PFMD UPDATE

A BULLETIN FROM THE PESTICIDE AND FERTILIZER MANAGEMENT DIVISION

APRIL 2022

Inside this Issue

Director's Notes

Joshua Stamper, Director, Pesticide and Fertilizer Management Division

"If you have time to lean, you have got time to clean" is a mantra that a lot of young employees hear on their first job. Facility cleanliness is often what separates facilities that need to do expensive clean ups from facilities that get a clean bill of health in pesticide and fertilizer remediation investigations. The Ag Chemical Response and Reimbursement Account has reimbursed over $50 million dollars in clean up costs since 1989. While this program is a huge asset in preventing groundwater contamination from Ag Chemicals, its worth pointing out that some facilities have no environmental liability because they ran a clean operation.

Facilities that train staff how to appropriately abate and clean up spills are facilities that are going to make more money and have less environmental liability over time. Simple things like having brooms, dustpans, absorbent material allow trained staff to quickly contain any products that do hit the ground. Seal those cracks in the concrete to prevent contamination under the building. Drip pans and hose holsters are also key tools in containing chemicals that might otherwise be hard to contain.

Little things add up over time, and cleaning up ag chemical spills is never going to be less expensive. Take the time to work with your staff on a game plan to keep things clean. For a complete guide to keeping your facility tidy see www.mda.state.mn.us/sites/default/files/inline-files/preventfacilitycontamination.pdf and remember to train staff to report spills immediately to the Minnesota Duty Officer at 1-800-422-0798.

A MESSAGE FROM COMMISSIONER THOM PETERSEN

Research Makes Us Better

From major improvements in seed genetics and hybrids in the mid-20th Century to today's precision agriculture, the ag industry has long benefitted from science and research. We are fortunate in Minnesota to have world-class researchers studying the latest technology and science to improve the way we grow and process our food, feed, and fuel.

Since 2008, the Agricultural Fertilizer Research and Education Council, or AFREC, has been leading the way in soil fertility research, technology development, and education. Through a tonnage fee on fertilizer sales in Minnesota, approximately $1 million is raised annually to fund studies to improve fertilizer efficiency and farm profitability while enhancing Minnesota's environment. The farmer-led council develops research priorities and ensures the funding is well spent on meaningful research.

One important topic studied over the years is the use of nitrogen fertilizer. The science generated from the research has led to a better understanding of nitrogen application rates and split timing, crediting for manure application, and more best management practices. Overall, this information can help lower farmers input needs and costs, something important with high fertilizer prices, while helping our water resources.

Given the years of valuable research generated by AFREC, it's important we continue to support this work. Those that connect with farmers are encouraged to discuss the investments being made thanks to funds generated from fertilizer sales, and farmers are encouraged to implement and share the research. While we have made much progress because of the AFREC-funded science, there is still more to learn in the years to come.

Learn more about AFREC in this newsletter and by going to their research website: MNSoilFertility.com.

New Pollinator Protection Videos for Applicators and Landowners

Theresa Cira, Research Scientist

Pollinators, such as bees, are very important to agriculture and the environment, so it is important to support them. In 2021, three short videos were made to promote and encourage pollinator-safe pesticide application and protection of pollinator habitat. These videos are being shown at pesticide recertification workshops and can be found on the MDA's YouTube channel for anyone to watch, use, or share. The Environmental Protection Agency provided funding for video production and University of Minnesota and Metro Blooms collaborators helped create the videos.

View the videos at: www.youtube.com/user/mnagriculture/videos

For more information, please contact Theresa Cira at 651-201-6237, Theresa.Cira@state.mn.us.

PFMD Update

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Supervising Editor: Stephanie Ende
Manager, Inspection and Enforcement
Stephanie.Ende@state.mn.us

Editor: Jen Schaust
Environmental Outreach Coordinator
Jen.Schaust@state.mn.us

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In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.

DEPARTMENT OF AGRICULTURE

MDA Private Well Pesticide Sampling Project Phase 2 Update

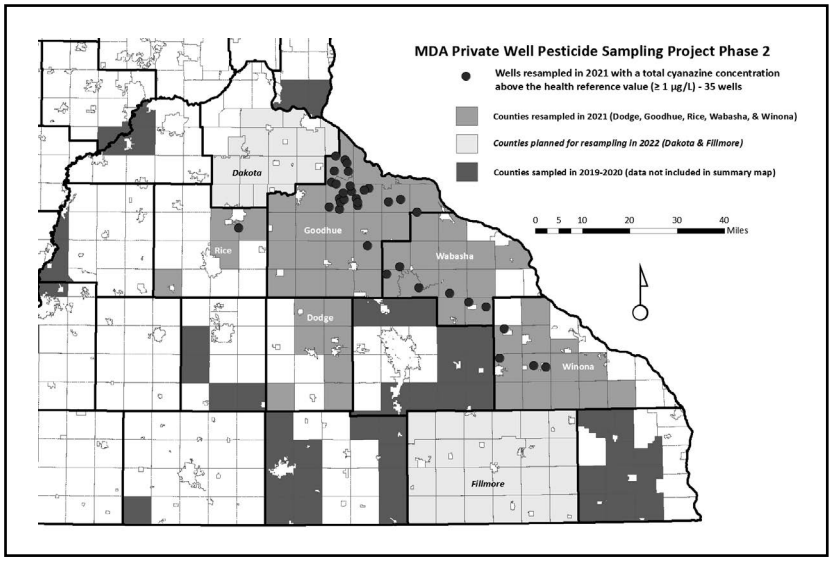
Brennon Schaefer and Heather Johnson, Hydrologists

The detection of pesticides in groundwater at levels above health reference values is rare in Minnesota. However, after the breakdown products (degradates) of cyanazine were added to the Private Well Pesticide Sampling Project laboratory analytical list in 2019 through 2020, concentrations were found to exceed the total cyanazine (cyanazine plus its degradates) reference value in some of the tested wells. Use of the herbicide cyanazine stopped in 2003, after the registration was voluntarily canceled. In response to these detections, the MDA began resampling wells that were tested prior to 2019 to allow for wider evaluation of total cyanazine concentrations.

In 2021, there were 512 samples collected from private drinking water wells in Dodge, Goodhue, Rice, Wabasha, and Winona counties. Testing was specifically focused on eleven compounds - atrazine, cyanazine, and their degradates. As shown in the figure, samples from 35 of the wells denoted a concentration greater than the total cyanazine health reference value of 1 µg/L (parts per billion). Based on sampling thus far, the wells of most concern appear to be those that have the St. Peter or Prairie du Chien aquifers as the uppermost bedrock formation and are not covered by thick glacial till.

In 2022, sampling will continue in other parts of the state, primarily in Dakota and Fillmore counties. Plans are also in development for a long-term sampling effort to track how total cyanazine concentrations change over time in aquifers.

For more information, visit: www.mda.state.mn.us/cyanazine-monitoring and www.mda.state.mn.us/pwps or contact Brennon Schaefer at 651-201-6491, Brennon.Schaefer@state.mn.us.



Groundwater Animations and Videos for Southeast Minnesota

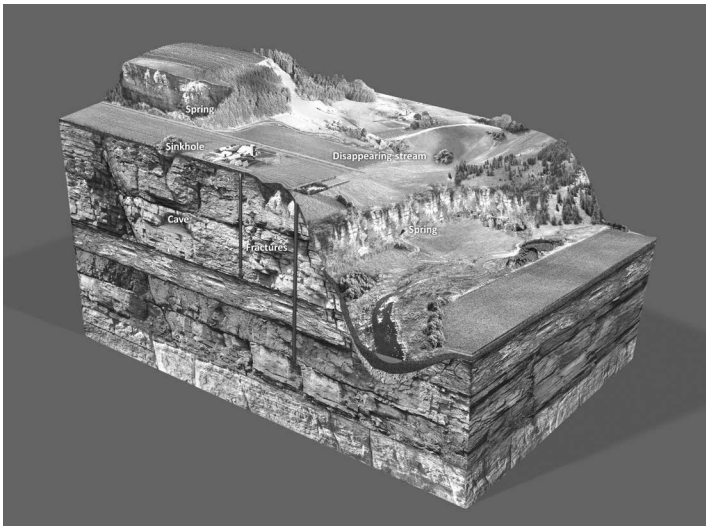
Kevin Kuehner, Hydrologist

The flow of groundwater in southeast Minnesota is fascinating and complex. In a video series released in 2020, the movement of groundwater is explored and brought to life using a unique approach that combines realistic graphics, animation, and drone footage of the region's bedrock geology. By understanding how groundwater moves through the soil and various layers of rock, viewers can better understand how water-soluble contaminants like nitrate can enter drinking water wells and streams.

Combining animation with the best available science, these videos help show the direct connections between groundwater and surface water, explain why certain wells are more vulnerable to nitrate contamination, and why nitrate levels are slowly increasing in certain streams. Although the video focuses on different landscapes in the Root River Watershed, the information can be applied throughout southeast Minnesota and the Driftless Region of the Upper Midwest. High resolution graphics and short, two-minute animations are also available.

The five short videos and three graphics can be found at www.mda.state.mn.us/segwresources.

For more information, please contact Kevin Kuehner at 507-765-4530, Kevin.Kuehner@state.mn.us.



Anhydrous Ammonia Inspection and Safety Tips

Ed Kaiser, Consultant

Proper maintenance and frequent self-inspections are key to making sure your anhydrous ammonia (NH3) equipment and facilities are both compliant and operating safely. Use the following resources to help ensure you meet all the requirements and safety guidelines. They can be found at: www.mda.state.mn.us/NH3. Use the gray tabs at the top of the page to find resources specific to equipment, storage, and safety. The resources are listed by the gray tab categories below.

Anhydrous Ammonia - Main page

The following YouTube Videos are listed under "External Links"

- NH3 Equipment Presentation
- NH3 Break-Away Coupling Device Installation
- NH3 Break-Away Coupling Device Parts
- NH3 Storage Facility Presentation
- Testing a Pressure Actuated Bypass System
- NH3 Incident Presentation

Anhydrous Ammonia – "Equipment" tab

- Equipment inspection checklist
- Break-Away Coupling Device Information
- Service Status Policy
- Pressure Relive Valve (PRV) Installation/ Replacement Record form

Anhydrous Ammonia – "Storage" tab

- Storage inspection checklist
- Procedure of Testing a Pressure Actuated Bypass System (annual testing required)
- Service Status Policy
- Pressure Relive Valve (PRV) Installation/ Replacement Record form

Anhydrous Ammonia – "Safety" tab

- Practice Safety When Handling Anhydrous Ammonia-NH3

For more information, please contact Ed Kaiser at 651-201-6275, Ed.Kaiser@state.mn.us or visit www.mda.state.mn.us/NH3.

CropCheck: A New Crop Registry and Mapping Program

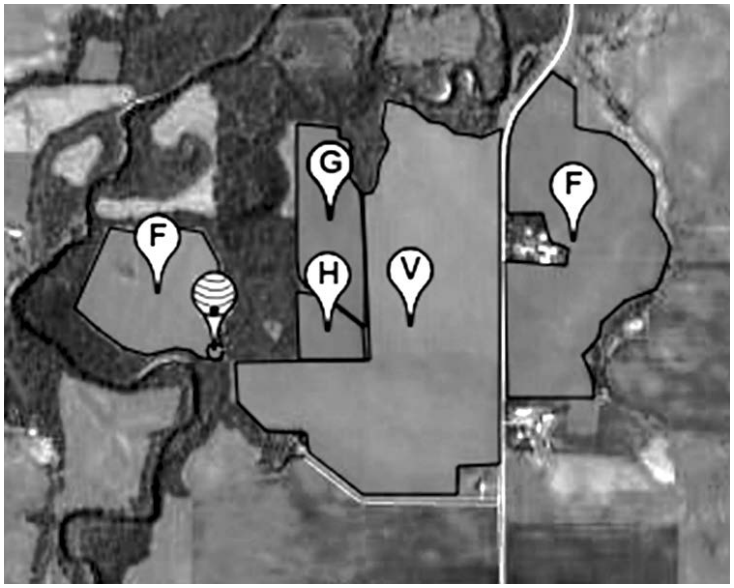
Larry VanLieshout, Research Scientist

Not long ago, pesticide applicators could estimate the herbicide sensitivity of crops in adjacent fields based on the crop species. However, the development of herbicide tolerant crops makes this difficult. Growers, especially of non-herbicide tolerant crops, have expressed interest in mapping their fields and herbicide tolerances on the FieldWatch map to reduce drift injury. Although any herbicide can drift under certain conditions, the prevalence of dicamba and 2,4-D tolerant crops has increased this concern since they have activity at low use rates and can be volatile.

This year, the MDA is adding CropCheck, another FieldWatch program, to allow sharing of herbicide tolerance information of field crops and their locations. Selecting a pin on the FieldWatch map displays crop and herbicide tolerance information for that field in addition to grower contact information. Prior to spraying, applicators are encouraged to check the sensitivity of adjacent fields and take precautions to avoid drift.

The MDA started working with FieldWatch in 2011 to protect pesticide sensitive sites. DriftWatch is for marking specialty crop fields, such as fruit and vegetables. BeeCheck allows beekeepers to mark the locations of their beehives on the FieldWatch map.

For more information, please contact Larry VanLieshout at 651-201-6115, Larry.VanLieshout@state.mn.us.



Pesticide Rinsate and Precipitation-Now What?

Matt Parins, Agricultural Chemical Consultant

Follow the label. Remember you must follow the pesticide label directions when you dispose of pesticide rinsate and rain or snow that has been contaminated with a pesticide. Discharging or dumping the liquid into the environment or mixing it with manure is not allowed. Illegal disposal is a violation of the pesticide label, and it may result in damage to the environment and subsequent financial penalties.

The goal is to minimize the amount of contaminated precipitation on your site and prevent the creation of hazardous, unusable product. First, add a roof over pesticide containment or storage areas. Second, don't mix the contaminated liquid of different products. When precipitation collects in outdoor containment areas and load pads that are used for multiple products it becomes difficult to use the rinsate at the correct labeled rates and for the intended target crop. Collect pesticide rinsate from a containment or load area into rinsate tanks and separate it by product and target crop.

Rinsate should be used the same season it was collected, and each use should be recorded (indicate crops, and dates of application). Precipitation accumulation should not be assumed to be "uncontaminated" unless it can be tested and determined as such.

For more information, please contact Matthew Parins at Matthew.Parins@state.mn.us or 651-201-6587.

Chemigation Program Update

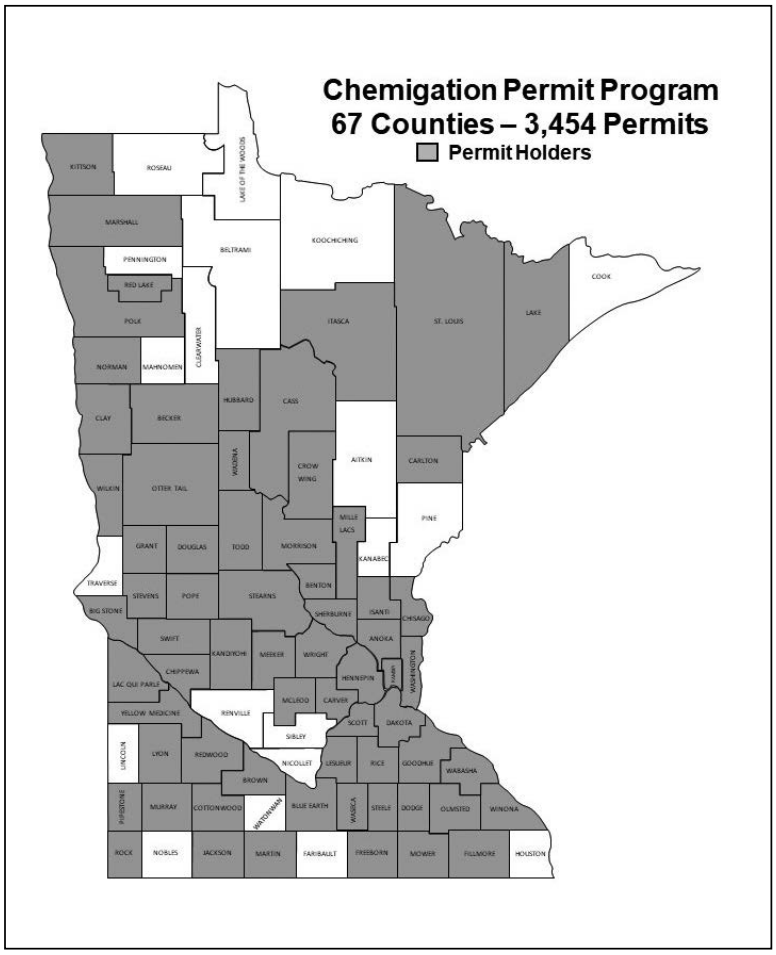
Jeff Lorentz, Agricultural Chemical Consultant

The MDA's chemigation permit program has been in place for over 30 years and it currently has over 3,400 active permits. It is possible, however, that many of these permits may actually be inactive. Permits may no longer be active for a variety of reasons (ex. property sale or lease/rental, deceased permit holders, etc.).

To maintain accurate permit information, staff will be contacting chemigation permit holders to verify the status of their permits. If you would like to deactivate a permit, a written request is required. Requests can be emailed to Jeff Lorentz (email below).

Chemigation permits are required for the application of either fertilizer and/or pesticide through an irrigation system that is directly connected to a water supply (surface water, private well, public water system). The majority of current chemigation permits are for the application of fertilizer and for crop field irrigation. Permit requirements apply to crop fields, greenhouses, nurseries, golf courses, and athletic fields.

For more information, please visit www.mda.state.mn.us/chemigation-permit-program or contact Jeff Lorentz at 320-223-6547, Jeffrey.Lorentz@state.mn.us.



Click, Click, Zoom: The Learning Curve of Online Recertification Courses

Brian Clark, Recertification Project Manager and Robyn Frederick, Recertification Project Manager

The MDA has always required in-person workshops, but just like our life, COVID-19 changed that. Within 3 months after everything was shut down, we moved forward with the decision to host the first online pesticide recertification workshops in MDA's history. Our workshop sponsors quickly stepped up and created on-line options for recertification credits, then MDA personnel reviewed each one. Morning coffee, pastries, lunch, and sidebars with presenters have given way to computer screens, cameras, and online technical difficulties. We have had to adapt on the fly and modify recertification guidelines as our knowledge of the virtual workshops evolved. We are hopeful that in the near future, our online workshops will have strong verification and accountability requirements just like our in-person workshops.

For more information visit: www.mda.state.mn.us/licensing/licensetypes/pesticideapplicator/recertreqs

Or contact Brian Clark at 651-201-6548 or Brian.Clark@state.mn.us.

Chlorpyrifos Product Registrations and Cancellations

Raj Mann, Section Manager, Pesticide Non-Point Section, Rajinder.mann@state.mn.us and
Trisha Leaf, Supervisor, Pesticide Management Unit, Trisha.leaf@state.mn.us

Chlorpyrifos is an active ingredient in many commonly used insecticides such as Govern, Hatchet, Lorsban, Lorsban Advanced, Vulcan, Warhawk, Whirlwind and Yuma, and formulated mixtures such as Bolton, Cobalt Advanced, Match-Up and Stallion. In August 2021, the Environmental Protection Agency (EPA) published its final rule revoking all chlorpyrifos tolerances, effectively canceling all food and feed uses. Tolerances for all commodities expired on February 28, 2022. The EPA indicated that if chlorpyrifos is detected in food and feed crops for sale in the U.S. after February 28, 2022, the crop will be considered adulterated and will be ineligible for sale. However, if it can be proven that chlorpyrifos was legally applied to the crop prior to February 28, 2022, and levels are below the previous tolerance level, it will not be considered adulterated. Producers can use spray records to demonstrate that application occurred before February 28, 2022. The Food and Drug Administration (FDA) published a guidance document to assist food producers and processors to address questions related to treated commodities with chlorpyrifos residues. The FDA guidance is available at: https://www.fda.gov/media/156012/download

Based on EPA's final rule, the MDA did not renew the registration of chlorpyrifos products containing food and feed uses for 2022. Products containing chlorpyrifos with food and feed uses on the label were placed into cancellation status starting January 1, 2022, meaning they can no longer be sold or distributed in Minnesota. EPA stated that it intends to cancel registered food and feed uses of chlorpyrifos associated with the revoked tolerances under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as appropriate.

Non-agricultural uses of chlorpyrifos on golf course turf, industrial sites, greenhouse and nursery production, sod farms, and wood products are unaffected by this rule.

With revocation of tolerances, farmers will need to consider alternative insecticides or other management tactics for crop pests. In collaboration with the University of Minnesota, the MDA published an article on alternatives for management of key Minnesota crop pests. The Extension crop and pest management guides listed below provide extensive lists of products available for management of pests but they are not Minnesota-specific. Use the MDA's registered product search (www2.mda.stat.emn.us/webapp/lis/productsdefault.jsp) to find out if a pesticide is registered for use in Minnesota. Always read the label before applying a pesticide

Field Crops: www.ag.ndsu.edu/publications/crops/north-dakota-field-crop-insect-management-guide

Vegetable Crops: https://mdc.itap.purdue.edu/item.asp?Item_Number=ID-56

Fruit Crops: https://edustore.purdue.edu/item.asp?Item_Number=ID-465-W

Disposal of unused chlorpyrifos products can be done through the MDA's Waste Pesticide Collection Program (www.mda.state.mn.us/disposal). Additional options may become available upon cancellation of products by the EPA following the revocation of tolerances.

FDA guidance: www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-questions-and-answers-regarding-channels-trade-policy-human-food-commodities

EPA Frequently Asked Questions: www.epa.gov/ingredients-used-pesticide-products/frequent-questions-about-chlorpyrifos-2021-final-rule

How are Fertilizer Tonnage Fees Spent?

Russ Derickson, Soil Scientist

Each year the ag community invests in the future success of Minnesota farms through the fertilizer tonnage fee. The state uses these funds to support a farmer-led program to advance soil fertility research, technology development, and education. The Agricultural Research and Education Council (AFREC) sets the priorities for the program and determines how these funds are spent.

Once AFREC develops a list of research and education priorities for the year, funds are distributed through a competitive request for proposal process. In the last few years, AFREC has been able to award about $1 million per year to soil fertility research and educational programs. Since 2008, the program has invested over $10.7 million to improve fertility efficiency, farm profitability, and the ag environment in Minnesota. When averaged across all of Minnesota's cropland, AFREC investments are around 7 cents per acre.

FUNDS INVESTED SINCE 2008	
Topic	**Percentage of Investment**
4 Rs	40%
Nutrient cycling	16.7%
Education outreach, coordination	15.5%
Water quality/Drainage	8.5%
On-farm demonstrations	6.7%
Soil/Plant analysis	4.8%
Intensive crop management	5.6%
Biomass/Energy	1.5%

Word Cloud of the most popular AFREC research topics

AFREC funded research examples and key findings

- Split application of urea % ESN vs a single urea application increased the return by $63/acre (7 year study)
- Single preplant ESN vs urea reduces ammonia emissions by 81% and nitrous oxide emission by 55% (3 year study)
- Sulfur project found a response to greater than recommended rates of sulfur when applied to corn on poorly drained soils with organic matter (>4% OM) in West Central Minnesota. These areas may be sulfur deficient.
- AFREC funds support University of Minnesota (UofM) research and Extension outreach
  - » Over 300,000 unique views for Nutrient Management webpage (2021)
  - » Over 20,000 views of 14 nutrient management blog posts

For more information on AFREC research visit MNSoilFertility.com or extension.umn.edu/crop-production#nutrient-management. And look for the AFREC logo at your next extension crop meeting.

Updated Groundwater Protection Rule Maps Available Online

Luke Stuewe, Fertilizer Management Unit Supervisor

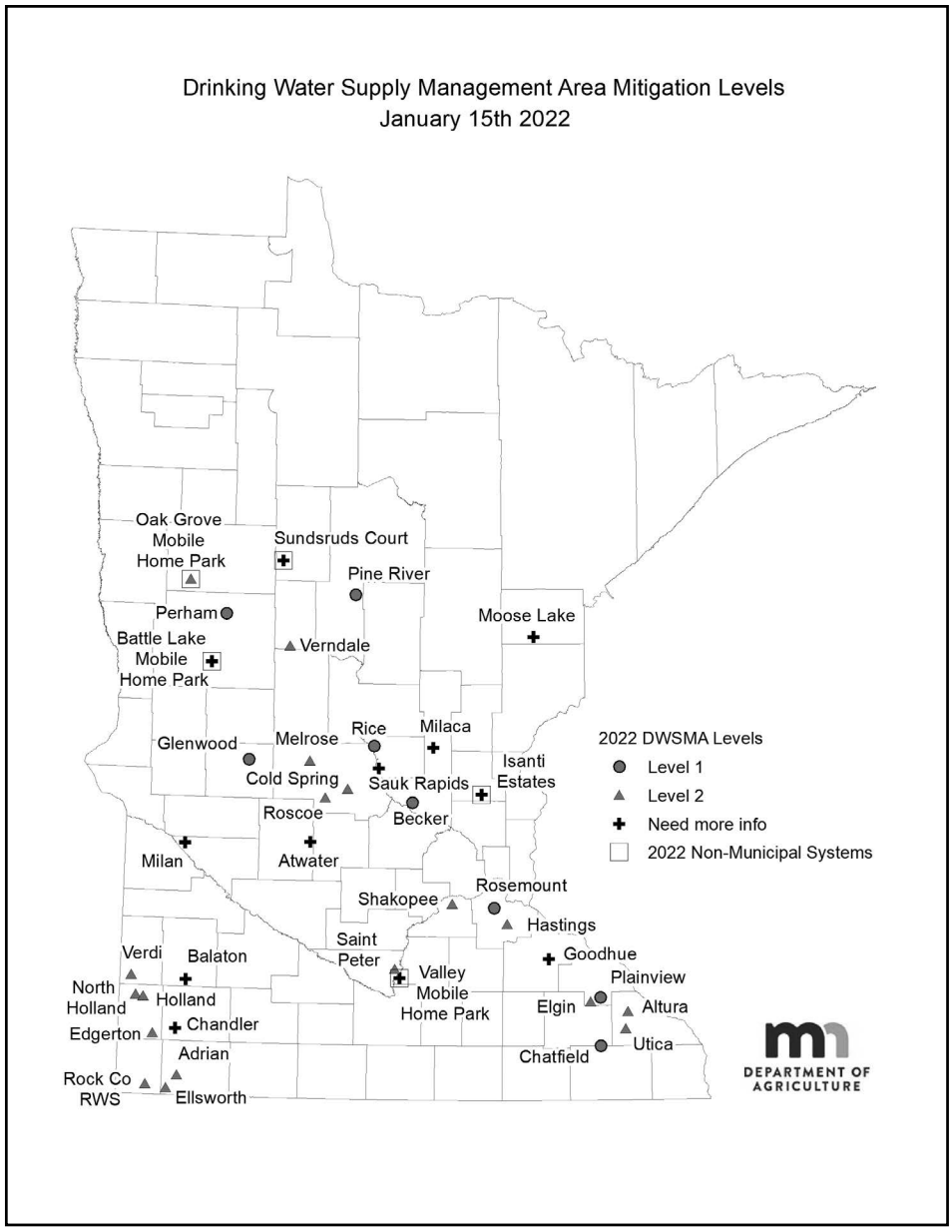
On January 14, the MDA issued updated maps that will help farmers across the state comply with the Groundwater Protection Rule. The rule restricts fall application of nitrogen fertilizer in areas vulnerable to contamination, and it outlines steps to reduce the severity of contamination in areas where nitrate is already elevated in public water supply wells. The maps that illustrate the vulnerable groundwater areas and public water supplies are updated each year in January as additional information becomes available.

An updated map of public water supply wells with elevated nitrate levels can be found at www.mda.state.mn.us/mitigation-level-determination.

The MDA has also made changes to the Vulnerable Groundwater Area Map. This map illustrates those areas that have fall nitrogen fertilizer application restrictions. A link to an interactive map can be found at www.mda.state.mn.us/vulnerableareamap.

The estimated number of acres being added this year is 248,433 cropland and 603,654 non-cropland acres, and 4,659 cropland and 20,506 non-cropland acres are being removed. This results in a total increase of 852,087 acres, and a new total acres subject to restrictions of 9,502,828.

Farmers are encouraged to check the new maps prior to the fall of 2022 to determine if their fields are subject to these restrictions. The restrictions begin September 1 of each year.



For more information, please contact:
Margaret Wagner
651-201-6488
Margaret.Wagner@state.mn.us

Luke Stuewe
218-850-9454 (cell)
Luke.Stuewe@state.mn.us

Select MDA, Pesticide & Fertilizer Management Division, Enforcement Actions

Corinne du Preez, Agricultural Adviser

Jackson, MN

An agricultural operator paid a $1,750 penalty for applying Tavium Plus VaporGrip Technology herbicide, a Restricted Use Pesticide, without a license or certification as a private pesticide applicator, without dicamba- or auxin-specific training as required by the product label, and application 45 days after the planting date which is prohibited by the product label.

Tracy, MN

An agricultural operator paid a $250 penalty for applying a Restricted Use Pesticide without certification as a private pesticide applicator or license as a commercial pesticide applicator.

Minnetonka, MN

A greenhouse paid a $2,750 penalty for Worker Protection Standard (WPS) violations that included failure to provide WPS safety training to workers and pesticide handlers, failure to display pesticide safety and application and hazard information for workers and pesticide handlers, and for incomplete pesticide application records.

Hamburg, MN

An agricultural facility with a commercial pesticide applicator paid a $1,000 penalty for applying Atrazine 4L herbicide, a Restricted Use Pesticide, in violation of label set back requirements. The product label states the pesticide cannot be applied within 200 feet of natural or impounded lakes or reservoirs.

Lamberton, MN

An agricultural operator paid $1,500 penalty for applying pesticides in wind speeds exceeding label restrictions and in a manner resulting in pesticide drift and damage.

Hanska, MN

An agricultural facility with an MDA fertilizer license and anhydrous ammonia (NH3) permit paid a $1,000 penalty for failing to report a NH3 incident and overfilling NH3 storage tanks.

Red Lake Falls, MN

An agricultural operator paid a $1,500 penalty for applying a pesticide beyond the boundaries of the target site resulting in damage to a State Wildlife Management Area.

Moorhead, MN

An agricultural operation with a Minnesota certified private pesticide applicator paid a $750 penalty for applying a pesticide resulting in drift and damage to nearby vegetable crops.

Argyle, MN

An agricultural operator and Minnesota certified private pesticide applicator paid a $1,000 penalty for failure to complete dicamba-specific or auxin-specific training as required by the Eugenia herbicide product label, prior to applying the product.

Loretto, MN

A lawn care facility paid a $750 penalty for commercially applying fertilizer and pesticides without the required company fertilizer license or commercial pesticide applicator license.

Walnut Grove, MN

An agricultural facility paid a $500 penalty for selling Restricted Use Pesticides to an individual that was not certified as a Minnesota private pesticide applicator or licensed as a commercial pesticide applicator.

Water Quality Certified Producers Go Above and Beyond Requirements

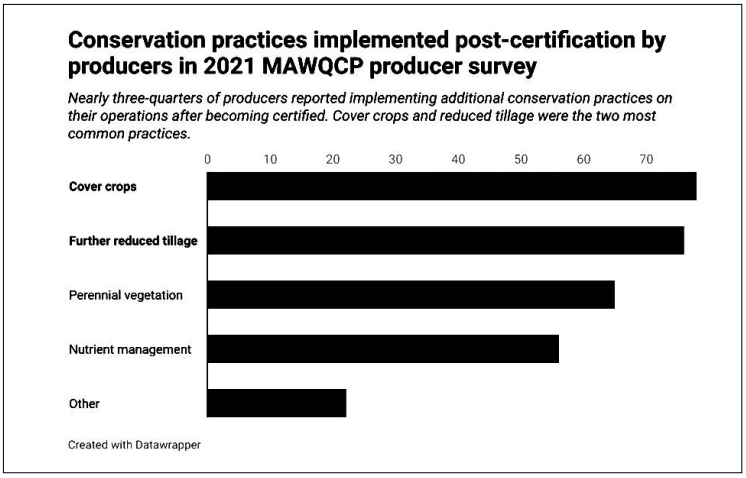
Jessica Jurcek, MAWQCP Student Worker

The Minnesota Ag Water Quality Certification Program (MAWQCP) reached a new milestone in 2021 with over 1,000 certified producers. A survey sent to about 500 recently enrolled producers shows that these farmers are continuing to protect Minnesota's water resources by implementing conservation practices on their farms.

Nearly three-quarters of survey respondents reported implementing conservation practices on their farms beyond what was required for their initial certification. These practices include planting cover crops, reducing tillage, establishing perennial vegetation, introducing pollinator habitat, and more. The primary motivation that farmers reported for implementing these conservation practices was to reduce soil erosion, suggesting a common concern about water and soil resources among MAWQCP-certified farmers. Aside from a commitment to reducing soil erosion, demonstrating their water ethic was the most common motivation producers reported for certifying their farms.

The MAWQCP is a voluntary program to protect Minnesota's water resources by connecting farmers with resources to mitigate the risks their farms might pose to water quality. Certified farms are recognized for their conservation efforts and positive contributions to water quality. Farmers and landowners interested in becoming water quality certified can contact their local Soil and Water Conservation District or visit MyLandMyLegacy.com.

For more information, please contact Jessica Jurcek at 920-342-1287, Jessica.Jurcek@state.mn.us



Conservation practices implemented by producers after becoming Water Quality Certified.

MN Specific Dicamba Restrictions for the 2022 Growing Season

Raj Mann, Section Manager, Pesticide Non-Point Section
Trisha Leaf, Supervisor, Pesticide Management Unit

The MDA received more than 300 dicamba drift related reports during the 2021 growing season. To curb alleged off-site movement (spray drift and/or volatilization) issues, the MDA has worked with the EPA and the registrants to impose following mandatory restrictions on the use of three dicamba products, XtendiMax®, Engenia®, and Tavium® on dicamba tolerant (DT) soybeans for the 2022 growing season.

- Cutoff date: Do not apply **south of interstate 94 after June 12th**. Do not apply **north of interstate 94 after June 30th**.
- Cutoff Temperature for the entire state: Do not apply if the air temperature of the field at the time of application is over 85 degrees Fahrenheit or National Weather Service's forecasted high temperature for the nearest available location for the day exceeds 85 degrees Fahrenheit. Forecasted temperature must be recorded at the start of the application.

The product label comprising these EPA approved MN specific restrictions is available on the product manufacturer's website. Check the company's web site to download the restrictions prior to application of any of these three dicamba products. The restrictions are also promoted through the mandatory dicamba specific training and the MDA's website. Compliance with these MN specific restrictions and other restrictions listed on the product label is mandatory.

Dicamba is an important tool in combating herbicide resistant weeds in DT soybeans. Products containing dicamba can cause serious damage to non-dicamba-tolerant soybeans and to other sensitive crop and non-crop plants. The MDA wishes to preserve this tool for farmers. However, it must be used without impacts on neighboring crops, homes, farms, and gardens.

For more information please contact Raj Mann at 651-201-6208, Rajinder.Mann@state.mn.us.

DEPARTMENT OF AGRICULTURE

Minnesota Department of Agriculture
Pesticide and Fertilizer Management Division
625 Robert St. N.
St. Paul, MN 55155-2538

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Are All Ag-Lime Materials Created Equal?

Ed Kaiser, Ag-lime Program Consultant

Ag-lime includes materials such as limestone, marl, pelleted, quick lime, and by-products like beet lime, eggshells, water treatment lime, wood ash, etc. In Minnesota, all ag-lime materials are analyzed and rated based of the pounds of Effective Neutralizing Power (ENP) per ton (lbs ENP/Ton). The lbs of ENP per/Ton rating is used to compare different ag-lime products and determine the ag-lime application rate for the intended soil pH increase. Increasing the soil pH promotes increased bacteria activity, nutrient availability, and crop production - depending on the crop being grown.

In Minnesota, the lbs ENP/Ton is required information on the ag-lime distribution label (i.e., billing, delivery, invoice document or scale ticket) that must be provided at the time of delivery. The lbs ENP/Ton ratings for ag-lime materials distributed in Minnesota is available at: www.mda.state.mn.us/ag-lime-analysis-results.

For more information, please contact Ed Kaiser at 651-201-6275, Ed.Kaiser@state.mn.us or visit www.mda.state.mn.us/aglime.