AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Cattle and Forages Can Play a Vital Role in Sustainable Agriculture

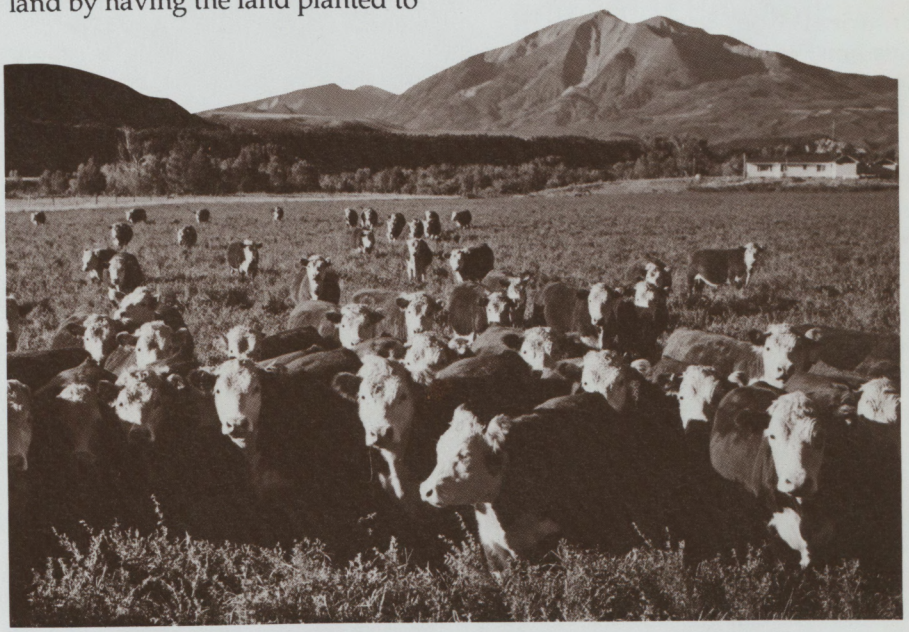
Ronald A. Gustafson
(202) 219-1285

Beef cattle grazing on forages can play an important role in a "sustainable" agriculture system—one that minimizes farming's impact on nonrenewable natural resources while providing adequate supplies of food and fiber.

Forages and beef cattle were once an important element in a more diversified agriculture, which used crop rotations instead of synthetic fertilizers and pesticides to maintain soil fertility, break pest cycles, as well as retain soil moisture. But in response to expanded export grain demand at favorable prices in the 1970's, farmers shifted land from production of soil-conserving forages to more erosive crops—primarily corn, soybeans, and wheat. This shift to a single crop or rotations involving only row crops was made possible with heavier use of fertilizers, herbicides, and insecticides.

While such production practices have provided shortrun profits, questions about long-term sustainability arose. Increased environmental awareness brings renewed concerns about soil erosion, fertilizer and pesticide contamination of drinking water, and pesticide residues in foods. And when lower exports pushed down grain and oilseed prices, the short-term profitability of intensive row crop agriculture disappeared.

The Federal Government responded to low profitability and environmental concerns with policies that reduced grain and oilseed production on the most erodible land by having the land planted to conserving uses, such as forages. The Government also began funding research on alternative crop production methods, including forage in crop rotations, to reduce farmers' reliance on fertilizers and pesticides. With increased emphasis on forage, cattle have an important role in maintaining an economically and environmentally sound agricultural production system.



Improved pastures sustain beef production while conserving soil and water resources.

The author is an agricultural economist in the Commodity Economics Division, Economic Research Service, USDA.

Forages Are Important

About 1.2 billion acres in the 48 contiguous States, or 64 percent of the total land area, is in agricultural uses. Much of this land, however, cannot support continuous crop (grains and oilseeds) production. Inadequate moisture conditions, poor quality soils, rocky soils, or soils on steep slopes limit the potential for producing crops. Only 38 percent of agriculture's land base is considered cropland—that is, suitable for crop production. Most of this land is concentrated in the Midwest. The remaining agricultural land is better adapted for grazing, with 49 percent open grassland pasture or range and 13 percent grazed forested land.

Forages can play a critical role in maintaining soil productivity, even on cropland acreage. Forage cover protects the soil from wind and water erosion. When decomposed, forages provide organic matter—an important component of soil productivity. Deep-rooted forages bring soil nutrients to the surface, where they can be used by succeeding crops. Leguminous forages add nitrogen, an important plant nutrient, to the soil. Forages use excess soil nutrients from fertilizers applied to previous row crops and prevent the nutrients from leaching into groundwater supplies. When part of a crop rotation, forages help disrupt the natural cycle of weeds and insects, reducing the need for pesticides.

Government Programs Increase Forage Production

The Conservation Reserve Program (CRP), authorized in the 1985 farm bill, has the dual purpose of reducing excess grain and oilseed production and reducing the quantity of soil eroded from the land. CRP idles highly erodible farmland from producing crops for a period of 10 years. The land is diverted into conserving uses, such as forages or trees. Farmers are not allowed to harvest or graze CRP land, except during emergency drought periods. In return, farmers receive annual rents to compensate for lost production and half the cost of establishing a cover crop.

By the spring of 1991, nearly 34.5 million acres of the 40-45 million goal were enrolled in the program. CRP acreage is concentrated in the winter wheat growing areas of the Great Plains and the small grains areas of the North Central region, particularly the western Corn Belt.

Participation in Government commodity support programs (annual set-aside acres) also requires farmers to idle cropland and usually requires some type of forage cover crop. Like CRP land, set-aside acres are concentrated in the North Central and Great Plains regions.

Beef Cattle Are Efficient Meat Converters

Beef cattle are not wasteful users of feed grains and protein meals (concentrated feedstuffs), as is sometimes argued. Only about 20 percent of the concentrated feedstuffs fed to livestock goes to beef cattle. Unlike simple-stomached hogs and poultry, beef can be produced with little or no concentrates.

Misused feed-conversion statistics often imply that beef uses most of the concentrates fed to livestock and poultry, and that beef is less efficient in converting grains into meat. Concentrates actually account for only a small portion of the feed used in cattle production. Less than 2 pounds of concentrates are used per pound of live-weight beef produced, which is lower than for hogs or broilers.

Concentrates used in finishing (fattening) cattle produce the tender product consumers prefer, although there is disagreement about the amount of desired finish or fat. Using concentrates during the finishing phase of beef production increases the daily weight gain enough to significantly reduce nonfeed costs per unit of beef produced.

Beef cattle have the flexibility to use varying combinations of concentrates and forages, as cost dictates, including straight forages—a flexibility not available in hog or broiler production.

Much of the forage fed to cattle comes from crop residues and vast lands with limited or no alternative agricultural use. Thus, beef production tends not to compete for resources usable in the production of either concentrate feeds for other livestock or crops for human food. To use this land for food production, it will have to be grazed by cattle or some other ruminant.

Grazing Can Benefit Forest Wildlife

When improperly managed, cattle grazing in forests or woodlots destroy plants that provide food and cover for wildlife, increase soil erosion, and even kill mature trees. But with proper management, grazing can actually increase plant diversity when compared with ungrazed woodlots, reports Ann Dennis of the Illinois Department of Energy and Natural Resources in *The New Farm*.

Using woodlots as shelter during the winter causes much of the damage cattle do to forests. Preventing access to woodlots during the winter months reduces grazing damage to forests. Dennis found that limiting cattle access to woodlots to just the summer months increased forest plant species, which improved wildlife habitat. She speculates that cattle disturbing the forest litter layer released some species that were being suppressed by the forest cover.

—Stephen L. Ott

Concept of Sustainability Introduced

The 1990 farm bill broadened the conservation program beyond removing marginal cropland from row crop production and introduced the concept of sustainability. Agricultural sustainability means production systems provide adequate supplies of food and fiber at prices acceptable to farmers and consumers. Production is attained by using techniques, such as crop rotations with forages, that limit the use of nonrenewable resources in order to minimize environmental impacts.

But, while forages help enhance environmental quality and maintain long-term soil productivity, forages themselves do not contribute directly to human food or fiber needs. People, pigs, and poultry have simple stomachs and thus cannot digest large quantities of forage material. Only ruminants, such as cattle, sheep, and goats, can convert forages into food (meat and milk) for humans. Thus, when fed to ruminants, forages contribute to human food needs and to the economic well-being of farmers.

Cattle Production Becoming More Efficient

Beef production has remained fairly static at about 23 billion pounds per year, while the number of cows, and thus calves born, declined. Beef production has been maintained by marketing a larger proportion of the steer and heifer supply through feedlots, including a larger number of calves that were formerly slaughtered for veal. By 1990, nearly 80 percent of commercial cattle slaughter was comprised of feedlot-fed steers and heifers. The remaining slaughter consisted of cull bulls, stags, beef cows, and dairy cows. As more animals were sent to feedlots, slaughter weights rose, producing heavier and higher yielding carcasses than cull breeding stock.

Though a greater proportion of slaughtered animals come from feedlots and they are being fed to heavier weights, there has been little change in the total amount of grain fed to cattle. Beef calves today are weaned at much heavier weights and are increasingly kept on pasture to even heavier weights before being placed on feed. Improved genetics and feeding technology helped increase feed efficiency. Consequently, the amount of grain fed per pound of beef produced has declined as beef cattle are becoming leaner and more efficient.

Future Trends

Increased forage supplies will be needed by the late 1990's. Cattle numbers are slowly increasing from their 1989 low; weaned calves (stocker-feeders) are being grown on pastures to heavier weights before being placed on feed; and grazing on public lands in the West is becoming more controversial. (Some debates include: the number of cattle that a particular area can sustain without damaging the envi-

ronment, and the fees the Government charges for the right to graze the land.)

While a major source of forage production is land dedicated to permanent pastures and ranges, millions of additional acres will become available when CRP contracts expire. Cattle ranchers will be under intense scrutiny as to how they use these forage-producing lands. Conservationists, environmentalists, and others will be monitoring the industry for environmentally sound production practices. Ranchers will have to integrate not only the needs of their livestock, but also conservation and wildlife needs, when developing operating plans for their farms and ranches. This will likely require more detailed stocking plans, possibly with a broader mix of cow-calf-yearling and/or stocker cattle activities to allow for cattle inventory adjustments. These adjustments become particularly important during a drought, when forage growth is reduced.

There is some uncertainty, however, as to how farmers will use the CRP land as it starts becoming available in 1996. For example, will it remain in forage production, or will the forage cover be plowed under and crops be planted? A recent survey by the Soil and Water Conservation Society and USDA indicates that nearly half of CRP program participants have made plans on how their CRP lands will be used. More than 51 percent of the survey participants with plans indicated that they expect to leave the land either in grass for livestock forage, in trees, or in wildlife habitat. Another third plan to convert the land back into crop production under an approved conservation compliance plan. But planting intentions can change. The majority of farmers said economic considerations will be the primary deciding factor. The higher the crop prices, the greater the acreage going out of forage production and into growing crops. However, farmers indicated that special consideration would be given to the acreage most vulnerable to soil erosion, implying the most erodible land likely will remain in forages.

Implications of CRP Acreage Availability

Land coming out of CRP enrollment will expand forage production. Most CRP land is more productive than that currently in cropland pastures. And, CRP acreage is being rejuvenated over the 10-year enrollment period. So if only 10-15 million acres of the 35-40 million acres ultimately enrolled in the CRP remain in forage for grazing or hay production, total forage production should greatly expand beyond that provided by the existing 65 million acres of cropland pasture.

The North Central region—with much of the CRP land and with abundant feed supplies from crop residues and current pastures—can greatly expand its forage-based cattle production. The North Central region receives adequate rainfall, allowing highly productive plant species with high nutritive values, such as legumes, to grow well. With such highly productive pastures, North Central farmers may choose to focus on adding weight to stocker cattle instead of expanding cow-calf herds. The stocker cattle could come from areas with shorter grazing seasons, such as the intermountain areas or other areas where stocker operations are not practical. Thus, by using crop-pasture rotations, intensive and controlled grazing plans, and improved forage management, farmers in the North Central region can increase the beef supply while improving the environment. ■