

## Causes of a Dark-Green Color in Turfgrasses

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Many individual turfgrass users prefer a dark-green color, although this does not necessarily indicate a healthier turf. Some grasses inherently have a genetically controlled light-green color and still are a healthy, competitive species and/or cultivar. There are numerous causes of a dark-green color, some of which are beneficial and others potentially of negative concern. They include the following:

**Nutritional Benefits.** Nutrients such as nitrogen (N), sulfur (S), and magnesium (Mg) are constituents of the chlorophyll molecule, and thus are required in minimal threshold levels to achieve the desired green color. Iron (Fe) also is an essential nutrient, but is not a constituent of chlorophyll. Rather iron is required for synthesis of the chlorophyll molecule. **Iron and/or nitrogen can impart a significant darker green color, whereas all four elements improve color if applied when at a deficit tissue level.** One advantage of iron is that it can enhance the dark-green color without excessive shoot growth, which occurs with nitrogen when used at high levels.

**Environmental Stress Negative Effect.** During chronic environmental stresses such as heat, drought/wa-

ter and cold, there is a distinct darkening of the turf associated with a very slow to minimal shoot growth stage. **In this situation the darkening of color caused by environmental stress may be a sign precluding significant injury and possible death of the turfgrass.**

**Growth Regulator Response.** Most growth regulators used for slowing the vertical shoot growth of turfgrasses also impart a darker green color. One possible contributing mechanism to this response is the reduced amount of shoot growth occurring, which allows increased nutrient availability for the existing grass shoots. **Associated with this will be an increased carbohydrate reserve accumulation, which can cause a darker green color,** as well as improve the recuperative potential from turf injury.

**Pesticide Negative Effect.** A number of pesticides used on turfs are reported to impart a darker green color for a period of time following application. The mechanism involved in this case may be an adverse physiological effect via atypical chemical reactions in the plant. **In this case the dark-green color could be a sign of a less healthy plant and an overall weakened turf.** Thus, in this situation a darker green turf is not a beneficial response. 

## Nutrient Harvesting from Golf Course Ponds?

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While visiting turfgrass facilities in the Queensland area of Australia for the purpose of advising on the establishment of a new government turfgrass research program I found an interesting set of observations. The Queensland government agency charged with environmental protection had been promoting the planting of certain aquatic plants for the purpose of harvesting unwanted nutrients from ponds and lakes. Specifically targeted have been golf courses, under the assumption that a significant nutrient load enters these water bodies due to the golf course maintenance practices.

Several years ago two golf courses initiated programs to plant these recommended aquatic plants with the objec-

tive of removing nutrients from the water. During discussion with the superintendents in charge, it was indicated that **great difficulty was encountered in getting these aquatic plants established.** It was **only after fertilizer was applied to the water sites that the aquatic plants were successfully established, and they were only sustained on a longer-term basis if periodic fertilizations were made to the multiple pond areas occupied by the aquatic plants.** In other words, a minimal and insufficient amount of fertilizer nutrients was being carried in the runoff water into these ponds to sustain even minimal growth of the aquatic plants. This indicates that **under the conditions on these golf courses, the turfgrass nutrient fertilization programs were not a negative concern to the quality of these water bodies.** 