

Think of Management of Water Repellent Soils First

Therefore Management of Localized Dry Spots can be Achieved

By Jim Turner

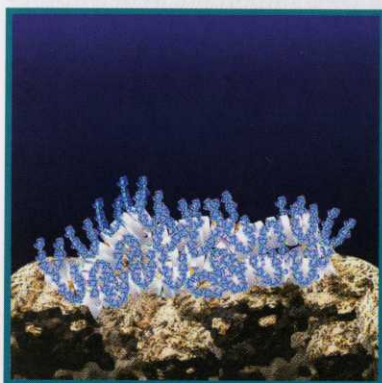
Business Manager Specialty Products, J.R Simplot Company

Superintendents each season fight LDS (Localized Dry Spots) conditions on their golf courses. The superintendent may want to think of water repellency management first before management of LDS. Moderate water repellent soils with dry weather conditions manifest into LDS. Water Repellency starts at the thatch soil interface and generally only reaches down to a depth of 4 to 5 centimeters. Water Repellency generally is a shallow soil condition. Water Repellent soils are coated with non-polar organic acids coatings,

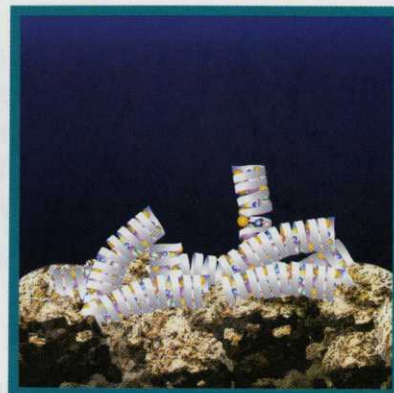
which repel water from hydrating the soil particles effectively. Water Repellent soils are progressive in nature; this fact is extremely important. Turf managers grow a monoculture crop - TURF, research has shown growing a monoculture crop will greatly increase the incidence of water repellent soils each year. Each season

superintendents grow more and more dense turf conditions the overall goal. Growing dense turf each season also contributes to more non-polar organic acid coatings which is one of the major contributors to water repellency. There is no cure for water repellent soils; the superintendent has to learn to manage the challenge. All soils can show water repellency symptoms from sandy soils to clays. Sandy soils generally show the symptoms of water repellency the strongest. Sandy soils have less water holding capacity than fine textures soils. Performing the WDPT - Water Drop Penetration Test - can test water repellency for the degree and persistence of repellency. The WDPT can be a valuable tool for the superintendent; it can help determine both the locations and the severity of water repellency on the golf course. The WDPT is a measurement in time, time in seconds it takes for a water drop to dissipate into the soil core. The water drops are placed on the soil core starting at the thatch soil interface 1 centimeter at a time to a depth of 5 centimeters. After the water drops are placed on the soil core, they are measured in seconds how long it takes for the water drop to dissipate into the soil core. If the water drop takes longer than 10 seconds the soil is considered being water repellent. Important to note: a 10 plus second measurement at the "0" centimeter level can be very detrimental to the superintendent, and the other WDPT measurements on the same core sample are considered not to be water repellent. This type of WDPT evaluation shows that infiltration of

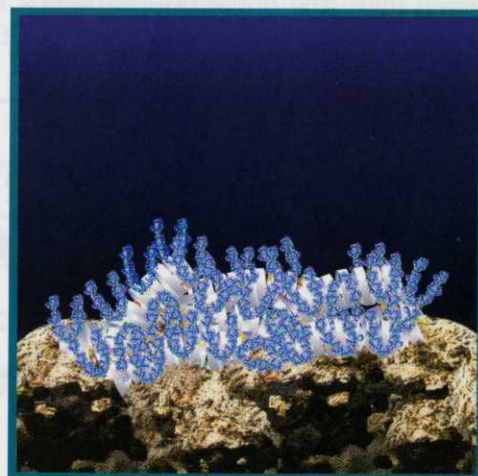
(Continued on Page 10)



Surfactant pattern after a treatment program. For illustration purposes only.

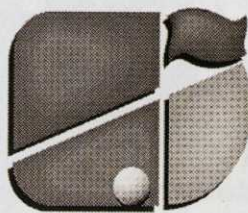


Graphic depiction of water repellent organic acids on soil surface.



Surfactant pattern after a treatment program. For illustration purposes only.

WDPT - Water Drop Penetration Test - can test water repellency for the degree and persistence of repellency. The WDPT can be a valuable tool for the superintendent; it can help determine both the locations and the severity of water repellency on the golf course. The WDPT is a measurement in time, time in seconds it takes for a water drop to dissipate into the soil core. The water drops are placed on the soil core starting at the thatch soil interface 1 cen-



**GILL
MILLER** INC.
Golf Course Architects

Design • Renovation • Master Planning • Practice Centers

122 North 2nd Street • River Falls, WI 54022 • 715-425-9511 • e-mail: info@gillmiller.com

visit our website www.gillmiller.com

Member: American Society of Golf Course Architects

Water Repellent Soils—

(Continued from Page 9)

water in the soil thatch interface is not being completed, therefore water movement into the soil profile will not happen uniformly.

Water does not move uniformly into soil profiles. Even in

Water does not move uniformly into soil profiles. Even in new green construction water does not move in a uniform pattern thru sandy or push-up green soils. Water will move in preferential patterns; one of the patterns identified is fingered flow.

new green construction water does not move in a uniform pattern thru sandy or push-up green soils. Water will move in preferential patterns; one of the patterns identified is fingered flow. The finger flow pattern is where most of the water movement will take place in a golf course. The finger

flow patterns are small river -lets of water that happen in water repellent and non -water repellent soils. Once the finger flow pattern has developed it will remain in place for extremely long periods of time. The superintendent must remember the water both applied and rainfall the golf course receives will now move through the finger flow patterns. Finger flow water movement is not uniform. Water will also move through cracks and crevices, flow over sloping layers and through different soil interface profiles. Superintendents should remember water is necessary for both for turf grass survival; we also need uniform water movement to achieve proper coverage of fertilizer applications and uniform coverage of control chemical products applied.

Plant water availability has to be taken into account when managing water on the golf course. Where is the water in relation to the root zone? What is the water holding capacity of the soils? These factors help explain why the frequency of water applications is important. When applying irrigation, the root zone can only hold a finite amount of water; excess water will move below the root zone due to gravity. Gravitational water is no longer available to the turf grass system. If the turf's grass root system is shallow (which is generally the circumstance) in summer heat stress

(Continued on Page 19)

**CARRIES JUST ABOUT
EVERYTHING
BUT A BIG PRICE TAG.**

Kawasaki

UTILITY VEHICLES

- Liquid-cooled, V-Twin engine
- Air intake system overhead
- 1,330 lb. load capacity
- Rack & pinion steering
- Sound-insulated and extra-quiet muffler
- Governed to 16 mph safety
- Lock-out differential for min. ground disturbance
- Full line of accessories available



KAWASAKI 3020 MULE™

Call Tim Commers or
Steve Scanlan today...
(612) 333-3487 or
Toll Free 1 (800) 759-5343

CUSHMAN MOTOR CO., INC.

2909 EAST FRANKLIN AVENUE, MINNEAPOLIS, MINNESOTA 55406
(612) 333-3487 • Fax (612) 333-5903 • Toll Free 1-800-759-5343

Water Repellent Soils—

(Continued from Page 10)

conditions, the superintendent now has to manage water in a very shallow soil profile. Management of water in shallow root profiles places a premium on the uniformity of the water applied. Remembering both uniformity and penetration of water is critical.

One management tool available to the superintendent is the effective use of soil surfactants. Remembering that water repellency is progressive is the key. Choosing soil surfactants that provide unique hydration patterns and proper penetration characteristics will allow the superintendent to effectively manage water repellent soils, therefore LDS. There are four strategy possibilities when using soil surfactants.

Soil Surfactants should give both water penetration benefits and hydration benefits. Remember the biggest challenge in management of water repellency is providing hydration sites in the soil profile. The superintendent wants to be able to uniformly wet the soil profile to successfully manage LDS conditions.

Superintendents when choosing soil surfactants may want to ask the following two questions. After answering the two questions the superintendent then can choose the

appropriate product strategy that will best fit his or her needs.

1) Where on the golf course are the water repellent conditions? Are the greens, tees, fairways, mounds or bunker faces the biggest challenges?

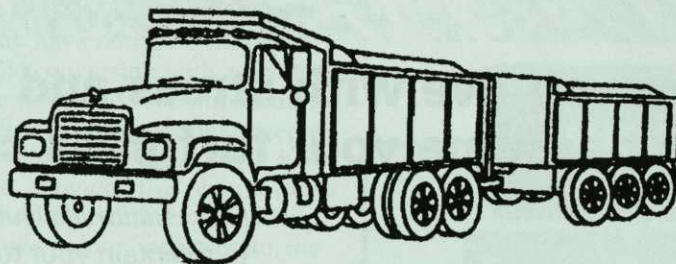
2) How does the superintendent want to manage the challenges of water repellency?

Long Term Preventative - Prevention products that generally last for an excess of 30 days. Long-term soil surfactants can be used on fairways and greens. If a superintendent only wants to spray every 3 to 4 months, long term products can be useful.

30 - Day Prevention - 30-day prevention products generally provide the best overall management of water repellency conditions.

Treatment Strategy - Superintendents can manage effectively LDS conditions under a treatment strategy of waiting until the LDS appear or start to appear. When wilting or discoloration appears a treatment is applied to give relief. Generally treatment products only last a few days and need to be reapplied.

Injection strategy - Soil surfactants can be applied through irrigation systems. Soil surfactants applied in this manner will provide relief to large brown out areas on the golf course safely and economically. Injection strategy will assist in reducing the amount of applied water required.



LEITNER COMPANY

Specializing in Soils for Golf Course Maintenance & Construction

Soil mixing and processing specialists.

Supplying the Golf Course Industry with soil and sand products for over 50 years.

From 10 yards to 10,000 yards - material to specification for topdressing and construction.

Quality - Reliability - Experience

MIKE LEITNER
LEITNER COMPANY
945 Randolph Avenue ~ St. Paul, Minnesota 55102
(651) 291-2655

PROUD SUPPORTER OF RESEARCH AND EDUCATION THROUGH THE MGCSA