Grazing Cover Crops Improves Water Quality

Dr. David Wright, a professor of agronomy with the UF North Florida Research and Education Center, presented a recent seminar on how cover crops and cattle grazing are a BMP to following crops.

Cover crops in combination with cattle grazing can enhance soil health and improve nutrient storage. The combination also results in less irrigation and nutrients needed and enhances following crop yields. Some practices that are considered BMPs are: using a mixture of cover crops, conservation tillage, following a year-round cropping plan, planting perennial grasses where they work, following 4R guidelines for fertilizer and manure, using proper irrigation methods, planting legumes as a part of cover crop mixes prior to non-legume crops, and filtering water (with terraces, grass waterways, filter strips, etc.). Grazing cover crops benefits soil health, promotes soil microbial population, and recycles nutrients for following crops.

Ryegrass and millet are good options for cover crops that are needed for a short period (3-6 weeks). Both covers can be

planted with shallow tillage even though biomass will not be high over a 3 to 6-week duration, but its established root system prevents erosion. Ryegrass is an inexpensive cover crop and can be planted year-round (mostly used in the fall and winter) but must be watered as it warms toward summer because it cannot survive hot and dry conditions. Millet will sprout with heavy dew and establishes a root system quickly (although not much biomass in 3-6 weeks). A frost will kill millet and it along with ryegrass are good for chean

Winter grazing prior to planting peanuts and cotton leads to doubling of root mass (larger and deeper) as compared to non-grazed cover crop and 40-70% less

along with ryegrass are good for cheap, short-term cover crops.

grazed cover crop and 40-70% less irrigation as well as less N and K and other nutrients needed. Photo by Dr. David Wright.

Cover crops should be chosen carefully based on what crop will be planted afterwards and what you want the cover crop to do. If you want the cover crop to release nutrients quickly, kill the cover crop in the vegetative stage or use a legume in the mix. If you want a cover crop to moderate soil temperatures later in the season, you may want to let the cover crop grow to near maturity before killing and use cover crops like rye, which has a high C:N ration at maturity. Brassicas like forage radishes are useful for reducing nematodes, scavenging nutrients, preventing leaching in soil profile, and breaking compaction layers in the soil. However, certain cover crops like ryegrass, which is one of the most nutritious of cover crops for animal grazing, is known to reduce yield of certain crops like cotton and peanut as compared to oat and rye cover crop mixes because of its competitive nature and perhaps of allelopathic properties.

Cover crop biomass is most beneficial to slow erosion and moderate soil temperatures as well as aid water infiltration, while roots aids soil health from added organic matter. They also boost soil microbial population and soil structure while slowing erosion.

A long-term systems trial has been in effect for the past 20 years at the NFREC Marianna where cattle grazing winter cover crops of oat/rye has been shown to be a BMP for following crops. Winter grazing before planting peanuts and cotton leads to doubling root mass of these crops as compared to planting into non-grazed cover crops which then requires 40-70% less irrigation along with 30-50% less nitrogen needs for cotton. Cotton yield is often 150-400 lbs. higher following grazed cover crops vs. non-grazed cover crops. Grazing results in roots of following crops to grow deeper and faster, which results in better drought tolerance. This has shown up in peanut as having less aflatoxin. A high adoption rate of grazing cover crops ahead of summer crops in areas where irrigation is prevalent would result in higher spring flows, according to models. Maintaining high spring flows in Florida would result in less nitrates due to dilution alone. Our data shows less applied N is needed after winter grazing due to recycled nutrients by livestock which would further reduce nitrates in ground water.

Grazing cover crops improves water quality because it conserves water, reduces nitrogen needs, protects stream water levels, reduces leaching from rain and irrigation, lowers discharge of nutrients and pesticides into streams, and reduces soil movement. Farmers also enjoy reduced risk in their operation because of increased

movement. Farmers also enjoy reduced risk in their operation because of increased yields and quality and reduced inputs. Both crop growers and cattlemen benefit from this arrangement because crop yields are higher, and calves gain more weight due to higher quality and more abundant forage.

Even though there are many benefits that result from adopting these BMPs (especially grazing cover crops ahead of summer row crops), some farmers are deterred due to costs of building infrastructure such as fencing or water wells for cattle or purchasing expensive cover crop mixes. Approximately 10% of producers are currently implementing this BMP. IFAS is working to find ways to assist farmers in adopting these BMPs through increased incentives funding and developing better infrastructure for the project. Farmers that see how grazed cover crops are benefitting following crops and viewing the results of research along with incentives for building infrastructure will improve the rate of adoption by other farmers.

Questions about grazing cover crops can be directed to Dr. David Wright. Watch the recording of his webinar. View the PDF of his presentation.

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