Should You Aerate Your Pastures?

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Recently, there has been increased interest in using aerators in pastures and hayfields thanks to the rise in fertilizer prices and limited summer rainfall. We have also heard concerns that cattle and machinery traffic in pastures and hayfields may cause soil compaction. Compaction, in turn, could limit water infiltration and thereby reduce forage yield.

Spike-tooth aerators have been promoted as a tool to decrease soil compaction. These aerators penetrate the soil, which supposedly decreases compaction in the upper soil surface. Holes created by the aerator should allow water to infiltrate the soil, rather than run off without being absorbed. This improved water infiltration should improve forage yield.

Research with aerators has shown no improvements. Aeration did not increase the yields of bermudagrass, bahiagrass or alfalfa in university trials in the Southeast. Work in Mississippi showed that the spike-tooth aerators actually increased compaction around the penetration area.

We conducted trials using aerators in Knoxville, Crossville and Spring Hill a few years ago. We aerated at different times of year, using several types of aerators, and differing the levels of soil disturbance. This article is too short to show all of the data, but there was a consistent result seen in all studies: Aeration did not improve the forage yield of tall fescue.

Why was there no improvement?

Aerators promoted for forage use are not the same as those used in the golf industry. Golf courses use aerators that pull a core of dirt out of the soil; pasture aerators punch a hole in the ground. The spikes are usually only about 8 inches long. With this information, it becomes easier to understand why aeration does not increase forage yield. First, compaction is usually not a major limiting factor in forage growth.

Compaction in the top 8 inches of the soil is usually broken by plant root growth (even from weeds) and freezing/thawing during the winter. Second, since these aerators generally punch a hole in the ground instead of removing soil, they may actually increase compaction. Compaction below 8 inches will not be affected by an aerator.

UT Extension does not recommend the use of spike-tooth aerators to decrease compaction in pastures and hayfields. Instead, focus on fertility issues, weed control and summer forage species to improve production. Δ

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