

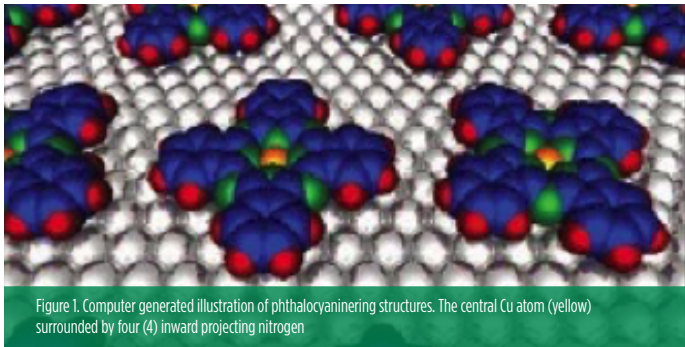


Research Driven,
Proven Results™

TECHNICAL BULLETIN

USING GRIGG™ GREENPIG® COLORANTS FOR SUMMER STRESS MANAGEMENT

GRIGG™ GreenPIG® is a premium pigment additive specifically formulated for golf course and sports turf to enhance and extend the aesthetic appearance. The use of pigmented products on fine turfgrass has increased in the past five years. The most noticeable benefits are better color and quality of both actively growing and dormant turfgrass, and possible physiological benefits resulting in better overall plant health (to be determined by future turf research).



GRIGG™ GreenPIG® Active Ingredient

GreenPIG contains a green colored (reflected light) aromatic macrocyclic pigment called phthalocyanine. The phthalocyanine found in GreenPIG contains a central copper (Cu) atom. Phthalocyanine is very similar in chemical structure to porphyrins—or naturally occurring compounds such as chlorophyll and heme B. As a result, it absorbs light strongly in the visible spectrum. The word porphyrins is derived from the greek word, “porphyra” or “purple pigment.” GreenPIG also contains trace levels of zinc (Zn).

Key Advantages of GRIGG GreenPIG Formulations

GreenPIG contains a highly concentrated amount of pigment that is 10-20% higher than many competitors. This results in a formulation that offers low use rates and promotes fast, intense, and long lasting turf color, as well as improved overall turf quality. GreenPIG is available in 4 X 1 gallon and 12 X 1 quart cases to allow flexibility in spray preparation.

Key Advantages of Using GreenPIG on Turfgrass

GreenPIG may be used on all turfgrass species in a wide range of climates and with different turfgrass management intensity levels. The primary uses of GreenPIG include:

1. Optimizing turf color and quality
2. Enhancing aesthetics for dormant turf
3. Speeding spring green up and possibly establishment
4. Increasing stress tolerance (see research—reverse)

Application Rates

- **Single Application (Cool Season Turf):**
Semi Dormant - 20 fl oz/ac
Actively Growing - 16 fl oz/ac
- **Multiple Application (Cool Season Turf):**
14 day application interval
Semi Dormant - 14-16 fl oz/ac
Actively Growing - 10-12 fl oz/ac
- **Bermudagrass:** Apply 4-6 fl oz higher rate per acre
- **Higher heights of cut on golf course fairways and roughs, or sports fields and home lawns:** Increase rate 6-10 fl oz per acre

GreenPIG applications target the turf canopy and are NOT a substitute for a sound fertilizer program. GreenPIG may be compatible with foliar fertilizers, plant growth regulators, and crop protectants*.

**Jar tests are always recommended before use.*



Photo Courtesy: B. Whitlark, USGA.

FIELD TRIAL: USING GRIGG™ GREENPIG® TO MANAGE TURFGRASS QUALITY DURING SUMMER STRESS

2012, Kimberton GolfClub. Phoenixville, PA. McDonald, S.

Objectives

During high intensity light and heat, near infrared light that is not reflected off turfgrass can cause oxidative stress and plant injury.

GRIGG set out to determine if the use of GRIGG™ GreenPIG® on turfgrass would increase NIR reflectance compared to untreated turf and turf treated with foliar nutrition during summer stress (high heat/drought), and lead to an overall increase in plant health. To view the full trial, visit www.grigg.co

Application

The trial was conducted on a G-6 creeping bentgrass (*Agrostis stolonifera*) sward mown at 0.125 inches. Treatments included GRIGG applied alone and GRIGG GreenPIG tank mixed with GRIGG™ UltraPlex® foliar nutrition and Chipco® Signature™ Fungicide.

Results

All GreenPIG treatments, either alone or tank mixed with foliar fertilizers, impacted NIR reflectance. This effect corresponded well with visual ratings. The GreenPIG treatment produced the best CB color, see Figure 3.

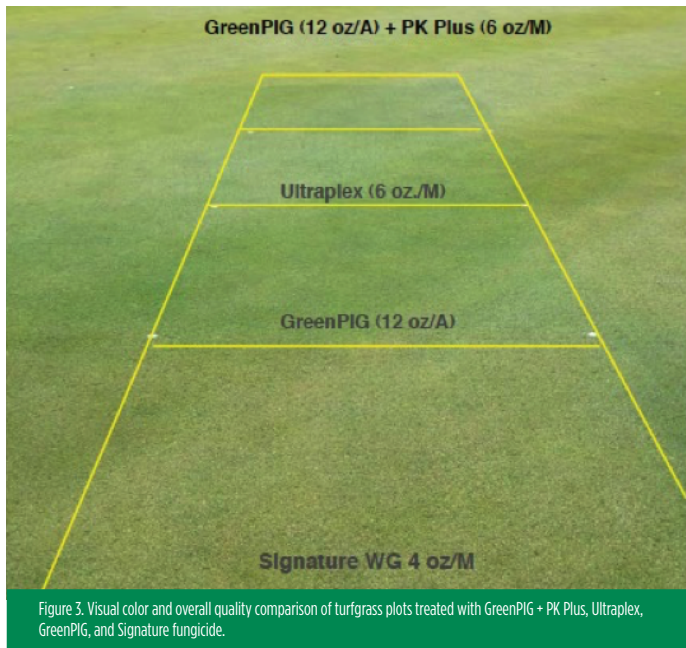


Figure 3. Visual color and overall quality comparison of turfgrass plots treated with GreenPIG + PK Plus, Ultraplex, GreenPIG, and Signature fungicide.



For a distributor near you contact:
GRIGG: 1 888 246 8873
www.grigg.co

GRIGG is part of Brandt Consolidated, Inc.
2935 South Koke Mill Road
Springfield, IL 62711
www.brandt.co

The GRIGG GreenPIG and fungicide application also affected near infrared reflectance (NIR) (780 nm). NIR was significantly higher than the control and turf treated with foliar fertilizer, see Figure 4.

Effect of pigments and foliar fertilizers on near infrared (NIR) (780 nm) light reflectance from creeping bentgrass turf.

McDonald, S., TDS (2012)

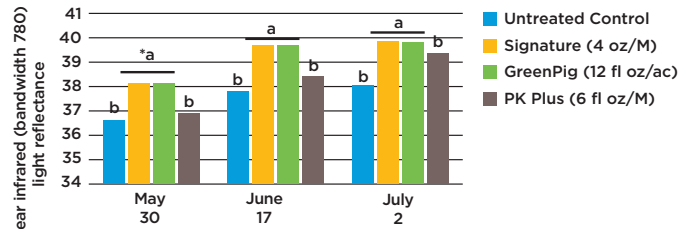


Figure 4. Effect of GreenPIG, PK Plus, and Signature fungicide on NIR light reflectance using remote sensing technology. A Holland Scientific Crop Circle is a ground mounted unit with an active light source and multi-spectral data capabilities. The Crop Circle was mounted to a Turf Scout designed cart using a sub-meter GPS.
*Means followed by a different letter are statistically different (P=0.05)

On four rating dates, creeping bentgrass treated with GreenPIG was significantly better overall quality compared to the untreated control, see Figure 5. On 23-Jun, GreenPIG alone and GreenPIG + GRIGG™ UltraPlex® produced significantly better creeping bentgrass quality than the fungicide treatment and untreated control, see Figure 5.

Effect of pigments and foliar fertilizers on creeping bentgrass quality.

McDonald, S. (2012)

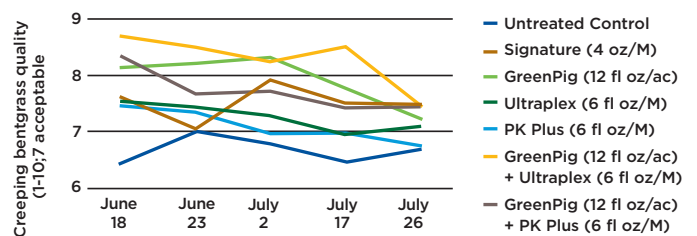


Figure 5. Effects of treatments on overall turf quality. *GP treatments (3) significantly different from untreated control **GP and GP+UP treatments significantly different from Signature and untreated control \$GP and GP+UP treatments significantly different from untreated control #GP+UP treatment significantly different from untreated control

Recommendations

1. Maximize turf vigor using the correct cultural practices.
2. On cool season turfgrass, apply GreenPIG sequentially with GRIGG™ PK Plus® or GRIGG Ultraplex foliar nutrients in summer to maximize turf quality.
3. Use GreenPIG at the recommended rates to improve turfgrass color.
4. For better overall turfgrass quality, apply GreenPIG to increase the reflectance of harmful NIR light.