Maintenance budgets are a significant contributor to the high cost of green fees. An example of an ethical issue, as well as prudent integrated pest management practices, is the overall wise and efficient use of budget resources. Using spot treatments versus overall blanket treatments makes more efficient use of maintenance budgets and reduces pesticide loading.

Purchasing New Products and Technologies: An Ethical and Common-Sense Approach

Advice for superintendents to determine if new products and technologies are for your golf course.

by ROBERT N. CARROW

STAYING on the cutting edge in the golf course superintendent's profession requires integrating new products and technologies into a sound turfgrass and golf course management program. The question is, "Which products and technologies are truly beneficial and cost-effective?"

In answering this question, golf course superintendents are confronted with two difficulties: (a) The turfgrass industry has attracted many companies and consultants offering new products, technologies, and services. A casual walk through the Golf Course Superintendents Association of America's (GCSAA) Trade Show reveals the immense scope of these offerings, and (b) many new products and technologies have very limited field/lab testing to validate their claims.

In this presentation, practical, stepwise guidelines are discussed concerning making wise decisions about purchasing new products/technologies for superintendents desiring to stay on the cutting edge of advancements in their profession. *Three ingredients for wise and successful decision making are: ethical decisions and actions, information, and common sense.*

Ethical Decisions and Actions

What is "ethics"? "Ethics" is the discipline dealing with what is good or bad and with moral duty and obligation. It involves the moral principles or values that determine the conduct of an individual or a group. A code of ethics attempts to define an acceptable standard of conduct which is enforced by peer pressure, voluntary compliance, or law. Values can, therefore, direct a person's decision making and actions either by internal (character or inherent discipline to do right) or external (codes or laws with enforcement means or peer pressure) means. A profession, or society as a whole, functions best when the moral principles or values are understood and when individuals exercise the character or internal discipline to live moral lives.

Where does ethics impact my profession? Ethics enters into all relationships, decisions, and actions arising from decisions. Consider, for example, the relationships common to golf course superintendents:

- Person-to-person relationships.
- Person to course officials and the course as a facility.
- Person to profession (professional conduct).
- Person to society, such as in the areas of environmental stewardship of water, wetlands, endangered species of plants or animals, water, and soil; the immediate golf course neighbors and community.
- Person to God (spiritual aspects).

As interaction occurs in these relationships, they can be governed by honesty, truth, and integrity or the opposite. In a recent request for education proposals for seminars, the GCSAA specifically addressed the need for more emphasis on ethics and values in the workplace. The "desired outcomes" of the course reveal the breadth and depth that ethics impacts the profession. Quoting from the GCSAA (2000):

"Take any commonplace remedy, give it a mysterious origin, advertise it with extravagant claims, and it will be purchased by the credulous. At present, the crop of grass-growing nostrums appears to be above normal!" — Drs. Piper and Oakley, *The Green Section Bulletin*, 1922

1. *Identify and integrate* personal and professional *values* and *ethics* into daily activities.
2. *Create ethical guidelines and values* for the golf facility.
3. *Communicate golf facility ethics and values* and help others understand them.
4. *Demonstrate ethical problem-solving abilities* by tying decisions to the values and goals of the golf facility.
5. *Ensure that appropriate legal and ethical interests* are considered in all decisions.
6. *Review the decisions and activities of your staff* to ensure they are parallel to the values and ethics of the golf facility.
7. *Demonstrate acceptance* of diverse opinions and values.
8. *Act* in a fair and ethical manner.

Ethics and purchasing new products/technologies. As noted earlier, specific science-based information is often limited or lacking for many new products/technologies. Substituted for testing and evaluation may be manufacturer claims, testimonials, and pseudoscience (claiming a product can theoretically provide a response while knowing that the magnitude is very small, or providing "selected" data to support a claim while withholding data that proves otherwise). The issue of how to obtain useful information is dealt with in the next section. The ethical point is that golf club officials *assume* that the golf course superintendent is making *science-based decisions* on new products/technologies when spending their money. Even when a superintendent is basing the justification for purchasing a new product/technology solely on a manufacturer's claims, club financial officials assume that the superintendent, as the resident expert, agrees with the claims because of a science-based expertise.

If a new product seems to have potential to address a problem but adequate information is lacking, it is very acceptable for a golf course superintendent to purchase some product at a reasonable cost for a trial. However, some products or technologies can cost $10,000 to $50,000 just to "try out" due to the hardware expenses. A good example is water treatment technology. There are specific reasons supported by science to treat irrigation water — if the reason/problem exists (Carrow et al., 1999). However, it is not unusual to find different types of water treatment apparatus present on a golf course where the water quality is such that treatment is not needed. Also, new water treatment techniques seem to appear each year without data to support their usefulness in golf course irrigation situations. Thus, expending large amounts of club funds for testing a new technology is an ethical issue when the decision is based on "I hope" rather than "I know" and the club bears the total cost if the technology fails to perform according to prior claims. Another example of an ethical issue is the overall wise and efficient use of budget resources. Golf course maintenance budgets can often be made more efficient while not sacrificing quality. Maintenance budgets are a significant contributor to the high cost of green fees.

Improving cultural practices and drainage is a good first step to solving black layer, a common symptom of a serious soil physical problem.

Information — True and Unbiased

To ensure high ethical standards, golf course superintendents can take three actions: (1) demand high ethical standards from themselves, (2) insist on a high ethical standards of conduct by the staff under their direction, and (3) require product/technology/consultant providers to adhere to an acceptable ethical standard. This latter aspect requires that providers respect the golf course superintendent's need for *truth-based information*. It is not a question of whether good, science-based information can be provided (unless the product does not do what is claimed), but a question of whether it is demanded. If a product or technology is able to significantly prevent or correct a specific turfgrass management problem, then this is a scientifically testable claim. Thus, it is not unreasonable for a purchaser to request valid, unbiased data to be provided. To insure that "good information" is provided, golf course superintendents are encouraged to ask themselves seven questions (Table 1).

1. Is this product needed in my situation? The turfgrass plant is exposed to many stresses (climate, soil physical/chemical/biological, pests, traffic). All cultural practices except mowing are done to prevent or correct a particular stress. Thus, a new product or technology should help address a specific

problem on the turfgrass site or it is not needed.

Sometimes a product is not necessary because it is already present in the soil or plant. For example, humic acid or humate products most consistently cause positive responses (from micronutrients, growth stimulants/hormones) when applied to sites with very little organic matter (O.M.) such as during grow-in of greens or in hot climates that decompose much of the inherent O.M. However, on areas with even 1% or 2% O.M. by weight, responses are often non-existent or limited because 35% to 40% of the existing O.M. is classified as humic acids. Similar situations often exist when microorganism (M.O.) inoculations are used to enhance M.O. populations. The high O.M. production, nutrient-rich, well-irrigated environment of many turf areas already supports large M.O. populations. If soil or climate conditions are unfavorable to sustain inherent populations, added M.O. cannot be sustained, either.

It is also questionable whether a product is needed if the manufacturer will not list the active ingredient on the label. Proprietary materials can be protected by patents, which are public documents. Sometimes the term proprietary is used to justify not listing what a material is because it is a material that others could easily market — possibly at a more competitive price. It is always amazing to read detailed product literature claiming many benefits, but the material is never identified or else identified in general terms.

2. Are there better "alternatives"? Two examples will suffice to illustrate this question. When alkaline soil conditions are present (i.e., pH>7.0), a pH reduction program could be initiated using S compounds to acidify the soil. Even if free $CaCo_3$ is not present in the soil and, therefore, acidification is possible, it is often less expensive to simply apply somewhat more Fe, Mn, or P, since high pH causes few problems except these nutrient deficiencies. Or, in the case of acidifying irrigation water (which requires considerable hardware expense), to prevent the "potential" for calcite sealing of sand greens over time, it is unreasonable to treat water over the whole course for a problem restricted to the greens. Also, routine cultivation and granular S materials can effectively alleviate this physical problem at much less expense (Carrow et al, 1999).

3. Is the positive response due to the "active ingredient" or to an added material? It is not unusual for N, Fe, or colorants to be added to various soil amendments, or even some fungicides, to provide a "greening" effect that implies a growth response from the product. One could wonder why these are needed if the product does what is claimed. Certainly a turf manager would not want to pay a high cost for a product whose only response came from small quantities of relatively inexpensive N, Fe, or colorants rather than the advertised "active ingredient."

These are situations where Fe or N is added intentionally to enhance product performance. Foliar Fe products often provide a greater degree of greening when applied in conjunction with a small quantity of water-soluble N. Also, cytokinin materials often benefit from added Fe, which causes a greater greening response, while the cytokinin gives a longer-term effect. In these situations, scientific data exist to support a synergetic response.

Table 1

Questions to Ask About a New Product/Technology

1. Is the product *needed*?
2. Are there better *alternatives*?
3. Is the positive response from the product or an *added material*?
4. What about *magnitude, duration,* and *consistency of response*?
5. Are valid, unbiased *test results* available?
6. Should I try this on a *trial area or basis*?
7. Do the *benefits* justify the *costs*?

High salinity and sodium levels can contribute to soil physical problems. Your USGA agronomist can assist with decisions regarding the latest science-based information involving soil amendments and water treatment options.

4. How important is the response? Every soil amendment has the "potential" to influence all soil properties — physical, chemical, or biotic. Altering one factor has a "ripple effect" on all others. Thus, soil amendments (whether physical, chemical, or biotic) are sometimes advertised to improve a wide variety of properties — improve soil structure, increase soil aeration, enhance soil M.O. activity, etc. These statements are "theoretically" true, but even with careful scientific measurements the practical importance of the claimed responses is often very small or not measurable.

To illustrate this point, one could add some water or N to a turfgrass system. The water can "stimulate M.O. activity," "improve soil physical properties (i.e., water in the soil is a soil physical characteristic), and "increase nutrient availability." Added N could stimulate M.O. activity, thereby enhancing structure development while improving soil chemical properties. Thus, one could sell bottled water or NH_4NO_3 fertilizer as a "soil amendment" and make a wide variety of general claims about improving soil physical, chemical, and biological properties.

The important question is not whether a "theoretical" response can occur, but instead is the *magnitude, duration,* and *consistency of the response* of practical importance to justify the expense.

- *Magnitude:* Is the response great enough to be important, or so small that it does not justify the expense and time?
- *Duration:* Does the response last long enough to be important?

Water treatment technology, such as the sulfur generator, has been used successfully in agriculture for decades. A thorough evaluation of the problem should be conducted before investing the considerable amount of money needed for this technology.

• *Consistency:* Do I get the same response all the time or only once in a while?

5. Are valid, unbiased "test results" available? If only unsubstantiated manufacturer claims and testimonials are available to support a product, then it becomes a "buyer beware" situation. Sometimes testing is conducted but the results are mixed. It is important to see the full set of unbiased results and not just the positive data for a fair evaluation. Scientific results from universities, unbiased private laboratories, or unbiased consultants are the best protection from false claims, but individuals testing products must be careful to be ethical in reporting results. The reporting of full results is often difficult for university researchers since there aren't many publication outlets for negative or no-response data. They may provide a company with the full data set, but a company may misrepresent the data by selecting only positive data. This can be countered by honest verbal presentations by researchers at conferences or written reports in local (in-state) publications.

A good technique to use, especially for high-dollar items, is to ask, *"Will you put in writing exactly what this product will do in my situation and why that response occurs? Then, please supply me with independent data and its source to support the claims."*

6. Should I try this item on a trial area or basis? Many times a small expenditure will obtain sufficient product to test on a trial area, and this is a good means of evaluating the material. However, as noted previously, expenditures of relatively high-dollar amounts to "test" a product or technology are inappropriate unless club members are fully aware that they are the testing facility and funding source for testing. When conducting a trial, be sure to include proper scientific technique.

- Have a control (check).
- Have replications.
- Randomize.
- Determine ahead of time what you specifically expect based on product claims. Do these occur?

7. Do the "benefits" justify the costs? The "bottom line" is whether benefits to a golf facility justify the cost. A sobering question that will reveal true feelings is to ask yourself, *"Would I purchase this product or technology with money from my personal bank account if I were the owner?"*

Common Sense

In addition to basing purchasing decisions on an ethical and information basis, plain common sense is important. A few common-sense statements illustrate this point.

- The foundation of all excellent golf facilities is solid, basic turfgrass management. This starts with priorty attention given to the basics — good fertilization, irrigation, mowing, pest control, and cultivation programs. The "extra 5% or 10%" enhancement in quality from incorporation of new products or technologies cannot compensate for the missing 90% from good "basics."
- There is no "silver bullet" product or technology that will come along and solve all or most of your problems. Thus, do not respond to "silver bullet" claims or testimonials. The nearest to a silver bullet in the turfgrass system is a good golf course superintendent. The nearest to silver-bullet products are water and N.
- If it sounds too good to be true, then most likely it is not true.

In summary, all of our decisions and actions are, in reality, based on ethics. Ethical decisions and actions are made on a foundation of truth and right. This requires a high level of good information and a common-sense approach. The results of these ingredients are wise decision-making and more affordable golf.

Reference

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