



ORGANICTM
PRECISE

TURF GRASS
SURFACTANT
EVALUATION



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Turfgrass Surfactant Evaluation

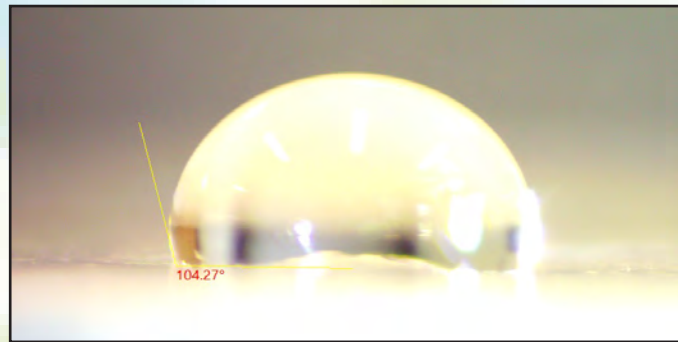
Turf Trade has the ability to evaluate surfactants for wetting characteristics using well-established, industry standard testing.

- Draves Wetting
- Contact Angle
- Surface Tension
- Percent Active

Contact Angle Measurement.

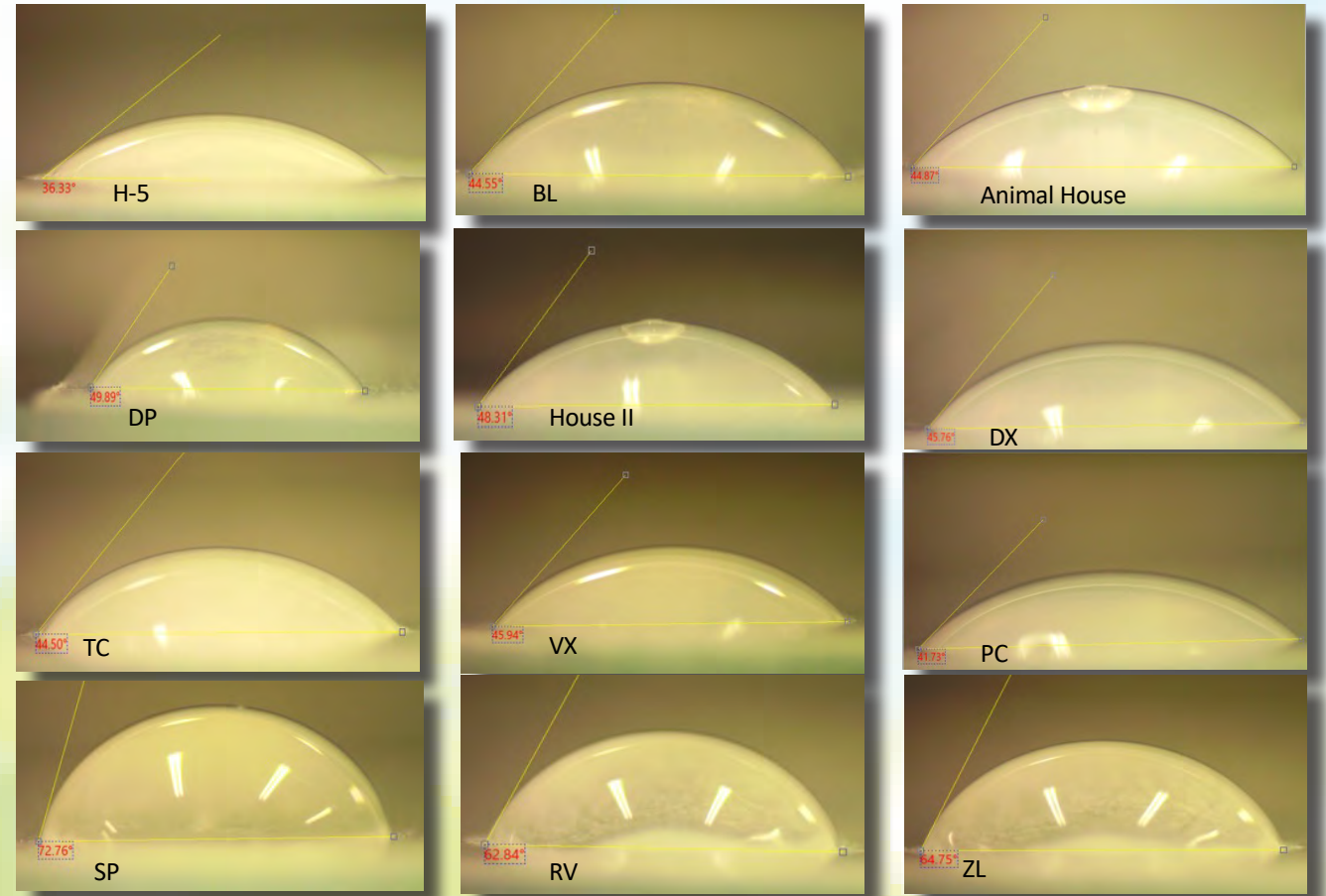
Contact angle measures the disruption of the inherent cohesiveness of the water molecules and is a direct indicator of how well a surfactant “wets”.

A 1% solution of each product was prepared with water. 10 µl of the solution was placed on wax paper affixed to a microscope slide and observed through a stereoscope. The contact angle was then measured and photographed. Water was used as a control and is shown here.



Draves Wetting Test

Draves Wetting is an official ATSM test method to determine how rapidly a surfactant will wet a hydrophobic fabric. Because several of the wetting agents tested performed similarly at 1% concentration, we also looked at a 0.1% concentration in order to further differentiate the products’ physical characteristics. The image below is an actual Drave’s test in progress.



Surfactant	Time (sec)
H-5	<1
BL	<1
Animal House	<1
House II	27
PC	<1
TC	<1
VX	<1
DP	3.1
DX	5
RV	8.3
ZL	17.8
SP	65

Surfactant	Time (sec)
H-5	31.1
BL	63
Animal House	76
House II	28.7
PC	68
TC	93
VX	>300

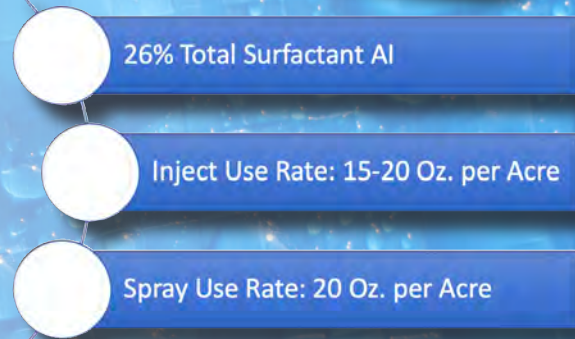




- Multi-component soil surfactant 23% Total active
- Extremely low phytotoxicity risk
- Use rates are 15-20 ounces per acre
- Can be sprayed or injected
- Can be added to other applications when more water movement is needed or to firm up playing surfaces

Multiple Active Penetrant System

- APG penetrant:
 - Extremely strong wetter
 - Significantly reduces surface tension and “pushes” water
 - Sugar-based molecule is extremely strong
- Block Co-Polymer Soil Surfactant
 - Reduces surface tension
 - Enhances lateral movement of water and uniformity of hydration.



Biostimulant Enhanced Surfactant

- Combination of a penetrating soil surfactant with multiple biostimulant chemistries:
 - Chitosan oligosachharide
 - Quick Fix proprietary biostimulant
 - 6% Total surfactant AI
- Designed as a supplement to any tank mix to enhance stress resistance and increase turfgrass quality



Animal House Tabs Wetting Agent

- Wetting agent tabs for hand watering / spot treatment of LDS 100% Active ingredient: block polymer surfactant blend. 8oz / 1/2 lb pellet size (some in the industry are only 6oz)
- Contains similar polymer chemistry to Turf Trade “BL” wetting agent in a pellet form:
 - Traditional block polymer soil surfactant
 - Alcohol ethoxylate surfactant
 - Reverse block surfactant
- Treatment area is approximately 8,000 ft² or about 2 greens.



Animal House Tournament Conditions Penetrant System

- 30 Day Soil surfactant:
- Combination of multiple soil surfactant chemistries designed to:
 - Uniformity of hydration
 - Elimination of LDS
 - Move excess water and ensure firm playing surface
 - Rapidly rewet
- 70% Total active

Product positioning:

- Designed to compete against “tournament ready” products
- Use strategy is to ensure irrigation efficiency, uniformity of hydration while keeping a firm surface and moving excess water
- Positioned as a premium product for those who want to strictly maintain soil moisture and rapidly rewet when needed.



Turf Trade Soil Surfactant Program

Soil Surfactant Program Greens (4 Acres)

Product	Cost/Gal	13-May	27-May	10-Jun	24-Jun	8-Jul	22-Jul
		enter rate in box according to the date					
Animal House		4	4		4		4
House II							
AH Tabs				0.03	0.03	0.03	
SeaCure+			0.5	0.5	0.5	0.5	0.5
Product	Cost/Gal	5-Aug	19-Aug	2-Sep	16-Sep	30-Sep	14-Oct
		enter rate in box according to the date					
Animal House			4		4		4
House II							
AH Tabs		0.03	0.03	0.03			
SeaCure+		0.5	0.5	0.5	0.5		
		Gallons Needed		Cases Needed			
Animal House		38.12		8			
House II		0.00		0			
AH Tabs		3.92		4			
SeaCure+		6.13		2			

Total Product Cost

Animal House	
House II	
AH Tabs	
SeaCure+	
TOTAL	

Soil Surfactant Program Fairways & Tees (27 Acres)

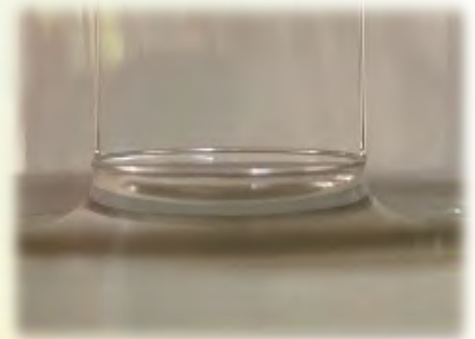
Product	Cost/Gal	13-May	27-May	10-Jun	24-Jun	8-Jul	22-Jul
		enter rate in box according to the date					
Animal House			3		3		3
House II							
SeaCure+			0.5		0.5		0.5
Product	Cost/Gal	5-Aug	19-Aug	2-Sep	16-Sep	30-Sep	14-Oct
		enter rate in box according to the date					
Animal House			3		3		
House II							
SeaCure+			0.5		0.5		
		Gallons Needed		Cases Needed			
Animal House		137.83		28			
House II		0.00		0			
SeaCure+		22.97		5			

Total Product Cost

Animal House	
House II	
SeaCure+	
TOTAL	

Tensiometer Surface Tension Test

- A Surface Tension Test in a laboratory involves tensiometer that utilizes a platinum ring (Du Noüy Ring) to determine surface tension.
- The ring is submerged in a solution of surfactant and water and then is pulled slowly up and out of the solution.
- The machine measures the force required to pull the ring free of the liquid and thus, measures surface tension
- This type of test will tell you the efficiency of wetting as well as uniformity of wetting and depth of wetting



Organic Precise Wetting Agents Surfactant Offering

Existing:

- Animal House Wetting Agent Tablets
- SeaCure Plus
- House 2
- Animal House

Surfactant	Time (sec)
House II	28.293
H-5	28.851
Animal House	29.049
BL	30.137
DP	27.804
VX	28.168
DX	28.876
PC	29.404
TC	30.055
RV	34.111
ZL	34.601
SP	37.630

