



What Does it Mean to be Organic?

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In February this year several organizations hosted a two-day organic lawn care seminar in Madison, WI. Initiated by the National Integrated Pest Management Institute, partners included the Greater Madison Healthy Lawn Team, Inc., Whole Foods Inc., and the University of Wisconsin-Extension. The objective of the workshop was to describe organic lawn care methods to interested parties. Professional lawn care owners and operators, product distributors, extension agents, municipal employees and administrators attended the event. Nearly 40 persons, including several from out-of-state, paid the \$150 registration fee. The showpiece of the workshop was a two-person team from the East Coast who specialize in organic lawn and sports care services: Chip Osborne of Osborne Organics and James Sotillo of Tree-Wise Organics.

Why should this workshop be of interest to golf course superintendents? Because the topic is one often discussed in relation to golf courses, and some of the speakers and sponsors were behind the drive to force the Madison city golf courses to "go organic" a couple of years ago. While many people say they support the idea of "going organic", or at least using "organic" products or practices, what does organic really mean? Can the current organic standards work for golf turf management?

According to the U.S. Environmental Protection Agency (EPA), an organic pesticide is one that contains carbon. As it turns out, synthetic pesticides contain carbon, thus they can be considered "organic". Or can they? The Organic Food Production Act was passed in 1990 and the United States Department of Agriculture (USDA) started labeling organic products in 2002. Three classes for labeling of organic food items were created: 100% organic, organic, and made with organic. The production practices are clearly spelled out for each term. Misuse of the terms can lead to hefty fines. To become a certified organic operation requires an application and fee payment to the USDA and/or appropriate state agency. A certified organic inspector must visit the site and view records: a minimum of three (3) years of organic practices is required before an operation can be certified organic. An organic management plan must be submitted to the USDA and/or the state describing procedures to foster soil fertility through crop rotation and other practices. Detailed application records must be maintained for a minimum of 5 years, including the rates

and methods of product application and applicator name and address. The USDA publishes a list of approved products which is determined by the National Organic Standard Board. The Act specifies the types of persons on the board: no provision is made for someone who understands/practices turf or landscape management. Produce must be periodically tested for pesticide residues.

Landscape professionals and homeowners both commonly ask me where they can purchase organic products to maintain turf and control pests. The answer isn't necessarily straightforward. Currently no federal definition for organic turf care exists. In many ways, this is a good thing as it allows the industry time to help define what might be appropriate. Consider the following requirements for organic food products and how they would affect turf management.



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First, essentially no synthetic pesticides may be used*. Look at the product line on the shelves in your maintenance shop: probably nothing you currently stock would be allowed. This includes many of the newer pesticides such as Heritage™ fungicide which was developed from naturally-occurring compounds found in certain fungi. Also excluded would be insect growth regulators such as ecdysone and new herbicides based on plant derivatives such as mesotrione. These are all compounds the EPA has deemed "reduced risk" pesticides which underscores the strides companies have made towards developing environmentally benign pesticides.

According to the Organic Food Production Act, in general only purely natural pesticides can be used although exemptions do exist. For example, products such as copper sulfate (CuSO₄) can be used in organic food production even though toxicity issues exist and high levels of copper can be hazardous to humans and the environment. Corn gluten meal, a by-product of the wet milling process of corn, is often identified as an "organic" herbicide for turf maintenance. However, since it is a by-product of a human initiated process, would it be allowed under organic turf standards? An interesting sidenote: the Organic Food Production Act allows synthetic pesticides to be used to control certain pests or diseases if they are part of an identified state or federal emergency pest or disease program. This stipulation acknowledges that in some cases only synthetic pesticides are truly and quickly effective for controlling certain pests or diseases. Could methanoxam (Subdue™) fungicide be used to control Pythium outbreaks on an organic golf course? Would sethoxydim herbicide be allowed for control of reed canarygrass if the Dept. of Natural

Resources classifies the plant as a regulated invasive species, requiring landowners to remove it?

Secondly, synthetic fertilizers could not be used on organic golf courses according to current standards. Urea, ammonium sulfate, etc. would certainly be banned, unless provisions were made for natural liquid urea (i.e., urine). Inability to apply water-soluble nitrogen would prohibit any nitrogen application on some golf turf areas subject to Wisconsin's Turf Nutrient Management guidelines (DNR document 1100). It might be interesting to experiment with diluting and applying urine on turf assuming the smell could be contained. I wonder how the Material Safety Data Sheet for urine would read, and what sort of personal protective equipment would be required?

The number of products I found while researching fertilizers for organic food production offer a seemingly large list (Table 1). However, knowing that nitrogen is usually the limiting nutrient for turf production, followed by phosphorus and potassium, how many of the products in Table 1 would be useful as a main fertilizer source? Several, of course, do contain nitrogen, some with nitrogen as the primary ingredient. None could be considered a high analysis nitrogen fertilizer (>20% nitrogen). While in many cases perfectly fine turf can be maintained with low-analysis natural products, what about the need for rapid establishment or recovery from damage/disease? Also, natural products require microbial activity to release the nitrogen in a slow-release fashion. Good micro-

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bial activity requires moisture and moderate to high temperatures. We lack information on the ability of natural sources to provide sufficient nitrogen during cool spring or autumn temperatures to grow-in or heal turf. Instead we may be enhancing the proliferation of cool-season weeds such as *Poa annua*. Transportation would present another conundrum. By switching from a 46-0-0 (synthetic urea) to a 6-0-6 natural fertilizer, eight times the amount of the natural product would need to be transported compared to the synthetic urea to provide an equivalent nitrogen rate. Theoretically this would burn up to eight times the amount of fuel and result in eight times more carbon being released into the atmosphere.

Locally-developed compost may be part of the answer for organic golf courses. However, after 100 years of scientific-based research which has allowed golf course management to achieve the high standards of today, golf course management would essentially turn back to a trial and error system. It would be impossible for all locally-grown composts to be sufficiently tested for their turf effects—we're still researching simple, uniform synthetic products such as urea decades after its development. Also, what

would happen to nationally-marketed brands of compost? Numerous compost products are being introduced to the turf market, but many of these are "fortified" with a little urea or other fertilizer. Would they be allowed? Not according to current organic standards.

The third major hurdle is with regulations. Part of the problem with regulations is that they by nature are restrictive. This became apparent at the onset of the organic lawn care symposium as Marcia Hartwig, the stormwater education coordinator for the Madison Area Municipal Storm Water Partnership, spoke about the importance of banning phosphorus in turf fertilizers to enhance lake water quality. Chip Osborne of Osborne Organics followed Ms. Hartwig's presentation and began discussing his company's reliance on natural organic fertilizers with analyses like 5-2-0. It took only a minute for some audience members to realize that most natural-based fertilizers and composts contain at least as much if not more phosphorus per unit of nitrogen as conventional synthetic fertilizers—in Dane county, these would not be allowed. The Organic Food Production Act also bars genetically-modified feedstocks, plants, or other inputs from organic production. One of the audience members realized the

Table 1. Fertilizers used for organic food production.

Product name	Contents and comments
Alfalfa meal	N-P-K = 3-2-2
Aragonite	Calcium carbonate (CaCO_3)
Azomite	0-0-2.4 plus 5% calcium
Blood and bone meal	
Boron 14.3%	A required micronutrient; never known to be limiting for turf
Calcium 25	
Chilean nitrate 16-0-0	Sodium nitrate—is the standard for salt index of all fertilizers; high burn potential
Corn gluten meal	10-0-0 (P not claimed, < 1%)
Crab meal	5-2-0.5
Epsom salt	
Feather meal	12-0-0
Fish meal	10-0-0
Gypsum	Calcium sulfate
Kelp meal	Seaweed extract
Natural No P	6-0-6
Peanut Meal	
Phosphate Rock	Insoluble P source; not allowed in P-free areas
Pre-Booster 10-0-0	Vegetable + animal protein, nitrate of soda
Sulfate of potash	0-0-52
Zinc granular	A micronutrient without known deficiencies in turf

impact of this regulation half-way through my presentation on corn gluten meal as an herbicide/fertilizer. The vast majority of the corn produced in the U.S. is genetically-modified. Consequently, corn gluten meal would not be allowed for use on turf if standards similar to those in the Organic Food Production Act were applied to turf. In addition, the move towards distilling our corn supply to produce fuel (ethanol) is driving up corn prices and the price of corn gluten, already an expensive option, will continue to increase.

The turf industry will need to move quickly to develop an organic maintenance program before someone else develops regulations that are unworkable. One caveat to such a program will be the realization that different approaches may be needed for different parts of the country and/or different turf situations. Most such programs have a list of approved products. However, such lists have the effect of delaying or preventing adoption of new and better products as it takes time before they can be added to the list. For turf, it may be better to develop criteria for products rather than a set list to make it easier for new products to be added. The National List for organics utilizes such criteria when determining appropriate products.

It is unlikely most golf courses will need to "go organic" anytime soon. What will most likely happen is that the permitting process of new golf courses will require them to use organic methods and/or products. Some city or municipal golf courses such as those in Madison may be required to use organic methods and/or forgo synthetic products. Other golf courses will be pressured to adopt at least some organic methods and/or products.

Golfer attitudes will undoubtedly affect the degree of organic approaches adopted on golf courses. I expect we'll see a number of regulations adopted to enable organic turf production once golfers begin to accept lesser quality turf than is currently expected. The best thing the turf industry can do is to develop their own organic standards in advance of outside groups or agencies. In a forthcoming issue of The Grass Roots I'll propose a framework for developing "organic" golf courses.

You can read more about the 1990 National Food Production Act at:

<http://www.ams.usda.gov/nop/archive/OFPA.html>.

The National List of prohibited and excepted items can be found at:

<http://www.ams.usda.gov/NOP/NOP/standards/ListReg.html>.

*Over two dozen products may be routinely allowed under certain situations but they only include products not useful for routine turf management, such as insecticidal soaps, vitamins, hydrated lime, calcium hypochlorite (bleach), baking soda, and alcohols. 🌱



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