



# FORAGE FACTS

*Publication Series*

## CATTLE GRAZING AND SOIL COMPACTION

### INTRODUCTION

Soil compaction can be a problem on most Kansas soils. Compaction can reduce plant growth, inhibit root penetration, restrict water and air movement in the soil and, ultimately, reduce yields. Soil compaction is influenced by soil structure and texture, organic matter content, and soil water content. Figure 1 demonstrates the relationship between soil water content and susceptibility to compaction.

The structure of a soil (how well the soil breaks up into small, cohesive clumps when crumbled) also plays a role in the potential for compaction. A soil with higher levels of organic matter generally has better structure and resists compaction. Organic matter helps create large, strong soil aggregates. Hard, dense low organic matter soils suffer more from compaction than loose, friable, high organic matter soils.

What about cattle grazing and compaction? Grazing can result in compaction, yet compaction is rarely an issue in pastures grazed in conventional systems at normal stocking rates. Even in rotational grazing systems which concentrate large numbers of animals on smaller areas, there have not been concerns with compaction.

There are two primary reasons why compaction is not a major concern in grazing systems. First, established pastures generally have high organic matter levels, particularly in the surface 2 to 3 inches. High organic matter levels help resist compaction. In addition, pasture forages tend to have dense root systems which resist compaction. The second major reason compaction rarely becomes an issue in pastures is that the compaction caused by cattle grazing tends to be very shallow. This shallow compaction is easily eliminated by normal wetting/drying or freezing/thawing cycles in the soil.

What about equipment to address compaction in pastures? Machinery has been designed to help alleviate compaction; terminology like “pasture saver” or “pasture renovator” is used. Limited research in Kansas with equipment like this has not shown any consistent positive effects.

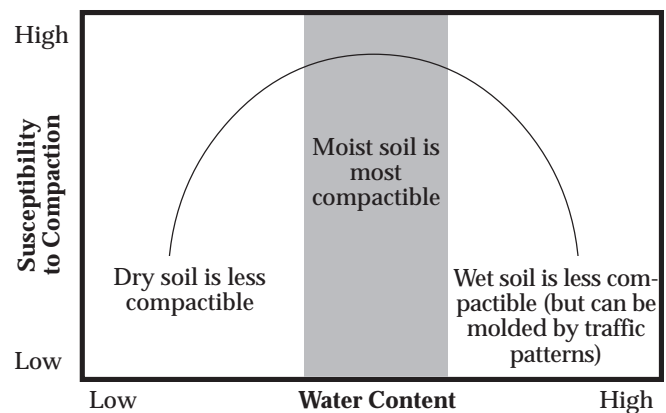


Figure 1

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