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TELEPHONE: (312) 546-9444

Arthur E. Schroeder
Richard A. Schroeder
Don Vircens

GRAYSLAKE, ILL.
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DEW IS NOT DEW

by Tom Mascaro

Dew, in the popular sense, is water of condensation. Dew forms on a cold surface when the air is warm and water is present as humidity.

The "dew" we find on turfgrass areas is not water of condensation. This water is the plant sap being pumped out or "exudated" from the hydathodes. The hydathodes are relief mechanisms that transport excess water out of the plant system.

Relatively speaking, very little research has been done on this important function of turfgrass culture. In 1887, Dr. Marloth in Egypt studied the Tamarix (salt cedar) and found that it exuded salts and identified them.

Dr. J. K. Wilson, Cornell University, in 1923 found that the difference in dew on a turfgrass area was not due to soil moisture, but to the species that grew. He classified the different grasses in the following manner:

1. Bentgrasses, Bermudagrasses, and Poa Annua are prolific pumpers of exudate and rated them high.
2. The Bluegrass family (with the exception of Poa Annua) were medium pumpers of exudate.
3. Zoysiagrasses, fescuegrasses and ryegrasses were low pumpers and produced the least amount of exudated water.

This difference in the rate of exudation explains why we can observe patches of heavy "dew" on turfgrass areas that are not pure stands.

Dr. Endo, University of California in 1969 found that spores of dollar spot fungus grew sparingly in ordinary water, but when the spores were germinated in exudated water they grew sparingly to well and caused a variable amount of infection. In other words, exudated water increased infection and disease. It induced acceleration and increase in spore germination.

Dr. G. N. Hoffer, Purdue University, in 1949 demonstrated that quickly available nitrogen was rapidly transported through the leaf tissue and into exudated water. The high salt content of the exudate caused leaf, stem and root burn.

With this background information we can begin to understand better why the United States Golf Association Green Section advocated syringing of greens many years ago. Their findings indicated that the Superintendent who syringed his greens in the early morning had less disease than the man who didn't.

This practice very simply diluted the concentration of the exudated water and rendered it harmless.

Exudated water contains glutamine, a form of sugar that is ideal for bacterial and fungal growth. If you touch your hand to exudated water you will feel the stickiness of this material which is identically the same as the plant sap.

The salt index of exudated water will rise sharply when quickly available plant foods, (especially nitrogen) are applied. If these salts are allowed to accumulate in the thatch or compacted soil surface root, stem, or lower leaf, burn may occur. The potency of the exudate can be demonstrated by gathering a cupful from a well fertilized green and pouring it in one spot. A chemical burn will result.

These combinations of factors can and do have a profound effect upon the survival of turfgrasses under certain conditions. Until more research is conducted to supply more information, the wise turf manager will:

1. Practice early morning syringing to dilute exudated water.
2. Use sufficient water to wash the exudate into the soil. Aerify to insure water intake.
3. Use slowly available plant foods to minimize the salt concentration in the exudate. If quickly available plant foods are used, split the feeding into light amounts on a frequent basis.
4. Control thatch to minimize the accumulation of exudate. Frequent vertical cutting, light top dressing, dragging, brushing, all help to keep excess thatch under control.
5. PH is a factor that can be related to exudated water. The lower the PH, the more susceptible turfgrasses are to disease attack. Dusting (during periods of stress) with 5 to 10 lbs. hydrated lime per 1,000 sq. ft. when grass is dry, or applying Dolomitic limestone 10 to 20 lbs. per 1000 sq. ft. will change to PH in the thatch layer, which can become very acid.

I hope that this discussion "Dew is Not Dew" has given you a better understanding of this rather unrecognized subject.

Some will continue to call it "Dew", others will call it "Exudated Water". Another common name is "Guttated Water" or "Guttation Water". Poets will eternally call it "Fairy Rain". By whatever name we call this liquid that is exuded from the Hydathodes of the grass leaf, we must always remember that this is a normal function of the plant. The turfgrass manager that recognizes this basic principle and adapts his management practices to it wisely, is the one who will produce superior putting surfaces for better golf.

The South Florida Green