



Smart Sustainability: How we care for the land, water and air



MY HOME

"I live in the front yard of our original farm. This is our home."

Lee Kinnard



Clean water is important to our family. We care about clean water not only for our community, but also because our livelihood depends on it. Quite simply, healthy water is critical for healthy cows and quality milk.

At Kinnard Farms, we go above and beyond what is mandated by law to ensure that our farming practices care for the soil, water, air, our cows and our community. All of our farming practices are science based. We work with a team of soil scientists known as agronomists, as well as university experts, the Natural Resource Conservation Service, the Farm Service Agency, the Wisconsin Department of Natural Resources and the Environmental Protection Agency to make sure we are doing things right.

As always, we welcome you to call us if you ever have questions.

- The Kinnard Family

Lee Kinnard, Rod & Maureen Kinnard, Jackie and David Stewart



HEALTHY SOIL

Soil is a Natural Filter

The higher the concentration of organic matter in the soil, the less fertilizer we apply to our fields. We pride ourselves on producing organic matter and work to preserve the soil with our tillage practices, by adding cow manure and cover cropping. Kinnard Farms continues to use innovative and effective options for managing nutrients.



Healthy soil is characterized by its ability to hold and retain nutrients needed for plant growth. Healthy soil is vital to water quality, because healthy soil binds the applied nutrients and holds them for slow release so the plants can grow. Plants require these nutrients to grow. It's the same concept as fertilizing your garden.

Our farming practices are designed to not only preserve organic matter content, but to actually build organic matter content over time. This is accomplished by using specialized tillage equipment and using natural manure instead of chemical fertilizer whenever possible. It's also realized by rotating crops, such as alfalfa, and using cover crops. Preserving and building organic matter in soil is vital to long-term sustainability in agriculture. It is a practice our family is firmly committed to.

Manure application is a precise science. Our team of agronomists takes soil samples on our entire farm every three years. These samples are taken from the exact same spot in each field by using satellites to guide the agronomist to a precise location. This ensures that we are able to track over time the impact our farming practices have had on soil quality. These soil samples go to a soil lab and are analyzed for nutrient content and organic matter. Our agronomy team uses these test results to write instructions for every acre we farm, including crop rotation, tillage practices, cover cropping and which nutrients should be applied and when to ensure optimum soil health. This gives us the best chance of producing a healthy crop and also ensures we are protecting our environment.





Our Healthy Crops are Fed to Our Cows

Alfalfa is a magical crop. We have seen roots of alfalfa at the bottom of 18' deep test holes.

HEALTHY CROPS

Our primary crops are alfalfa, corn and triticale. Harvesting the entire plant, versus harvesting only the grain, creates forage. A cow has four stomachs that enable her to digest forage. Our cows dine from a buffet line that is comprised of 70% forage.

We grow a lot of alfalfa, an extraordinary crop. Alfalfa persists for 3-4 years through our rough Wisconsin winters, eliminates erosion of our precious topsoil, is a great scavenger of nutrients in the soil, and has the ability to go very deep into the soil to find water. It's also very good at loosening soil, allowing rainwater to filter through the soil versus running off.

Corn silage is another crop we grow. It is used as a source of energy for our herd and works very well in a rotation with alfalfa.

Triticale is a forage crop grown on land through the winter and early spring months. It does a great job of protecting our soil from erosion during the winter months.

Our goal is to have about 75% of our acres covered with a growing crop every winter, which helps us protect our soil and water quality. Some of these winter crops are simply cover crops. They will not be harvested, and are grown only to help improve soil health and organic matter.

At Kinnard Farms, our goal is to constantly improve soil quality leaving it in better condition for future generations.



WATER PROTECTION

Ground Water Protection on Karst Topography



Some of the land we farm is located on karst topography. Extra care must be taken to protect groundwater on this land. Identification of shallow soil is vital to the future of our community and our farm. This soil can be very productive. However, to ensure we are doing it right, we take the extra step to run a Veris Machine (a specialty machine that uses electromagnetics to read soil profiles) over all of our land. We've mapped our fields in 50' x 50' grids and have GPS positioning on each field. These maps show us exact locations and depth to bedrock on any of our land where we suspect bedrock to be less than 20' from the surface.

This information is then used to manage this land differently than the rest of our land. The Wisconsin Department of Natural Resources (DNR) has determined that the nutrients in manure could possibly become a pollutant when applied to land with less than two feet of soil. We voluntarily exceed this rule, and do not apply manure to any acres with less than three feet of soil to rock. As a result, we currently farm 226 acres of land that do not receive manure nutrients. We are the only farm in the state that uses this technology to protect our groundwater – it is that important to us.

This technology has been used by our family for nearly a decade, and has proven to be very effective at identifying shallow soil areas. Recently, the Town of Lincoln began a study using this exact technology throughout the rest of the town, trying to create maps like the ones we have used for the last ten years.

As part of our permitted dairy process, we are required by law to have our well water tested quarterly by the DNR. All of our wells have always tested clean with very high water quality. We work diligently to ensure our water quality remains clean for the future.





Manure Storage Exceeds Regulations

We wanted to build it right in order to continue to protect the groundwater.

EXCEEDS REGULATIONS

When designing facilities on a “permitted dairy,” you are required to submit all plans and specifications to the DNR for approval prior to construction. This is a rigorous process taking countless hours to prepare and present. We hire environmental engineering firms to assist us, discussing at length the options available. Because this is our home and our community, safety is important to us. We opted to engineer and construct our site to not only meet, but also far exceed all regulations.

Regulations require that manure storage structures must be at least 6 feet above ground water. We designed our lagoons to be built largely above grade, far exceeding the minimum requirements set forth by regulators.

The lagoons are built of waterproof concrete, and the cement must be poured in a checkerboard pattern, with each piece measuring 100’ by 100’. Each square needs to be dried and tested for strength prior to pouring the next square. The area where the squares come together is connected with a heavy-duty watertight vinyl gasket. All of this concrete is reinforced with $\frac{3}{4}$ ” rebar, laid in 10” x 10” squares. As we poured the walls, a canal building machine was used. This machine ensures a perfect slope and excellent quality watertight concrete.

As an extra protection, all of this concrete is poured over a secondary liner of clay. Most manure storages are built of only clay and don’t have concrete over the top.

Though regulations require only 180 days worth of manure storage, our family has opted for more than double this capacity. This allows us to apply nutrients to plants as needed and when weather conditions are good for safe nutrient application.



HOMEGROWN PRODUCT

What is Liquid Manure?



Did you know that as a permitted dairy we are required to record and collect rainwater that falls on our feed pad (where we store our feed)? Every year our farm collects 13 million gallons of rainfall from our feed pad alone. This water is pumped to the lagoon and dilutes the manure. Adding all of this extra water is the primary reason it becomes “liquid manure.”

A common misperception about liquid manure is that it is the result of cows being fed differently today than they were in the past. In reality, cow manure is exactly the same as it was years ago. The extra water in liquid manure comes from the addition of wash water and rainfall to the manure storage facility. Collecting this water has been a great environmental benefit, but it has vastly increased the amount of water we have in our lagoons. This means we haul more and more tanker loads of mostly water to apply to our fields.

All of our water used to wash machinery and milking equipment, as well as all of the rainwater that falls onto our feed storage areas is collected and added to the cows’ manure. This changes the moisture content from 75% to 96%. This extra water dilutes the nutrient content of manure and requires higher field application rates to deliver the same quantity of nutrients to the soil. Collecting and recycling all of this extra water is very costly, but the benefits to improved water quality are well worth the investment.

If our only goal was to grow a crop as inexpensively as possible, a petro-chemical based commercial fertilizer could be spread instead of recycling a natural fertilizer, cow manure.

We are using a renewable, recyclable homegrown product.





SAND RECYCLING

Sand Infinitely Re-used

Our cows lie on sand. Why? Because cows like to lie down 14 hours a day! Animal scientists have proven that sand is the most comfortable bed for a cow's legs and udders and best for her health.

We invested in new, exciting technology that allows us to recycle the sand bedding used in our barns. In our new system, recycled water that has been mechanically scrubbed to remove the solids is pumped to the high end of the farm to a flume pipe. The flume pipe is in the center of the cattle barns, and is where we scrape the cattle manure. The manure is scraped to the flume three times daily using skid steer loaders while the cows are in the parlor being milked. The recycled water flowing through the flume carries the manure to our manure processing building.

Upon entering the building, augers separate the sand from the original mixture of manure, sand and recycled water. The augers convey the sand, which is still dirty at this point, to a sand washer. The washers scrub the sand clean using recycled water that has been captured from the cleaning of our milking machinery. After a thorough washing, the sand passes over a vibrating screen that dries the sand. The end result is sand that is clean, dry and infinitely reusable.

An added benefit of this system is odor control. Prior to installing the recycling system, our system relied on pumping water back from the manure lagoon to be used to convey the manure through the flume. By eliminating this practice, odors have been greatly reduced.

With our new sand recycling system, there are fewer trucks on the roads, and it's more environmentally friendly. This cutting-edge, costly technology is made accessible to us by expanding our cow herd.





ENSURES SUSTAINABILITY

Comprehensive Nutrient Management Plan Protects Resources

CNMP is a roadmap that tells us where to spread nutrients, in what amounts, and when. The plan must be pre-approved by the DNR annually. We work with an agronomist to assist us in writing this scientific document, which can be well over 1,000 pages.

Farms with more than 750 cows must have a Comprehensive Nutrient Management Plan (CNMP) and are required to obtain a permit from the DNR that governs their farming practices. These farms are sometimes called “permitted dairies.” The CNMP documents practices and strategies to address everything we do on our farm related to soil, manure handling and disposal of organic by-products. The CNMP is part of a good conservation plan and its purpose is to protect water quality and soil health by managing manure and the nutrients in it.

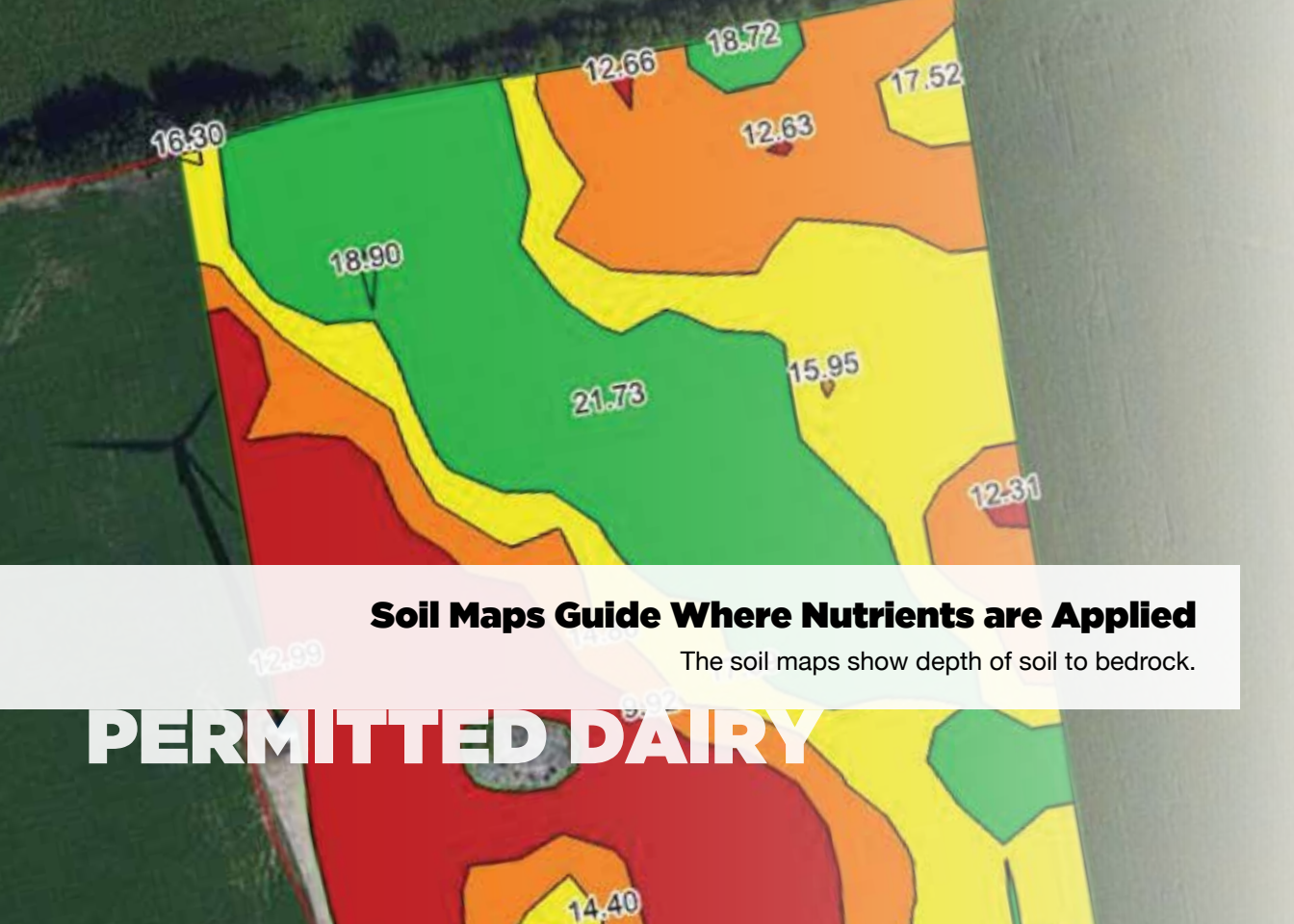
The DNR requires farmers to do the following as part of the CNMP:

- Have the DNR inspect and approve your land for nutrient recycling
- Keep a detailed log of the nutrient content in the manure you spread
- Detail and report your crop rotation
- Be compliant on the erosion index
- Submit maps with detailed setbacks, where required
- Log all weather events, such as rainfall and temperatures

Technological innovations revolutionized agricultural production from an environmental stewardship standpoint and a cow numbers viewpoint over the last 60 years. We don't milk cows by hand or use horses to cultivate our fields, like our ancestors did.

In 1947, Wisconsin was home to 2.32 million milk cows. The average cow produced less than 9,000 pounds of milk/year. Today, cows that are better-cared for produce 21,693 pounds of milk/year and there are only 1.27 million cows in Wisconsin. We have one million less cows, yet we are producing food for millions more people around the world.





16.30

12.66

18.72

17.52

12.63

18.90

21.73

15.95

12.31

12.93

9.92

14.40

Soil Maps Guide Where Nutrients are Applied

The soil maps show depth of soil to bedrock.

PERMITTED DAIRY

Feeding our crops with nutrients is an exact science, whether the nutrient source is manure or commercial fertilizer – soil must first be sampled to determine how much fertility is already available in the soil. These tests are performed every three years in exactly the same spot, using GPS technology to pinpoint the location. All fields are split into three-acre management zones, and our nutrient application is capable of adjusting application rates in each of these fields within a field.

Nutrients are precisely applied to meet, but not exceed, a crop's needs. During the growing season, we routinely take samples of the growing crop and analyze the plant's tissue. This is a check of our nutrient application system, confirming that the proper amount of nutrient has been applied.

As crops are harvested, each field's total yield is tracked and tested for quality. This information is also necessary to ensure that the amount of nutrient removed with harvest matches the amount of nutrient applied.

All of these recommendations are made by a specially trained soil scientist called an agronomist. Our family has had the pleasure of working with some of the best agronomists available, and we follow their recommendations precisely.

Overapplication of a nutrient, whether natural or commercial, makes no sense from an environmental or an economic standpoint. If we are able to produce more manure than needed on our own land, we have a ready market and are able to sell this excellent soil amendment to other farms that need to purchase nutrients.



CLEAN AIR

Protecting Air Quality



We live and work on the farm, too. We take extra steps to make sure the air is clean. As dairy farmers who are proud members of our community, we care about air quality. We are always looking at new technologies to help protect the environment.

Naturally, there are odors associated with livestock farming. We work to minimize odor through containing, controlling and recycling manure produced on the farm. We have a stake in following regulations and best management practices to protect the health of our families, our cows, and our community. It's important to us to be good neighbors.

In addition to containing manure in secure long-term storage, there are other actions we take to make sure the air stays clean:

- Our feed piles are covered at all times
- We use minimum tillage practices on our crops, which not only prevents erosion, but also reduces dust particles
- Our cover crops prevent wind erosion, which makes sure our soil is staying put, and this reduces dust particles
- All of our vehicles are fully emission compliant

Our manure tankers are sealed units filled from the bottom using air instead of mechanical agitation. By using this system, odors are greatly reduced while applying nutrients to the fields.

The previous generations taught us that this is not our land and these are not our resources. It's simply our responsibility to be the next generation of caretakers. We take that responsibility seriously.





Our work. Our life. Our home.

FAMILY

Our parents and our grandparents recycled long ago. We follow in their footsteps by being committed to following regulations and best management practices to protect the health of our families and yours, to keep our cows healthy, and to maintain the quality of the milk we produce.

We support practices that make economic sense, help the environment and are socially responsible to our community and our world by reducing energy use and protecting water and air quality while producing a nutritious product.

The reason we farm is because we love agriculture. We want to be good neighbors. At the end of the day, we all have to ask ourselves, "From what we accomplished today, is the world a better place?" We like to think farming the land and providing people with good nutrition is still an honorable profession. We hope you do, too.

The Kinnard Family





Find us on 

Kinnard Farms ■ E2675 County Rd S ■ Casco, Wisconsin 54205 ■ kinnardfarms.com