Grasslands, Part of the Solution

by Matt Booher, Virginia Cooperative Extension

Let's talk about beef cattle, the environment, and climate change. Are you cringing at the words yet?

A lot of times agriculture comes under attack for the impact it has on the environment, and a lot of times the knee jerk response is to deny it, or to attack someone else.

The reality is that beef cattle on the landscape can be a potential contributor to environmental problems—it depends on how they are managed. The best response to blanket criticism may be simply to offer a more complete picture that shows how livestock can be part of the solution to our environmental problems when managed responsibly and with careful stewardship of our land and water resources.

Farms that have fenced cattle out of streams and created a grass or tree-covered buffer along the streams are credited with filtering up to 60% of nutrient pollutants from surface and shallow groundwater flows.

Consider some of the facts:

Virginia has almost 1 million pasture acres of pastureland. According to Virginia's latest implementation report, almost a quarter of Virginia pasture acres are currently using pasture rest and rotation as part of planned grazing.

This particular practice is credited with reducing soil erosion and nutrient loss by up to 40% compared to continuous grazing where cattle are not rotated in a timely manner.

Rotational grazing also improves plant growth, builds soil, and enables soils to hold more water—adding resilience against drought.

Have you seen farms that have fenced cattle out of streams, creating a grass or tree-covered buffer along the stream?

These buffers are credited with filtering up to 60% of nutrient pollutants from surface and shallow groundwater flows.

Fencing cattle out of the creek and using simple rotational grazing can greatly reduce the nutrient pollution and soil erosion that cause so many problems for water quality downstream.

Streamside grass or forested buffers also create and protect habitat for wildlife like brook trout, waterfowl, and pollinators. An increasing number of farms use practices that enhance upland wildlife habitat as well, such as leaving vegetative fencerows in place, or deferring hay harvest until mid-July so that ground-nesting birds can fledge their young.

You may have already had a sense of how pastureland can and is being managed to minimize water pollution and help wildlife, but what about that big wildcard—climate change?

As you may know, climate change is centered around greenhouse gas emissions—our carbon footprint it is often called.

You've probably heard that beef cows are one of the biggest producers of the greenhouse gas methane, and that production and transport of feed and livestock contributes significant amounts of carbon dioxide, another greenhouse gas. These things cannot be denied, but they need to be put into perspective.

The U.S. EPA reports that beef production in the United States annually produces about 246 million metric tons of greenhouse gases. This is about 1/10 of what the U.S. transportation sector produces by using fossil fuels.

To put this in a global perspective, the United States produces about 20% of the world's beef supply and emits less than 1% of all human-caused greenhouse gases. About 1/3 of the greenhouse gas emissions produced by the beef industry in North America and here in the U.S. are the result of fertilizing, processing, and transporting feeds.

The message here is that strategies that extend the grazing season—such as stockpiling pasture and rotational grazing—not only reduce feed costs, but also help to mitigate climate change.

Does this mean supplementing cattle with grain or grain byproducts should be avoided at all cost? Not necessarily.

While the production of grain and harvested feeds emit greenhouse gases, these feeds are also more easily digested by cattle, which means that they produce less methane, in addition to being an important option to provide energy in the diet.

This means that feed supplementation often serves a strategic role in boosting the nutrition of livestock with special needs, such as lactating cattle or animals grazing poor quality pasture.

From a global perspective this kind of strategic use of feed supplementation is an important catalyst to ensure livestock grow and reproduce efficiently.

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The United Nations has identified higher quality feeds as one of the largest potential sources of greenhouse gas reductions globally. They also cite optimizing herd health, reproductive efficiency, and genetics as critical parts of reducing greenhouse gas emissions, which is surprising to some people.

Similarly, a common misconception is that the transportation of beef from farm to feedlot and retail point is a major contributor of climate change. Seems logical, but according to the United Nations assessment of emissions, transportation between farm and retail points represents less than 1% of greenhouse gases produced by the North American beef industry.

This information suggests that, despite the temptation to find a blanket solution by "going back to the old ways of doing things," the science shows that many of our modern technologies, production, and supply chain efficiencies allow us to minimize our impact on climate change.

So, while we should look for ways to reduce our carbon footprint when raising beef cattle, we should be reminded to be careful not to throw out the baby with the bathwater.

There are many other practices that are a flat win-win for livestock producers and their carbon footprints.

Well-managed pastures can be a carbon sink—meaning they actually capture and store carbon in the soil.

For example, a 10-acre pasture which practices rotational grazing and has replaced the use of nitrogen fertilizer with clover captures enough carbon to offset the greenhouse gases produced annually by four passenger vehicles.

Planting an acre of trees on a farm is the equivalent of annually removing three cars from the road.

The bottom line is that in addition to producing nutritious protein, our pastures and beef cattle can also be managed to filter water, promote wildlife, and capture carbon if we act as good managers and careful stewards.

Extending the Sheep Grazing Season Using Brassicas

by John Benner, Virginia Cooperative Extension Graze 300 team, and Alston Horn, Chesapeake Bay Foundation

One option to providing fall and winter forage is to incorporate winter annuals into a grazing system.

Winter annuals can make more efficient use of moisture, while providing greater yields over cool season grasses.

For sheep, brassicas such as turnips, rape, and kohlrabi can provide significant supplemental forage during the fall and early winter.

This article summarizes a grazing demonstration using turnips to extend the sheep grazing season at Shamoka Run Farm.

When using annuals in a grazing system we must first determine what percentage of acreage we would like to dedicate to annual plantings, and how often we will use them.

A general recommendation is to have no more than 10-20% of total grazeable acres dedicated to annual forages.

At Shamoka Run Farm, two pastures are used for annual crops. In the spring, warm season annuals utilizing pearl millet, buckwheat, partridge peas, and sunflower are planted for summer grazing.

In the fall, forage turnips and sometimes ryegrass are planted for fall and winter grazing.

Figures 1 and 2: Forage turnip field on November 3, 2022.

This year, we elected to plant only turnips to help keep seed costs low, as well as increase overall turnip vegetative yield. We expect to plant a summer mix in the field this spring.

In July we soil sampled a 7-acre annual field, at which time was planted with pearl millet. The millet was cut for hay in early August.

The soil test indicated fertility was adequate. To terminate the millet, glyphosate was applied after the hay cutting at a cost of $15 per acre ($105 total).

On August 19, 2022, we successfully planted a generic forage turnip at a rate of 4.5 pounds per acre.

We calculated seeding costs using a $5.80 per pound forage turnip cost, which gave us a seed cost of $26.10 per acre, or $182 in total.

We assumed $15 per hour of producer labor, and total time invested in seeding at 6 hours, for a total of $90 in labor costs.

We further assumed a drill rental cost of $100 per day. Thus, our total establishment cost was $105+$182+$90+$100=$477. On a per acre basis, our costs were $68 per acre.

Turnips were sampled for dry matter yield and nutrient content on November 3, after 76 days of growth (see Figures 1 & 2). Forage samples were clipped from a 1/10000-frame and dried in a forage drier.

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