

Ignorance Breeds Fear . . .

# What You Need to Know About GMOs (Genetically Modified Organisms)

*You, the superintendent, will soon be faced with new decisions concerning what grasses you select to use. Turfgrass breeding using conventional techniques has, for many years, been the only avenue for genetically improving grasses. Looming just ahead for our industry is the use of modern technology for moving genes into plants. Organisms that have genes added to their constitution this way are referred to as “genetically modified.” With the advent of new technologies come questions as to their value, safety, usefulness, acceptance and impact. Genetically modified organisms (GMOs) are already being used in agriculture and other microbial-based industries. They have stirred up a lot of thought and controversy. As turf professionals, you need to understand this science and make decisions based on your knowledge. This short article will get you thinking, so read on!*

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The basic blueprint of all living things, past, present and future, is deoxyribonucleic acid (DNA). The diversity of living organisms on the earth is beyond the imagination of any human. With this diversity comes a tremendous natural resistance to biological change. However, over the millions of years organisms have been on the earth, natural (non-artifactual) changes have slowly shaped and altered the types of organisms that survive on the earth today. All of these changes have a common thread: their DNA was altered. Changes in DNA have been occurring for millions of years.

There are many natural means of changing DNA. In fact, one organism can naturally change the DNA of another organism. For example, viruses have been changing plants and animals for as long as both have been cohabiting the earth. Man is one more vehicle that can effect changes in DNA, but his methods may extend beyond nature by forcing changes to take place that might not otherwise occur. For example, breeding a plant from Australia with a

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plant from Nova Scotia might result in a “new” plant that, without man’s action, would not have developed. We humans have been doing this for hundreds of years.

When the term “genetically modified organism” (GMO) is used, it refers to this very situation, but the methods and degree of change are increasing. Before you jump to an unfounded conclusion (negative or positive), you need to understand more. In fact, all of us, and especially scientists, need to understand more, but we will never know everything. The mysteries of DNA and how it has, with its very simple structure, created the unfathomable diversity of life on earth, are slowly being unraveled. The salvation of the earth’s ecology can be appreciated from understanding its diversity. It is my opinion, after more than 20 years of studying the biology of the earth, that no single factor, not even man, will dominate life on earth. The rule in our ecosystem is that for every action there is a reaction. If man puts foreign DNA into organisms that would not normally acquire such DNA, you can count on nature reacting in a controlling way. You cannot argue with this fact: it will happen. People may or might not like the reaction, but it will occur. Because our earth’s ecosystem is so diverse and large, it is impossible for anyone, scientists included, to fully predict the impact any single event will have on the whole of the ecosystem. However, it can be predicted that the reaction will generally not be catastrophic or long-lasting. Take, for example, the release of genetically-modified Texas male-sterile corn. This was a big mistake, but I bet you do not even remember it. Through

breeding, which has gone on for hundreds of years, man created a situation that allowed a pathogen to dramatically reduce the yield of corn. Nature reacted to man’s change, and 20 years later you and I are no worse off and probably more knowledgeable.

Genetically modified organisms, including turfgrasses, could offer man many advantages for managing our environment. My understanding and knowledge of the earth’s biology indicates to me that GMOs will not have a large or extended impact on the earth. Along with the many potential benefits GMOs offer, there are also going to be new challenges. These are the reactions of nature to man’s actions, and they cannot be fully predicted. However, through science we can minimize and manage these potential challenges. To remain ignorant and not seek understanding through science will only culture fear.

The stewardship of the earth should not be left in the hands of any single group, regardless of their motives. Capitalists and doomsayers are equally bad for the earth when it comes to interpreting the value of GMOs. Collectively, all people should rally around the pursuit of knowledge, upon which the best decisions for stewardship should be based. Genetically modified turfgrasses offer many exciting possibilities for the industry, but they also will raise many challenges that need to be addressed.

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#### **How should superintendents approach GMOs?**

1. Open your eyes and ears, and seek knowledge from objective sources.
2. Support research efforts that seek facts about GMOs.
3. Ask questions of experts and policy-makers: get involved!
4. Make decisions on what you understand, not on what you fear!

