

Rich-Ro Farms

St. Johns, Michigan



Case Study

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

Mercury Removal in Agriculture

In 1998, a pilot program was initiated to remove potentially toxic mercury from Michigan dairy farms. The program was implemented by the Michigan Departments of Agriculture and Environmental Quality in cooperation with several agricultural industry representatives. The goal of the program was to

Mercury is a naturally occurring, odorless, silvery liquid. It expands and contracts evenly with temperature and pressure changes, which makes it an ideal medium for use in vacuum gauges (manometers).

remove mercury manometers from dairy farms and replace them with mercury-free gauges. Mercury manometers are used to measure and monitor the vacuum pressure in a dairy farm's milking system.

Participants in the program included the Feldpausch family. Richard Feldpausch and sons Glen and Charles, are progressive dairy farmers in Clinton County. In 1964, Richard began a milking operation with 18 cows and has expanded each year since. Richard is in the

Mercury and Dairy Farms
One-quarter of the dairy farms in Michigan may have mercury manometers, each containing approximately one pound of mercury.



The Feldpausch Family

process of retiring from day-to-day dairy activities, leaving his sons with the challenge of making a living in this quickly changing industry. Over the past ten years, Glen and Charles have assumed management of the farm, and like their father, continue to expand each year. Together, they oversee a combined 1,500 cows and 2,100 acres of land on two neighboring facilities.

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December 1999 • #9816



AUTHORITY: PA 451 OF 1994 TOTAL COPIES: 6200
TOTAL COST: \$229.18 COST PER COPY: \$.036
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◆ *Mercury can convert to methylmercury, a form that can build up in the tissue of certain species of wildlife, such as fish.*

◆ *On average, a gram (1/70 of a teaspoon) of mercury enters a 20-acre lake from the atmosphere, every year. This alone is enough to elevate the mercury levels in fish.*

◆ *Methylmercury in large fish can be hundreds or thousands of times greater than that in the surrounding water.*

The mercury manometer program initially removed 12 pounds of mercury from 16 dairy farms in Clinton and Gratiot Counties, including manometers on Feldpausch's two facilities. The cost to replace each manometer was about \$300 per gauge. The program was 100 percent cost shared, meaning no expense to the participants. Since Glen and his family catch and consume fish on a regular basis, he and Charles were eager to participate in mercury reduction efforts.

In addition to the environmental benefits of replacing their mercury manometers, Glen and Charles both experienced other positive returns. The new digital gauges are "accurate, easy to read, and easy to manage," reported Glen. Typically, vacuum pressure should be 13.8-13.9 pounds per square inch. A lower pressure leads to longer milking time and greater energy consumption. A higher pressure can cause an outbreak of mastitis among the dairy cattle. A mastitis infection can create a loss of milk since infected milk may not be shipped. Glen points out that the new gauges make it easier to run at a constant, efficient pressure level, thereby reducing milking time, and subsequently, energy consumption.

At one of the Feldpausch facilities, the new digital gauge led to the discovery of large fluctuations in vacuum pressure caused by a malfunctioning vacuum controller. Charles

immediately replaced the controller, avoiding the possibility of a mastitis outbreak, which could have cost the farm several thousand dollars. At that point, Glen said, "It definitely paid for itself."

Glen and Charles both feel positive about the new gauges they received. Glen said, "If I knew what I know now, you would not have had to pay for it for us. I would have just put one in." When asked if he would recommend this program to other farmers, Glen responded, "Oh yeah, I think managing your vacuum level is very important and progressive dairymen know that. I would say it is an easy sell to progressive dairymen! I would go to bat for it. I'd recommend it. I'm happy to get the mercury out of the environment, and I think it made us a better farm in the end."

If mercury is spilled, it can evaporate at room temperature and then be easily inhaled. Mercury vapors are colorless and tasteless. Short-term exposure to a concentration of mercury or mercury vapor can lead to nausea, shortness of breath, bronchitis, migraine headaches, and fatigue. Long-term exposure can cause symptoms such as shakiness, tremors, numbness in the fingers and toes, loss of muscle control, memory loss, kidney disease, impaired child development, and even death. Particularly at risk are unborn children.

This publication was developed in partnership with the Michigan Department of Agriculture and other agriculture industry leaders to promote the Pollution Prevention Strategy and Implementation Plan for Michigan Agriculture. For further information on this case study, contact the Michigan Department of Agriculture, Dairy Section, at 800-292-3939.

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