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IPM Leading To Holistic Plant Health Care – Part 2

Dan Dinelli North Shore Country Club

PART 2—Continued from the December 1996 issue.

IV. CULTURAL METHODS

The following is an overview of cultural practices that I feel made a significant favorable impact under our growing conditions. By no means does this include all cultural methods used.

Proper pruning and thinning of trees: This ensures better air movement and solar radiation on the turf canopy. Root pruning of trees that surround all greens, tees and fairways: This practice is done every five to seven years. A powered pipe puller with a vibrating plow is used. Irrigation needs are reduced by this practice.

Overseeding is done using improved cultivars. On greens, tees and fairways, compatible cultivars are used in blends of bentgrass. We choose fine leaf texture and upright growth habit varieties. In the roughs, mixtures are used utilizing endophyteenhanced varieties when possible. We look for similar leaf texture, growth habit, color and fertility requirements in our compatibility evaluations. Our goal is to achieve genetic diversity with adaptive potential.

Dew and guttation water is removed daily. First task of the day is to either mow or drag. A length of high-pressure spray hose is used between two trucksters to manually remove the exudates on fairways. This has improved early morning playing conditions and removes free water favorable for disease development. Vertical mowing is done each time the greens are mowed. On tees and fairways, brushing or combing is done with each mowing. This, with overseeding upright, fine leaf textured cultivars, keeps turf grain free. Golfers

Recently, we have used yard waste compost as a soil amendment, fertilizer and disease suppressant on fairways.

like this for better golf ball lie and trueness in ball roll. When this is achieved, slightly higher mowing heights can be used without sacrificing playability.

Rolling greens after mowing is done prior to golf events. This allows faster ball roll without lower mowing heights. With the incorporation of a high sand upper root zone, compaction and wear has not been observed.

Fertility Management

The following is our basic

fertility program. Though we constantly fine-tune our program, I feel the products used have given us a great life support system for plant health and essential soil microorganisms required to build a strong, healthy, aggressive growing plant while improving the productivity of the soil naturally. Annual soil tests are performed, both acid extraction and base saturation. With this, tissue tests are performed periodically as a "snapshot" of the plant's activity. We strive towards balancing nutrients to turfgrass requirements, noting proper ratios of nutrient elements to one another and pH.

The backbone of our fertility program is based upon many natural and organic fertilizers. Products used are derived from activated sewage sludge, hydrolyzed feather meal, meat meal, bone meal, poultry meal, blood meal, fish meal, langbeinite and sunflower seed hull ash. These carriers contain carbohydrates, fats, proteins, sugars, humus and humic acid. Also, over 12 amino acids and vitamins like E, B₁₂, riboflavin, biotin, chorine, thiamin, folic acid and niacin. These biostimulants enhance biological activity as well as being a source of plant food nutrients. When applying fertilizer, the program is to apply light and frequent applications, stimulating microbial activity without excessive top growth. Occasionally, foliar sprays are used with readily available elements: Calcium glucoheptonate as chelated calcium, ferric nitrate as soluble iron, potassium nitrate, magnesium sulfate, sodium silicate. Hormonal applications are made as biostimulators. Seaweed extract is used as a source of cytokinin.

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On Course January 1997 13

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Recently, we have used vard waste compost as a soil amendment, fertilizer and disease suppressant on fairways. Overall results of this topdressing amendment have proven well, with fewer localized dry spots, reduced thatch and increased earthworm activity. Integrating these various inputs has created an environment for the turf plant to better withstand harsh environments, suppress disease and offer better playing conditions, promoting a dense stand of turf with good wear tolerance and surface resiliency.



Cultivation

Compaction relief by deep shatter tining is done on greens and tees. This practice has helped our rooting tremendously. Half inch tines are used, penetrating 10 inches deep. Holes are left open to allow root mass to develop. As the internal holes collapse (two to three years' time), trails of organic matter is left, allowing for deep root penetration without the visible hole. This tool has greatly improved our soil gasses exchange and water percolation.

On tees, fairways and roughs, coring is done spring and fall. On tees, the cores are removed. On fairways and roughs, the cores are broken up and worked back into the thatch and soil profile. On fairways, we have included a topdressing of yard waste compost as part of the operation. The procedure on fairways is to: (1) pull up cores, (2) break up cores with vertical mower, (3) topdress with well decomposed vard waste compost, (4) mix and drag in virgin soil/compost mix, (5) blow off debris from fairway into rough, and (6) pick up debris from rough with rotary mower equipped with bagging attachment.

Mid-season cultivation on greens and tees is done by highpressure water injection when needed.

Irrigation

Information from our weather station, combined with daily field monitoring, dictates our irrigation needs. The weather station figures evapotranspiration (ET) according to the Penmann formula. A soil moisture sensor is located 2 inches deep in our fourth green. The readings reflect soil water tension or suction. This physical force of soil water is a direct indicator of how hard the plant's root system has to work to extract water from the soil. The sensor uses centibars as a measure 0 - 200. The drier the soil, the higher the reading. We target consistent soil moisture of 50 - 60 centibars, avoiding severe drying cycles.

On the average, this constitutes daily light watering opposed to deep infrequent watering. Periodic rains are often enough to purge and ensure soil moisture deeper in the root zone. Each day during course set up, the turf is surveyed for malfunctioning heads and dry spots. Soil moisture along with rooting assessment is done while changing the cups on the greens. Collectively, information is gathered to judge irrigation needs.

Several water treatment additives are injected into our irrigation system. Surfactants are used according to label directions to aid in water retention and percolation. Another injection system incorporates urea-sulfuric acid. The acid is injected at a rate of one gallon per 35,000 gallons of water on the average of every third watering cycle. This system helps manage high bicarbonate levels in the irrigation water. It is not my intent to use this material to alter soil pH. The overall goal is to have irrigation water that moves through the soil profile well, will not precipitate calcium and offer quality water for life support systems. A third injection system involves a bioreactor to incorporate antagonistic bacteria for disease suppression. This is covered in "Biological Controls."

V. CHEMICAL METHODS AND CONSIDERATIONS

Our plant protectant program is designed to minimize the use of chemicals. When used properly on turf, chemicals pose little threat to wildlife and human health. However, animal tolerances differ with each individual. (continued on page 16)



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All human activities have an element of risk. Peanuts, for example, are found in many health foods, but people have died eating them due to their hypersensitive reactions. The reasons we strive to avoid chemicals are due to their <u>known</u> side effects, including modifications in carbohydrate metabolism, alterations of tissue and nutrient contents, changes of microbial composition, and reduced nitrogen mineralization.

Plant pathogens have developed resistance to certain fungicides. Under certain conditions, an increase of incidence and severity of both target and nontarget diseases occur with fungicides. Pesticide degrading microorganisms are enhanced with multiple use pesticides. Pesticides are expensive. Costs are driven up from the extensive testing required by the Environmental Protection Agency (EPA).

When pesticides are used, they are chosen carefully and used according to label instructions. Considerations are made on how they may affect biologicals, especially the microorganisms we are using. Every effort is made to maximize the chemicals used. The pH is tested to assure alkaline hydrolysis is minimized. Covered spray booms are used equipped with flat fan high pressure nozzles. This assures good spray distribution deep into the sward. Being covered, drift is prevented putting all the product on the target.

With the exception of putting greens and some diseases, I adhere to a curative chemical program. Many of the patch diseases caused by ectotrophic rootinfesting fungi, Pythium and winter diseases are still controlled by preventive applications, when conditions favor these diseases. I look forward to better using biologicals for these organisms, along with better prediction by disease forecasting models or immunoassays. The Pythium and Brown Patch model I use from the weather station works well indi-

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cating the need to scout. Nontraditional chemical controls are also considered. Ammonium sulfate, for example, is used as a nutrient and pH alteration. The acidifying effect has helped control take-all patch. Antitranspirants and surfactants have been used to minimize powdery mildew.

What has made the largest impact on reducing chemical use is my attitude toward diseases. In the past, strict preventive spray programs were followed. If any symptoms of disease (with some tolerance for Dollar Spot) was observed, first I tried to figure how the disease "got through" the preventive spray program. Then I would figure what should be sprayed the next day to stop any further disease development.

I have learned that tolerance of some plant diseases is OK. Many times the symptoms go away by microbial antagonism, immunity or change in environmental conditions. I have also learned that it was I who demanded the perfect disease-free turf, not the golfer. Golfers do not recognize minor disease symptoms unless they are on the putting greens.

Our program has largely moved to a preventive program by the use of cultural, biological and biostimulant approaches. This has afforded us to move to a curative chemical approach. This change is challenging for several reasons. First, a more intimate understanding of the plant's ecosystem is needed to understand plant health care. It is easier to budget for preventive spray programs. And it is unnerving to monitor disease symptoms taking a "wait and see" approach.

VI. BIOLOGICAL PRACTICES AND CONTROL

A brief study of microbiology quickly demonstrates that microbial activity governs the world. Though largely invisible with the naked eye, microorganisms' effects on earth are colossal. Their powerful world is a network of living organisms with great diversity. Each has developed a way to inhabit their ecological (continued on page 24)



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Stepping to Spikeless Public Golf

Luke Cella Pottawatomie G.C.

s we know and have seen over the past few years, many private golf clubs have become spikeless. Though there are many facets to look at when deciding to become spikeless, the real decision lies within the club itself. A private golf club's membership is relatively constant; and, therefore, the option of becoming spikeless is really up to its members. Wynstone Golf Club, St. Charles Country Club, Skokie Country Club, Bryn Mawr Country Club, to name a few, are all spikeless clubs. If you attended any Midwest meeting this year at Skokie or Bryn Mawr, then you have experienced spikeless golf. What a true joy! Once having experienced spikeless golf, there is no choice to ponder, unless, of course, you are the superintendent of a public golf course.

The public realm is a different story. Though a few public golf courses have become spikeless across the country, the thought of spikeless public golf can be a bit overwhelming. Though there are many golfers we term regulars, there is no true membership. Play is open to all. As Lynn Wesson of Phillips Park Golf Course in Aurora states, "I wish I could make my course spikeless; but for now, we are going to remain the same. I have people playing golf in bare feet, sneakers and sometimes combat boots. To tell them they have to wear spikeless shoes would be a joke." Lynn does agree it would be wonderful to get the public to wear spikeless shoes but sees cost as a problem. "There are no spikeless golf shoes in the \$40 to \$50 price range. Spikeless golf shoes will not catch on until the manufacturers provide affordable products." Though the major golf shoe manufacturers are putting money into their research of spiked alternatives, Lynn would like to see an affordable line of nonspiked golf shoes similar to the teaching shoes that many of the PGA professionals wear.

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As I thought about this and spoke with others on this topic, I came to the belief that the manufacturers of shoes will be a key in helping the spikeless trend to last. It is through their advertising that people make decisions to purchase products. How is there a better way to advertise than to endorse a touring professional? Gary Hearn, superintendent at Salt Creek Golf Course, says, "The pros on tour need to start wearing spikeless shoes." This is true. Backing from the professionals will help us tremendously in changing the attitude of the public golfer.

Look into the golf bags of your clientele and see what clubs are hot on the tours. As much as the public may deny it, advertising sells. That little box our society has become so accustomed to has become a very powerful tool. Television, used properly, is very profitable in business. Placing advertisements on the tube is a sure way to sell a product, and showing a product used by people in the limelight only guarantees success.

Gary also brought up a good point of whether or not we have the right to tell a golfer what he can or can't wear on our golf course. "Who and what should dictate what a golfer can and can't do?" Gary asked me. This is a very valid question. There will always be people who resist change, and I feel they are not the people we need to waste our time with right now. Change is continuous and never stops. If we are able to educate and lead by example in this spikeless trend, many will follow and see the benefits of spikeless golf.

There are steps that we can take at our own respective golf courses. The number one thing we can do as superintendents is expose our clientele to spikeless conditions. Tony Kalina, superintendent of Prairie Landing, hopes to go spikeless one day a month. *(continued on page 20)*

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Stepping to Spikeless Public Golf (continued from page 18)

"I am willing to pay for the spikes and labor out of my own budget for one day a month in order to expose players to spikeless golf." Tony also makes it mandatory for any complimentary-round golfers, including employees, to wear spikeless golf shoes on his course. Tony feels "through contact with spikeless conditions, golfers will become educated in the realm of spikeless golf." Once seeing and playing on the results, Tony hopes to make many converts. Tony has also proposed a reduction in fee to those who show up wearing spikeless golf shoes. This idea has potential, but has been put on a back burner.

Last year Fred Benhke at Mt. Prospect Golf Course encouraged his senior league to wear spikeless shoes by providing the players with complimentary spikeless alternatives and the labor of changing them. Fred felt the condition of his greens after the league had completed play was a spectacular improvement. Much to his delight, Fred's Golf Advisory Committee declared that for the 1997 golf season, the reserved tee times on Saturday and Sunday mornings will now be spikeless. As Fred said, "I was very happy and a little surprised to see them make this decision. They made this decision on their own from their own experiences with spikeless golf." The Annual Club Championship at Mt. Prospect Golf Course will also be a spikeless event in 1997.

Jim McNair of Orchard Valley hopes to use our MAGCS outing in 1997 as an experience for the administration of his golf course. He wants to show to his supervisor what his greens will look like after a spikeless event. "There is no doubt about it. Once he is exposed to the conditions we

could have all the time, he will realize the difference." Jim would like to set up a voluntary exchange program for people who wish to use spikeless alternatives at his course. "I would give part of my budget to cover the cost for the exchange." In order to expose

Work with your professional and pro shop staff to urge and educate people. They are the people who come into contact with the public the most. Encourage them to wear spikeless shoes on your course.

some of his clientele to spikeless conditions, Jim hopes to rope off part of his practice green and make it spikeless only.

In this day and age of increased and superinflated liability, who should take the first step in encouraging spikeless golf? We as superintendents. We need to educate by showing what spikeless golf is like. The first step is to wear spikeless shoes ourselves. Get people talking and involved. Immediately you will see who is willing to change. Target these golfers and use them to help you encourage others to use spikeless alternatives. Show those who make the decisions the difference there really is by taking them to a spikeless event or set one up at your own course. Take the initiative to encourage the use of spikeless shoes in league play. Work with your professional and pro shop staff to urge and educate people. They are the people who come into contact with the public the most. Encourage them to wear spikeless shoes on your course. Give the public every opportunity to see what they are missing by wearing spikes.

Do whatever it takes to make spikes as collectible as hickory shafted clubs and featherie balls. We need to keep the public's interest in spikeless golf so it doesn't become a fad. We need to make spikeless golf a craze and then the norm. Many of public courses already have some type of dress code whether it be a collared shirt, shoes, or proper golf attire required. Perhaps one day, through our encouragement, proper golf attire will include spikeless golf shoes.

When I spoke with Gary Hearn, he asked me if it was proper golf etiquette to wear spikeless shoes. I think it is. After all, golf etiquette is remembering there are other golfers on the course and not just yourself. Golf etiquette encourages people to play the course in a manner that does not disturb the conditions we provide. Our greens should be as pure for the last group as they were for the first. After all, they all pay the same green fee.