ON THE HORIZON

Turf events in New York

THE FOLLOWING UPCOMING EVENTS of interest to turf managers in New York and surrounding areas are scheduled:

■ **Cornell Turfgrass Field Day, July 1**
Pine Island, NY, NY State Turf Assn., (800) 873-TURF

Research updates on water management, annual grass weed control in new seedings, turf renovation, and other topics—plus 125 varieties of Kentucky bluegrass shown in high maintenance demonstration trial. The fee is $20 if you register by June 24, or $25 on-site.

■ **Turfgrass Management Seminar, July 30**
Saratoga Sod Farm, NY State Turf Assn., Stillwater, NY, (800) 873-TURF

Talks on installation and maintenance of sod on athletic fields, the non-target effect of fungicides, and new technology for applying insecticides and other materials below the soil surface. Dr. Eric Nelson, *Turf Grass Trends* Associate Editor, will discuss late July turfgrass diseases and the latest—use of aerial photography as a diagnostic tool for golf course greens. The fee is $25 for members of sponsoring organizations and $32 for non-members.

■ **Turfgrass Field Diagnostic Course for Golf Course Managers, Aug. 4–6** Cornell University, Ithaca, NY, J. Gruttadaurio (607) 255-1792

■ **Grassland Field Day & Equip. Show, Aug. 12**
Grassland Equip. Corp., Latham, NY, (518) 785-5841

Texas bluegrass has possibilities

CROSSES BETWEEN TEXAS BLUEGRASS (*Poa aracnifere*) and Kentucky bluegrasses from the bluegrass program at Rutgers University have successfully withstood 100 degree temperatures. The tests may lead to some interesting new introductions.

Buffalograss has limitations

RESEARCHERS LOOKING FOR A BETTER, low input turf have found several disappointing limitations to buffalograss. It cannot be used in shady areas, and it may be difficult to grow in areas where it does not occur naturally. Interested turf managers should contact their local extension agent to see if they are aware of any local test results, or simply plant a small test patch, and see for yourself how well it does in your area. ■

Biotechnology

The future of the turfgrass industry

by Dr. Eric B. Nelson

WHEN MOST PEOPLE hear the word "biotechnology", they immediately think of ivory-tower scientists tinkering in their laboratories, creating various types of genetically-altered mutant plants or animals capable of mass destruction and world conquest. This vision of biotechnology is perhaps the furthest from reality. Over the past decade, opponents of these new biotechnologies have attempted to convince the public of their dangers, resorting to all kinds of scare tactics, and, in some cases, citing unusual examples of how some of these technologies could end human life as we know it. On the other hand, defenders of these biotechnologies (generally scientists like myself) have tried to convince the unenlightened and the ill-informed of the power by which various biotechnologies can benefit mankind by protecting our national agricultural enterprises and facilitating the clean-up of our polluted planet.

So what is biotechnology anyway? In the broadest sense, biotechnology is any form of applied biology, ranging from plant breeding and the use of microorganisms for the biological control of plant pests and diseases to biological waste treatment and the production of human medicines and industrial biochemicals. You probably are already familiar with several products of biotechnology. For example, the *Bacillus thuringensus* or "BT" biological insecticides for use on turfgrasses and other agriculturally-important crops, are products of biotechnology. They are preparations of microorganisms that produce an insecticidal chemical. Likewise, the use of endophyte-infected ryegrasses and fescues resistant to a number of insect pests and diseases, are products of biotechnology. Additionally, the treatment of municipal solid wastes and waste water also relies on specific microorganisms to degrade pollutants and organic matter and aid in the purification of municipal water supplies. The latter is probably one of the older biotechnologies known.

Whereas the above-mentioned biotechnologies have provided novel and, in some cases, uniquely effective ways of dealing with agricultural and industrial problems, the biotechnologies with the greatest potential to change the way in which we approach plant production and plant protection are those based on developments in molecular biology—particularly in the filed of plant and microbial genetics. Many of these advances have arisen from a discovery—nearly 20 years ago—that DNA (deoxyribonucleic acid), the basic genetic material within every living cell, could be transferred artificially to create new "hybrid" plants, animals, and microorganisms. DNA can be transferred from microorganisms to plants, from plants to microorganisms, microorganisms to

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animals, and so forth.

For the first time, tools are available to "engineer" living organisms with traits desirable for particular tasks or adaptations. For example, with this technology, it is possible to introduce genes from a bacterium that encode the production of an insecticide into a plant. These "trangenic" plants constitute the new wave of resistant varieties that will appear on the market in the next decade. Efforts are currently underway to develop turfgrass varieties resistant to a number of pests using recombinant DNA technologies.

Biological control of insects, diseases, weeds, and frost injury are all biotechnologies that are dependent on recombinant DNA techniques to engineer microorganisms for use as plant bio-protectants. One of the better-known biological control agents for the control of crown gall disease of stone fruits and roses is based on a genetically-engineered bacterium. Other preparations of microorganisms used for the biological control of plant pests are likely to be genetically altered in some way in the future.

What does all of this mean to you, as a turfgrass manager. First of all, it means that, in the 21st century, you will have to be more scientifically literate than in the past: our society will be based largely on advanced technologies, such as biotechnology. Second, it means that you should start developing an informed opinion about the pros and cons of the environmental risks of such technologies. There are many aspects of recombinant microorganisms and transgenic plants that we do not understand. However, if we compare transgenic plants with those bred by conventional means, it is readily apparent that we know even less about those bred by conventional means. No technology is without risk; however, you need to be informed about biotechnology and its inherent risk relative to other products or practices currently in use.

Finally, it is important to be aware of major developments in biotechnology, because it is likely that many of the products and practices used in the future will be based on developments in biotechnology. Many of the turfgrass varieties available for your use will be products of biotechnology, a number of fertilizers, fungicides, insecticides, and herbicides will be products of biotechnology. Many of the ways in which you dispose of pesticide and non-pesticide wastes will likely be based on various biotechnologies. The use of products and processes developed from biotechnologies is certainly the direction in which science, industry, and agriculture are moving. As the turfgrass industry evolves, many of these developments will gradually be adopted. We at *Turf Grass Trends* will try to keep you abreast of the latest developments in science and technology that affect the way in which you approach turfgrass management. The challenge for all of us will be to keep pace with this rapidly changing area. ■

FIELD TIPS

Benefits of reducing thatch in bluegrass turf

Several years ago, in a test of fungicides for control of dollar spot on a disease prone turf, one of the treatments tested was not a chemical: it was a springtime dethatching with a verticutter. One verticutting—without chemical control in the spring—reduced the incidence of Dollar Spot symptoms by 50% over the untreated control. Apparently, the verticutting disrupted the normal disease growth process and reduced the expression of symptoms.

Cutting height impacts soil temperature

Cutting height has a significant effect on soil temperatures at a depth of 1". Raising the cutting height from 1.5" to 3.0" consistently lowers the soil temperature by 5% The tests were conducted in Silver Spring, Maryland.

Short-cut turf has three months—July, August, and September—where soil temperature conditions are at the maximum for *M. poae*—the fungus that causes Summer Patch. Tall-cut turf has only two months—July and August—where the soil temperature is ideal for *M. poae*.

MONTH	CUTTING HEIGHT	AVERAGE SOIL TEMP.	
July	1.5"	86°F	(30°C)
	3"	83.3°F	(28.5°C)
August	1.5"	84.2°F	(29.0°C)
	3"	81.5°F	(27.5°C)
September	1.5"	76.75°F	(24.75°C)
	3"	74.3°F	(23.5°C)

COMING ATTRACTIONS

The next issue of *Turf Grass Trends* will feature in-depth articles on

- **Grubs** by Michael Villani
- **Foliar summer diseases** by Dr. Nelson
- **Biological & chemical control of broadleaf weeds** by Dr. Nelson
- **PLUS** our regular updates on the latest research findings, new products, regulatory actions, and timely tips on improving your turf management practices.

Subsequent issues will include articles on

• WETTING AGENTS AND WATERING • SEEDS, SEEDING AND SOD
• SOIL TESTING, DORMANT FERTILIZERS AND SOIL AMENDMENTS
• TRAINING AND SEMINARS • WINTERKILL.