

No Harm to Soils When Cattle Graze Cover Crops

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A cow and calf grazing on a summer cover crop of pearl millet. ARS scientists conducted studies on cover crops and cattle grazing and found that moderate grazing does not significantly affect the amount of organic matter in the soil.

For years, some growers in the Southeast have used cover crops to reduce soil erosion, boost organic matter, and keep more moisture in soil. Combined with no-till production, cover crops are credited with sequestering more carbon in soil so that less of it is released as a greenhouse gas.

But more growers could be using cover crops.

Alan Franzluebbers, an ecologist in the Agricultural Research Service's Plant Science Research Unit in Raleigh, North Carolina, wanted to see if the use of cover crops could be encouraged by allowing cattle to graze cover crops. Conventional wisdom holds that grazing would remove the nitrogen and carbon otherwise left on the soil in the cover crop plant residue. Allowing cattle to tread on the soil could also compact it, preventing air and water from passing through the soil to reach plant roots. But if grazing wouldn't harm the soil, it might encourage more growers to try using cover crops.

Franzluebbers and his colleagues conducted a 7-year study to assess whether grazing cover crops at a site near Watkinsville, Georgia, affects the health of soils typical of the Piedmont region of the Southeast. They looked at growing winter and summer grains, with cover crops planted in the off-season for each

grain crop. They compared no-till versus tilling, and grazing versus no grazing. Cow/calf pairs were allowed to graze at a rate of one animal per 4 acres. The scientists took periodic samples of the soil to a depth of 1 foot.

The results showed that the relatively low rate of grazing did not significantly affect the amount of organic matter in soil and did not cause soil compaction. Additional studies should be conducted to determine a stocking threshold that increases compaction, Franzluebbers says. The findings also showed that cover crops make for high-quality forage. Organic matter lost by allowing cattle to graze on cover crops is likely made up in the organic input from manure. As in previous studies, the team found that using no-till generally keeps more carbon and nitrogen in soil than using conventional tillage.

The study was the first in the region to analyze these practices for such an extensive period, and that makes it important, Franzluebbers says. "Soil conditions can fluctuate year to year, and when it comes to something as lasting and significant as the health of the soil, it's important for us to have a comprehensive picture of the effects of these practices over an extended period," he says.—By **Dennis O'Brien**, ARS.