



Efficacy of surfactants to aid water penetration into hydrophobic organic layers in turfgrass root zones

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Water repellency is a common problem for turfgrass managers, particularly in arid and semi-arid regions. Therefore any improvement in water penetration is critical not only to the survival of turfgrass stands but also for the efficient use of water.

In a 2-year study 10 wetting agents commonly used in turfgrass management to aid in water penetration into hydrophobic organic layers were tested to determine their efficacy. The data for the analysis were collected over four months during the period of peak drought stress in turfgrass. The study site was a golf course practice putting green in Las Cruces, New Mexico, a semi-arid region in the southwestern United States. Green construction was California style with a 300mm deep one hundred percent sand root zone layer without a gravel layer at the bottom of the root zone.

Ten wetting agents and a control were applied to 3 m² plots in a completely randomized split block design with four replications. Aquaduct, Brilliance, Cascade Plus, HydroWet, LescoFlo, Naiad, Primer Select, Respond 2, Surfside 37, and Tri-Cure were applied following label rates. The putting green was irrigated every other day at 80% potential evapotranspiration during the study. Cores 25 mm in diameter and 100 mm in length were taken at the beginning of the study before the first treatment application and then every two weeks thereafter for the four month period of study. The cores were air-dried and tested for water repellency using the water drop penetration test (WDP). Visual ratings for turf color and quality were also taken every two weeks throughout the study.

Water drop penetration test, turf color and quality data were statistically analyzed using auto regressive correlation with date as a repeated measure. Statistical analysis showed no overall significant differences in turfgrass color and quality between the

different treatments. Results of the WDP analysis indicated that there were significant differences in mean WDP times between several of the products and the control. The results suggest that water repellency on turfgrass root zones in the semi-arid southwestern United States can be significantly reduced with wetting agents and some wetting agents tested were more effective at reducing water repellency than others.