Discovery Farms, An Invaluable Resource

Professional Dairy Producers of Wisconsin acknowledges the Discovery Farms program team for its collaborative work involving the research community, environmental and agricultural communities and the regulatory community. “The findings of Discovery Farms help Wisconsin dairy producers develop practical applications and proper regulations that help protect our natural resources,” says PDPW president Doug Knoepke, More-To-Do Farms, Durand, Wis. “Fresh water, clean air and sustainable land are important to dairy producers, and we want our management practices to work in harmony with the environment for the good of agriculture and the community.”

PDPW applauds its members who participated in the various research projects featured in this issue as well as its three members—Jeff Opitz, Saukville; Knigge Farms, Omro; and Koepke Farms, Oconomowoc—who were part of a joint research project conducted by UW Discovery Farms and the Wisconsin Buffer Initiative that increased the understanding of and quantified storm water runoff and snow melt runoff.

Want More Info About Discovery Farms Projects?

Additional information about each topic highlighted in this issue is available at the Discovery Farms website: uwdiscoveryfarms.org. Please visit this web site to obtain more detailed reports about Discovery Farms’ core farms, nutrient management and soil conservation, specific projects—including work on various dairies—and other items.

Answers to questions about Discovery Farms project can be obtained by contacting the office directly at 715-983-5668.

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What It Takes to Be a Discovery Farm Participant page 7
What the Discovery Farm Program Entails page 2
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Discoveries Lead to Increased Understanding

According to the Merriam-Webster dictionary, the word “discovery” means “the act of discovering.” If you go a step further and looked up the word “discover,” the definition is “to find out what one did not previously know.” Ah-h-h, no wonder the UW Discovery Farms Program that involves several Wisconsin dairies is called Discovery Farms Program.

The Discovery Farms Program is one of three modules that comprise the Wisconsin Agricultural Stewardship Initiative and is a University of Wisconsin Extension/UW College of Agriculture and Life Science program. The program has tremendous support from state and federal agencies as well as many of the agricultural groups. The Program is in its eighth year and is modeled after a Netherlands program where producers work hand-in-hand with the government and universities through research on their own farms and where research helps find the most economical and effective ways to implement environmental management decisions that are compatible with profitable agriculture.

“Discovery Farms involves real Wisconsin farms where whole farming systems and not individual components are evaluated,” states Dennis Frame, co-director of Discovery Farms. “Data on sediment and nutrient losses from farm fields and watersheds is collected, then evaluated against field management practices. Collected data is also compared to modeling or estimates of nutrient and sediment losses based on small trials conducted in controlled settings.”

The program has two types of projects: core farms that represent a farming system or setting that needs to be better understood and special projects that are more targeted and last two to four years in duration. Discovery Farms also has a nutrient management component whereby nutrient management strategies and practices are evaluated by Discovery Farms staff and researchers at a systems farm at UW-Platteville. These practices are aimed at reducing non-point source pollution while protecting farm profitability.

“A primary objective of the nutrient management work is to establish baseline data that can be used to determine environmental impacts of various farm management practices,” Frame elaborates. “Big picture, the Discovery Farms Program spans the state’s diverse soil types, physical and water characteristics and livestock and cropping systems.”

Fred Madison, co-director, stresses that the Discovery Farms Program has four key goals: 1) To increase understanding of agricultural impacts on soil, water and air quality and work toward reducing adverse impacts; 2) To integrate outreach and research programs with environmental management and regulatory efforts; 3) To provide research-based information on agricultural production and natural resource management to public policymakers; and 4) To promote the economic viability of Wisconsin’s agriculture across the state’s diverse livestock and cropping systems.

“The Discovery Farm Program emphasizes farmer input and direction,” Madison continues. “Representatives from Wisconsin farms, agribusiness and environmental organizations comprise the Program’s Steering Committee, and this Steering Committee is the entity that identifies on-farm systems research, evaluation and demonstration project possibilities, selects projects for funding, solicits commercial farm cooperators and provides support.”

See Discoveries on page 3
Discoveries

Continued from page 2

guidance on the coordination and reporting of data and information generated.”

A Project Design Team develops details for each Discovery Farms project, including required characteristics of participating farms, variable measurements, measurement protocols, data handling and analysis and study length.

“Farmers agree to work with the program for a period of five to seven years which provides adequate time for identification of concerns and the evaluation of effectiveness of best management practices.”

Each producer involved with a Discovery Farms project has an On-Farm Project Team which helps implement the project, monitor progress, collect and analyze data and share results. Chaired by the farm cooperator, the team is comprised of neighboring farmers; fertilizer, feed and financial consultants; county UW-Extension personnel; local representatives of NRCS and Land Conservation Departments; local Wisconsin Technical College System instructors; U.S. Geological Survey personnel; and others.

“Farmer input and direction at all levels ensure that this program addresses problems most relevant to producers,” Frame reiterates. “In addition to producer concerns, Discovery Farms projects also respond to needs of county, state and federal agencies such as DNR, DATCP and NRCS.”

Frame adds that Discovery Farms Program is unique because monitoring is conducted first to determine if an operation is having a negative or positive impact on the environment. All management practices are documented, and Discovery Farms staff works with the producer to understand how and why they have adopted their farming system.

To date, Discovery Farms has worked on six core farms—three dairies, a multi-species livestock operation, a beef feedlot/grain farm and a swine operation. Special projects include four farms on the Wisconsin Buffer Initiative, two farms in the Manitowoc County Discovery Farms Area, and a five-year project evaluating the potential nutrient losses to surface and groundwater from headland stacked poultry manure.

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Five years ago this July the Discovery Farms team toured the fields of Soaring Eagle Dairy, located in Manitowoc County, to evaluate potential sites for surface water monitoring and the farm’s participation in the Discovery Farms Program. Soaring Eagle Dairy owners Jim and Sandie Fitzgerald and their three daughters—Kelly Goehring, Julie Maurer and Stacy Fitzgerald—were excited when approval for participation was given.

“The program was seeking to add a farm where a multi-field/small watershed area could be monitored,” states Eric Cooley, Discovery Farms outreach specialist. “This site was selected specifically to evaluate runoff in a slightly larger watershed and determine if our understanding of losses from a field site could be extrapolated to a larger scale. Once we understand whether a small watershed reacts like multiple fields, we can determine what practices can be implemented and what practices improve water quality on farms throughout the region.”

Soaring Eagle Dairy utilizes sand-bedded freestall housing, a transition barn with dedicated maternity area and a double-16 parallel parlor to milk 800 cows. Their liquid manure system includes a sand settling flume and a three-stage lagoon.

The farm is located in the Point Creek sub-watershed which drains directly to Lake Michigan. Crop and soil management is influenced by the red clay soils located along Lake Michigan in northeast Wisconsin. The red clay soils are known to be cool and wet each spring.

The farm manages approximately 1,100 acres of owned and rented cropland devoted to growing corn silage and alfalfa. Nutrients are applied according to an approved phosphorus-based Nutrient Management Plan.

See Soaring Eagle on page 6.
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Surface Water Study
The installation of surface water monitoring equipment began in late July 2004, with workers finding what Cooley describes as “inadequate getaway conditions due to the small slope—almost flat—downstream from the flume.” Cooley adds that this landscape condition is common of Manitowoc County.

“Thisspecial project provided information on the impact tile drainage systems can have on the amounts of water flowing through a small watershed,” states Dennis Frame, co-director of Discovery Farms. “Once we understood whether a small watershed acts like multiple fields, we could then determine what practices can be implemented and what practices can improve water quality on farms throughout the region.

“This project provided information and experiences that clearly identified the need to develop accurate tile drainage maps that show where tiles have been installed, the location of surface water inlets, tile outlets and an estimate of the drainage area.”

Although this water monitoring project incurred significant challenges, the Discovery Farms team was able to draw three key conclusions from Soaring Eagle Dairy’s surface water study that ran from December 2004 to the end of October 2006:

1) Based on the larger-than-expected flow volumes and long duration of the flow through the monitoring station, tiles draining into the waterway contributed a significant amount of runoff water to the basin. In this region of Wisconsin, tile drainage systems play a major role in the delivery of runoff to waters of the state.

2) Tile drainage significantly influenced surface water flow, causing this waterway to behave more like an intermittent stream.

3) It is important to accurately identify the tile drainage area when monitoring surface water on cropland with tile drainage systems. Tiles can drain water from fields outside the watershed and empty into streams and waterways. This is often the case for fields that are internally drained (closed depressions).

...we can determine what practices can improve water quality on farms throughout the region.

Sediment, Nutrient Losses Work
Sediment and nutrient losses on Soaring Eagle Dairy was another area of interest to the Discovery Farms team. Conclusions from this two-year study included:

1) In this region of Wisconsin, the establishment and maintenance of grassed waterways in areas of concentrated flow cannot be over emphasized, as runoff in this section of the state has the potential to carry significant levels of sediment and nutrients to surface waters.

2) Consistent with data collected at other Discovery Farms, sediment losses occurred predominantly during non-frozen ground conditions. Frame points out that, while soil loss can occur during frozen soil conditions, those losses “are greatly influenced by tillage practices and the amount of concentrated flow running across the soil.”

3) Sediment losses produced by a single runoff event can contribute the majority of the sediment losses for the year. This means that one event often makes the difference between high or low losses, and that farming systems need to be designed to handle these large events.

4) Although phosphorus losses were also relatively low—10 percent during the frozen ground period in field year 2006, phosphorus losses were more substantial than sediment loss which was about 1 percent.

5) Phosphorus losses in the dissolved, reactive form represent a considerable portion of total phosphorus: 45 percent in 2005 and 22 percent in 2006. These losses are similar to data collected on other Discover Farms.

6) Nitrogen losses in the form of nitrate were higher than expected in surface runoff. Frame says this is likely due to the influence of tile drainage in this watershed.

“In many portions of Wisconsin, tile drainage systems play an important role in the potential delivery of nutrients to surface water,” Frame elaborates. “Producers and agency personnel should work together to locate and better understand the impact of tile on water.”
The Discovery Farms Program is in the process of writing up the information and data collected on several farms and delivering this information to producers, agency personnel and the general public. As this information is developed and delivered, the program needs to begin looking for new cooperators that represent different farming systems and settings. The purpose of this article is to provide producers who are interested in participating in the program with some information on what happens on operating farms.

The Wisconsin Agriculture Stewardship Initiative was designed to have producers, university researchers, agricultural organizations and government agencies work together to develop a new approach to production agriculture that results in environmentally compatible and economically sustainable farms. The Discovery Farms Program is a module of the Wisconsin Agriculture Stewardship Initiative and links the research components—both component and systems research—and commercial operations.

The role of Discovery Farms is to determine whether selected farming systems have a negative or positive impact on water quality, if the impact was negative then how to implement management recommendations that improved the situation and to determine how these recommendations impact the operation in terms of environmental quality, labor requirements, changes in management practices and the impact on farm profitability.

**Participation Requirements**

To participate as a Discovery Farm, a farm must meet these requirements:

1. Must operate a functioning agricultural enterprise that is representative of the industry.
2. Must have or be willing to develop a soil conservation plan that reduces soil loss to tolerable level (T). The farm does not have to currently be farming within tolerable levels, but they must be willing to change management practices to get to tolerable levels during the study.
3. Must have or be willing to develop a nutrient management plan that at the minimum provides the nitrogen needs of the crop. A second nutrient management plan will be developed for the operation that is based on phosphorus management. A comparison of the differences in crop production, management practices, equipment needs, labor requirements and financial impacts of following a phosphorus based nutrient management plan will be evaluated.
4. Must be willing to share financial information so that the cost of adopting changes in management practices can be identified. Discovery farms need to provide information on the current costs of storing and handling manure, level of nutrient crediting currently being taken, hauling distances and labor and management requirements. This will provide the baseline information necessary to determine the cost of proposed environmental regulations.
5. Must be willing to adopt changes in farming practices and to keep track of how these changes affect their labor requirement, equipment needs, increases or reductions in

See Participant on page 14
Effective Business Growth

Business growth and expansion? Now? Yes. After all, some producers have positioned themselves very well financially and now may be an opportunity to grow. Cattle prices are well below last year’s prices and building costs are also very reasonable.

While lenders base the ability of producers to grow their business primarily on cash flow, equity position and collateral position, lenders also look at other factors—factors and characteristics that are hard to put on paper as a number or a ratio. I’m talking about managerial styles as lenders like to define and combine managerial style information with financial position when deciding whether an operation has the financial and managerial ability to grow.

Here are some of the favorable managerial style characteristics of producers who are successful at growing their business:

**Effective communicator:** Business leaders who are effective in expansion often have high levels of emotional intelligence, which involves their ability to communicate and deal with people. This includes employees, suppliers and community people.

**Expand the business for the right reasons:** Growing your way to profits can be dangerous. Often, when a business gets into financial trouble, the thought is that getting bigger will make it better. No! This usually makes the situation worse. Get better before getting bigger.

**Well-defined business, family, and personal goals:** Make sure there is a balance between business and lifestyle for the short- and long-run.

**Team approach to expansion:** Successful producers surround themselves with a team of professionals. They utilize their lenders, consultants, lawyer and accountant and ask these people for advice and opinions and welcome an open forum. Different viewpoints and aspects are then discussed. Effective managers listen to team members’ input while making informed decisions based on their own goals.

**Managers” vs “Doers”**: In a typical situation, most producers spend 65 percent of their time doing tasks and 35 percent of their time managing them. In an expansion, you cannot control all facets of the business and tasks. In a major expansion you must shift focus to 65 percent “managing” and 35 percent “doing.” It may not be the most fun, but it must be done.

**Ability to accept increased risk:** Usually expansion results in greater financial obligations which require higher levels of management. This requires a marketing and risk management program based on sound and accurate financial information. If thinking about expansion makes you or your spouse unable to sleep at night, you need to rethink your plans.

**Lifelong learner:** Modern day farming is about your ability as a knowledge worker. Are you trainable? Do you have the willingness and ability to adapt and change? Are you open to new ways of doing things? Learning is not only the ability to learn and change, but wanting to learn and change.

These are just a few key characteristics of producers who are successful in growing their business. While none of these characteristics can be put on paper and have a number value assigned to them such as equity position or debt repayment ability, these areas are equally important and lenders do look at these characteristics when you want to expand your business.
Bragger Family Farm Goal: Maximize Productivity, Maintain Stewardship

Bragger Family Farm of Independence is one of three farms graduating from the Discovery Farms’ Program. This family farm is a three-way partnership involving Hildegard Bragger and two of her sons, Joe and Dan. Joe handles overall management of the farming operation focusing on cropping and the farm machinery. Dan oversees the dairy, which now milks 285 cows on two farms, while Joe’s wife Noel is in charge of a 32,000 head pullet operation and beef operation.

Located at the head of a long valley in the Driftless Region of west central Wisconsin, Bragger Family Farm receives 30-35 inches of precipitation annually, and terrain is primarily steep hillsides with narrow valleys, most of which contain streams. The heavy clay soils on the ridge tops must be carefully managed to harvest as much rainfall as possible. Other areas of the farm have deep loess soils with topsoil ranging from 8-2 ft deep.

The bluff cropland tends to be less productive, and the risk of crop failure is higher due to shallower rocky soils. Although the soils on the ridges are mapped as only 40 inches deep, soil pits dug by researchers showed that the true depth of the ridge soils could be 8-feet to 13-feet deep. Cropland can range from 16 percent to 32 percent slope.

“Compaction has the potential to be a major concern on the farm,” states Dennis Frame, co-director of Discovery Farms.

See Bragger on page 10

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Bragger
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Program. “Deep tillage is not an option because of all the rocks in the soil.”

CHANGES
“Deeptillageisnotan optionbecauseofalltherocksin
thesoil.”

Changes
“The stream forking the Bragger Farm provided a unique surface water monitoring
opportunity,” states Fred Madison, co-director of Discovery Farms. “The north stream fork is
surrounded by cropping acreage, and the south stream fork is surrounded primarily by
woodlands, pasture and unfarmed land enrolled in the Conservation Reserve Program.”

Two surface water monitoring stations were constructed—one on each stream fork—to compare
water quality and run-off from the two system: one natural and one farmed. Initial baseline data
collected between September 2001 and November 2003 indicated the farm had low
nutrient and sediment losses entering the stream. Following the recommendation of his team,
a dam was constructed at the start of the north tributary to slow water and reduce stream
bank erosion.

Considerable changes have occurred on the Bragger Family Farm during its involvement with
Discovery Farms program:

• More corn acres are planted on the gentler slopes. Frame
notes that, if Bragger plants a second year of corn on a piece of
land, he will add 8,000 to 9,000 gallons of dairy manure per acre
in order to supply the correct levels of nitrogen for the corn
crop and build soil test potassium levels for alfalfa.

• Because of the on-farm nutrient sources resulting in soil
fertility improvements, corn
yields in some fields have
increased from 80 bushels per
acre up to 160 bushels.

• While Bragger initially went to
no-till because of time
considerations, Frame says, “as
he saw the (soil conservation)
advantages for his soils, he was
won over.”

• The dairy herd was expanded
to include a second herd of 70
cows that are milked in a
neighbor’s existing facility. The
Braggers own the cows, provide
the feed and move the manure,
while the neighbor milks the
cows.

• Energy efficient improvements
to the dairy include a plate
cooler—which paid for itself in
three years due to energy savings,
a variable speed vacuum pump,
isolation to a new large machine
shed and wood heat for the
machine shed.

SUSTAINABILITY
Bragger stresses the importance of maintaining productive soils and keeping
them in place for long-term farm viability. And he’s glad that the
family farm was a part of the Discovery Farms Program as
many components of the farm were studied: land use, soils and
fertility, crops, farming practices,
pest management, weed
management, equipment and
buildings, livestock enterprises,
manure and nutrient
management, natural resources,
energy, climate, business
management, soil and water
conservation programs, as well as
social and community
dimensions of the farm.

“While the Bragger Farm
demonstrates a comparatively
conventional farming operation—
focused on dairy but with a
significant place for the contract
pullet operation, it has also
successfully incorporated key
sustainable farming practices and
implemented careful
management and monitoring of
land and nutrients,” Frame states.

“Integration of the cropping
system with the dairy operation
and the availability of land on
which to spread manure and to
pasture cattle have resulted in a
stable system that has minimized
the need for purchased nutrients.
The addition of the pullet barn
has produced a further income
stream and a valued source of
nutrients which makes the
diversified system more
economically stable.”

Joe Bragger tells producers and agency personnel attending a Discovery Farms field day about the pond built by his father to collect water running through the barnyard from two springs.
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PDPW Member Producer Profile

PDPW member Jim Kusilek of Hillsdale worked in the banking industry for 13 years before becoming a dairy producer in 1998. Today, Four Mile Creek Dairy, located 23 miles southwest of the Kusilek’s home in Rice Lake, is 800 Holstein cows strong and is a family dairy that involves Kusilek, his wife Audrey and their four teenage children.

“The more you know, the better you can do.”

Four Mile Creek Dairy uses an equivalent to 13 full-time employees to help with the milking string of 700, which is milked 3X day in a double-13 parallel parlor, and to handle the many tasks associated with dairying. Planting and harvesting of the 1,100 acres of alfalfa and corn silage is hired, and Four Mile Creek Dairy utilizes both a wet-calf grower and a custom heifer grower to raise their youngstock. Facilities consist of four barns: two with sand bedding and two with sawdust or purchased bedding solids over mattresses.

Kusilek joined PDPW shortly after entering the dairy industry 11 years ago. He quickly discovered the value of attending PDPW-sponsored education events such as the Annual Business Conference and Managers Academy and the benefit of sending the dairy’s employees to various production seminars. Kusilek is also active in his church, and busy with his children’s sports and FFA involvement.

In addition to being very impressed with the caliber of the PDPW’s staff, Kusilek cites four primary benefits of being PDPW member.

“Certainly for the information,” he says of the first reason. “The more you know, the better you can do.”

His second reason to belong to PDPW is to confirm that he’s on the same track as his peers and to keep pace with “what others in the industry are doing.”

His third reason for being a PDPW member is that PDPW gives him “confidence to keep slugging away” in the dairy business.

Lastly, he says he appreciates the “influence as an organization” that PDPW has with policymakers.

By Jane Fyksen

“PDPW pushes dairy producers to reach the next level. I’m grateful that our leaders shoot for quality of excellence and expose us to what we need to know to help us achieve that quality of excellence.”

—Terry Nohr, Cornerstone Dairy, Marion, Wis.
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Participant
Continued from page 7

6. Willingness to participate in field days or meetings to discuss their experiences with other farmers.

7. It is anticipated that farmers selected as Discovery Farms will be in the program for a minimum of three to five years and a maximum of seven years. The collection of baseline data will take one to two years depending on weather conditions, and then the identification and implementation of practices will take another period of time. Monitoring outcomes and costs will be done for the remainder of the program. Practices that are cost-shared may need to be maintained for a period of time greater than the program (seven to 10 years).

Participation Benefits
In return for their commitment and involvement, farms participating in the UW Discovery Farms Program receive:

1. An honorarium of up to $5,000 for their time and assistance with this project.
2. Assistance developing and implementing their soil conservation plan to tolerable levels.
3. Assistance developing and implementing their nutrient management plan.
4. Technical and possibly financial assistance with changes in facilities or management practices that will improve their environmental management.
5. Some farms will have monitoring equipment placed in order to determine the level of nutrients or sediment reaching water resources.
6. Technical and possibly financial assistance with the implementation of best management practices.
7. Phosphorus and nitrogen balance sheets for the entire operation.
8. Some level of confidentially in terms of financial information.
9. Protection from the regulatory community and environmental groups for the changes that should be implemented based on their current farming practices.

Advisory Committee
In addition to meeting the seven requirements listed above, each Discovery Farm develops a local advisory committee comprised of respected producers, their advisors, neighbors and the cooperating farm's designated agency/education personnel. The farm-specific advisory committee provides guidance to the Discovery Farms Program on the types of issues that need to be researched and resolved for operations that are similar to this particular Discovery Farm. Operations that are similar could include farms that have similar location (topography, soil and physiographic settings), similar enterprises (dairies, cash grain, and vegetables), similar production practices (tillage, grazing, etc.) and similar size of operation.

The local advisory committee also reduces the chances of conducting research on a farm for a number of years without evaluating an issue that this operation or other similar operations are facing. This committee expands the "real world" knowledge of production agriculture and provides the Discovery Farms Program with a larger base of experiences.

The time commitment of an advisory committee is one or two meetings each year, with the local Discovery Farm determining how often and when the committee meets. The local Discovery Farm, in concert with their local advisors, are responsible for the selection of committee members.

By Dennis Frame and Fred Madison
Co-Directors, Discovery Farms Program

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<td>715-654-3252</td>
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<tr>
<td>JANESVILLE</td>
<td>Tri-County Dairy Supply</td>
<td>1-800-822-7662 or 1-800-530-9784</td>
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<td>JUNEAU</td>
<td>Central Ag. Supply, Inc.</td>
<td>920-336-2611</td>
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<td>LUXEMBURG</td>
<td>Kudick's Kooling</td>
<td>920-845-4725</td>
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<td>LANCASTER</td>
<td>Fuller's Milker Center</td>
<td>800-887-4634</td>
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<td>PLAIN</td>
<td>Ederer Dairy Equipment</td>
<td>608-546-3713</td>
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<td>SPARTA</td>
<td>Preston Dairy Equip</td>
<td>608-269-3830</td>
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<td>STEVENS POINT</td>
<td>Brilowski's Dairy Supply Co.</td>
<td>715-342-2205</td>
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<td>UNION CENTER</td>
<td>Preston Sales &amp; Service</td>
<td>608-462-8276</td>
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