

# Amazing Graze Acres

## *Kalkaska, Michigan*



### Case Study

*Agricultural pollution prevention is defined as source reduction, reuse, or environmentally sound recycling and other prevention activities including nonpoint source approaches.*

#### **A Desire to Improve Their Quality of Life**

George and Sally Shetler have been farmers for the past 25 years, and the last decade has been a time of many changes for the Shetler's Amazing Graze Acres dairy and beef cattle operation. The Shetlers adopted a more sustainable system of production on their 40-cow dairy farm to improve their quality of life, improve the health of their herd, increase the farm's profitability, protect the environment, and address a future labor shortage. The emphasis has been on reducing the need to purchase nonfarm-produced inputs such as chemicals, fertilizers, machines, electricity, and fuel.

In 1991, the Shetler's started an Intensive Rotational Grazing Project to compare the production costs and long-term fertility of grazed and conventionally harvested fields in a dairy operation. George Shetler also evaluated intensive rotational grazing as a way to reduce labor costs, electricity use, and supplemental feed costs during the summer months. Under intensive rotational grazing, cows are herded into a field and feed on the forage. In the first year of the project, the Shetlers fenced off approximately 50-60 acres of the farm into ten-acre paddocks. These paddocks were grazed at one-acre intervals and movable fencing allowed new grazing areas to be opened twice a day.

The initial results, when compared to 1990 under a corn-based feeding system, were



*The Shetlers*

promising. Cows performed well all season but did not match production levels achieved in 1990; however, the operation experienced decreases in electricity usage and supplemental feed costs (see Figures 1 & 2). Labor and machinery costs dropped from \$99.60 per acre

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July 1999 • #9813



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under the conventional system to \$34.34 per acre under an intensive rotational grazing system. Finally, in 1995 the net farm income on the grazed herd was \$431 per cow compared to \$397 for the conventionally fed herd. From an environmental perspective, source reduction was realized as no fertilizer, herbicides, or insecticides were applied in the fields that were planted with forage. In addition, the Shetlers experienced a decrease in tractor

Since 1991, the Shetlers have experimented with different types of grazing grasses and integration of small grain crops (oats and rye) in an effort to fine-tune their system. The entire 275-acre farm is now devoted entirely to forage and the Shetlers do not plan to return to corn in the future.

**Pollution Prevention Through Manure Composting**

Recently, the Shetlers started a manure composting project on their farm. The composting project is a wintertime activity for the Shetlers since their dairy cows graze during the summer months. The Shetler's on-farm composting begins with a mixture of manure from the dairy barn and vegetative materials high in carbon. The main source of carbon comes from the type of bedding the Shetlers use for their animals. Previously, they used shredded newspaper and now are using sawdust.

Supplemental Feed Costs

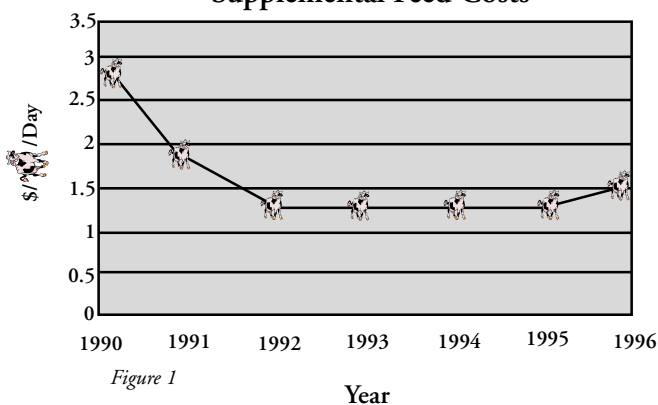


Figure 1

Electricity Use

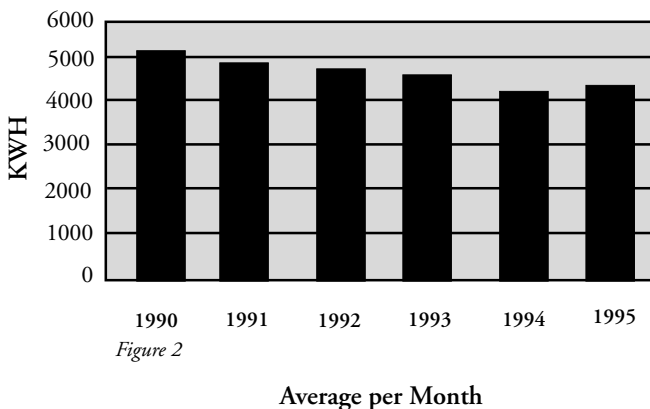


Figure 2

usage and fuel consumption compared to the previous corn-based feeding system. Also, under intensive rotational grazing, there was no need for tillage of the soil. This translated into a decrease in soil erosion from the Shetler's farming practices (refer to Figure 3).



Next, the compost piles are placed in rows of various lengths. A typical row is 4 to 6-feet wide, and 600-900 yards in length. Piles are turned over periodically with a commercial compost turner that is leased from a northern Michigan waste hauling company. Turning the piles over increases oxygenation, stimulating biological activity and making for a more completely composted, higher quality product.

Recycling manure has provided numerous economic and environmental benefits for the Shetler dairy operation. They have found that in the long run, composting saves their farm time and labor (see Figure 3). The Shetlers report that their labor requirements for manure handling decreased nearly 50 percent. They attribute the economic savings to the reduced

<b><i>Intensive Rotational Grazing May Reduce . . .</i></b>
<ol style="list-style-type: none"> <li>1. Soil erosion</li> <li>2. Petroleum use</li> <li>3. Electricity use</li> <li>4. Labor use</li> <li>5. Pesticide use</li> <li>6. Fertilizer use</li> </ol>
<b><i>Manure Composting May Reduce . . .</i></b>
<ol style="list-style-type: none"> <li>1. Odors</li> <li>2. Nitrogen leaching into groundwater</li> <li>3. Petroleum use</li> <li>4. Phosphorous loading into surface water</li> <li>5. Labor use</li> <li>6. Manure handling costs</li> </ol>

Figure 3

volume of manure that needs to be hauled. The Shetlers also report that the compost is lighter and easier to handle than manure, is nearly odorless, and has increased the organic matter content of the soil. In addition, fewer trips across a field with smaller machinery helped reduce soil compaction and led to a reduction in crop damage versus the previous manure spreading practices.

To ensure that manure composting remains environmentally friendly, the Shetlers rotate the

site of their piles to reduce phosphorus concentrations under each site. Moreover, potentially harmful runoff from the piles is contained because the piles are placed in the forage fields that utilize runoff nutrients.

Eight years after undertaking their first project, the Shetlers continue to remain profitable. Most recently they have decided to begin bottling and selling their near-organic milk. Although the milk will not be certified organic, it will be labeled antibiotic-free and hormone-free. An overwhelming positive response to a survey mailed to natural foods stores within a 60-mile radius encouraged the Shetlers to pursue this venture.

Behind the success of Amazing Graze Acres was the belief that whole-farm planning and a systems approach to daily operating activities would help them realize their goals. In making decisions, the Shetlers focused on improving the quality of life for themselves as well as their neighbors. Improvements have been achieved. Intensive rotational grazing as a pollution prevention technique reduced soil erosion and petroleum and electricity use. Manure composting decreased petroleum use and reduced manure odor. The sum of their activities yielded a more sustainable operation and a healthier environment for everyone.

### Key Components of the Composting Process

1. **Carbon and Nitrogen:** *In farm compost, carbon comes from a plant source and nitrogen from manure. For compost microorganisms to operate effectively, the ideal ratio is 25-35 parts carbon to 1 part nitrogen. The carbon source also reduces nitrogen loss during composting.*
2. **Moisture and Air:** *Effective composting requires adequate amounts of water and oxygen. Too little or too much of either results in nutrient loss. A good comparison for ideal moisture content can be made with proper silage.*
3. **Temperature:** *In order to kill weed seeds or pathogens, temperatures in the pile must reach 140 degrees Fahrenheit (60C). A low temperature indicates that a pile is not working, needs turning, or is finished composting. A high temperature may indicate deficient moisture levels, too much nitrogen, or too much carbon. Temperatures can be monitored with two or three-foot long thermometers.*

This publication was developed in partnership with the Michigan Agricultural Stewardship Association (MASA) and the Michigan Department of Environmental Quality (MDEQ) to promote the Pollution Prevention Strategy and Implementation Plan for Michigan Agriculture.



For further information on Amazing Graze Acres, contact MASA at 616-258-3305 or e-mail at [kscd@aol.com](mailto:kscd@aol.com). For further information on the Pollution Prevention Strategy and Implementation Plan, contact the Environmental Assistance Division at 800-662-9278.