

Putting Greens in the Shade: Tough Environment!

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Maintaining cool season turfgrasses in shaded areas is one of the most challenging aspects of turf management a golf course superintendent can face, especially if the shaded areas are annual bluegrass/creeping bentgrass greens. What makes maintaining greens difficult in shade is that how the turf grows in shade is entirely different than how it grows in full sun. Maintaining greens in shade requires an understanding of the environmental and growth changes that occur to turf when developing a management program.

The most noticeable environmental change on shaded greens is the reduction in light. Light is necessary for plants to carry on photosynthesis (the conversion of radiant energy into a usable form, ATP). Thus, shaded plants do not have the carbohydrate (how the energy, ATP, is stored) reserves as do plants growing in full sun. In addition, the quality of light the turf is receiving changes and is of poor quality. Light quality refers to the proportions of particular

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wavelengths within the light spectrum. The wavelengths of blue, red, and to some extent green provide energy for photosynthesis while far-red triggers morphological responses. Changes in proportion of red to far-red changes how a plant grows as well as its health. In shade there is an excess of far-red in comparison to red, which results in plants producing thin, delicate leaves with a rapid vertical growth. A poor root system is associated with these plants. The combination of reduced photosynthesis, and more succulence, makes shaded plants more susceptible to traffic and disease.

Besides the reduction in light quantity

and changes in light quality, the microenvironment is considerably different than what is found on a sunny green. Shaded greens have reduced airflow that promotes higher humidity levels. High humidity reduces the evapotranspiration (ET) rate, and thus the cooling of the turf. Shaded greens tend to remain wetter than those that are exposed to air movement. High summertime temperatures combined with wet humid conditions are not conducive to turfgrass growth, especially at low heights of cut.

Below are some general precautions for your shaded greens, realizing that each green situation is different and not all suggestions are feasible or applicable.

Mowing considerations:

̄ Raise the mowing height (if possible). Traffic or wear stress is a significant problem on greens under stress (lack of tillering, growth, etc. reduces the ability of the turf to

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withstand or recover from traffic). Raising the height increases the wear tolerance of the turf.

- Switch to solid rollers. On shaded greens, grooved or Weihley rollers cause wear/stress damage to the turf.
- Minimize the period "stuff" is left on the green. Clippings or heavy topdressing left on the greens can contribute to heat build-up. Topdress lightly so that the material gets quickly worked in by a quick watering or brushing.
- If you are using triplexes for greens mowing, you may want to explore the option of using walk behind mowers on the few shaded/problem greens (again this reduces wear).
- Stagger cleanup patterns or skip occasionally. Wear normally shows on cleanup patterns of the green. In addition, throttle down the mower on cleanups to minimize "sliding" around corners, which causes excessive wear on the turf.
- Minimize turning mowers on collars. Considerable wear and damage occurs to collars where the mowers are turned or spun around. Turn, if possible, on the higher cut turf.
- Try to scatter golf and equipment traffic entering and exiting a green. Concentrated traffic patterns are normally the first to show plant stress.
- If growth slows or recovery is slow (a good sign is how rapidly ball marks recover), frequency of rolling should be reduced to minimize wear.

Irrigation

- Avoid overwatering greens in shade. Generally the evapotranspiration (ET) rates are lower in shaded environments resulting in a wetter condition. A wet condition favors disease and also reduces the wear tolerance of the turf and increases the potential for compaction. Wet conditions can also promote black layer. You may want to water the problem greens by hand to avoid excessive moisture.
- Check the irrigation heads to make sure they are turning. Often times problems

show up with heads when the turf severely wilts around the head. During the summer stress period, this is not the best time to detect if a head is not turning.

- Check soil moisture levels. Periodically, using a soil probe to visually evaluate the soil moisture levels is a good routine practice.

Fertilization

Fertilization suggestions are difficult to make but below are a few general recommendations.

- On shaded greens that are beginning to thin, avoid the temptation to apply nitrogen at rates to promote recovery and "filling-in". Excessive rates of nitrogen can actually make the situation worse. When fertilizing apply more frequently and at reduced rates to minimize burning.
- Iron and potassium should be used to provide color and some enhanced wear tolerance to the turf.

Disease/Stress Control Through Fungicides:

(A product's name is used for convenience

purposes. Other products may be just as suitable).

- Preventative fungicide programs on shaded greens are effective. Often times when greens are declining and no visible disease symptoms are present, sample analysis shows the presence of "non-pathogenic" Pythium and Rhizoctonia species. Our work has shown the use of fungicides that control these pathogens enhances the quality of turf even when pathogenicity of the organisms present cannot be demonstrated.
- Applying a Pythium fungicide (ex. Signature®) in combination with a Rhizoctonia fungicide (Daconil Ultrex®) on a 14-day schedule starting prior to the stress time has provided better quality turf than waiting for decline to occur (using recommended rates). Chipco 26GT® in place of Daconil Ultrex® has worked well also. Fore® is often used in combination with Signature® or Aliette® with success, however Fore® is not effective on dollar spot like Daconil Ultrex® or Chipco26GT®. If algae is a concern Daconil Ultrex® or Fore® are effective controls.

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