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President's Message

Ray Schmitz

Gone Fishing

Dick Trevarthan and Dudley Smith on a recent fishing trip on Lake Michigan.

After another hectic "spring start-up" on the golf course a group of us decided to take a day off and go fishing with Charter Chaptain Craig Marfia on Lake Michigan. Yes, it is the same Craig that many of us know and love as a former Golf Course Superintendent.

Our charter started out of Waukegan Harbor at noon and we would be out 4 to 5 hours or until we reached our legal limit of fish. During our time on the water our party boated 17 fish including 2 beautiful rainbow trout and 15 chinook salmon. Believe it or not, at one time we had 4 poles with fish on. This was a very exciting time for everyone on board. The prize catch of the day went to George "Bo-Jo" Haddad with a 10 and a half pound rainbow. Dudley Smith came in second with a nice rainbow over 8 pounds. Dick Trevarthan took third prize with a large shiny chinook.

Captain Craig was a very capable and gracious host. I always knew he was capable of growing good turf and now I am convinced he knows Lake Michigan and he sure knows how to fish.

I think it should be part of our job, no matter what kind of work we do, to be able to take some time off and reflect on what is happening around us. It seems when we return to work we have renewed energy and/or more productive at what we do best. Also it gives people with responsibility under us to make decisions on their own. This also is part of the teaching process.

Guidelines for Controlling Moss in Greens

by Norman Hummel, Cornell University

The quality of golf course greens by present day standards is often determined by greens' speed. Golf course superintendents are mowing greens shorter and keeping the nitrogen fertility lower than ever before to obtain faster speeds. A consequence of these practices has been a reduction in turfgrass vigor to a point whereby the greens are much more prone to weed encroachment. One of the more troublesome weeds to have become a problem is moss.

Until recently, the only known means of controlling moss was through the use of mercury products. With the support of the Metropolitan Golf Association, research was conducted to look at means of controlling this serious weed. This research identified both chemical and cultural tools that could be used in a moss eradicating program.

Chemical Control

Pesticides and other materials offer hope in controlling moss on bentgrass greens. In the early spring, moss commences its growth much earlier than bentgrass, giving it an early competitive advantage. Hydrated lime applied in late March at 3 to 5 pounds per 1000 square feet will burn back the moss during this period. The lime can be spread easily if mixed with a dry sand topdressing.

An effective treatment for moss control would be the Scotts Goosegrass Control; a betasan-ronstar combination. Labelled for use on bentgrass greens, this product provided 83% control from only a single application. While this product will cause some discoloration, it appears to be one of the more promising moss control products.

Siduron (Tupersan) and bentazon (Basagran) provided from 53 to 74% control of moss. While they were not quite as effective as the Scotts product, both siduron and bentazon were much safer since no injury occurred for either product.

You should note that with the exception of bentazon the most effective treatments are preemergence herbicides. While it can't be determined from these trials whether the effect is pre- or post-emergent, it should be mentioned that the herbicidal activity of these materials on moss was chronic. It was several weeks before we noticed any significant decrease in moss populations.

Cultural Control

Chemicals only offer a partial solution to the moss problem. Unless cultural steps are taken to increase turfgrass vigor, chemical control of moss will be ongoing battle. We designed studies to look at the effects of cultivation techniques and fertility on moss eradication. The results clearly demonstrated that culture can be changed to the detriment of moss.

While silvery thread moss will tolerate dry conditions, it is favored by an abundance of free water. Core cultivation immediately followed by sand topdressing would create a system of "vertical drains" that would facilitate a rapid water removal of the surface. We found that moss removal was hastened where this practice was followed compared to core cultivation alone. Deep spiking was also beneficial compared to core cultivation alone.

Nitrogen and iron are the most important tools in a moss eradication program. Moss control improved as the rate of nitrogen was increased. Moss was eliminated over two growing seasons from plots that were initially 40% moss by increasing nitrogen rates to about 0.8 lbs. per 1000 square feet per growing month (6 lbs. N/year). Iron applications at a rate of 6 ounces per 100 sq. ft. per month were beneficial during the first year, especially at the higher rates of nitrogen. Iron had no effect on moss in the second year.

While we didn't measure greens' speeds, these high nitrogen treatments no doubt resulted in slower speeds. The bottom line though, is if you have moss, you are going to have to at least temporarily increase nitrogen rates. Effects on greens' speeds can be minimized by careful control of water, double cutting, or increasing potassium levels.

Moss control research has until now looked at fertility and herbicides independently. Studies will be conducted this year to look at combinations and nitrogen fertility in moss eradication "programs". Perhaps this research will identify more reasonable nitrogen rates to use in conjunction with a herbicide program to eliminate moss from greens.

In summary, enough information is known for a superintendent to develop a legal moss control program. Early spring application of hydrated lime, followed about a month later and in the early fall with a herbicide are the first steps in controlling moss. Increasing your nitrogen levels during this period will not doubt improve the competitive advantage of desireable grasses at the expense of moss. Furthermore, control your soil moisture levels through careful irrigation and by providing good drainage throughout the soil profile.

Credit: **Our Collaborator,**
Northeastern GCSA, Sept. 1990

USGA Green Section Research Summaries Released

United States Golf Assn.

FAR HILLS, N.J. — The United States Golf Association announces the release of the 1991 Turfgrass Research Summary and the 1991 Environmental Research Summary.

The USGA Green Section and the Golf Course Superintendents Association of America (GCSAA) teamed up in 1983 to fund a ten-year turfgrass research effort that would reduce water use, pesticide use, and maintenance costs by a significant amount. The 1991 Turfgrass Research Summary reports on the important progress made in 1991 by sponsored project investigators.

The 1991 Environmental Research Summary presents first-year progress on the 20 projects funded in this $3.2 million, 3-year study of the effects of golf courses on the environment. The research program includes investigations pertaining to: 1) the fate of pesticides and fertilizers applied to golf courses; 2) the development of alternatives to the use of chemical pesticides for control of certain golf course pests; and 3) the impacts and benefits of golf courses on people and wildlife.

The two Research Summaries are available from the USGA Order Department at 800/336-4446.

In Your Garden Don't Bad Mouth Bees

by James A. Fizzell

Those pesky "bees" so abundant now probably aren't bees at all. More than likely, they are small wasps called yellowjackets. These wasps are somewhat more slender than honey bees, about ½ inch long, smooth, with black and yellow stripes. Honeybees are plump, somewhat fuzzy, and brown and yellow in color.

Yellow jackets are perfectly happy to exist in close proximity to humans. They make large paper nests in cracks in the ground in our yards, in wall voids, or any other protected place they can find. And, they eat just about anything we eat. Thus, they enjoy our picnics just about as much as we do. It is not uncommon to find one between you and your hamburger just before you take a bite.

Unfortunately yellowjackets are quite aggressive, and unlike a bee which can sting only once, can sting repeatedly.

To reduce the chance of being stung outdoors, avoid wearing bright colors that might be confused for flowers on which the wasps also feed. Also, certain colognes attract the pests.

Keep all the food at your picnic covered until just before eating, and eat quickly. Then cover all food and dispose of leftovers etc. promptly, some distance from where you will be sitting.

If you do receive a sting, expect it to be uncomfortable for a few days, but unless you are unusually sensitive to stings, there should be no permanent effect.

Yellow jackets spend the winter as adult females. In spring they start building their paper nests and raising grub-like young.

The young are fed insects and bits of meat, fruit or any other food. They scavange from garbage cans, picnics, or other areas where food is left uncovered. When they mature into adult wasps they join their sisters in raising more young.

Late summer finds these pests in greatest number as they try frantically to feed their developing young to adulthood before winter kills off the nest.

Since the nests will not survive the winter there is no need to destroy them unless they are located where you will regularly encounter them, risking stinging.

If you find it necessary, elimination of nests is best done at night when the yellowjackets are less active. Be sure to wear protective clothing so that as little skin as possible is exposed to possible stings.

Underground nests will usually have a single opening that the wasps use to enter and leave the nest. Soak the nest with diazinon sprayed through this hole. Seal the opening with soil immediately after spraying.

Wall void nests are frequently a foot or more from the wall opening that the wasps use to enter and leave the nest. These nests can usually be killed by placing carbaryl (Sevin) dust in and around the wall opening. The yellowjackets pick up this dust on their bodies, groom themselves with their mouthparts, and feed each other in the nest. Often the dust must be reapplied up to 4 times over a two week period to kill all of the wasps in the nest. There is no honey in these nests so there is no need to remove them from inside the wall. Nests are not re-used in subsequent years.

Biostimulant/Growth Enhancer Technology in Plant Care Programs

Introduction

Biostimulants have assumed considerable importance in turf care and crop production practices in the United States. Field success and the increasing validation information confirm beyond reasonable question the viability of these products in this country, just as they have been viewed as critical in maximizing crop yields in other countries for many years. Along with genetically engineered improvements to plant species, biostimulants/enhancers now represent the only credible new technology for improving health, increasing yields and decreasing stress induced problems. As Dr. Ward of Auburn has stated, "There is a need for these products."

Certainly, as with all new technology, there has been a learning period — with some remarkable successes and some seeming "failures" over the past twenty years — in the application of biostimulants to improve plant performance. Fortunately, the past (and present) "failures" are identifiable as resulting from one or a combination of the following:

1. Ignorance or disregard of the needed balance and the interrelatedness among the various hormone groups.
2. Inappropriate attention to other critical constituent (e.g., nutrient) requirements of plants.
3. Poor formulation chemistry, particularly in regard to stabilization of compounds.

A number of companies have made progress in dealing with some of these basic problems, at least in regard to the second and third items, and in fact have products currently on the market which may be fairly said to give good results in many circumstances on some species. Nevertheless, as far as hormonal chemistry itself is concerned, most manufacturers have yet to achieve a balancing of inputs of *all* growth hormone groups, especially as it relates to different species and consistency of desired result. Perhaps Dr. Karnok of the University of Georgia identified this problem best when he doubted that any single hormonal material could have the same effect on "... all species growing under all conditions."

A Primer on Biostimulation & Growth Enhancement

There is now a substantial body of evidence that the addition of biostimulants to nutrient programs can significantly improve:

- Survivability & Vigor
- Root Depth & Mass
- Stress Resistance
- Nutrient Uptake
- Moisture Utilization
- Apical Quality
- Disease Resistance
- Insect Resistance

What is a Biostimulant?

It is a compound containing one or more plant hormones from the Auxin, Cytokinin and Gibberellic Acid groups which control the health, efficiency, and growth of plants.

What does a Biostimulant do?

Under ideal conditions, a plant has adequate hormones to function efficiently. In the real world of plant management, con-

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BIOSTIMULANT (continued from page 6)

ditions are never ideal, thus plants are always asked to perform at less than peak conditions. Biostimulant applications can replenish hormonal deficiencies and improve plant performance.

What results will Biostimulants give?

Generally a healthier, more efficient plant. The greater the stress, the greater the benefits — whether we are speaking of increased yields, more prolific roots or resistance to external agents.

What is a "Growth Enhancer"?

A compound containing both growth hormones and appropriate beneficial nutrients.

Are there differences in Biostimulant/Enhancer compounds?

Yes. Most compounds contain one or two hormone groups. While these sometimes *do* yield good results, often they lack consistency because they do not address all areas of hormonal deficiencies in the plant. They assume that one compound is appropriate for all types and all functionings of plants, and they often lack beneficial carrier constituents.

Plant Hormones

There are five types, or groups, of plant hormones. Two of these (Ethylene and Abscisic Acid) regulate or initiate decline activities including dormancy and death. The other three groups, primarily associated with growth enhancing activities, are:

Gibberellins (GA)

Produced and dominant in the new growth areas (particularly in seeds and apical portions), Gibberellins are key to cell division and elongation and are the "signal callers" or messengers of the plant. As apical growth occurs, GA travels downward (provided sufficient Auxins are present) and instructs the plant to:

a) Produce more Cytokins for root proliferation.

b) Translocate more Cytokins to the other areas of the plant to enhance the topical elements.

Auxins

Produced in the middle regions of the plant, Auxins contribute to root growth and formation and largely govern GA and Cytokinin movement to and from the extremities. They also play a major role in internode formation, which in turn significantly influences leaf quality.

Cytokinins

Manufactured in the roots, Cytokins profoundly affect root development and, with assists from GA, Auxins and sufficient nutrition, light, air and moisture, are integral to cell division and leaf and stem formation.

From a practical standpoint, the upshot of these facts is that a thorough understanding of hormones and their interrelationships to each other and the other sustaining elements of plant health is essential to producing dependable responses. The absolute corollary is that different responses require different prescriptions. Thus, for example, hormonal compounds with advantageous attributes for seed germination and early establishment may be ineffective or even damaging if applied to the same plant during a more mature state of the life cycle.

Credit: "Hole Notes" June 1992

Memory or Storage?

by Eugene Young

Other than the microprocessor ("brains") chip, memory and storage are the two components which determine the capabilities of your computer. They are not the same and both should be considered before purchasing additional software to increase your productivity (or game skills).

The easiest way to understand the concept of memory is to compare it to your desktop. It's a work area and anything you are working on is spread out on top of the desk. Storage is similar to your filing cabinet. Anything you want to keep is stored in the filing cabinet. It's indexed and you can (usually!) find what you need. When you are ready to work on something in your filing cabinet, you find it and put in on your desktop.

A computer is no different. When you want to work on something (use a program), the computer goes to storage (a diskette or a fixed disk) and places the information in memory. A fixed disk is also commonly called a hard disk or drive. Storage is measured in Kilobytes (Kb), thousands of characters of Megabytes (Mb), millions of characters. Buying another or a larger hard disk is like buying another filing cabinet: you now have more space to store programs and data.

Newer programs and updates to older programs have many additional features and take up more storage. In addition, most of these programs require a hard disk in order to run. Before making a new software purchase, perform a simple check to see if you have enough hard disk space remaining. At the C:►(C-prompt), type Chkdsk and press the enter key. The screen will display the amount of memory you have and the status of your hard disk.

If you need additional hard disk storage, your options are:

-Remove programs and/or data from your hard disk to diskettes

-Buy and install a data compression program (e.g. Stacker, AddStor, etc.; about $100)

-Buy and install another or a larger hard disk ($200 and up).

Memory is also measured a kilobytes and megabytes. The memory requirements for a program are usually printed on the outside of the package. Most programs are written with a maximum memory requirement of 640Kb. This limit was placed on the design of the microprocessor chip used in the original IBM PC. It could only keep track of 640Kb of program and data at one time, a phenomenal amount in 1981. As programs became larger, some "fooled" the computer into using more memory than 640Kb. Eventually, others were written to use the capabilities of modern microprocessors that can utilize additional memory. If you are buying a program that needs or can use "extended" or "expanded" memory, you will need to:

-Determine if your computer can utilize additional memory

-Determine if your computer has additional memory

-Determine if you can appropriately configure the additional memory.

If your computer can utilize additional memory and either doesn't have any or the additional memory can't be configured appropriately, you will need an expansion board ($200 and up) and memory chips ($50-$100 per Mb) to populate the board.

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