Nematodes *from page 26*

The following are abstracts. The first is from the 1977 Proceedings of the American Phytopathological Society and the second is from Volume 69, No. 5, 1979 of Phytopathology.

SUSCEPTIBILITY OF BENTGRASS TO *BELONOLAIMUS LONGICAUDATUS*. L. T. Lucas, Department of Plant Pathology, North Carolina State University, Raleigh, N.C. 27607. High densities of *Belonolaimus longicaudatus* Rau were associated with poor areas of bentgrass (*Agrostis palustris* Huds. var. Penncross) on golf greens in eastern North Carolina. Bentgrass in these areas was yellow and thin, and some grass died during hot days even with frequent irrigation. Numbers of *B. longicaudatus* found in soil from poor turf areas ranged from 120 to 1320/500 cm^3 of soil and 0 to 70/500 cm^3 of soil were found in soil from good turf areas on the same greens over 4 years during June to September. Penncross bentgrass seedlings growing in a 1:1 mixture of a sandy loam soil and 65 mesh (230 um diam.) sand in 10-cm diam. clay pots were inoculated with 200 and 500 *B. longicaudatus*/500 cm^3 of soil. Plants were grown at 26-30 in the greenhouse for 3 months after inoculation and tops were allowed to to 5 cm and then cut to 1.5 cm as often as needed. The average root growth (wet weight) was suppressed 37 and 56% and top growth (total wet weight) was suppressed by 26 and 46% by inoculation with 200 and 500 nematodes, respectively. Numbers of nematodes recovered 3 months after inoculation with 200 and 500 nematodes/500 cm^3 of soil were 2972 and 1993/500 cm^3 of soil, respectively. *Belonolaimus longicaudatus* has the potention of becoming a serious probelm on bentgrass as the use of bentgrass increases on golf greens in areas where this nematode occurs.

CONTROL OF *BELONOLAIMUS LONGICAUDATUS* ON BERMUDAGRASS GOLF GREENS. L. T. Lucas, Department of Plant Pathology, N.C. State University, Raleigh, N.C. 27607. Poor growth of "Tifton 328" bermudagrass (*Cynodon dactylon*) on golf greens with sandy soil along the coast of North Carolina was associated with *Belonolaimus longicaudatus*. An average of 400 *B. longicaudatus* and 966 *Macroposthonia ornata* per 500 cm^3 of soil were found in soil samples before treatment with nematicides. Phenamiphos, fensulfothion and 1, 2-dibromo-3-chloropropane (DBCP) were applied as granules at 0.2, 0.2 and 0.64 kg (a.i.)/93 m^2, respectively, on August 8, 1977. Turf quality ratings (9 being the best quality) were 6.2, 6.2, 4.7 and 2.7 4 weeks after treatment, and 8.7, 4.0, 4.0 and 4.0 40 weeks after treatment in phenamiphos, fensulfothion, DBCP and nontreated plots, respectively. Densities of *B. longicaudatus* were 160, 100, 315 and 1390 4 weeks after treatment, and 106, 823, 406 and 752 40 weeks after treatment in phenamiphos, fensulfothion, DBCP and nontreated plots, respectively. Densities of *M. oranta* were reduced in DBCP treated plots only.

A treatment can enhance, reduce or have no effect, depending on the chemical and rate.

Residual activity of herbicide treatments on bermudagrass overseeded with ryegrass

By B. J. Johnson[2]

Goosegrass *(Eleusine indica* (L.) Gaertn.*)* is a major problem weed in bermudagrass *(Cynodon dactylon* (L.) Pers.) putting greens throughout the southeastern states. It grows into a large uneven plant which reduces the quality of the putting green turf. Goosegrass can be effectively controlled with postemergence treatments of methazole and metribuzin (2). Also, a combination of MSMA with reduced rates of either methazole or metribuzin controlled goosegrass without injury to bermudagrass (3). The disadvantage of these treatments (2,3) is that goosegrass may germinate and emerge after treatment and additional treatments may be required for consistent control. Bond and Roberts (1) reported that methazole can persist in the soil for a period up to 3 to 4 months. Savage (4) found that metribuzin starts to lose its phytotoxicity within a few weeks of application. Since most bermudagrass greens are overseeded in late summer or early fall with cool-season grasses, the question arises as to the length of time needed between herbicide treatment for goosegrass control and time of overseeding without injuring the newly planted grass. This experiment was conducted on burmudagrass green overseeded with perennial ryegrass to determine the optimum time interval needed from herbicide treatments to overseeding without affecting the newly planted overseeded grass.

Methods and Materials

This experiment was conducted for 2 years on "Tifway" bermudagrass maintained as a putting green at Experment, GA. It was overseeded with "Medalist IV" on 10 Oct. 1977 and "Medalist V" perennial ryegrass on 6 Oct. 1978. Herbicides were applied at 0, 1, 2, 4, and 6 weeks before planting. The treatments were MSMA at 2.2 kg/ha in each of two applications, methazole or metribuzin at 0.3 kg/ha in each of two applications or 0.6 kg/ha in one application, and combinations of MSMA at 2.2 kg/ha with either methazole or metribuzin at 0.1 kg/ha in each of two applications. When treatments were applied as a single application it was made at the indicated treatment date. For two applications, the first treatment was made 1 week before the initial treatment date followed by the second treatment 1 week later. Whether treatments were applied in one or two applications, the final applications was made at the indicated time of 0, 1, 2, 4, or 6 weeks before planting ryegrass.

Herbicides were applied broadcast in 376 liter/ha of water and seeding rate for ryegrass was 1,700 kg/ha. After overseeding, the turf was left unmowed for 10 to 14 days and then mowed at 1.0-cm in height for 3 weeks. After this period the cutting height was reduced to 0.8-cm until February and then maintained at a height of 0.64 cm during the remainder of the year. The turf was mowed twice per week during the winter and three times a week during the rest of the year. The experiment was conducted on a Cecil (Typic Hapludult) sandy loam with a 6.0 pH, 0.8% organic matter, 77% sand, 14% silt, and 9% clay contents. The turf was fertilized with 50 kg N, 22 kg P, and 42 kg K from a complete fertilizer prior to overseeding in October and again in April. After overseeding, 50 kg N as ammonium nitrate was applied at approximately 4-week intervals. Turf growth ratings were visually estimated from 1 to 10 weeks after planting each year. The rate of growth was based on percentage of toal ground cover.

The treatments were arranged in a split-plot design with dates of herbicde application as main plots and herbicide treatments as subplots with four replications. All data were analyzed statistically and reported as average from 2 years.

Results and Discussion

Methazole at 0.3 and 0.6 kg/ha were the only herbicide treatments that significantly reduced ryegrass growth when applied at the time of planting. Turf growth was not affected by other treatments when applied at anytime up to and including day of overseeding. Since both metribuzin (4) and methazole (1) persists in the soil for several weeks the newly-planted ryegrass tolerated the treatments as indicated above and maintained a normal turf growth. An exception occurred for metribuzin when applied on the day of overseeding. Seedling vigor of

Continues on page 41

[1]Contributed from the Agronomy Dept., Univ. of Georgia College of Agriculture Experiment Station, Experiment, GA 30212. Supported by State and Hatch funds allocated to the Georgia Agricultural Experiment Stations.

[2]Professor of agronomy.

IN A BUSINESS LIKE THIS YOU CAN'T AFFORD TO PLAY AROUND.

Behind all the fun and games golfers have on your course lies the serious business of running it profitably. That's where your local AMF Harley-Davidson® Golf Car dealer stands out. He proves himself on the bottom line, by helping you earn a better return on your investment.

To begin with, our dealers have fine quality gas and electric cars known for their performance and reliability, because they have the AMF Harley-Davidson name behind them.

But for a Harley dealer, it's not enough to just make sales. He helps plan your fleet. He'll suggest the right mix of cars for your course. He'll help you decide when to buy or lease, what to trade in. He can help arrange financing, storage, even special event fleets. That's professional advice you can't get everywhere.

For a Harley dealer, it's not enough to provide service. He goes beyond that. After all, he's part of the largest dealer network in the world. So you get more attention. More factory-trained personnel. Prompt and complete maintenance with minimal downtime.

You get an extensive inventory of genuine Harley-Davidson parts and prompt delivery from our Parts & Accessories Division. And the long term, bottom line benefit of significantly lower service costs.

The bottom line for your club's golf car investment is return. That's what our business is all about.

We improve your return on the bottom line. Or our name isn't Harley-Davidson.

AMF
Harley-Davidson
Golf Car Division

Write 104 on reader service card

HARLEY-DAVIDSON GOLF CARS

WE PROVE OURSELVES ON THE BOTTOM LINE.

Distributor *from page 14*

all, the number of customers the turf distributor will have remains almost static. Only in the Sunbelt are we seeing significant growth in the number of golf courses. A salesman must depend on the same customer to come back.

A salesman must know the ins and outs of his equipment and be able to assure the buyer that it is the best piece of equipment for the job that it will perform. He must know how to, in the face of tight money, offer the buyer a financing plan he can afford. And after he has sold the equipment, he must back it up with quick parts availability and service.

One of the big differences in service between a turf distributor and for example, automobile sales, is that the distributor teaches the customer how to work on his equipment himself. The manufacturer hold schools to teach the distributor the latest technology and the distributor holds schools passing the knowledge on to the customer. And they are glad to do so. It is not viewed as a money-losing operation. It is viewed as "That distributor supported my piece of equipment." It may put a sale off because the equipment will last longer, but when the sale comes, it will come back to that distributor.

Parts

The parts departments of most distributors has shown a surge as customers hang on to equipment and try to make it last longer. Distributors are implementing programs to make parts purchases flow through the system more efficiently. To get as fast service as is possible, it is important for the buyer to be as precise as possible when ordering parts. He will get much quicker service if he has looked in his parts book, and orders by part number. If he says, "Well, I need some parts for my mower, oh some points and maybe a hydrostatic muffler belt, I bought it last year, no I don't remember the model—threw the book away . . ." Well, that order is going to get shelved until the parts man has time to go to his books or the computer, look up the piece of equipment that the customer bought, look up the part number and then see if it's in stock.

Meanwhile, if there is another superintendent who ordered by part number, maybe even after the first one, and there is only one part, he will get it. His order will be filled first.

Volume of business is very important. It is impossible to run a profitable organization if you have to spend a lot of time searching for information that should be readily available. Because of this, distributors are educating their customers and trying to get them to work within their systems, as much for their own gain as for the customers.

More and more distributors are go-

Continues on page 39

The Front Line™

Proved tough enough to be a Cushman.

People in your profession naturally expect a mower from Cushman to be something special. In its first year, the Front Line proved it is just that.

The common-sense engineering and durability of the Front Line are just what you'd expect from a Cushman® product. But its cut is cleaner and more even than most people expect from a riding rotary mower.

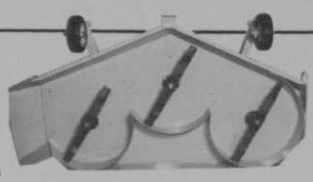
Now, in addition to the 72" deck, we are offering a 60" mower deck for smaller jobs. In fact, with just one tractor you can now handle a variety of jobs with the accessories shown below. And this year the Front Line is also available with a diesel power engine.

Yes, Cushman has put even more into the Front Line mower this year, so you'll get more out of it in the years ahead. To find out more about what Cushman value could add to your mower operation, contact your Cushman dealer today.

Now versatile enough to pay off all year.

These specialized accessories make the Front Line even more productive for you.

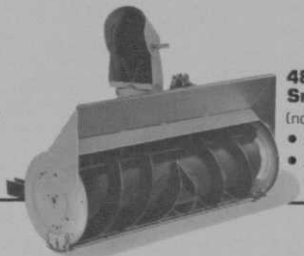
Roll-Over Protection Structure (ROPS) and Cab
- Weather-proof
- Meets OSHA requirements



60", 72" Mower Deck
- 12-gauge carbon steel
- Smooth-cutting

New! Diesel Power
- 4-cycle, 2-cylinder engine
- Water-cooled
- Economical

60" Rotary Broom
(not available for diesel)
- PTO-driven
- Long-life Bristles



48" Snow Thrower
(not available for diesel)
- PTO-driven
- Adjustable chute

CUSHMAN®
3003 Cushman, P.O. Box 82409
Lincoln, NE 68501

The Front Line™
Tough enough to be a Cushman.
Call: 402-435-7208

Write 121 on reader service card

CHIPC

LONG-LASTING CHIPCO® 26019 IS STRONG MEDICINE.

If you're serious about protecting your turf against diseases, give it your best shot. Spray Chipco 26019 fungicide. Thousands of superintendents have switched to Chipco 26019 in the past two years. And no wonder. Chipco 26019 gives you the longest residual. You can cut the number of sprays in your program, and that cuts your costs. And Chipco 26019 prevents the major turf diseases with unsurpassed effectiveness. You'll get good results with Chipco.

Please read label carefully, and use only as directed.

O® 26019

26019 against dollar spot (including benomyl-resistant dollar spot), Helminthosporium (leaf spot and melting out), brown patch, Fusarium blight and Fusarium patch (west of the Cascade Mountains). Chipco 26019 also suppresses grey and pink snow molds. Ask your Chipco distributor or Rhône Poulenc representative about effective, long-lasting Chipco 26019...the strong medicine in turf disease prevention. Rhône Poulenc Chemical Co., Agrochemical Div., Rhône Poulenc Inc. Monmouth Junction, NJ 08852.

RHÔNE·POULENC

RO7-8882

Write 108 on reader service card

Part II. The first part appeared in the January issue.

Carefully chosen trees can center views of each hole

By J.A. French and **R.P. Korbobo**

The first word of caution where we speak of using trees to frame the green is to know the tree and all of its habits for the rest of its life. Then, you must put personal likes aside just in case you have a favorite tree that will not fulfill these requirements. Now we must become very practical and select only those trees that suit your part of the country.

Natural is the key word

Care must be taken when locating the framing trees for the green never to make it a "formal" picture. A golf course is a place that is supposed to reflect nature at its best. Therefore anything formal, such as straight rows of trees, creates an unnatural look. Left should never equal right. Such balance is correctly used in a formal garden design. Every care must be taken to make the ultimate design appear to be untouched by man. This is not as easy as it sounds. After working nearly a lifetime at this we still find it takes great care as to just where to place these trees so that when they grow into maturity, they will look like they grew there out of the struggle for existence and also according to the laws of nature.

Three basic approaches to the green

Another thing that must be considered, in order to do the job in an artistic manner, is the physical approach to the green as seen by the golfer. There are three basic possibilities.

The first one is when the golfer and the green are at the same level. In other words, the ground he stands on is practically the same elevation as the surface of the putting green. In these instances, a broad selection of trees is available. The only concern other than horticultural is that of branching habit, since branches to the ground would be desirable here.

The second category is where the surface of the putting green is at a higher elevation than the golfer's feet. This is important to the designer because he knows that if the green is higher than the golfer he can use a smaller sized tree in order to gain the effect of framing that green. The golfer will be looking uphill and a tree of only 15 or 20 feet in height, if placed correctly, can give the illusion of being a much larger tree when it comes to the job of framing that particular green.

The third category is when the green is lower than the golfer and he stands above it as he makes his club selection. It will take very tall trees in order for the golfer to have a clear view of the green and yet have it framed.

The most important thing of all when placing these framing trees either on one side or on both sides of the green is the precise location.

These trees can be as far as 150 feet away from the green and still create a frame for it. It should not be a narrow view to the green between these trees. Such tight passages could make it too difficult for the golfer to fly his ball onto the putting surface from a good lie on the cut fairway.

We are reminded of a golf course where one of the authors first cut his teeth on the game of golf. It was a public course and someone had decided that a particular green on a par three hole had to be elevated because of the drainage problems. Apparently, they were not aware of the requirements for successful growth of large established trees. There were two huge, extremely attractive oak trees that were actually framing the green without any assistance from man. They simply were left there. When the green was elevated to a height of five to six feet above the original grade, the fill that sloped off the green covered the lower portions of the trunks of these two handsome old oaks. Since the soil in that area was poorly drained to begin with, these oaks simply could not take the fill soil that was placed over their root systems and around their trunks. They both died, of course, in a very short period of time. However, even in their death, as the wood became bleached by the sun, they took on a truly beautiful character while framing this green. So they stood there for many years, as the expression goes, "deader than a doornail", but yet were serving a great aesthetic purpose of framing that green. As the years wore on and branches started to fall off, of course, the trees had to be cut down. Once they were removed, this green lost all of its character and looked very nude indeed.

And speaking of death, we might say that Dutch elm disease is now sweeping all the way into the western states of our nation and we have little reason to believe that it will not continue and ultimately consume all of our American elms. Therefore, if you have these trees that are performing vital aesthetic and playing purposes on your golf course and they are having problems with their general health, we certainly suggest consulting with the best tree specialist in your area to see if they can be saved. If such an expert tells you it will be a long down-hill losing battle, it would be wise to consider starting a replacement tree or groups of trees so that you can gain that many more years in time by having new ones starting to take over the jobs of the ones that will die. It is especially important where the tree in trouble is one that is framing a tee, or a green.

Distributor *from page 34*

ing to computers for ease in maintaining inventories and also to facilitate finding needed parts among distributors. In some areas, distributors are tied together by computers to make locating a hard to find or out of stock part faster.

Options

When a distributor orders a piece of equipment, it doesn't roll off the truck ready to go. The distributor orders the piece of equipment in parts and must spend as much as 30 hours putting it together. Different wheels are available, different frames, reels, operator ease options . . . a long list.

Freight bills can be astronomical. The distributor must weigh the fact that freight for a truckload is maybe $1200, while freight for a single piece might be be $700. (Figures are for illustration only.) Does he think he can sell a truckload? Can he sell a single piece if the freight bill raises the price so high?

Service department

Most distributors' service departments perform major repair operations that the mechanic at the course is not equipped to do. They maintain highly skilled mechanics. Between training and wages for a skilled mechanic and overhead for specialized equipment, labor rates are high. However, when a piece of equipment needs major repair, superintendents want it done right. In the eyes of the distributor, it is another highly necessary service to keep the customer coming back.

Chemicals

Chemical distributors depend to a great extent on early season buying. Often, preventitive pesticides are one of the first cutbacks in a budget. Most of the time, however, chemicals are ordered through late winter, or early spring, as budgets are settled.

Expenditures for chemicals are high, perhaps not so much as the initial expense for a piece of equipment, but considering that chemicals are ordered year after year, while equipment might last several, it adds up. At $135 a case, 35 cases to treat a course for fusarium and maybe a couple of other diseases, you're looking at nearly $5000 as only a part of the pesticide budget.

Objective

Our objective, as we pursue this subject with thorough interviews with distributors, is to pass along information that will help the superintendent do his job better. With this article, we have laid the groundwork behind why a distributor speaks as he does. In next month's issue, we will hear from them directly, and they will tell you how to get the most value for your money, and how to maintain that value.

Products

Quick signs

Make your own signs

Universal Sign Systems now allow you to make all your own signs quickly, inexpensively and still obtain professional results. A new unique formula spray ink works on almost all materials so you can make both indoor and outdoor signs with one system. A complete rubber letter assortment allows any one of your employees to make your custom promotional, directional, or safety signs with no waiting and no high costs. Needs no special designated area or professional operator. Kits are unconditionally guaranteed for as long as you own them.

Write 201 on Reader Service Card

Front-mount flail

Vemco unit fits Kubota B & L series

Vemco Corp. has introduced new front-mount flail mowers for Kubota "B" and "L" series tractors. The new design creates a maneuverability never before possible with large detachable mowers, according to Vemco. The improved visibility and ease in backing allow the operator to get in and out of those tight spots. Large pneumatic, 360 degree rotating caster wheels provide a secure, cushioned right over rough terrain. The mower is available in 48and 60-inch cutting widths.

Write 206 on Reader Service Card

Top dresser