

Why My Putting Greens Appear Purplish in Winter

Peter H. Demoaden
The University of Maryland

The first frosty nights in October bring about some pronounced physiological changes in plants. In bentgrasses, especially lower-cut putting greens, leaves may develop a purple or blue-gray color. The discoloration may be uniform, but frequently, the various shades of purple, red, or blue appear in circular patches. These patches represent clones. The colors are most prevalent on older greens, especially those seeded to Seaside or "Old South German" bents. These seeded varieties are genetically variable; and as a result, all plants emerging from these seeds are not true type. Hence, individual plants grow, and the more aggressive types dominate, producing a circular patch.

These patches are not unlike the circular areas of blighted turf associated with some diseases. The purplish discoloration is most often misdiagnosed as leaf spot by some golf course superintendents. Leaf spot is an uncommon disease of bents in Maryland, but it can cause a red-purplish discoloration in Kentucky bluegrass. The purpling is very prominent in Penncross greens. Penncross has three parents; and, therefore, at least there different types of color patches or clones can appear on the greens. Presumably, similar color changes will appear in Pennlinks, Southshore, Providence and all of the newer seeded bentgrass varieties as well.

But why do greens turn blue or purple? The cool-to-cold temperatures trigger the color responses. During mid to late

October, we experience relatively warm days (65° to 75°F), but cool nights (32° to 55°F). The sunny, bright and warm days stimulate plants to produce large amounts of sugars (through photosynthe-

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sis) in leaves and leaf sheaths. At night, the sugars must be translocated out of leaves to crowns for storage or use in other physiological processes. When nights are very cool, the sugars are not completely moved out of leaves, and they accumulate.

There are many types of sugars. Glucose is a common plant sugar, and sometimes glucose molecules are chemically bound with anthocyanins. Anthocyanins are pigments, and their function in plants is unclear. The word "anthocyanin" is from Greek: anthos = "flower," and Kyanos = "dark blue." Anthocyanins provide the red, purple, and blue colors in flowers. Anthocyanins accumulate in the foliage of trees during cool and bright weather to provide the spectacular colors in autumn leaves. Hence, bentgrasses experience a similar accumulation of sugar and, therefore, anthocyanins, following the first cool or frosty nights of fall. These colors may intensify and persist throughout winter months and slowly disappear in midspring after turf begins active growth.

A somewhat similar blackening or purpling of bentgrass leaves also may be elicited by the following: iron applications, low soil phosphorus levels, ammonium sulfate application, fungicides classified as sterol inhibitors (e.g., Banner, Bayleton, Sentinel and Rubigan), some plant growth regulators (especially Cutless and TGR), and arsenic toxicity. These responses are well known and can occur at any time of year.



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