COMAND®

MAXIMIZE TURF HEALTH & PERFORMANCE

COMAND provides a natural, cost effective way of maintaining quality playing surfaces, while creating wear tolerant and attractive turfgrass

ADVANCED NATURAL TOPDRESSING & SOIL BUILDER

WHAT IS COMAND?

- One-of-a-kind organic soil amendment
  - Completely natural product created specifically for use on turfgrass
- Contains stabilized organic matter essential for optimum soil health and function
- Supplies a diverse population of beneficial microbes to the soil

Golf Ventures

LIFE SOILS
RESTORING THE BALANCE

Sustainable Stewardship

WHAT MAKES COMAND SO UNIQUE?

- Produced with precise proprietary blends of enzyme-producing microbes
  - Thermoactinomyces
- Unique composting methodology
  - MSAP Method
- Inventive techniques of maximizing beneficial microorganisms in the finished product
  - Re-inoculation

COMPOSTING FROM THE OUTSIDE IN

HEAT RISES

CO_2

CAPPING LAYER
Biofilter
Insulate Pile

INITIAL HIGH
TEMPERATURES

HARVEST QUEST

O_2

O_2

Accelerated aerobic decomposition

PRECISION SCREENING PROCESS

Fine screened

¼” and ⅛” minus

Weed free

Fully stabilized

Superior replacement for peat

ADDITION OF MESOPHILIC MICROBES

- Mesophilic microbes thrive at ambient soil temperatures
- Introduced to maximize:
  - Natural disease suppression
  - Thatch reduction
  - Improve nutrient uptake

Advanced Curing & Re-inoculation

APPLICATIONS (New Construction)

COMAND can be utilized as the organic component of a sand-based rootzone media

- ✓ Ideal for golf course and sports field construction mixes
- ✓ Can also be incorporated into existing soils to greatly improve characteristics and accelerate turf establishment for recreation areas and home lawns

APPLICATIONS (Maintenance)

Topdressing of fairways, tees, greens, sports fields, lawns, and as a component of divot mixes

- ✓ Encourages regeneration of damaged turf
- ✓ Boosts performance in weak areas
- ✓ Improves strength and rate of germination when overseeding
- ✓ Can accelerate transition from winter dormancy
- ✓ Will hold moisture in potentially problematic dry areas, such as mound tops and bunker faces.

BENEFITS OF USING COMAND

COMAND possesses excellent soil building attributes, greatly improving the soil physically (structurally), chemically (nutritionally), and biologically

- ✓ Supplies stabilized high quality organic matter
- ✓ Improves soil structure and porosity, thus creating a better plant root environment
- ✓ Increased root density and length
- ✓ Increases moisture infiltration and permeability, thus helping to maintain percolation rates and relieve compaction

BENEFITS OF USING COMAND

- ✓ Improved water holding in light soils, providing greater drought resistance and more efficient water utilization
- ✓ Increased soil cation-exchange capacity (CEC), thus improving the soils ability to hold nutrients
- ✓ Supplies beneficial microorganisms
- ✓ Aids the proliferation of soil microbes, which assist in Thatch reduction
- ✓ Contains humus, assisting in soil aggregation and making nutrients more available to plants
- ✓ Improved wear tolerance, promotes faster turf establishment and recovery rates

BENEFITS OF USING COMAND

- ✓ More even turf density and color, green-up without excessive top growth
- ✓ Complimentary to other management programs, provides for more efficient utilization of fertilizers

- ➢ COMAND can be incorporated into your turf establishment and maintenance programs all season long

- ➢ Typically showing results within a few days; exhibiting green-up and new lateral growth

BETTER WATER MANAGEMENT

Comand holds 6x its weight

COMAND's stabilized organic matter has the ability to improve the water holding capacity of sandy soils, while at the same time increasing infiltration and permeability

- ✓ percolation rates are maintained
- ✓ provides greater drought resistance
- ✓ frequency and intensity of irrigation can be reduced

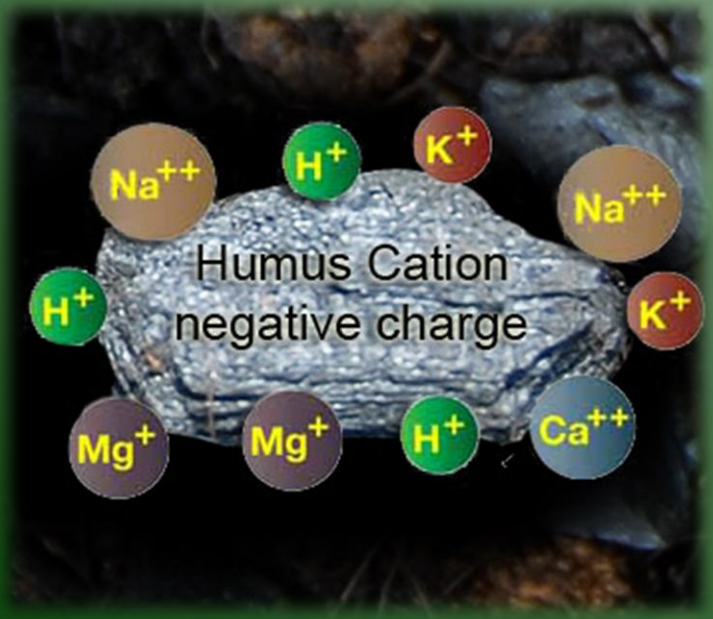
For every 1% increase in organic matter content' a cubic foot of soil can hold an additional 1.5 quarts of plant-available water"
(Sullivan, 2002)

16,500 gallons of water per acre foot"
(Scott and Wood 1986)

INCREASED CATION EXCHANGE CAPACITY

Sand-based rootzones possess a low cation exchange capacity (CEC)

Cations are positively charged ions such as calcium (Ca2+), potassium (K+), magnesium (Mg2+) and iron (Fe2+). The organic matter in COMAND is comprised of negatively charged particles, which attract and hold, through electrostatic forces, the positively changed ions.



COMAND enables the soil to better absorb and retain nutrients in the root zone while reducing nutrient losses through leaching

Existing fertilizer program inputs can typically be reduced

PROVIDES SLOW RELEASE NUTRIENTS

COMAND contains a broad array of macro and important micronutrients

The nutrients, particularly nitrogen, are contained in stabilized organic matter and become available in a slow-release form

When compared to commercial fertilizers, on a pound-for-pound basis, COMAND has far less nutrients and is not characterized as a fertilizer

However, COMAND can have a significant cumulative effect on nutrient availability and existing fertilizer program inputs can typically be much more effective

Organic N, Mineral N (NH_4-N, NO_3-N), P, K, Ca, Mg, SO_4-S, B, Cu, Fe, Mn, Mo, Se, Zn, Humus, Humic Acid, Fulvic Acid

Midwest Laboratories, Inc.
13611 B Street • Omaha, Nebraska 68144-3693 • (402) 334-7770 • FAX (402) 334-9121 • www.midwestlabs.com

Lab # 2600564 **Report of Analysis** Report Number: 16-327-4123

Account: 38433

RYAN MCMEEKIN
LIFE SOILS, LLC
11616 NW 16TH LANE
GAINESVILLE FL 32606

Robert Ferris
Account Manager
402-829-9871

Date Sampled:
Date Received: 2016-11-17
Sample ID: 1/4" COMAND TURFGRASS

NUTRIENT ANALYSIS

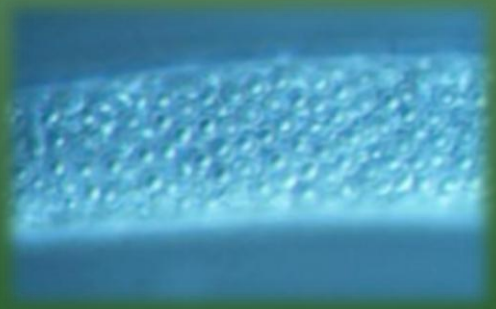
		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
NUTRIENTS				
Nitrogen				
Total Nitrogen	%	1.74	2.55	34.8
Organic Nitrogen	%	1.38	2.02	27.6
Ammonium Nitrogen	%	0.360	0.527	7.2
Nitrate Nitrogen	%	< 0.01	----	----
Major and Secondary Nutrients				
Phosphorus	%	0.94	1.38	18.8
Phosphorus as P2O5	%	2.15	3.15	43.0
Potassium	%	0.28	0.41	5.6
Potassium as K2O	%	0.34	0.50	6.8
Sulfur	%	0.41	0.60	8.2
Calcium	%	2.18	3.19	43.6
Magnesium	%	0.25	0.37	5.0
Sodium	%	0.110	0.161	2.2
Micronutrients				
Zinc	ppm	395	578	0.8
Iron	ppm	7220	10571	14.4
Manganese	ppm	34.8	51	----
Copper	ppm	122	179	0.2
Boron	ppm	< 100	----	----

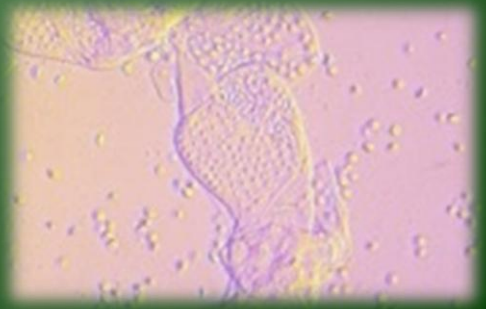
NATURAL SUPPRESSION

Disease incidence in turfgrass can potentially be influenced by the level and type of organic matter and biology present in the rootzone

Certain microorganisms help suppress specific plant diseases as well as being antagonistic to nematodes

- ✓ Actinomycetes populate the soil and outer surfaces of plant roots, driving off parasitic fungi and other soil-borne pathogens
- ✓ They are antagonistic to plant-parasitic nematodes and inhibit egg hatch and/or penetration of roots
- ✓ Pasteuria spp. are endospore-forming Actinomycetes, which are parasites of invertebrates, including nematodes





NATURAL SUPPRESSION

11% of the total fungi population in COMAND has been shown to be species in the *Orbiliomycetes* family.

Several species are carnivorous fungi, and possess a number of specialized mechanisms to trap nematodes

Shortly after coming into contact with its prey, fungal mycelia penetrate the nematode and spontaneously differentiate into functional structures, known as traps, which will ultimately digest the nematode's internal contents

The types of microorganisms present in COMAND are determined & monitored through DNA extraction

DISEASE SUPPRESSION MECHANISMS

- **Antagonism** – some beneficial microbes produce antibiotics which can kill pathogenic organisms and inhibit egg hatch of nematodes
- **Direct Competition** – pathogenic organisms are poor competitors when compared to beneficial microbes, which rapidly populate the soil and overwhelm disease causing organisms by consuming nutrients, energy, oxygen and competing for space
- **Competition for root colonization** - some beneficial microbes have the ability to colonize the surface of plant roots; protecting them from pathogenic organisms. Actinomycetes degrade root exudates that nematodes rely on for root location and to stimulate egg hatch
- **Induction of systemic acquired resistance (SAR)** – a mechanism whereby disease-repressive genes in the plants are activated enabling the plant to better fend off disease causing organisms

COMAND RESEARCH

The University of Florida was commissioned in August 2015 to conduct experiments comparing turf grown in a rootzone mix with COMAND vs. a traditional mix with sphagnum peat

- Determine if COMAND has an effect on suppressing nematodes
- Accelerates grow-in
- Improves root density and length

Micro-plots

8” diameter PVC pipes

12” depth rootzone mix

Sprigged with Tifway Bermuda

250 Sting Nematodes introduced

85:15 sand/peat

80:20 sand/Comand

60:40 sand/Comand

COMAND RESEARCH RESULTS

During grow-in the bermudagrass sprigs filled in much faster in soil amended with either 20% or 40% Comand than in soil amended with peat

At six months after sprigging, soil and roots samples collected for analysis

- The root lengths in soil amended with 20% or 40% Comand were 55% and 80% greater, respectively, than in soil amended with 15% peat
- Sting nematode population densities were 89% lower in soil amended with either 20% or 40% Comand than in soil amended with 15% peat

At 12 months nematode population densities were 95% lower

THATCH REDUCTION

Actinomycetes and fungi induce the breakdown of the turf's thatch layer

Thatch restricts the percolation of water and movement of air and coupled with compaction, can result in anaerobic conditions, leading to very shallow root systems, drought stresses, and disease pressures

- Thatch is 'organic material' (largely undecomposed), whereas
- COMAND is 'organic matter' (decomposed and stabilized)

In practical terms, the degradation of thatch and its conversion to humus (organic matter) and humic compounds (plant food) provides the turf manager with a host of practical benefits, potentially saving work time and costs whilst improving the playing surface.

COMAND IN ACTION

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08/04/2016
08/15/2016


07/28/2016


08/05/2016

COMAND®

LIFE SOILS
RESTORING THE BALANCE

Golf Ventures

MAXIMIZE TURF HEALTH & PERFORMANCE

Turfgrasses beautify our landscapes, improve our physical and mental health, and truly touch each and every one of us in some way every day!

Take COMAND of Your Soil Health and pamper your turf