GRIGG™

Research Driven,
Proven Results™

NUTRITION PROGRAM

GET THE MOST FROM AERATION

Overview of Aeration Practices

Aeration is conducted on golf and sports turf for many agronomic reasons including compaction relief, oxygenation of the root zone, improved water infiltration, as a means to modify soils and to achieve organic matter control in the upper soil profile. Aeration is often the optimum time to apply granular nutrient carriers and soil amendments including sand. Properly conducted, aeration also has a long term smoothing effect on the surface, whether that surface is a putting green, lawn bowling pitch, infield or other turf surface. Regardless of the type and timing of the aeration procedure, most turf managers are trying to maximize the agronomic benefits of aeration and promote a rapid recovery of the disrupted surface. GRIGG™ has the products and programs to assist turf managers with achieving these goals.

GRIGG Proprietary Nutrient Technologies

GRIGG™ Proven Foliar™ products, including GRIGG™ Gary's Green®, GRIGG™ Ultraplex®, GRIGG™ Gary's Green Ultra™, GRIGG™ Nutra Green™ and GRIGG™ Kelplex™ stimulate rapid recovery, strong root growth and optimal turfgrass vigor. The technology and nutrients in our programs contain adequate nitrogen for spoon feeding with a controlled release and response that provide superior color and controlled growth. A typical program also includes micronutrients, biostimulants, buffering capacity, and an organic surfactant.

GreenSpec™ granular nutrients, including GRIGG™ Seven Iron™ (7-7-7) and GRIGG™ Turf Rally™ (16-4-8) are formulated with protein technology that is utilized more efficiently by bacteria, this provides better nutrient availability and results than other granular fertilizers on the market. Adding a GreenSpec™ granular to your aeration program is ideal for establishment, root growth, and recovery from mechanical or environmental stress.

GRIGG™ soil amendments, including GRIGG™ ZeoPro™ and GRIGG™ Z-mendit™ (inorganic zeolite), are designed to improve cation exchange capacity (CEC) – thus increased nutrient utilization and a subsequent improvement in turfgrass recovery from mechanical cultivation and/or aeration.

How Zeolite Enhances Turf Health

The natural form of zeolite, clinoptilolite, is a microporous tetrahedral arrangement of silica and alumina, which improves soil chemical properties and results in an increased nutrient pool for plant use. This provides accelerated establishment, limited nutrient leaching, lower fertilizer requirements, improved turfgrass recovery and vigor, and increased rooting. GRIGG zeolite product comparison:

Product	Bulk Weight lb/ cu ft	meq/100 g soil CEC
GRIGG™ ZeoPro™	50	100-110
*GRIGG™ Z-mendit™	60	165-180

**also contains K, Ca, Fe*

GRIGG Nutrition Program for Maximum Recovery and Performance at Aeration

Pre-Aeration

3-5 days prior to aeration, apply the following to kickstart recovery from mechanical stress (per 1,000 ft²):
GRIGG™ Gary's Green® Ultra @ 12-15 fl oz

Post-Aeration

1-3 days after aeration make a granular application GRIGG™ Seven Iron™ @ 10-15 lbs and irrigate immediately after.

5-7 days after aeration, begin the following foliar application and continue every 14 days (per 1,000 ft²): Gary's Green Ultra @ 9-15 fl oz GRIGG™ Nutra Green® @ 6 fl oz

GRIGG™ Kelplex™ @ 1.5 fl oz for increased rooting.

If pre-mixing *GRIGG™ Z-mendit™ use the following guidelines per ton of sand: @5% 60 lbs, @10% 120 lbs, @15% 180 lbs, @20% 240 lbs

** Contact your representative to discuss zeolite incorporation depending on the hole sizing, spacing and depth of the aeration process.*

References

Miller G.L. 2000. Physiological response of Bermudagrass grown in soil amendments during drought stress. In Hort. Sci. 35(2): 213-216

Ok, C., S. H. Anderson, and E.H. Ervin. 2003. Amendments and contruction systems for improving the performance of sand-based putting greens. In Agron. J. 95:1583-1590.

GRIGG Research

A 5% v/v ZeoPro application increased root zone mix CEC compared to a 10% v/v application of other soil amendments (Table 1.) This subsequently increases the volume of other amendments required to produce an equivalent CEC (Figure 1).

Root Mix	lbs / 1,000 ft²	CEC meq/ liter	CEC meq/ 100 g
Sand	n/a	33	2.0
GRIGG™ ZeoPro™ 5%	2083	74	4.6
GRIGG™ Z-mendit™ 5%	2500	111	6.8
AXIS 10%	2083	43	2.8
Profile 10%	3223	50	3.0
Isolite 10%	2859	43	2.8

***Table. 1** - Comparing root zone Cation Exchange Capacity (CEC) after treatment with various volumes of different soil amendments*

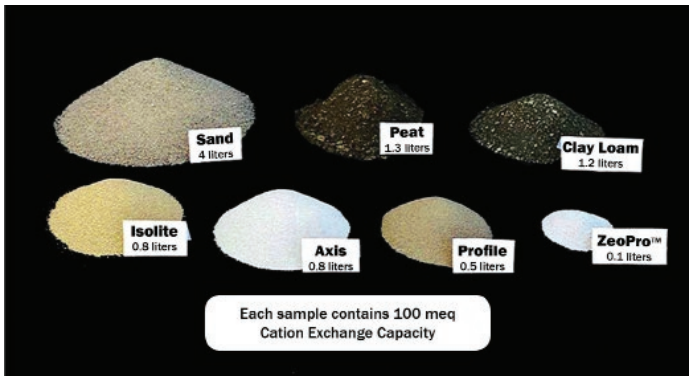

***Figure. 1 -** Bulk density comparisons necessary to generate an equivalent CEC*

Ok et al., 2003 reported improved establishment of creeping bentgrass and higher root zone CEC's after treatment with 15% zeolite (v/v) compared to sand and peat amendments. ZeoPro treatment increased 'Tiftway' Bermudagrass relative transpiration rates under lower soil water conditions (Figure 2) (Miller, 2000).

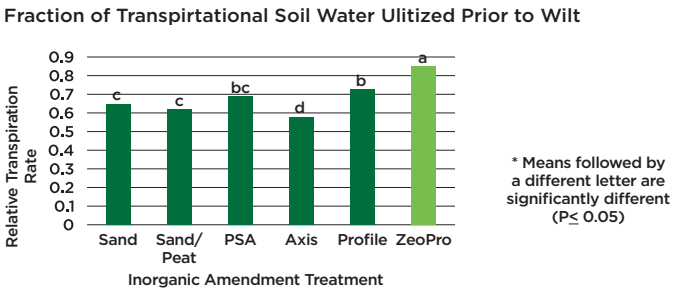

***Figure. 2** - Bermudagrass response to drought stress. The mechanism for this effect was reported as a delay in stomatal closure under increasing water deficit.*

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