Objective

Determine the water-holding capacity of sand root zones (meeting USGA recommendations) modified with various amendments and determine the effect of amendments on grow-in rate and dry down characteristics of creeping bentgrass established in the amended root zones.

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Summary

Previous research has shown that while some inorganic amendments increase the total water-holding capacity of a root zone, they may have little impact on plant-available water. Given that the cost of inorganic amendments is greater than peat, it is important to understand the benefits of inorganic amendments so superintendents can make well-informed decisions when selecting amendments.

Moist sand: amendment root zones were mixed at the appropriate ratio and were packed into cylinders and plant-available water was determined through laboratory testing procedures. The same sand: amendment root zones were packed into lysimeters, established with creeping bentgrass in the greenhouse and were subjected to a dry-down period during which irrigation was withheld.

Results

- All root zone treatments met USGA recommendations except for capillary porosity in the sand control.
- In the laboratory, reed sedge peat was the only amendment that significantly increased plant-available water compared to the sand control.
- Increasing amendment ratios from 10% to 20% enhanced germination, but the difference was significant in only one of two trials.
- Diatomaceous earth enhanced establishment rate, green cover during dry-down and resistance to wilt, but using it for putting green construction would greatly increase costs. Long-term studies must be conducted to determine whether this product has long-term benefits compared to traditional peats.
- This experiment was performed in a controlled setting that favored turfgrass growth. The results might be different if this experiment were performed under field conditions that included foot traffic, mowing stress and greater environmental variability.

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