

"BIOFUNGICIDES" ECONOMICAL ALTERNATIVES

Biological controls ranging from special concoctions of microorganisms to tailor-made disease-fighting composts could replace millions of dollars worth of chemical fungicides applied to golf courses and home lawns, according to Cornell University turfgrass pathologist Eric Nelson.

The result would not only save money but reduce environmental damage and dangers to humans, animals and beneficial microorganisms, he said.

Nelson reports significant progress in replacing chemical fungicides with biological alternatives in a new Cornell Cooperative Extension publication, *Biological Control of Turfgrass Diseases* (Information Bulletin 220).

Nelson reports that he is now able to suppress major fungal diseases of turfgrass to levels comparable to those achieved by chemical fungicides through such biological methods as top-dressing golf courses and lawns with composts or with higher-than-normal populations of microorganisms that inhibit plant pathogens. His studies on the non-composting aspects of biocontrol are published in a recent issues of *Phytopathology*, and his work on the effects of compost applications on turfgrass diseases will be in a forthcoming issue of *Plant Disease*.

By using Nelson's methods for four years, the golf course at The Country Club of Rochester, N.Y., has reduced its use of synthetic fungicides by 89 percent.

"Although the biological control of turfgrass diseases is still very much in the developmental stage, research is showing that the future of biofungicides is extremely bright," said Nelson. "We may someday be able to offer a whole cocktail of natural antagonists that will replace the use of chemicals for turfgrass altogether."

Working with experimental plots and golf courses at Rochester, Cornell and the Sagamore Resort at Lake George, N.Y., he has successfully used microbial-based fungicides to control turfgrass diseases, including pythium blight and root rot, dollar spot, red thread, grey snow mold, and brown patch.

Currently, more than \$55 million is spent annually on turfgrass fungicides to control diseases on golf courses, home lawns, parks, athletic fields, corporate and school grounds and elsewhere. Almost 75 percent of that amount is spent on golf courses. Golf course turf experts spend about 60 percent of their chemical pesticide budget on fungicides. Golf course turfgrasses are particularly vulnerable to fungi because they are monocultures, as opposed to mixed grasses which are used for home lawns.

Also, the fact that such turf is cut so short - down to one-eighth of an inch compared to two inches for the average home lawn - contributes to vulnerability to infection. With such close croppings, parts of the root system shut down so the roots will remain proportioned to the growth; yet, the smaller root system makes the plant more vulnerable to infection. A very short cut also places the wounded part of the grass blade much closer to the pathogens in the grounds.

Finally, golf course putting green turf is unusually vulnerable to infection because greens are composed of sand, which is largely devoid of microorganisms, many of which are important for plant health.


Chemical fungicides are not ideal treatments, said Nelson, because they are expensive and tend to become less effective over time as pathogens become increasingly resistant to them. Also, changing regulations may cause particular fungicides to be taken off the market unexpectedly.

Developing a new chemical fungicide takes 10 to 15 years at a cost exceeding \$80 million, Nelson added, citing data from companies that produce the chemicals. A microbial fungicide, on the other hand, takes less than three years to develop and costs less than \$500,000, he noted.

Money, however, is not the only cost involved in chemical use. Chemical fungicides could pose a health risk every time a golfer picks up a ball or a child rolls in the grass, said Nelson. "One 1987 study showed for example, that in a typical suburban neighborhood, there were potentially more than 8,000 cases where homeowners were exposed to lawn pesticides at levels that could endanger health. As pesticide use increases, this figure will likely rise," Nelson said.

Synthetic fungicides also endanger wildlife and non-target organisms, promote non-target diseases in some cases and threaten soil and water, said Nelson.

Credit: Turf North - April 1992



Pacific Sod
A Division of Pacific Earth Resources

600 N. 2nd Street, Suite 3
Patterson, CA 95363
(800) 692-8690

Brian Snow
Sales Representative

Cardella's
GARDEN SUPPLY INC.

PLANTER MIX • TOP SOIL • SAND • GRAVEL
DECORATIVE ROCK • FIR BARK • FERTILIZERS
PROFESSIONAL CUSTOM BLENDS • NURSERY

2027 E. BAYSHORE
PALO ALTO, CA 94303
415/321-5913

R.A. "BOB" BUDELLI
VICE PRESIDENT



Don Naumann

510 Salmar Avenue • Campbell, CA 95008 • (408) 374-4708
(800) 827-TURF Mobile (408) 234-4571 Fax (408) 374-4771