



The Grass is Always Greener

Manure Generated by Cattle Enhances Gardens and Landscapes

Sunny and dry Colorado offers a great environment for raising cattle but can be a challenging place for growing a lawn. Colorado State University professor of soil science and Cooperative Extension soil specialist Jessica Davis, associate professor of turfgrass science and management Yaling Qian, and professor of animal science and Extension feedlot specialist Tim Stanton are working together to show exactly how the manure generated by cattle can enhance suburban gardens and landscapes. (Pictured from left are Qian, Davis, and Stanton.)

Nearly 89,000 acres of agricultural land are developed along Colorado's Front Range annually, and about one-third of this area, or 29,653 acres, is estimated to be planted with turf every year. Front Range soils naturally tend to be heavy and clayey, and are easily compacted during construction. They also tend to lose their topsoil, making them very difficult to landscape or garden. Compost can help restore these soils. "Composted manure is great for landscaping," Davis says. "Turf represents one potential high-value use for composted manure."

Davis and Qian, along with graduate student Grant Johnson, are studying the benefits of using manure as top dressing on turfgrass. They have concluded that compost application at a rate of 35 cubic yards per acre improved turf quality and increased clipping yield over no treatment at all, and two annual applications of manure at this level eliminated the need for synthetic fertilizer to maintain a good-looking lawn. As manure and compost are the best natural, organic sources of phosphorus for Colorado's high pH (basic) soils, applying composted manure rather than chemical fertilizers could be a very attractive

lawn care option for consumers interested in organic products.

The research team also is investigating how turfgrass top-dressed with composted manure responds to drought. A dry period was imposed on the turfgrass test plots. One week after the dry period had started, plots treated with 35 cubic yards per acre of compost had higher levels of soil moisture and lower turfgrass canopy temperature than untreated plots. The compost increased soil water-holding capacity and reduced drought stress on established turf. The compost treatments even helped one variety of turf, a drought-sensitive bluegrass, to maintain its quality during the simulated dry spell. "These beneficial results have important implications in Colorado, where water conservation is of critical importance," Davis says. "Homeowners and turf managers can conserve water and save money on their water bills."

To make manure safe for use in the landscape, it must be composted. "Composting is a managed microbial process," Davis explains. "The microbes need carbon, nitrogen, water, and oxygen in order to compost well. When the composting process proceeds correctly, temperatures will rise to 140 to 150 degrees Fahrenheit. These high temperatures kill pathogens and weed seeds in the manure. The entire composting process can take up to six months, depending on the intensity of the management."

However, even when composted correctly, some manure sources are better than others. Due to the diets of some animals in feedlots, some composts have relatively high levels of salt that can hinder seed germination and slow plant growth. The Colorado State University research team is addressing the problems

Homeowners
and turf
managers can
conserve water
and save money
on their water
bills.

**Colorado
State**
University

Knowledge to Go Places

posed by salts in manure. Stanton uses his role as Extension feedlot specialist to explore methods of reducing the amount of sodium in manure by changing the diets of cattle in the feedlot. The industry standard is to supplement the food of feedlot cattle with 0.25 percent sodium chloride. Stanton and the team compared cattle treated in this standard way with cattle that were given no sodium chloride, cattle that were offered free access to a salt block, and cattle that were given a 0.125 percent sodium chloride supplement. After feeding on these diets for six months, the cattle were harvested, and their carcasses were evaluated. The cattle with the different amounts of sodium chloride in their diets performed the same as the cattle fed the standard supplement when evaluated by average daily gain, feed intake, and feed efficiency. However, the sodium levels in the manure were significantly reduced by lowering the sodium chloride levels in the food fed to



the cattle. Therefore, removing salt from the rations of feedlot cattle could reduce sodium levels in manure and increase the horticultural value of manure without having detrimental impacts on cattle performance.

As the benefits of composted manure are proven to homeowners and landscape professionals, it is Davis' hope that the market for compost may rise, giving feedlot operators and small-acreage horse owners an incentive to compost manure. Manure shouldn't be a disposal problem as it sometimes is now, particularly when it has such high potential to keep urban and suburban landscapes beautiful.

– Leslie Patterson

Annual Report, 2004

Cooperative Extension
Colorado State University
01 Administration Building
4040 Campus Delivery
Fort Collins, CO 80523-4040

www.ext.colostate.edu
Phone: (970) 491-6281
FAX: (970) 491-6208

Agricultural Experiment
Station

Colorado State University
16 Administration Building
3001 Campus Delivery
Fort Collins, CO 80523-3001

www.colostate.edu/Depts/AES
Phone: (970) 491-5371
FAX: (970) 491-7396

Colorado State University Collaborates with Composters

In the past year, a group of local composters has joined together to form the Rocky Mountain Organics Council (RMOC). Their first order of business has been to develop compost quality standards to help consumers evaluate a compost and its potential uses.

Salinity levels are one of the key factors in evaluating compost quality. When salinity levels are too high, the RMOC recommends that compost not be used on salt-sensitive plants, like ornamentals. Another factor that contributes to compost quality is compost maturity, which is measured through both carbon to nitrogen ratio and germination tests.

Colorado State University has been at the table with RMOC aiding in the development of the quality grades from the start. In addition, research associate Kathy Doesken has just finished drafting a fact sheet on the compost grading system for consumers, and research associate Addy Elliott is planning a workshop to train composters and agricultural professionals in February. Colorado State and RMOC also are working together to seek funding for additional research in the area of compost quality and use. The relationship between Colorado State and RMOC is just one example of how the University supports partnerships to encourage local businesses and agricultural sustainability.

For more information on RMOC, visit the Web site at <http://www.cafr.org/membership/rmoc.htm>.