

How to use organic fertilizers and herbicides in pastures

Donald Lester for *Progressive Forage Grower*

The organic market is growing in size and scope. In 2008 the sales of organic foods reached \$22.9 billion, which represented 17.1 percent growth for the market. This impressive growth took place despite the economic turmoil last year, indicating an on-going dedication to organics by consumers. The number of farmland acres certified as organic in the U.S. rose from 850,000 in 1997 to 4 million in 2005. Of the 4 million acres, 2.3 million acres were organic rangeland and pasture.

Two types of organics

The public is often confused by the use of the term "organic," especially when it comes to fertilizing materials. In chemistry the term "organic" means that the material contains carbon. This is quite different from the U.S. Department of Agriculture (USDA) regulated term describing materials that are not synthetically produced, contain no genetically modified organisms, no human pathogens or sewer sludge and other assurances.

When deciding on an organic material to apply, check to make sure it is certified by one of the organic certifying agencies. The USDA oversees the National Organic



With the ever-growing movement of environmental awareness, soil health has become a primary concern.

Photo by **FG** staff.

Program (NOP). This organization authorizes some 45 organizations to actually certify growers and organic material suppliers.

Organic fertilizers

Arguably the most limiting nutrient in pastures and hay fields is

nitrogen. Most organic producers use compost or manure to provide plants an available source of nitrogen, but this is generally not practical in large-scale operations. Large producers often add supplemental nitrogen using commercial organic N-P-K fertilizers, but the nitrogen content

in these products is often very low. Recently the organic rules have changed so that any organic fertilizer with a nitrogen content greater than 3 percent is now considered to be a high nitrogen organic fertilizer. There

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are literally dozens of formulations on the market to choose from.

With the ever-growing movement of environmental awareness, soil health has become a primary concern. In an effort to maintain healthy soils the market offers several biologically-based fertilizers. Some of these products are biological organisms that break down and free up nutrients for the plant. Others are extracts of biological fermentations that provide essential nutrients. These microorganisms often occur naturally in the soil, but their populations are reduced from the use of strong chemicals and soil disturbances or tillage. Restoring these beneficial bacteria and fungi to your pasture can help prevent root diseases and often adds a measure of added drought resistance to

the grasses. Biologicals have been around for many years but the old formulations required refrigeration and had a short shelf life. Today's biological products have shelf lives of up to two years and come in easy-to-use powder or liquid formulations.

Organic herbicides

Perhaps the most challenging problem to having an organic pasture is controlling weeds. Little research has been done to identify the most effective ways to control weeds in pastures after ceasing traditional weed management practices and converting to organic methods. Tillage operations can decrease the quality of organic matter of soil, so few organic farmers prefer it. There are only a few types of organic herbicides available on the market. All are non-selective, post-emergence products.

The first type of organic herbicide is the vinegar-based or acetic acid products. Vinegar products get a lot of press these days. But commercial vinegar is commonly available at only 5 percent concentration. Typical field studies show that 20 percent acetic acid is most effective in killing weeds. At this concentration the material is hazardous to breathe and handle because it will burn skin. Moreover, this high concentration is not allowed by the U.S. Environmental Protection Agency (EPA), which regulates pesticides. And due to the high cost of registration, manufacturers are hesitant to go through the lengthy and costly process for a relatively inexpensive material.

The second type of organic herbicide is the oil-based products, including clove oil (eugenol). Besides being an organic weed killer, you might be interested to know that clove oil was used in dentistry as a numbing agent before the advent of novocaine. Clove oil is still used today in some teething gels for children. But in plants, the mode of action is a contact burn, meaning that whatever the oil-based product touches will burn, much like an acid does on skin. The oil melts the waxy coating on leaves, rendering the tissues susceptible to rapid dehydration.

So, they are not meant to be over-the-top application materials. They are designed more for spot treatments, bare ground, right-of-ways, border areas and between-the-row applications. These products are not systemic and do not migrate into the plant and travel to the roots. Therefore, the best you can do is burn off the top of the plant.

In general, plants less than six inches tall have a weaker root system than taller plants. Treating the smaller plants provides a better chance of killing the weed. This is true with annual weeds. Grasses and perennial weeds will only be set back for a few weeks until re-growth from the roots occurs. Often in the spring this window of time allows a crop or pasture to out-compete any newly emerging weeds that may appear after application.



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Safety

The vinegar products can be a hazard to handle and use, but the clove oil preparations are much safer. One day I had a customer call in a panic saying that her son had sprayed a clove oil-based herbicide into his mouth. She was asking whether she should take him to the emergency room, induce vomiting or call the poison control center. I calmed her down and told her the product contained food-grade ingredients. This particular product was a mixture of cinnamon oil and clove oil. I told her the boy was screaming because his mouth was burning from the cinnamon oil – the central ingredient in hot cinnamon candies. I told her to wait awhile and the clove oil would kick in to numb his mouth. Later she called back and said that the boy was quiet and happy but drooling like a dog.

Growing with organics

The politicians, the public and the market are all moving toward organics. Understanding the use of natural fertilizer materials and supplemental organic fertilizers, as well as the weed control products available for use in organic systems, will help producers adjust to this new environment. **FG**

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