) attempt gradual soil modification in conjunction with management practices such as aerification and topdressing; (3) radically modify the existing soil by incorporating massive amounts of soil amendments; (4) keep nursing the bad green. "The last alternative puts the superintendent into the 'bad green syndrome,'" Hall said.

Hall said if the choice is to reconstruct the green that United States Golf Association Green Section specifications should be obtained and used. He also said Texas A & M provides a soil testing service to find out what combinations meet USGA specifications.

Gradual soil modification in conjunction with aeration and topdressing is most often the first approach to improving a bad green. This approach involves frequent aeration with large-diameter tines to as great a depth as possible. The cores must be removed from the green and then topdressing is applied and dragged into the holes. This procedure would have to be repeated several times over several years to achieve extensive soil modification.

Radical soil modification is an alternative that would involve trying to modify the existing soil structure and texture by incorporating the amendment into the existing soil with plows and discs. This procedure obviously takes the green out of play for about four months. In situations where the existing bentgrass is good it should be removed as sod before soil modification and replaced after the amendments have been incorporated. This considerably reduces the time the green is out of play.

Several amendments are available. The type of amendment selected should depend on what corrective result is desired. If improved soil permeability is desired, sand and calcined clay have been shown to be very effective.

If increased water retention is desired, amendments such as soil, peat and calcined clay will be needed. The amounts of any of these amendments needed to achieve a given level of water permeability or water retention is difficult to determine but this service can be provided if the existing soil and amendments are sent to a laboratory, Hall said. Massive additions are generally required. If a superintendent is attempting to modify a clay soil, it is likely that 85 to 90 percent sand will be needed to achieve adequate modification.

Pine Needle Scale Control Covered with Supracide

"Supracide 2E" has received label acceptance from the federal Environmental Protection Agency for control of pine needle scale on Scotch, Mugho and red pines in the northeast section of the United States.

Supracide is Ciba-Geigy Corp. methidathion insecticide-miticide that controls certain insects of alfalfa, cotton, tobacco, grapefruit, lemons, oranges and nursery stock.

For pine needle scale control, application should be made once a season after scale crawlers have hatched in early spring for spring-generation crawlers or in summer for second-generation summer crawlers.

The summer spray will also control pine tortoise scale.

Whose Responsibility Is It To Enforce Course Rules?

Are common-sense rules on the golf course made to be broken? Unfortunately for many superintendents, this is the case.

"What's the use?" one superintendent told Gerry Finn, contributing editor of the newsletter of the Golf Course Superintendents Association of New England. "I take time and money to see that rules signs are made up and set up in certain spots on the course. So, what happens? Some member in a cart knocks one down. Another sees that it is in the way of his swing. So, he pulls it up and tosses it into the woods. That's why I don't bother with the rules signs anymore."

Many superintendents feel the same old golf car rules are being ignored. Most flagrant of these are driving too close to the green, driving over and through tees, straying off the golf car path and making spinout turns. The same goes for ball marks not being repaired in many cases. Add to this the inconsiderate member who takes target practice on par three holes and the problem becomes compounded, Finn writes. But who should enforce the rules?

One counter to those breaking golf and course rules would be a combination of the superintendent and the professional. Since the pro has the opportunity to "socialize" with members in the form of playing a round or two together, perhaps he might be better-versed in reporting violations. And the superintendent in his daily inspection tours could supplement this with reports of his own.

Another superintendent suggested, "I think that the grounds and green committee should be those responsible for enforcing the rules. It is something else for a member to be reminded of rules by the pro or superintendent. He could resent it. It must be his peers who do the enforcing."

Japanese Beetle Parasite Found In Northeast U.S.

A new nematode parasite of the Japanese beetle has been discovered in the northeastern United States. The parasite is being studied as another possible natural method to control the insect.

M. G. Klein, entomologist at the Agriculture Department's Japanese Beetle Research Laboratory at the Ohio Agricultural Research and Development Center says that Japanese beetle grubs parasitized with this nematode or mermithid (a cylindrical parasite worm) were collected from areas in New York and Vermont.

Identification of the nematode was made by William R. Nickle, nematologist at the Agriculture Department's Beltsville, Md., Agriculture Research Center. Nickle says this worm was previously not known to occur in North America and was thought to be native only to the Soviet Union.

Apparently, Japanese beetle larvae become infected by the mermithids in late summer. Klein told WEEDS TREES & TURF that mermithids emerged in March from larvae collected in October and held in cold storage until January. Parasites emerged in mid-May from larvae collected in April.

The thread-like merimithids, about nine inches long, could be observed coiled inside the collected larvae. At the time of emergence, individual Japanese beetle grubs showed little sign of life except for feeble movement of the mouthparts. A single mermithid normally emerged from each grub, although as many as three parasites were recovered from one host. Most of the host larvae had completed their third moult when the merimithids emerged. Klein says the discovery of this parasitic worm may prove to be an important biological control of populations of Japanese beetle grubs in the northeast.

Tree Protection Needed Before Heavy Snows Fall

Waiting until heavy snow or ice has damaged landscape plants before trying to save them is like closing the barn door after the horse is out, according to Harold Davidson, Michigan State University horticulturist.

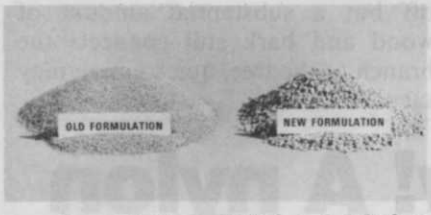
"Preventing damage to ornamentals is likely to be much more successful than a salvage effort after the damage is done," Davidson told WEEDS, TREES & TURF. He said remove dead, diseased or weak branches from trees. These are likely to break and fall when loaded with ice. Pay particular attention to limbs overhanging utility lines, buildings or parking areas. These branches should be removed by a trained arborist.

Much of the potential for injury can be eliminated by pruning young trees to take out sharp V-shaped crotches. A broad U-shaped or angle crotch is much stronger, he said. Propping up willows and birches and other flexible trees to keep ice from bowing them down may do more harm than good, he said. The trees tend to bend over and break off at the support point. Injuries to trees can sometime be repaired, depending on the severity of the injury and the importance of the plant.

If ice causes a tree branch to split off but a substantial amount of wood and bark still connects the branch to the tree, quick action may save it.

Balan Application Easier With New Formulation

Indiana golf course superintendents and distributors to the turf industry gathered recently at the Country Club of Indianapolis to get a first-hand look at Elanco Products Co.'s



new formulation of Balan 2.5G for turf.

The new formulation's larger, coarser granule results in several advantages to the user, officials of the Indianapolis company told WEEDS TREES & TURF. Since the larger granule moves more readily through rotary spreaders, the application is easier. At the field demonstration, it was observed it can be spread as conveniently as fertilizer with less dust and with less likelihood of drift.

The change in particle size does not affect the weed control results, company officials said. Tests indicate this new formulation effectively controls crabgrass, foxtail, goosegrass and *Poa annua* and is not affected by heavy rain or irrigation.

New Disease Control Unit Started by Forest Service

The Forest Service, U.S. Dept. of Agriculture, has established a new national team of forest insect and disease specialists to provide Forest Service administrative regions and areas with specialized assistance in survey technology aimed at assessing impacts on forest resources caused by destructive insects and diseases.

The new Methods Application Group (MAG), headquartered at Davis, Calif., will also provide help in the application of new and improved techniques and strategies for reducing insect and disease losses.

The MAG will operate on a national scale under the direction of the agency's staff director or Forest and Disease Management in Washington, D.C.

Forest insect and disease-caused losses of forest resources have reached their highest levels ever during the last four years, a spokesman for the Forest Service told WEEDS, TREES & TURF.

Outbreaks of the Douglas fir tussock moth, spruce budworm, southern pine and mountain pine bark beetles, gypsy moth and various diseases are making unprecedented assaults on forest resources.

The MAG will assist field units by strengthening survey efforts to reduce the time required in the detection of these outbreaks and to improve the reliability of insect and disease outbreak evaluations.

This will provide land managers with better information for control decisions.

As its first objective, the MAG will provide leadership and coordination in obtaining forest insect and disease impact information.

Research needs identified by the MAG will be promptly relayed to the appropriate research units.