

Turf Nutrition for Mid-Summer Heat Stress – Cool Season Turf

Mid-summer is a stressful period for cool season turf. High traffic areas in particular suffer from a combination of mid-season stress conditions that reduce turf vigor and complicate management decisions. Cool season grasses in the transition zone or farther south are especially susceptible to mid-summer stress. Nutrition leading up to and during this difficult period can make a significant difference in a turf's ability to tolerate this stress.

Conditions leading to mid-summer stress

Cool season turf is most difficult to manage in summer heat due to a complex of conditions:

High temperatures - Air and soil temperatures are highest in mid-summer. Soil temperatures near the surface of close cut turf can be 10°F higher than air temperatures in the afternoon on hot sunny days.

Vigor due to growth cycle - Cool season turf species are at the end of their annual growth cycle in July.

Disease - Hot humid conditions that are stressful for turf are often optimum for disease pathogens. Turf under stress is more susceptible to disease.

Traffic - Traffic on turf is high during the mid-summer. Heat stress can be amplified by increased summer use.

Nutrient Monitoring Program

The following program should be used as a guide. Monitoring nutrient levels in leaf tissue and soils is critical for designing the most efficient nutrient program. BioPro recommends the use of a diagnostic service that provides soil, water, and NIRS (Near Infrared Reflectance Spectroscopy) tissue analysis. With diagnostic results, BioPro nutrient programs may be modified to correct imbalances and prevent future problems.

Application Recommendations

June 15

- | | |
|----------------------------|---|
| 1) Multi-Purpose (6-0-0) | 3 oz. |
| 2) Enviro K (0-0-30) | 4 oz. |
| 3) Greens Plus (14-4-10)** | 8 to 20 oz.
(0.1 to 0.25 lb. N/1000sf) |
| 4) CytoGro | 0.4 oz. |
| 5) H3O | 2 oz. |

July 1

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|-----------------------------|-------------------------------|
| 1) Multi-Purpose (6-0-0) | 3 oz. |
| 2) Tuff Greens (0-0-13) | 2 oz. |
| 3) Calcium Plus (8-0-0-10) | 3 oz. |
| 4) Magnesium Plus (7-0-0-6) | 6 oz. |
| 5) Iron Plus (15-0-0-6) | 3 oz. |
| 6) Organic Granular | 4-8 lb.
(0.5 lb. N/1000sf) |

July 15

- | | |
|----------------------------|---|
| 1) Multi-Purpose (6-0-0) | 3 oz. |
| 2) Tuff Greens (0-0-13) | 2 oz. |
| 4) Greens Plus (14-4-10)** | 8 to 20 oz.
(0.1 to 0.25 lb. N/1000sf) |
| 5) CytoGro | 0.4 oz. |
| 6) H3O | 2 oz. |

August 1

- | | |
|-----------------------------|-------------------------------|
| 1) Multi-Purpose (6-0-0) | 3 oz. |
| 2) Enviro K (0-0-30) | 3 oz. |
| 3) Calcium Plus (8-0-0-10) | 3 oz. |
| 4) Magnesium Plus (7-0-0-6) | 6 oz. |
| 5) Iron Plus (15-0-0-6) | 3 oz. |
| 6) Organic Granular | 4-8 lb.
(0.5 lb. N/1000sf) |

August 15

- | | |
|---|---------|
| 1) Multi-Purpose (6-0-0) | 3 oz. |
| 2) Tuff Greens (0-0-13) | 2 oz. |
| 3) Greens Plus (14-4-10)**
(0.15 lb. N/1000sf) | 12 oz. |
| 4) CytoGro | 0.4 oz. |
| 5) H3O | 2 oz. |

September 1

Begin BioPro "Fall Fertilization for Cool Season Turf"

** Substitute 9-14 oz. Greens Plus (12-0-12) when phosphorus is not desired.

Mixing: Fill spray tank with ½ the necessary water; add *Multi-Purpose* or *Bio CN* first, then additional products one at a time; if *Calcium Plus* is in the mix add it last; add remaining water last.

Note: Syringe lightly after application of liquid products

BioPro Products

Calcium Plus (8-0-0-10) is a chloride free, readily available calcium source. Calcium is critical for vigorous new growth and for establishing stress tolerance for the next season.

CytoGro (Liquid Root Biostimulant) is an EPA registered hormone biostimulant that improves turf tolerance to stress resulting from disease, insect damage, drought, and soil temperature extremes by augmenting cytokinins and auxins, the turf's natural growth hormones.

Enviro K (0-0-30) provides potassium from potassium carbonate, a high quality, less caustic, chlorine-free source that is retained in the root zone longer for more uniform and consistent uptake by plants. It also contains organic acids from leonardite, which enhances turf performance and improves soil quality. Potassium's role in stress tolerance and recovery is well known.

Greens Plus 14-4-10 & 12-0-12 (Liquid NPK Nutrient Blend) are balanced nutrient blend with nitrogen, phosphorous, and potassium in the same ratio as they are generally found in plant tissue. Nitrogen is supplied as a polymethylene urea blend to provide uniform turf growth and color. This product contains 8.85% controlled release nitrogen, and organic acids from leonardite, which may enhance nutrient uptake.

H3O (Liquid Soil Moisture Management Product) employs a revolutionary new chemistry formulated to manage root zone moisture, making efficient use of water and protecting the turf from the harmful effects of drought stress, thus reducing disease pressure and root shrinkage. It attracts and holds free water molecules from the air within the soil, and efficiently transfers them to the plant root.

Iron Plus (15-0-0-6) is a particularly effective Fe source. Humic acid is known to be an excellent organic chelator of Fe increasing its availability for plant uptake and mobility within plant tissue.

Magnesium Plus (8-0-0-6) is an excellent source of plant available magnesium with an organic base. Magnesium is involved in increasing stress tolerance in turf plants.

Multi-Purpose 6-0-0 (Liquid Organic Soil Conditioner) is a unique mixture of organic acids and biostimulants derived from a biological composting and extraction process. It is designed to increase nutrient availability to the plant, stimulate soil microbial activity, increase root mass, and improve overall turf quality.

Tuff Greens (0-0-13) is a superior potassium source with calcium, silica, and iron that increases leaf stiffness for increased wear tolerance and greens speed.