

- Reducing herbicide usage through the increased flexibility to treat only as needed for weeds;
- Reducing fungicide, insecticide, water and fertilizer usage through the elimination of *Poa annua* and *Poa trivialis*;
- Eliminating the need for growth regulators to control *Poa annua*.

Regulatory Review Process

Before the benefits from products enhanced through biotechnology can be enjoyed, they must be vigorously examined and pass a thorough review by the Environmental Protection Agency and the US Department of Agriculture. The process can be summarized by addressing the following five issues:

- To determine that the product exhibits no plant pathogenic properties;
- To show that the product is no more likely to become a weed pest than traditional breed varieties;
- To prove that the product is unlikely to increase the weediness potential for any other cultivated plant or native wild species with which the product could interbreed;
- To ensure that the product is unlikely to cause damage to processed agricultural commodities;
- To show that the product is unlikely to harm organisms beneficial to farming and agriculture.

Data to address the topics above is developed over several years and in multiple locations. The analysis determines if the enhanced turfgrass is substantially equivalent (except for the introduced trait) to other turfgrass cultivars currently on the market. Herbicide tolerant creeping bentgrass is currently being examined with over 50 tests in 19 states by scientists from several disciplines and universities. This product may reach the sports market as early as 2003, dependent upon additional product testing and review by the regulatory agencies.

Better Turfgrass for Sports

Over 90 field test notifications have been acknowledged by the US Department of Agriculture APHIS since 1994. While most of the activity is focused on creeping bentgrass (75 notifications), a growing number of notifications are being submitted for Kentucky bluegrass (14 notifications), bermudagrass (2 notifications), tall fescue (2 notifications), and perennial ryegrass (1 notification). The traits being studied include herbicide resistance, modified growth rate, fungal disease resistance, drought tolerance and salt tolerance.

It is possible that one day soon, there will be a well-maintained stand of turfgrass that needs less watering, less fertilization, less mowing and no

supplemental protection from insects or disease. The continued activity of turfgrass scientists, combined with the growing knowledge of gene function, provide great promise for impressive advances in turfgrass biotechnology to provide these valuable management tools. In addition to golf courses benefitting from these improvements, in five to 10 years biotechnology enhanced turfgrasses could provide a broad spectrum of impact on other sport turf fields such as football, soccer or baseball fields, or wherever natural turfgrass is used. ♦

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