More on Corn Gluten Meal (CGM) for Weed Control

Iowa State researchers, under the direction of Dr. Nick Christians, the individual who identified the herbicidal properties of the material, have expanded their search to enhance this natural product's weed control potential. A recent paper published in *Crop Science* described the effects of the active molecule responsible for the herbicidal action of CGM on perennial ryegrass seedlings as a model species. The dipeptide Alaninyl-Alanine (Ala-Ala) was identified as one having the highest level of growth regulating, root inhibiting effects at low concentrations. This study explored the precise inhibitory action on morphological and anatomical aspects of ryegrass seedlings. The results indicate that root length was reduced 42% with specific abnormalities observed regarding cell walls, nuclei and mitotic structures.

What does this all mean? The CGM project is a wonderful example in our industry of how science works, once it "stumbles" onto a new technology, in this case the development of a new pest management tool. At this stage, with concerns over the nitrogen content in the CGM products, the researchers are investigating the water soluble active components that could be developed and formulated in a more easy to apply system and eliminate problems associated with applying excessive amounts of N under spring growth flush conditions.

(From: Unruh, J.B., N.E. Christians, and H.T. Horner. 1997. Herbicidal Effects of the Dipeptide Alaninyl-Alanine on Perennial Ryegrass Seedlings. Crop Sci. 37:208-212.)

Turfgrass Problems Bugging You?

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Bentgrass Relations

Up until the last seven years, the selection of seeded types of creeping bentgrass was very limited. In fact, there have been more bentgrasses developed for release in the last seven years than the previous 40 combined! As my friend, Dr. Virginia Lehman, of Lofts Seed says, "the good news is you have more bentgrasses to choose from, and the bad news is you have more bentgrasses to choose from." Now that we have many new cultivars, researchers are concerned about maintaining a diversity within the species so that resistance to diseases and environmental stress is conserved. To this end, researchers at Michigan State University utilized an analytical technique that could determine the relationship among eighteen commercially available cultivars and a European introduction from 1958. The goal of the study was to see how much the bentgrasses have in common with each other so that if continued development persists, breeders are aware that they may be narrowing the genetic base of cultivars while improving for other desirable traits.

Results indicated that the bentgrasses in the study segregate into two main clusters, one cluster includes ten cultivars (penncross, penneagle, putter, trueline, viper, emerald, 18th green, cobra, crenshaw, and seaside) that all seem to relate back to seaside creeping bentgrass introduced in 1924. The second cluster contains eight cultivars that break into two groups; four of them are almost indistinguishable (southshore, pennlinks, pro/cup, and lopez). The remaining four cultivars (providence, sr1020, national, and cato) do not group closely with other cultivars and appear to be unique. The fascinating aspect of this study is related to crenshaw and sr1020, that share three of the same parental materials, yet cluster differently. This may indicate a weakness with the technique or demonstrate the well known within cultivar variability of this cross pollinated species under the selection pressures imposed by the breeders. Nevertheless, our ability to understand genetic relationships will ultimately contribute to the development of grasses that can produce desirable traits, all that's left is figuring how to manage them!

(From: Warnke, S.E., D.S. Douches, and B.E. Branham. 1997. Relationships Among Creeping Bentgrass Cultivars Based on Isozyme Polymorphisms. Crop Sci. 37:203-207.)

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Scanning the Journals

A review of current journal articles

Researchers are investigating water soluble active components that could be developed and formulated in a more easy to apply system and would eliminate problems associated with applying excessive amounts of N.

With many new bentgrass cultivars now available, researchers are concerned about maintaining a diversity within the species so that resistance to diseases and environmental stress is conserved.

Short Cutts

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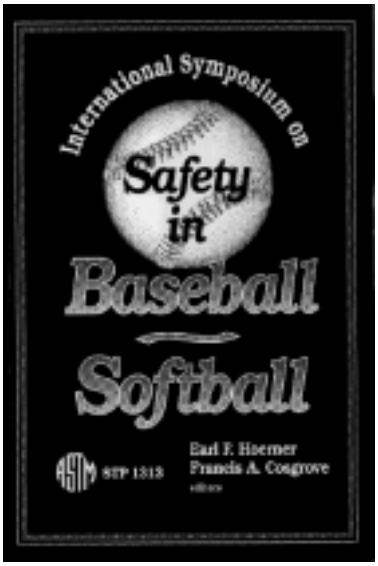
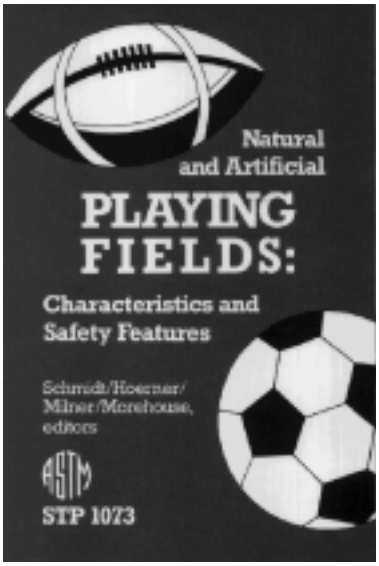
More on Safety in Athletics

The Summer 1997 issue of *CUTT* described a text from the American Society for Testing and Materials (ASTM) on Safety in American Football. In addition, ASTM published a companion text entitled, *Safety in Baseball/Softball* that is a compilation of papers presented at a symposium held in 1995. This text, as with the football text, is filled with very technical information for administrators, coaches, players, and community leaders interested in maximizing player safety. Chapters review the number and types of injuries associated with baseball/softball; the technical aspects of equipment such as bats, balls and protective equipment; ensuring spectator safety; and, of course, constructing and maintaining safe playing surfaces. This text is a must for any sports turf, grounds or facility manager's library.

Several years ago, in 1990, the ASTM published a text that may not have received the attention it deserved. The text entitled, *Natural and Artificial Playing Fields: Characteristics and Safety Features,* provides yet another in-depth treatise on the aspects of designing and maintaining safe athletic fields. This text covers the gamut of issues related to field construction and maintenance from matching the player to the field, and the impact absorption of natural and artificial surfaces, to the role of core cultivation in reducing surface hardness and enhancing shear resistance.

Both of these texts are available from the ASTM office at 100 Barr Harbor Dr., West Conshohocken, PA 19428.





Scanning the Journals

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Crown Hydration of Annual Bluegrass

Crown hydration is widely thought to be the cause of annual bluegrass turf loss during the late winter-early spring fluctuating freeze-thaw conditions. Researchers at the Prairie Turfgrass Research Center (PTRC) in Alberta, Canada have been investigating this issue and are beginning to develop a database of environmental parameters that influence annual bluegrass survival.

Turfgrasses have varying levels of winter hardiness throughout the season. For example, 50% of the plants removed from the field in June will be killed at temperatures of 23 °F. However, plants at peak hardiness in January can survive temperatures as low as -6 °F; of course bentgrass can tolerate temperatures as low as -40 ° F. It is well known that this hardening process is intimately related to crown moisture content.

Still, the incipient freeze-thaw conditions in the spring can result in immediate crown hydration and subsequent death. In fact the researchers observed a significant reduction in plant hardiness when soil temperatures warmed to 46 °F for 48 hours. They noted that plants deharden in the spring well before there is visible growth and that crown tissue does not take up water until after the dehardening process has begun.

In a separate study, they investigated the role of snow cover on hardening and dehardening. It was clear that longer, more persistent snow cover aided in maintaining hardiness levels through the reduction in temperature fluctuations. Therefore, it was clear that temperature was more important than amount of moisture as it related to loss of hardiness and that it is advisable to maintain hardiness as long as possible in the spring.

(From: Tompkins, D.K., C.J. Bubar, and J.B. Ross. 1997. Physiology of Low Temperature Injury with an Emphasis on Crown Hydration in Poa annua L. and Agrostis palustris. 1996 PTRC Annual Report, 40-50.)

Crown hydration is widely thought to be the cause of annual bluegrass turf loss during the late winter-early spring fluctuating freeze-thaw conditions. Researchers in Canada concluded that temperature was more important than amount of moisture as it related to loss of hardiness.

Safety in Baseball/ Softball, ***a new text from ASTM, provides administrators, coaches, players, and community leaders with technical information to maximize player safety.***