TURFGRASS WATER CONSERVATION ALLIANCE®
33725 Columbus St SE Tel: 541-971-4418
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Turfgrass Water Conservation Alliance ® (TWCA®) Protocol for Low Maintenance Turfgrass™.

The Turfgrass Water Conservation Alliance® (TWCA®) has a primary focus to conserve water. In addition, reductions in other inputs such as chemicals, fertilizers and mowing are encouraged. A best management practice (BMP) is described below. These practices will reduce fertilizer inputs, require fewer pesticides, reduce mowing and irrigation.

The key to conservation is the understanding that grasses are healthier, less stressed, and more energy and water efficient at a higher mowing height; and grasses are inherently drought tolerant and can survive prolonged drought stresses.

The United States is a large geographical region and a single management plan cannot work in all instances. The TWCA suggests consulting local extension agents to see if a best management practice for low input turf is available for your area. The guidelines listed below are generalized but are well-suited for most low maintenance conditions.

Fertilization

Historically the fertilization rates used in the National Turfgrass Evaluation Program tests range between 0 and 8 lbs of nitrogen per year. The average is generally between 3.0 to 3.75 pounds per year for normal maintenance and 2 to 3 pounds for low maintenance species such as fine fescue. Most turfgrass responds favorably to increases in nitrogen. However, lower nitrogen levels reduce growth and subsequently less mowing, and watering are required. Extremely low levels of nitrogen may result in thinning of the turf, weed encroachment, and increased erosion and sediment runoff.

The Turfgrass Water Conservation Alliance (TWCA) recommends:

1. 1 to 3 lb of nitrogen rate/1000 sq ft/year, using a slow release nitrogen source, when low maintenance conditions are desired.
2. The 3 lb rate should be reserved for very nutrient poor conditions, which could occur on sand or sandy loam soils, or when turf stands are relatively immature (< 3 years).
3. The year of establishment may require up to 3 lbs of nitrogen/1000 sq ft/year since young seedlings tend to require higher soil fertility.

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4. Mature stands of turfgrass generally require less fertilization.
5. Turf stands managed in shaded areas will generally require less fertilization.
6. Increasing traffic or wear stress will likely increase the amount of nutrients needed.
7. To avoid excessive growth a split application of fertilizer should be used.

   For example, if a 2 lb of N/1000 sq ft/ year rate is selected, apply 1/2 lb in April, ½ pound in May, ½ pound in June and ½ pound in September. This may be modified depending on season of growth, turfgrass species used, growing season.
8. Apply fertilizer when the grass is green and actively growing.
9. Avoid fertilizing when the turfgrass is under stress.
10. Avoid fertilizing on sidewalks and near bodies of water.

Mowing.

Removal of leaf tissue from a grass plant introduces stress. The clipping of the leaf blade reduces the amount of area which can produce energy for the plant. Grass plants gain energy for growth through a process known as photosynthesis, whereby sunlight is converted into carbohydrates (sugar), which serves as a food source for the plant. Therefore a turf which is maintained at a 3 inch mowing height has the ability to produce more energy than when maintained at a 1 inch height. This additional energy allows the plant to develop a deeper root system, allowing nutrient and water uptake from a deeper soil level. Additionally, the plants are more resilient to stresses such as wear, shade, cold and heat and have improved ability to recuperate following injury from traffic, diseases, or insect pests

The TWCA encourages a higher cutting height when a low maintenance turf is desired.

1. Cool-season grasses should be maintained between 2 to 3.5 inches.
2. Warm--season grasses between 1.0 to 4 inches. Generally, bermudagrass peforms well at the lower end of this range, while zoysiagrass lawns do well in the middle-high end of this range and St Augustine grass performs best at the higher end of the range.

3. The clippings should be returned to the turf when mowing. If clippings are excessive, to cause suffocation, they should be removed. To avoid excessive clippings, be sure to follow the "1/3" rule described below.
4. A mulching rotary mower is a recommended choice for homeowners. A reel mower may be used but could result in more frequent mowing.
5. Avoid mowing when the turfgrass is stressed and under hot conditions.
6. Increase mowing frequency when the turfgrass is growing rapidly by following the "1/3 rule". This rule regulates mowing can by never removing more than 1/3 of the leaf tissue.

   For example, if your desired mowing height is 2 inches, never allow your grass to grow more than 3 inches in height. Note that the "mow at" height is the mowing height x 1.5. Therefore, when your mowing height is 2 inches, you should mow when your lawn reaches (2 x 1.5), or 3 inches.

Irrigation

The TWCA® encourages the use of cultivars which have been evaluated and approved through its Turfgrass Water Conservation Protocol ® (©Hignight et al. 2010). Only varieties approved by this protocol can receive the TWCA ® Label. This protocol is administered by the TWCA ®, and then reviewed by a peer-review university committee. Although these cultivars have demonstrated superior drought tolerance, additional water conservation is possible with good management practices.

1. The maximum amount of water savings can be obtained by watering deep and infrequently. The turfgrass can survive turning brown and irrigation can be withheld until the lawn has reached a 75% tannish brown color. (PHOTOS)
2. When complete green cover is desired during the growing season, the grass should be allowed to wilt before watering.
3. Watering during the early morning hours, when wind is normally reduced and evaporation rates are lower, is recommended.

Many problems associated with irrigation systems are due to the system not working properly. The TWCA® recommends an irrigation audit which should include:

1. evaluation of water distribution,

2. water infiltration rate of the soil,
3. replacement of damaged sprinklers
4. proper operating pressure
5. For automatic irrigation systems, the TWCA encourages the use of soil moisture sensors or ET based systems.

The TWCA® recommendations:

1. A 1 inch irrigation event every other week to obtain maximum water savings.
2. Irrigation should be withheld if 1 inch of rainfall has occurred.
3. It is possible that sandy soils in the southern United States could require additional water.
4. Remember that for maximum water savings the grass can have up to 75% browning without permanent damage. (PHOTO)
5. Turning off irrigation timer and manually turn on system when watering is needed.

The TWCA® Low Maintenance Protocol ™ suggests irrigation to prevent loss of stand. The TWCA suggest watering:

1. When the turfgrass has reached 25% green cover (75% brown).
2. Digital Image Analysis should be used when the turfgrass is actively growing. The University of Arkansas has developed a macro that may be utilized in Sigma Scan Pro to evaluate turfgrass quality.
3. In addition, a macro to evaluate percent green cover has been developed, and should be used for evaluation in periods of drought stress.

Herbicides

The use of herbicides should be minimal for low maintenance turf. Herbicides are usually not needed when dense, healthy turf is produced through proper fertility and irrigation practices.

Recommendations:

1. A maximum of one application per year is recommended.
2. Additional applications are allowed but should only consist of spot treatments.

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This reduction in herbicide use results in lower cost and impact on the environment.

Fungicides

Most diseases are much more active in moist environments and therefore worse when turf is irrigated regularly. By following irrigation recommendations above, disease incidence should be reduced significantly. A reduction for some diseases such as brown patch is likely when using a low maintenance program.

However, some diseases will likely increase such as rust, dollar spot and red thread. Resistant cultivars are available for rust and dollar spot but information is limited. The low maintenance test conducted by the TWCA ® will help identify turfgrasses which exhibit resistance to these diseases.

Recommendation:

1. Fungicides should be used infrequently but may be used to prevent severe damage.

Insecticides

Use of insecticides is discouraged. Some turfgrass species contain fungal endophytes which deter insect feeding. The TWCA® encourages the use of the cultivars which contain fungal endophytes to reduce insecticide applications. Some species do not contain fungal endophytes and some insects are not deterred by the presence of endophytes. In these cases, an application of an insecticide is allowed but should be limited to the season which controls the target pest.

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REFERENCES

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