

The Effect of Liquid Soil Aerator on Root Growth and Turf Density on Arizona Bermuda Grass

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Question

Does the application of Liquid Soil Aerator improve grass shoot density, root depth, and blade color in Bermuda grass, in Oklahoma clay soil conditions?

Purpose

To compare and determine the effectiveness of Liquid Soil Aerator with the standard chemical fertilizers being used on Arizona Bermuda Grass in clay soil conditions.

Test Site

Three (3) 200 square feet test sites were selected in a full sun exposure.

Control

Three applications of 20-5-10 (N-P-K) fertilizer applied. First application on May 1st, 1999; second application on July 1st, 1999; and third application on September 1st, 1999 and the grass was irrigated on each of the test sites with an equal quantity of water throughout the testing period on a regular basis.

Application

On May 1st, 1999 Liquid Soil Aerator was applied at the dilution rate of 2oz Liquid Soil Aerator per 1 gallon of water at a coverage rate of 4oz. Liquid Soil Aerator per 1000 square feet to test sites #2 and #3. The first fertilizer application as described above was applied on all three sites. Nothing else was added except ¼ inch of water to all three-test sites. On May 10th, 1999 a second application of Liquid Soil Aerator was applied to test site #3 at the same rate as above. All three sites were watered ¼ inch.

Tests Performed

On April 25th, 1999 the following tests for each plot was conducted:

Grass Root Depth - It is generally assumed that by observing grass root depth by length and by growth pattern can indicate if there is a compacted soil challenge. A two (2) foot hole was dug leaving one side free of shovel marks. Masses of roots, running horizontal and the absence of roots below certain depths were observed.

Grass Shoot Density - It is assumed that turf density can be affected by compacted clay soils. Measurement of number of turf shoots per square inch was counted. Twenty random samples within each plot were counted to give an average result.

Grass Blade Color - Observation of grass blade coloration is observed to help assess the general health of the turf.

Test Results For Root Depth:

- Site 1: Average Root Depth Increase 28%
- Site 2: Average Root Depth Increase 278%
- Site 3: Average Root Depth Increase 264%

Test Results For Shoot Density:

- Site 1: Average Shoot Density Increase 18%
- Site 2: Average Shoot Density Increase 250%
- Site 3: Average Shoot Density Increase 263%

Test Results For Grass Blade Color:

- Site 1: Grass Blade Color: It is quite apparent at first glance the difference in coloration between Site #1 and the other two sites. The coloration varies from a light yellow to a light green with a few areas of moderate green hue. The shoots are light yellow in appearance to a light green. The turf has a stressed appearance and the blades are finer in appearance. A few small bare areas are present, and several areas of thin turf density.
- Site 2: Grass Blade Color: This site is adjacent to Site #1 and the difference is remarkable. The coloration is dark green with little variation in color. The shoots are thicker than in Site #1 and are moderately green to dark green. The turf is noticeably thicker and healthier in appearance. No bare ground is seen anywhere in Site #2.
- Site 3: Grass Blade Color: This site is indistinguishable from Site #2 in appearance. It is adjacent to Site #2 and only the marker between them separates the two.

Interpretation

The three tests performed for this project support the effectiveness of Liquid Soil Aerator on clay soils. These tests indicate substantial increase in grass shoot density and root depth. It is widely believed that “as the root goes- so does the plant”. The root mass was not measured in this test project, however visual examination of the roots show that Site #1 had considerably less root mass than either Site #2 or Site #3. Rhizome development was considerably more prominent in the two sites treated with Liquid Soil Aerator. As noted above, the general health of the turf between Site #1 vs. Site #2 and Site #3 is obvious by visual examination.

Conclusion

The application of Liquid Soil Aerator on clay soil conditions in Oklahoma has substantially improved grass shoot density, root depth, and blade color on Arizona Bermuda Grass.