

Growing Montana

FALL 2022



2022 MABF
**SCHOLARSHIP
WINNERS**

2023 MABA/MGEA
**ANNUAL CONVENTION
& TRADE SHOW**

MONTANA
**SOILS BECOMING
ACIDIC**

A Publication of
MONTANA AGRICULTURAL BUSINESS ASSOCIATION

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CONTACT INFORMATION:

<p>Montana Agricultural Business Assoc. PO Box 7325 Helena, MT 59604 (406) 439-2215 mabamgea@gmail.com www.mtagbiz.org www.facebook.com/MontanaAgriculturalBusinessAssociation/#</p>	<p>Krista Lee Evans Blake Creek Project Management, Inc. PO Box 7325 Helena, MT 59604 (406) 439-2215</p>
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MABA OBJECTIVES:

- To encourage the proper use of all pesticides, plant food, seeds and other agricultural products.
- To promote educational programs to bring together those who are associated with the aforementioned practices and uses.
- To provide a means for an exchange of information and ideas among persons associated with agricultural business.
- To encourage and support research and educational programs.
- To cooperate with local, state, regional and national agencies, both public and private, in the solution of problems and/or in the proposal of legislation relating to all such practices.
- To sponsor desirable laws and law changes that would be beneficial to the Association and its members.
- To serve as a clearing house for the legislative requests of various organizations regarding programs affecting the Association.



Jake Yates, President

Nutrien | Billings
(406) 696-7942 • jake.yates@nutrien.com
At Large, Term Expires 2024

Tanner R. Hoversland, Vice President

Moore Farmers Oil | Moore, MT
(406) 374-2555 • mfochem@mtintouch.net
At Large, Term Expires 2024

Johnnie Scott, Secretary

Syngenta Crop Protection | Great Falls
(406) 453-5004 • johnnie.scott@syngenta.com
At Large, Term Expires 2023

Marcus Weatherhead, Treasurer

Corteva | Worden
(406) 690-3946 • Marcus.weatherhead@corteva.com
At Large, Term Expires 2024

James Baguley

Corteva Agriscience | Whitefish
(406) 407-0827 • james.allan.baguley@corteva.com
At Large, Term Expires 2023

Tim Tackes

KALO, Inc | Stevensville
(406) 370-7253 • ttackes@kalo.com
At Large, Term Expires 2023

Casey Odom

Nutrien Ag Solutions | Billings
(406) 633-3463 • Casey.odom@nutrien.com
At Large, Term Expires 2023

Dan Brattain

Helena Agri Enterprises | Great Falls
(406) 781-0530 • brattaind@helenaagri.com
At Large, Term Expires 2025

Don Soper

CHS Big Sky | Havre
(406) 265-2275 • donald.soper@chsinc.com
At Large, Term Expires 2025

Burl Brawley

Helena Agri Enterprises | Great Falls
(406) 216-2100 • BrawleyB@helenaagri.com
At Large, Term Expires 2025

Ryan Helmer

Wilbur Ellis | Vaughn
(406) 650-1134 • rhelmer@wilburellis.com
At Large, Term Expires 2024

Luke Neal

Rocky Mountain Supply | Belgrade
(406) 660-0098 • lukencal@rmsi.coop
At Large, Term Expires 2025

Dr. Sreekala Bajwa

Vice President of Agriculture, MSU
Dean and Director, College of Agriculture
and Experiment Stations, MSU | Bozeman
(406) 994-3681 • agdean@montana.edu
Advisory

Dr. Clain Jones

Montana State University | Bozeman
406-994-6076 (o) • 406-994-3933 (f)
clainj@montana.edu
Advisory

Krista Lee Evans

MABA | Helena
406-439-2215 • mabamgea@gmail.com
Executive Director

A Message from the President

I remember as a kid how long it took for a full year to pass. I would comment to my parents or grandparents how time was dragging by, and the school year will never end. They always replied with a very similar answer basically saying, “oh you wait until you get older”. So, here I am no longer a young pup, and they were right! This year has flown by, and I cannot believe we are already into the Fall. I must confess Fall is my favorite time of the year. We have harvest and football and tailgating, hunting, cooler temps and the excitement of the holidays fast approaching.

I believe the reason time goes so fast for many of us other than the fact we are busy is we are having fun and enjoying life. One of the best parts of my life is I get to work in the agriculture industry. I am proud of what our industry does and how we do it. We can proudly tell people we help feed the world. My kids have asked me many times if I love my job and it always makes me feel good to explain to them what folks in agriculture do and why. I get to brag on these amazing people who work hard every day with integrity and passion. I am so thankful I get to serve on the MABA board where I continue to be exposed to great people and examples of why Ag is so important. We need to remember what we do matters, and we can make a difference.

In September a few of us travelled to Washington DC. I won't go into details as Tim Tackes has provided a great summary of the trip in this newsletter. But one thing I heard several times was changes and communication must come from the ground up. We need to communicate from the field up to the state and federal levels. They want to hear real firsthand accounts and the impact to our members and growers. We need to provide our legislators with the ammunition to go fight for us. So, as I said what we do does matter and there are people who care and want to hear from us. MABA is here to help and be a conduit to Helena and DC. So, as 2023 approaches and our state legislators will be gathering in Helena lets work together to protect Agriculture in Montana.

Look out for one another and stay safe! ■



Jake Yates

President

*Montana Agricultural
Business Association*

2022 MABF Scholarship Winners



At the Montana Agribusiness Foundation (MABF) we encourage and support the legends of tomorrow. We strive to provide scholarships to the next generation of Montana agriculturalist. These scholarships are designed to aid students in achieving their educational goals and to help them prepare for their future and the future of Montana agriculture. The students to the right are the recipients of the 2022 MABF scholarship. Please help us in congratulating and encouraging them in their future endeavors.

Go like and follow our Facebook page to stay up to date with our current happenings. Please email us at mtagribusinessfoundation@gmail.com with any questions about our foundation or about the process to donate. If you are interested in being a part of the MABF please send an email to us to get started. Thank you for your continued support of our Montana youth.

Sincerely,
Nichole Drake, MABF President ■



Dakota Auck



Eric Koch

Welcome To Our New Members!

In 2022, MABA added 10 new memberships! Please join me in welcoming our new members:

**Miller Chemical
& Fertilizer LLC**

Tilleman Motor Company

Ceres Ag LLC

Davis Diversified Services

Elevation Agronomy LLC

Kop-Coat

MaxAg of Montana

N-7 LLC

North 40 Ag

**Montana Cooperative
Development Center**

Sustaining Membership

Sustaining Membership

Standard Membership

Standard Membership

Standard Membership

Standard Membership

Standard Membership

Standard Membership

Standard Membership

Affiliate Membership



Thanks for your support! We look forward to working with you all. ■



2023 MABA/MGEA Annual Convention and Trade Show

JANUARY 25-27, 2023 – HERITAGE INN, GREAT FALLS, MT

Opportunities and Optimism

The Annual MABA/MGEA Convention will provide a great opportunity for MABA members to learn, share experiences, and collaborate with colleagues. If you've never been to the convention, you should certainly make plans to attend this year's event. The event is host to professional speakers from across North America and over 500 attendees that are active in Agricultural Business in Montana.

Here's what you can expect at the "Opportunities and Optimism" conference:

- Certified Crop Advisor (CCA) Points
- MT Department of Agriculture Points
- Over 60 vendors participating in the trade show
- Outstanding speakers
- Information pertinent to your businesses and employees

MABA takes the needs of its membership very seriously and it is for this reason that the MABA ensures that there are Certified Crop Advisor (CCA) and Department of Agriculture points available for all the sessions!

The "Opportunities and Optimism" agenda includes discussions on High Impact Meteorology, Pesticide Safety, Cybersecurity, Soil Water Measurement and Irrigation Management, Canola Challenges and Opportunities, Biologicals/Biostimulants, Employee Recruitment and Retention, Nutrient Management Impacts of Drought, Strategies for Replanting Winter Crops, OSHA Update, Warm Season Crops, Fungal Pathogens of Pulse Crops, Sugar Beets and Cereals, Soil Science Precision Ag and Agronomy, Irrigation Decision Support Systems, and Long Term Rotation Studies Related to Cover Crops, Winter Dicot crops, No-Till and Organic Systems.

The MABA Annual Convention also provides an exciting opportunity for new agriculture professionals through a meet and greet and luncheon. During the luncheon there will be an opportunity for veterans

and new professionals to share challenges, concerns, opportunities and to create relationships to further build the professionalism of our industry. The New Agriculture Professionals Meet and Greet is scheduled for Thursday, January 26 at Noon.

The annual convention is a great opportunity for leaders in the Montana Agricultural Business Community to come together and share ideas, solutions, and challenges.

Thursday evening presents an opportunity to support Montana's youth agricultural programs. Each year, MABA and MGEA select an entity to receive the profits from the Thursday night social and auction. This year the proceeds will go to Montana FFA Foundation and Montana 4H Foundation to support our endowed scholarships with those organizations.

The MABA/MGEA Annual Convention brings together friends and acquaintances from across the state and country and provides a significant opportunity for networking. The breakout sessions are appropriate for management as well as employees and we look forward to seeing all of you in Great Falls in January!

To sign up to be a sponsor, vendor or to register for the "Opportunities and Optimism" Convention please go to the www.mtagbiz.org website and click on the Convention banner or contact the office at mabamgea@gmail.com and we will get you all set up!

Pesticide Recertification and Profession Training Opportunities

Wednesday morning of the MABA/MGEA Annual Convention and Trade Show is set aside for the Pesticide Recertification Workshop. The 2022 agenda does not disappoint and includes expert speakers and discussions related to Grasshopper and Weevil Insecticide Use, Drought Impacts to Herbicide Carryover, and Improving the Management of Chickpea, Field Pea, and Lentil Diseases. CCA and Department of Agriculture points will be offered for this event. ■

Opportunities & Optimism

2023 MABA – MGEA Convention & Pesticide Workshop

Heritage Inn – Great Falls, Montana

January 25 – January 27, 2023

Detailed agenda/registration online at: www.mtagbiz.org

PESTICIDE RECERTIFICATION AGRONOMIC WORKSHOP:

- Insecticide 101
- Drought Impacts to Herbicide Carryover
- Improving the Management of Chickpea, Field Pea, and Lentil Diseases

JOINT SESSIONS:

- High Impact Meteorology – Eric Snodgrass, The Weather Guy
- CyberSecurity
- Employee Recruitment and Retention

GRAIN SESSIONS:

- Pesticide Safety
- PNW Panel
- BNSF Update
- Railyard Safety

- OSHA Update

AGRONOMY SESSIONS:

- Soil Water Measurement and Irrigation Management
- Canola Challenges and Opportunities
- Biologicals/Biostimulants
- Nutrient Management Impacts of Drought
- Strategies for Replanting Winter Crops
- Warm Season Crops
- Fungal Pathogens of Pulse Crops, Sugar Beets and Cereals
- Soil Science Precision Ag and Agronomy, Irrigation Decision Support Systems
- Long-term Rotation Studies Related to Cover Crops, Winter Dicot Crops, No-till and Organic Systems



REGISTER ONLINE AT WWW.MTAGBIZ.ORG

or send your registration to:

MABA/MGEA Annual Convention
PO Box 7325 • Helena, MT 59604

406.439.2215 (c)



mtagbiz.org



[@maba_ag](https://twitter.com/maba_ag)



facebook.com/MontanaAgriculturalBusinessAssociation





**Montana Agricultural Business Association
 Montana Grain Elevator Association
 Convention Registration
 January 25, 2023 – January 27, 2023
 Heritage Inn, Great Falls, MT (406-761-1900)**



Company _____
 Contact _____ Phone _____
 Address _____ Fax _____
 City, State, Zip _____ Email _____

Refund Policy: A full refund will be given if the request is received in writing by fax, mail, or email at least one week before the convention begins. Beginning Monday of the convention week, no refund will be given except under unusual circumstances such as medical emergencies or death.

Late Registration: Registration received after January 10th 2023 will be assessed the late registration fee.

Option 1: Convention AND Pesticide Workshop – \$160/person (\$170 after Jan. 10, 2023)

Name	Address	Fee
_____	_____	_____
_____	_____	_____

Please Enter Total (attach additional sheets as necessary) Sub-Total \$ _____

Option 2: Pesticide Workshop Only \$60/person (\$70 after Jan. 10, 2023)

Name	Address	Fee
_____	_____	_____
_____	_____	_____

Please Enter Total (attach additional sheets as necessary) Sub-Total \$ _____

Option 3: Convention Only \$130/person (\$140 after Jan. 10, 2023)

Name	Address	Fee
_____	_____	_____
_____	_____	_____

Please Enter Total (attach additional sheets as necessary) Sub-Total \$ _____

Additional Purchases or Contributions – Meals are included with your registration.

Montana Ag Business Foundation Cash Donation	\$ _____
Silent Auction Cash Donation	\$ _____
Additional Wednesday Lunch Tickets (\$15 each)	\$ _____
Additional Thursday Lunch Tickets (\$15 each)	\$ _____
Additional Thursday Night Key Note Speaker and Dinner Tickets (\$50 each)	\$ _____
Sub-Total	\$ _____

Total of registration package and additional items **TOTAL \$ _____**

On Line registration is preferred at www.MTAGBIZ.ORG

Credit Card Payment:

Charge to Visa _____ Master Card _____ or American Express _____

Number: _____ Exp. Date _____

Name on card: _____ Address: _____

Zip Code: _____ 3 or 4 digit code _____ Signature _____

Please return to MABA/MGEA Convention, PO Box 7325, Helena, MT 59604/Email:mabamgea@gmail.com/Questions:

Call Krista 406.439.2215(c)/REGISTER ONLINE AT WWW.MTAGBIZ.ORG





2023 MABA-MGEA CONVENTION SPONSOR / VENDOR CONVENTION CONTRACT



Company _____

Name for Badge _____ Phone _____

Address _____ Fax _____

City, State, Zip _____ Email _____

MABA and MGEA will provide night security on Tuesday and Wednesday evenings from 10pm to 6am, but assume no liability for damage to or loss of exhibitors' property or for any losses in case of inability to provide exhibit space due to fire, earthquake, storm, riot, strike, civil insurrection or war.

TRADE SHOW

Sub-Total \$ _____

Booths are \$450 if paid **by** Nov. 15, 2022; \$500 if paid **after** Nov. 15, 2022

- Please reserve our same booth(s) space
- We would like a different booth space. The booth numbers that I would prefer (written in order of priority) are:

- We are a new exhibitor. (With this layout, all booths get excellent traffic. We try to place space between competitors.) The booth numbers that I would prefer (written in order of priority) are:

SPONSORSHIP

Sub-Total \$ _____

Sponsorship options are first-come, first-served. Options are listed on convention information handout.

The option numbers that I would prefer (written in order of priority) are:

Registration is included for one person with each booth or sponsorship.

ADDITIONAL REGISTRATIONS

Sub-Total \$ _____

For additional individuals, please enclose \$105/person if they are attending the convention only or \$135/person if they are attending both the convention and the pesticide workshop and list their names below.

Name(s) _____	City _____
_____	_____
_____	_____

- Please check if additional persons are attending and write those names on a list and attach to this form.

CONTRIBUTION TO AUCTION

Sub-Total \$ _____

Donation to Montana Agricultural Business Foundation Sub-Total \$ _____

TOTAL \$ _____

Online Payment is preferred at www.mtagbiz.org or

- Check Enclosed Check will be sent from my company headquarters Other
- Charge to: VISA Mastercard or American Express

Number: _____ Exp. Date: _____

Name on card: _____ Address: _____

Zip Code: _____ 3 or 4 digit code _____

Signature: _____

MAIL TO: MABA-MGEA Convention • PO Box 7325 • Helena, MT 59604
EMAIL: mabamgea@gmail.com • **SIGN UP ONLINE:** WWW.MTAGBIZ.ORG



Participate in the Future of YOUR Association

The MABA/MGEA Annual Convention brings an opportunity for members to reconnect with colleagues as well as gain a better understanding and knowledge of the vast issues facing our industries. One of the most important agenda items that is often overlooked by members is the Annual Meeting! MABA exists to serve the needs of its membership and it is critical that MABA membership provide feedback and guidance to the Board.



The MABA Annual Meeting will give you an opportunity to hear about the work conducted during the previous year, objectives for the upcoming years, financial health of the association, selection of board members, and a general discussion to bring everyone up to date.

Please become an ACTIVE member in YOUR association so that MABA can continue to thrive and represent Montana's agricultural businesses.

MABA ANNUAL MEETING

Wednesday, January 25, 2023 – 1:30 PM

A/B/C Rooms – Heritage Inn, Great Falls

Montana Agricultural Business Association

BOARD OF DIRECTORS NOMINATION FORM

The MABA Board of Directors works diligently to represent, support, and protect Montana's agricultural businesses and all the associated issues. Active participation from MABA Membership is crucial to having a board that represents all facets of this diverse and exciting industry.

Serving on the MABA Board is a great opportunity to increase your (or a coworker's) understanding of environmental, legislative, and regulatory issues facing Montana businesses! This is a great leadership opportunity that will benefit the individual board member but also the company that they represent. Please take a minute and nominate an individual to serve a 3 year term on the MABA Board of Directors.

Name: _____

Company: _____

Phone: _____ Email: _____

You can email this form to mabamgea@gmail.com, mail it to MABA, PO Box 7325, Helena, MT 59604; OR simply fill out the form online at www.mtagbz.org.

After receipt of the nominations from membership the MABA Nominating Committee will identify 2 for each open position and one where members will run against current board members whose 3-year terms are expiring. MABA does not have a limit on the number of terms that a board member may serve. ■

Top 6 Questions (and Answers) Every Agribusiness Should Be Asking About Cyberattacks and Data Security

Michael Moore, EVP at EFC Systems (2022, August 30). Retrieved from www.croplife.com

CropLife News

Cyberattacks are an ever-growing threat to thousands of organizations and businesses worldwide and the ag industry is a top target these days. In fact, experts estimate that a ransomware attack will occur every 11 seconds. With that in mind, here are the most common questions — and answers — on cyberattacks and data security that will quickly educate you on the subject.

1. IS THE AG INDUSTRY A TARGET FOR CYBERATTACKS?

Not only is ag a target, but it is an easy target regardless of size. On average, ag retailers allocate about .6% of gross revenues towards their technology budgets. Underspending on technology makes it extremely challenging to install the necessary lines of defense to protect technical resources and opens the door for threat actors to enter your environment. As a comparison, businesses outside of ag allocate 2%-5% of gross revenues towards their technology budget and actual amounts vary based on company size and industry. The increased technology spend allows for advanced tools to be installed that ultimately protect business applications and help secure sensitive data. While purchasing equipment and upgrading facilities are more exciting topics when budgeting, remember to allocate the necessary funds to your technology budget to defend against the threats of today.

2. HOW DO CYBERATTACKS OCCUR?

Roughly 91% of cyberattacks originate from individuals clicking on embedded links in enticing emails that are commonly referred to as a phishing

email. Once activated, harmful tools are installed on source systems that ultimately provide a gateway for threat actors to encrypt computer systems and hijack sensitive data. We all play a vital role in reducing the spread of cyberattacks by bringing awareness of phishing attempts. Incorporating phishing training and simulation services will educate your team members on the undesirable consequences that successful phishing attempts deliver and will provide insights on which individuals are more prone to respond. Phishing training and simulation services are a cost-effective way to reduce risk through education and has significant ROI. So, think twice before clicking on that link in an email and be sure to validate unexpected emails before acting.

3. WHAT HAPPENS DURING A CYBERATTACK?

It is common for tools installed by threat actors to go undetected for weeks or months so that critical systems and sensitive data can be identified for encryption at a future date. Once complete, threat actors will encrypt data and a systematic process to shutdown systems will occur. It all starts with one user reporting some sort of cyber notice, which quickly spans throughout the entire network. Access to various systems for accounting/financial, agronomy operations, email, and other mission-critical applications are all unavailable. Eventually, a ransom notice will surface and a request to negotiate a price to restore access to systems and data will occur. During this time technology teams should be following their Incident Response Plan (IRP) to assess the damage, determine system restore points, bring up new systems on a clean network, clean infected devices, and transition from electronic to a manual/paper path to continue to serve customers. It is common to engage with outside firms for legal, forensics,



and negotiation services, especially for those with cyber insurance coverage.

4. WHY SHOULD I BE CONCERNED ABOUT CYBER THREATS?

The first obvious reason why cyberattacks should be concerning is generally all systems are unavailable during an attack, which creates operational challenges for every part of your organization. The second and less obvious reason is the exfiltration of data from your network can be sold on the dark web potentially exposing your customers and team members. Threat actors target sensitive data from HR and finance teams, so it is a good practice to encrypt, or password protect files that contain sensitive data to add an additional layer of protection.

5. DO THE ABOVE-MENTIONED ITEMS MAKE YOU A LITTLE NERVOUS ABOUT THE CURRENT STATE OF YOUR NETWORK?

Are you now asking what is the best path to secure your technical assets? If so, the FBI has a few resources that provide general information on the topic. The best low-cost option to determine your risk factor is to apply for a cyber insurance policy. Even if you do not intend to purchase a cyber policy, the process will provide valuable insights into the health of your systems as you complete the multi-page questionnaire that defines the current state of your network. The questionnaire will identify technology

gaps within your environment that should transition to a prioritized project list to factor in your budget cycle. A few high-priority items will likely filter out throughout the process and immediate action should be taken in the event the insurance company is unwilling to extend a cyber policy.

6. WHAT ARE SIMPLE, YET EFFECTIVE WAYS TO PROTECT TECHNICAL RESOURCES?

Multi-factor authentication (MFA), Endpoint Detection and Response (EDR), and backups that are encrypted and detached from the primary network should be top priorities. MFA requires a two-step process to authenticate to various applications and is a good path to eliminate unauthorized access to systems. EDR solutions are antivirus on steroids that helps defend against potential threats while disabling systems with suspicious activity to reduce the spread of harmful tools throughout your network. Most insurance companies will not extend a cyber insurance policy without MFA, EDR, and encrypted backups and this should be a top priority to help mitigate cyber threats in your organization.

As cyberattacks are on the rise, a security-first mindset will help bring awareness across your organization. Taking the steps to review your incident response plan and align your budget with technical gaps will provide a roadmap to help mitigate potential cyber risk. ■



Photography graciously provided by Jared Unverzagt.
Find him on Twitter and Instagram to see more of his great work. @jzagt

SPRAYERS 101:

Ten Tips for Spraying in the Wind

By Tom Wolf (Nozzle_Guy)

Choosing the right time to spray can be tricky. Our gut tells us that spraying when it's windy is wrong.

The experts tell us that spraying when it's calm is wrong. So when can you actually spray?

I've always advised my clients to spray in some wind, because it has a few advantages. The main one is that wind helps disperse the spray upward and downward, diluting the spray cloud fairly rapidly. Another advantage is that winds tend to be reasonably steady in their direction and velocity (or at least that can be forecast), so downwind areas can be identified and potential impacts are known or predictable. It helps if it's sunny, because that improves the dispersion of the cloud even more.

First, let's define "windy". The classic wind scale is

the Beaufort Scale, intended for the sea, but also used on land. The upper limit for spraying is probably Force 3 or Force 4, with upper limits of 20 – 25 km/h or so. The Beaufort Scale calls these "Gentle or Moderate Breezes" (they had to save the alarming words for hurricanes), and the scale provides good visual clues such as what wind does to flags, leaves, or dust.

Spraying under breezy conditions can be done fairly safely if you follow specific steps. The idea is to understand what the risks are and to manage them.

The cornerstone is to use a low-drift spray and match it to a pesticide that will work well with larger droplets. But there are other important aspects to consider. Below are the top ten to think about:

BEAUFORT SCALE

Force	Anemometer reading	Description	Effect on kite
	mph kmh m/s knts		
0	0-1 <1 <0.3 0-1	Calm; smoke rises vertically.	Calm Launch frustration
1	1-3 1-5 0.3-1.5 1-3	Direction of wind shown by smoke drift, but not by wind vane.	Light air Very large droplets, adjuvants, Roakoko etc. may fly on a light line
2	4-7 6-11 1.5-3.3 4-6	Wind felt on face; leaves rustle; ordinary vanes moved.	Light Breeze Station #80 kites 650g at 3.5mph
3	8-12 12-19 3.3-5.5 7-10	Leaves and small twigs in constant motion; wind extends light flag.	Gentle Breeze Drogues needed on flowform kites
4	13-18 20-28 5.5-8.0 11-16	Raises dust and loose paper; small branches are moved.	Moderate Breeze
5	19-24 29-38 8.0-10.8 17-21	Small trees in leaf begin to sway; crested wavelets form on inland waters.	Fresh Breeze Reduce kite size increase line weight & drogue size
6	25-31 39-49 10.8-13.9 22-27	Large branches in motion; whistling heard in telegraph.	Strong Breeze
7	32-38 50-61 13.9-17.2 28-33	Whole trees in motion; inconvenience felt when walking.	Near Gale
8	39-46 62-74 17.2-20.7 34-40	Breaks twigs off trees; generally impedes progress.	Gale
9	47-54 75-88 20.7-24.5 41-47	Slight structural damage occurs (chimney-pots and slates removed).	Severe Gale
10	55-63 89-102 24.5-28.4 48-55	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	Storm
11	64-72 103-117 28.4-32.6 56-63	Very rarely experienced; accompanied by widespread damage.	Violent Storm
12	73-83 ≥118 ≥32.6 64-71		Hurricane

- Choose a herbicide that can handle large droplets. Glyphosate products are well suited to coarse droplets. But glyphosate commonly has contact actives in the mix, members of Group 6, 14, and 15, and these are less likely to perform well with big droplets than those that contain Group 2 and 4 mixes. Actives with soil activity also have more tolerance for larger droplets.
- Use a low-drift nozzle and operate it so it produces a Coarse (C) to Very Coarse (VC) spray quality, as described by the manufacturer. **Dicamba** labels call for Extremely Coarse (XC) to Ultra-Coarse (UC) sprays, and Enlist requires at least Coarse. To achieve these you may need to purchase new nozzles. **Low-pressure air-induced nozzles** operated at about 50 – 60 psi will generally be very low-drift, but lower drift models are available. If you need a finer spray, produce it either by increasing the pressure or moving to a finer tip. Do this when the weather improves, for contact



CATEGORY	SYMBOL	APPROX. Dv0.5 µm
Extremely Fine	XF	~50
Very Fine	VF	100
Fine	F	150
Medium	M	190
Coarse	C	275
Very Coarse	VC	350
Extremely Coarse	XC	480
Ultra Coarse	UC	660

Based on ASABE Standard S572.3 (February 2020)
 Note: Coarse and Very Coarse colours swapped and now align with ISO 25358:2018

The name, symbol and range of droplet sizes used to describe the median droplet diameter produced by nozzles according to ASABE S572.3

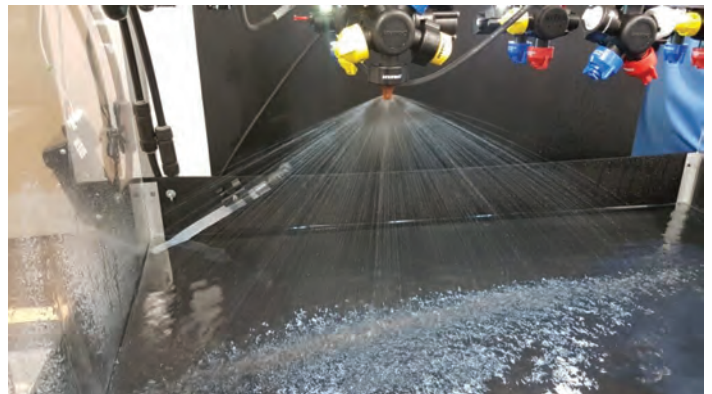
modes of action.

- Keep your boom low. Lowering the boom ranks as the second-most effective way to reduce drift, after coarser sprays. But there's a limit. For low-drift sprays, you need at least 100% overlap (more for PWM), which is for the edge of one nozzle pattern to spray into the centre of the adjacent pattern. In other words, the spray pattern should be twice as wide as your nozzle spacing at target height. For most nozzles, a boom height of close to 20 inches is enough to achieve this overlap. That's pretty low by current standards from suspended booms on self-propelled sprayers, so being too low for a good pattern will only happen due to boom sway.
- Maintain reasonably slow travel speeds. These reduce the amount of fine droplets that hang behind the spray boom, reduce turbulence



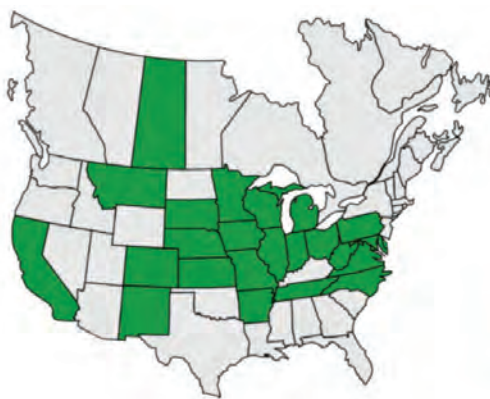
from sprayer wheels, and they also make low booms more practical. An added bonus is less dust generation.

- Know what's downwind and what harms it. Survey the fields on all sides of the parcel you're treating. When you have a choice, avoid spraying fields that have sensitive areas downwind such as water, shelterbelts, pastures, people, etc. If you can't avoid being upwind of these areas, make sure you check and obey the buffer zone restrictions on the label. These will also give you an idea if the product can cause harm in water or on land, or both.
- Let the weather help you.
 1. Take the wind from the side if you can. Going straight into the wind creates a lot of extra drift.
 2. Spray when the sun shines if you have a choice. **Early morning, late evening, or cloudy days increase the distance that drift moves.** When it's sunny, the drift cloud disperses quickly and causes less damage.
- Consider a dicamba tip for special situations, even if you don't use dicamba. If you're in a situation where quitting and waiting is a poor option, these tips allow you to finish the job with minimal drift risk and with only slight reductions in product performance due to poor coverage.



Nozzle Guy continued on page 15

FieldWatch State	Year Activated
Indiana	2009
Illinois	2010
Wisconsin	2010
Michigan	2010
Minnesota	2011
Nebraska	2012
Colorado	2012
Montana	2012
Missouri	2013
Delaware	2014
Kansas	2014
New Mexico	2014
North Carolina	2016
Iowa	2017
Arkansas	2018
Ohio	2018
South Dakota	2018
Tennessee	2018
Virginia	2018
California	2019
Maryland	2019
Pennsylvania	2019
District Of Columbia	2021
West Virginia	2022
Canadian Provinces	Year Activated
Saskatchewan	2014



<http://www.fieldwatch.com>
[MORE INFO](#)

FieldWatch Mapping Tools to Enhance Stewardship

The issue of off-target spray drift on sensitive crops is an issue that has only grown in the past few decades with the increase of Organic crops and farms as well as the growth of GMO crops in commercial agriculture. This very issue is why DriftWatch® was established in 2008 by the Purdue University College of Ag and Biological Engineering. This registry was just the beginning of what has become now a non-profit called FieldWatch® and several other registries since 2012 to meet specific needs of crop producers, beekeepers, and pesticide applicators. These registries are a communication tool to help increase stewardship of pesticide applications with awareness of sensitive crops and honeybees.

TODAY THE FIELDWATCH® REGISTRIES ARE AVAILABLE IN 23 US STATES, WASHINGTON DC, AND SASKATCHEWAN

Registering and mapping your farms / crops on the DriftWatch® registry is likely the best tool to help pesticide applicators be aware of your sensitive crops,

but it also provides them the opportunity to modify their behaviors and practices near these sensitive areas. As of early 2022 outside of seasonal seed corn fields that are mapped across the corn-belt, just over 50% of the 1.1 million acres mapped across the map above were either Certified Organic or in transitional status to certified. Commercial commodity crop growers as well as pesticide applicators are becoming more aware of the extreme sensitivities and risks that are present when working near any organic crop. Using the FieldWatch® registries is one step in helping make your neighbors aware of sensitive crops. The other step that is just as important is sharing the FieldWatch® registries with others to increase adoption and have more crop producers, beekeepers and pesticide applicators be aware of these critical tools that can foster critical communication.

The recent growth of GMO commodity crops and the use of herbicides such as glyphosate and dicamba have also brought about changes to these registries. All states with commodity row-crops now have the



availability to map both GMO (pesticide tolerant) as well as non-GMO crops such that pesticide applicators have a better awareness of these crops as short of mapping there is no other way for the applicators know what crops and specific tolerances (or lack thereof) are present.

FieldWatch has recently been working on ways to increase awareness and adoption of all the key groups: Crop Producers, Beekeepers and Pesticide Applicators in Montana. Earlier this spring, all the apiary sites registered with the state were added to the map which increased that number from around 1,600 beehive sites in April to over 7,500 in May. Efforts are underway to have FieldWatch present at the December Montana Organics conference. FieldWatch will also be attending MABA and MGEA in January as well as speaking at the Montana Aerial Applicators in January. Any other opportunities to get the Montana FieldWatch registries in front of Montana folks is welcomed!

IF A PRODUCER SUSPECTS AN INCIDENT REGARDING A PESTICIDE APPLICATION, WE RECOMMEND THE FOLLOWING:

- o Record date / time / location and any applicator information (company name / aircraft tail #
- o Visit YOUR states DriftWatch® registry page - Contact Us tab you will find your State Data Steward contact info as well as a link to YOUR states page for pesticide resources
- o Timely actions and connecting with YOUR state is critical in these types of situations

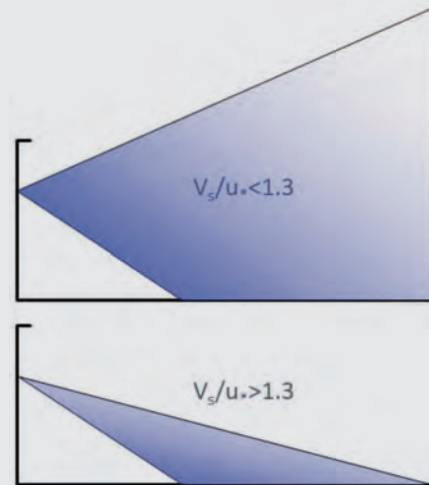
The QR code on the previous page will take you to the FieldWatch® home page where you can learn more and provides links to creating an account as a grower in states that participate. ■

Nozzle Guy continued from page 13

- Use a low-drift adjuvant. Specific products such as Interlock or Valid have been shown to reduce driftable fines (<150 microns) by between 40 – 60%, without adding significant volume in coarser droplets. The response will depend on the nozzle and the tank mix, but can be very noticeable.
- **Study drift and how it forms and moves.** It's about more than wind speed and droplet size. Knowledge in this area can help you work out the best strategies.
- Invest in **productivity**. You may not need it every day, but on occasions when you have a small window to avoid bad weather, it pays dividends.
- If you feel that drift is unavoidable and someone might be impacted by it, talk to those people first. It's one of the most important things you can do.

Keeping pesticide sprays on target continues to be one of our top responsibilities. ■

Tom Wolf (2021, June 8). Ten Tips for Spraying in the Wind. Retrieved from <https://sprayers101.com/>



ResponsibleAg Goes Far Beyond Regulatory Compliance

Program Is a Resource to Help Prevent Safety Incidents

Being in compliance with regulations that ensure the safety of employees, customers and communities is one of the most important, but among the toughest, responsibilities ag retailers have. Improving safety

at ag retail facilities and ensuring their regulatory compliance through ResponsibleAg certification shows that the industry is protecting communities and puts the industry in a good light.



Committed. Compliant. Safe.

One Source for Current Regulatory Details

Agribusinesses must follow hundreds of regulations from OSHA, DOT, EPA and DHS, covering everything from storing, transporting and applying crop protection inputs, to maintaining the shop, office and grounds at agribusiness facilities. Because regulations change frequently and new regulations are created, the ResponsibleAg Technical Committee continuously monitors and updates the ResponsibleAg assessment checklist and the compliance assistance library. Online resources are available to help registered facilities comply with regulations and achieve ResponsibleAg certification.

The ResponsibleAg Program Comprises Five Elements:

- Credentialed Auditor
- Facility Audits
- Corrective Action Plan
- Access to Tools and Information
- Facility Certification

Credentialed Auditors

The road to certification for a registered facility begins with an audit by a ResponsibleAg credentialed auditor who identifies issues of non-compliance. Only thoroughly trained, experienced professionals with industry knowledge make the list of ResponsibleAg credentialed auditors. They must successfully complete the one-of-a-kind ResponsibleAg auditor training course to receive credentials.

Helpful Resources

ResponsibleAg offers a broad range of industry-approved online safety resources to companies that participate in the program – and even those that don't. These include:

SUSTAINING MEMBERS

406 Agronomy

Lance Lindbloom
lance.lindbloom@406agronomy.com
406-265-5887



Ag Fertilizers, Inc.

Margaret Vaughan
shawn@agfertilizers.com
406-600-7973



Shawn Ostberg

shawn@agfertilizers.com
406-590-8665

AgroLiquid

Stuart Schilling
stuart.schilling@agroliquid.com
406-223-3451



Albaugh LLC

Andy Hampton
brocks@albaughllc.com
800-247-8013



Brock Shelton

brocks@albaughllc.com
509-990-3065

Jim Schmidt

jim.s@albaughllc.com
800-247-8013

Asmark Institute

Amber Duke
amber@asmark.org
270-926-4600 | fax 270-926-0011



ATP Nutrition

Brandon Hoheisel
branden.hoheisel@atpnutritionag.com
204-230-6599



Ryan Hansen

ryan.hansen@atpnutritionag.com
406-366-5284

Scott Schubert

scott.schubert@atpnutritionag.com
406-321-7000



SUSTAINING MEMBERS

BASF

Jared Unverzagt
jared.unverzagt@basf.com
406-224-2783



Jason Dahl
Jason.dahl@basf.com
406-590-1843

Josh Reimers
joshua.reimers@basf.com
406-590-1843

Kendra Legge
Kendra.legge@basf.com
984-227-5747

Matt Smith
joshua.reimers@basf.com
406-590-1843

BNSF Railway



Roger Hsieh
roger.hsieh@bnsf.com
360-418-6271

Central Life Sciences

Bob Johnston  CENTRAL Life Sciences
ggroves@central.com
701-230-8954

Garret Groves
ggroves@central.com
701-230-8954

Warren McDougal
wmcdougal@central.com
785-488-3497

CF Industries



Brad Weaver
bweaver@cfindustries.com
406-868-2922

CHS Agronomy



Julie Brayton
Julie.brayton@chsinc.com **Agronomy**
406-868-2862 | fax 866-623-0984

- **Public Access: The ResponsibleAg Audit Checklist** contains more than 400 questions, covering the safety, health, security and environmental regulations that apply to 17 areas commonly found at ag retail facilities.
- **Participant Only Resource: The ResponsibleAg Online Compliance Assistance Library** enables safety professionals and others to easily find answers to questions about any rule or regulation affecting ag retailers.

ResponsibleAg Can Fill Various Roles for Ag Retailers

For retailers with well-developed internal environmental health and safety (EH&S) programs and dedicated staff, ResponsibleAg complements their existing programs. For ag retailers without internal EH&S programs – or whose managers wear many hats, including safety and compliance responsibilities – ResponsibleAg can serve as the primary resource in helping meet mandated safety regulations, without incurring the cost of investing in a full-time internal EH&S team.

Agribusinesses that have questions or want to learn more about the ResponsibleAg program and auditing process can contact Tim McArdle, the organization’s industry ambassador, at 217-415-6895 or tim.mcardle@responsibleag.org, or visit www.ResponsibleAg.org. ■



2022 EPA Nutrient Reduction Memorandum

Source: www.epa.gov

EPA's Office of Water plans to accelerate progress in controlling nutrient pollution in our nation's waters by scaling up existing, foundational approaches and more broadly deploying new data assessments, tools, financing approaches, and implementation strategies. EPA plans to integrate the objectives of both the Safe Drinking Water Act and Clean Water Act in a One Water approach to find durable solutions to the challenges and costs associated with reducing nutrient pollution. At the same time, EPA foresees incorporating promising innovations, creative partnerships, and unprecedented opportunities to invest in clean and safe water in the Bipartisan Infrastructure Law to accelerate progress in reducing nutrient pollution.

As outlined in EPA's 2022 Memorandum, the Agency plans to accelerate progress in controlling nutrient pollution in our nation's waters using five governing principles: (1) advance equity and environmental justice, (2) build and foster partnerships, (3) follow the science and invest in data-driven solutions, (4) support innovation, and (5) scale successful initiatives. These principles lead to three main strategies and associated actionable items that will continue to drive nutrient reductions.

STRATEGY 1: DEEPEN COLLABORATIVE PARTNERSHIPS WITH AGRICULTURE

- Actively collaborating with USDA leadership to build and maintain connections and momentum to help targeting funds whenever feasible to the locations and practices that will generate the most significant reductions in nutrient loads.
- Expanding engagements with agricultural stakeholders and highlighting their innovation and successes in reducing nutrient loads to waterbodies.

- Deepening on-the-ground collaboration with USDA, states, territories, tribes, and stakeholders in key geographic areas to leverage EPA's current activities and identify additional opportunities to help reduce nutrient pollution.

STRATEGY 2: REDOUBLE EPA'S EFFORTS TO SUPPORT STATES, TRIBES, AND TERRITORIES TO ACHIEVE NUTRIENT POLLUTION REDUCTIONS FROM ALL SOURCES

- Strongly encouraging states to use a One Water approach to deliver a range of water quality benefits including protection of sources of drinking water.
- Championing innovative financing and using the flexibility of the Clean Water Act regulatory framework to spur development of more effective technologies, drive market-based approaches, including water quality trading, third-party credit aggregation and banking, and stronger agriculture-water sector partnerships.
- Prioritizing strategies to support small, rural, and disadvantaged communities.

STRATEGY 3: UTILIZE EPA'S CLEAN WATER ACT AUTHORITIES TO DRIVE PROGRESS, INNOVATION, AND COLLABORATION

- Urging more robust adoption of numeric nutrient criteria, particularly the newly published stressor-response based numeric criteria recommendations to address nutrient pollution in lakes and reservoirs, into Water Quality Standards.
- More fully using the CWA assessment and listing process support identifying nutrient-re-

Nutrient Reduction continued on page 21



MSU Southern Agricultural Research Center (SARC)

The SARC is a 462-acre facility located in the heart of the Huntley-Worden Irrigation District, which resides along the Yellowstone River approximately 20 miles east of Billings, Montana. Created as a demonstration farm by the U.S. Bureau of Reclamation in 1907, the farm evolved into a USDA Bureau of Plant Industries Field Station cooperating with Montana State College and the Montana Agricultural Experiment Station in 1910. Ownership of the station was formally transferred from the USDA to the State of Montana by Congressional Patent in 1953. In 1963, formal USDA-ARS involvement with SARC ended. Today the center is staffed by nine personnel and is served by a 24-member advisory committee made up of farmers, agricultural industry representatives, and extension agents representing the nine surrounding counties.

There are three research programs at SARC including cropping systems, weed science, and crop variety development. Cropping systems is headed by Dr. Kent McVay, interim Superintendent and Extension Cropping Systems Specialist. His research program involves field studies that include crop rotations and cover crops to investigate related crop productivity, soil carbon, and soil health changes. They evaluate new crops such as camelina, faba bean, mung bean, as well as recent additions to Montana agriculture like pulse crops. One current study in cooperation with scientists at the Eastern Agricultural Research Center evaluates intercropping of chickpea with flax to understand the impact this practice has on *Ascochyta* movement and severity of disease within chickpea production. Crop water use, reduced tillage, and nutrient response studies on malt barley, sugar beets, and camelina are a current focus. The cropping systems program conducts all the off-station variety trials for wheat, barley, and pulse crops for south central Montana.

The weed science program is headed by Dr. Lovreet Shergill. His research interests lie in investigating crop-weed dynamics in different cropping systems to improve weed management and crop productivity. Field research focuses on integrated weed management strategies with an emphasis on locally relevant irrigated row crop and cereal production. Other areas of research include herbicide resistance monitoring and characterization, development of integrated pest management (IPM) practices, harvest weed seed control (HWSC) systems, and optimizing cover crops for weed management and weed seedbank management. Additionally, the program evaluates new and existing herbicides for weed management and crop safety. The MSU-SARC Weed Lab will screen plant samples sent by stakeholders with molecular-markers to confirm herbicide resistance. This is a free service for early detection of herbicide-resistant weeds. This helps producers manage or prevent further spread of problematic weeds.

The third research program at SARC is currently open following the retirement

SARC continued on page 31



Are We Tough Enough to get Beyond the Weather?

CHANGING THE NARRATIVE ON RURAL MENTAL HEALTH

Editorial by Courtney Kibblewhite, Northern Ag Network

We got a call this week from a friend and listener who said, “Maybe you ought to be careful about getting into this mental health stuff. My Mom, used to say, ‘buck up, buttercup.’”



Photo by Dan Sullivan – Courtney Kibblewhite and her Dad, Taylor Brown, on Shipping Day at the Brown Ranch in Sand Springs, MT.

Fair enough. There are days when we do have to buck up and go feed the cows in a foot of snow. And it just takes a little push to get us headed out the door. Sometimes we do have to “buck up” and do the hard stuff.

I’ll tell you from my personal experience that some days, my mind fights negativity that’s a whole lot darker than a bout of laziness. My inner dialogue will start chirping, “I’m no good. They are better off without me. I shouldn’t be here anymore.”

Now, that is hard to write because I know that’s not correct. That may be my mind talking, but I’ve realized that’s not me. I don’t know why my brain gets me headed in that direction, but I know those things are simply not true.

I believe I’m here for a reason. I believe we are all connected. I believe in God’s divine plan, and I know that includes me, even if I don’t know how.

SUSTAINING MEMBERS

Corteva Range and Pasture

Claire Volk
 Claire.Volk@corteva.com
 307-439-9095



FEI

Ben Rixe
 lkarsky@feiinc.com
 425-260-7493



Brad Moen

bmoen@feiinc.com
 701-845-1113 | fax 701-845-0298

Tim Larsen

lkarsky@feiinc.com
 406-259-3966 | fax 406-259-9678

Gowan

Kurt Bowman
 kbowman@gowanco.com
 503-803-9836 | fax 503-625-8869



Greyn Scale Company

Steve Greyn
 stevegreyn@yahoo.com
 406-868-5276



Heartland AG Systems

Casey Lilly
 casey.lilly@heartlandag.com
 406-590-9044 | fax 406-453-0121

Jared Kunz

jared.kunz@heartlandag.com



Corey Baker

corey.baker@heartlandag.com

Helena Agri Enterprises

Brandon Byington
 byingtonb@helenaagri.com
 509-544-0417

Jerys Enget

engetj@helenaagri.com
 406-482-1303



SUSTAINING MEMBERS

Helena Agri Enterprises (continued)

Paul King
kingp@helenaagri.com
406-788-0619 | fax 406-392-3618

Thomas Lee
Leet@helenaagri.com
406-373-2226



Bill McKinley
mckinleyw@helenaagri.com
406-278-2541

Gordon Hawks
hawksg@helenaagri.com
406-228-9499

Jeff Rearden
reardenj@helenaagri.com
406-452-9505

Karissa Floerchinger
floerchingerk@helenaagri.com
406-788-0619

Mason Shaw
shawm@helenaagri.com
406-873-2778

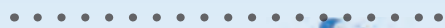
Brooks Hammel
floerchingerk@helenaagri.com
406-656-2320

Burl Brawley
BrawleyB@helenaagri.com
406-216-2100 | fax 406-216-5977



Hub Intl Mountain States, LTD

Mike Inman
mike.inman@hubinternational.com
406-357-2227 | fax 406-357-2177



Hub Intl of Montana

Brandon Riska
brandon.riska@hubinternational.com
406-862-5463 | fax 406-862-0470



Kevin Dotseth
gary.mcferrin@hubinternational.com
406-771-9981 | fax 866-801-0495



For those of us that fight with our minds now and then, it makes me wonder: Is the problem really that we need to “toughen up”?

I can wrestle calves with the teenagers (though it hurts more than it used to!). I can move a portable panel all on my own (though I’d rather have someone on the other side!). I can get up before the crack of dawn and do whatever needs to be done in whatever elements the day brings.

For those of us born with the stuff of homesteaders and pioneers, we are born with grit in our blood. Imagine the grit it took to trail those cattle thousands of miles north on horseback. Imagine the grit it took to head west in a railcar through untamed country. You don’t have to imagine the grit it took to stay in this country, you can feel it.

So, are we tough enough to get into an actual conversation with our neighbors rather than just sending a text message? Tough enough to get beyond the weather to find out how they are really doing? Tough enough to share how WE are really doing?

I think we are. I think we can change the story for our kids: We are not too tough to need mental health. But, we are tough enough to talk about it.

Shoot, we’ve helped each other through winters, floods and wildfires. Heck yeah. We are tough enough to get “beyond the weather”!

Let’s go there.

*If you know someone who is feeling constantly down and unable to enjoy the things they used to, send them to Beyondtheweather.com to sign up for free, virtual, Counseling Access for Montana Agriculture program. Or have them call 406-200-8471 and press 7. ■

Courtney Kibblewhite is the Vice President of Northern Ag Network and her family has run cattle in Eastern Montana for five generations.

Nutrient Reduction continued from page 18

lated impairments and assisting states in the development of robust and ready-for-implementation TMDLs and other restoration plans to reduce nutrient pollution.

- Further reducing nutrient loads from point sources by providing strong support of innovative permitting approaches that can drive deeper, sustained nutrient reductions. ■

For additional information please go to:

EPA: <https://www.epa.gov/nutrient-policy-data/2022-epa-nutrient-reduction-memorandum>



MONTANA DEPARTMENT OF AGRICULTURE

The Montana Department of Agriculture (MDA) State Grain Labs, with locations in Great Falls and Plentywood, are still the only federally licensed crop testing facilities. The labs host visitors from across the state, country, and globe who visit to see how their advanced equipment and grain grading operations work first-hand. Established in 1921, the state

The Department of Agriculture will have a relatively quiet Legislative Session for 2023. A total of four bills are planned that pertain to moving Aquatic Invasive species, moving the Noxious Weed Seed Free Forage Board program and duties, eliminating the Huckster License, and eliminating the Huckleberry registration program.



grain lab recently celebrated their 100th anniversary in providing producers and agricultural businesses with quality assurance and consistent, unbiased results. A few members from the Department of Agriculture's CSD division had the opportunity to visit the lab and talk with the employees that work "behind the curtain" day in and day out to drive Montana Ag (pictured above).

The MDA is excited to announce a few new faces that joined the team this September. Kima Traynham joins us as the Agriculture Sciences Division Bureau Chief with extensive experience working for the department for years as a Plant Science Specialist. Furthermore, Logan Kruse joins us as the Communications Officer with a diverse background in marketing and communications.

As for the Montana Department of Agriculture (MDA) Pesticide Program, 2022 has been a challenging year. The department has seen some significant staff vacancies, including in Training & Certification, as well as in our licensing program. We are working to fill vacancies and our existing staff is covering those positions; we appreciate the patience of our applicator and dealer community and are trying to respond to requests as quickly as possible.

Fall recertification training will be offered as 4 live webinars in November and December. We are still finalizing those details – more information will be posted on our Training & Certification website as soon as possible: <https://agr.mt.gov/Pesticide-Training-Recertification-Program>. For now, there are in person, online, and live webinars available to earn recertification credits. You can use our MT Plants



course locator to find those credit opportunities: <https://mtplants.mt.gov/PesticideApplicator/MeetingSearch.aspx>. There are online trainings available for most categories; you can get up to half of the 12 needed credits thru those courses. Webinars count as in-person credits, so those can help cover the 6 credits that can't be earned thru on-line courses.

MDA approves over 400 trainings for Continuing Education Credits annually. Several are sponsored by the Department, and many others are provided by industry groups and Montana State University (MSU). The Department continues to collaborate with the MSU Pesticide Education Program, providing private applicators with opportunities to earn credits through the 2022 Pest Management Tour.

These are the categories expiring in 2022:

- Dealer
- Aquatic Pest
- Forest Pest
- Ornamental & Turf
- Piscicide
- Special Utility
- Wood Treatment

For those interesting in getting certified for the first time, or anyone wanting to recertify by testing, exams are available by appointment at MDA field office locations in Missoula, Bozeman, Great Falls, Glasgow, Billings and Kalispell, or at the main office in Helena. Computer-based testing continues to be offered at Metro Institute Centers in Great Falls, Missoula, Bozeman, Butte, Helena, Glendive, with a new location added this year in Billings.

MDA has new field staff in several offices: Jake Degenstein started as our Great Falls field agent in April 2022, Kate Schelbert became the Kalispell agent in early September, and Caitlyn Forrester joined as the Billings agent in late September. ■

NEW MDA STAFF		
Kima Traynham <i>Bureau Chief, Ag Sciences Division</i>		406-444-9431 ktraynham@mt.gov
Logan Kruse <i>Communications Officer</i>		406-444-3684 logan.kruse@mt.gov
MDA FIELD OFFICES		
Location	Counties Served	MDA Enforcement Field Sta☒/ Contact Information
Missoula	District 1: Deer Lodge, Granite, Mineral, Missoula, Powell, Ravalli, Silver Bow	Tonda Moon (406) 329-1346 TMoon@mt.gov
Bozeman	District 2: Beaverhead, Fergus, Gallatin, Judith Basin, Madison, Park, Sweet Grass, Wheatland	Theresa Schrum (406) 587-9067 TSchrum@mt.gov
Great Falls	District 3: Cascade, Choteau, Glacier, Hill, Liberty, Pondera, Teton, Toole	Jake Degenstein (406) 761-0655 Jake.Degenstein@mt.gov
Glasgow	District 4: Blaine, Daniels, Dawson, Garfield, McCone, Petroleum, Phillips, Prairie, Richland, Roosevelt, Sheridan, Valley, Wibaux	Diana DeYoung (406) 228-9590 DDeYoung@mt.gov
Billings	District 5: Big Horn, Carbon, Carter, Custer, Fallon, Golden Valley, Musselshell, Powder River, Rosebud, Stillwater, Treasure, Yellowstone	Caitlyn Forrester (406) 652-1917 C.Forrester@mt.gov
Helena	District 6: Broadwater, Jefferson, Lewis & Clark, Meagher	Matt Deaton (406) 444-5953 Matthew.Deaton@mt.gov
Kalispell	District 7: Flathead, Lake, Lincoln, Sanders	Kaitlyn Schelbert (406) 257-9015 KSchelbert@mt.gov
Lewistown		Stephen Vantassel 406-538-3004 SVantassel@mt.gov

Congressional Comments



Jon Tester

*United States Senator
For the State of
Montana*

U.S. SENATOR JON TESTER

Over the past year we've seen input costs rise for a number of reasons.

Much like in the cattle industry, there's a lack of competition in the marketplace that allows large multinational corporations to jack up prices at a moment's notice.

A strained supply chain and outdated infrastructure has made it harder to get goods from point A to point B.

And vaccine mandates along the northern border have slowed down commerce between Montana and our biggest trading partner.

I've heard your concerns, and that's why we're working hard in Congress to find solutions that will lower costs for farmers, ranchers, and the folks in agribusiness.

That starts with holding corporations accountable by enforcing antitrust laws, and ensuring that CEOs of the biggest corporations aren't able to collude and corner the market.

It continues by implementing my bipartisan infrastructure law which will improve our supply chain by repairing our roads and bridges, making it easier for folks to haul goods; connecting folks in rural America to high speed internet, allowing people to do business from anywhere; and improving our grid efficiency, so that energy savings are reflected in the cost of goods across the board.

Finally, we're going to continue to pressure the Biden Administration into dropping the outdated vaccine requirements for truckers along the Northern border. Last month, I once again pushed the Administration to drop these regulations, and I'm optimistic that they'll listen to Montana small businesses and do what's right.

It's long past time for these restrictions to be lifted on our side of the fence, and I'm not going to stop banging down the door until that border is fully reopened.

Our economy can't run without truckers, it's that simple. And we need to help these folks do their job, so that everything from fertilizer to ag products get where they're supposed to on time.

With your support we'll keep fighting to make sure that folks in Montana's ag industry are getting their fair shake.

SUSTAINING MEMBERS

Intl Raw Materials Ltd

Brooke McMullin
cmcr@irm.com
215-928-1010



Chelsea Clark-Rodriguez

cmcr@irm.com
215-928-1010

Wes Schock

was@irm.com
215-928-1010

Intrepid Potash

JA Beall
ja.beall@intrepidpotash.com



Itafos Conda LLC

Ken Cihacek
ken.cihacek@itafos.com
720-635-5420



Matt Conlon

matt.conlon@itafos.com
712-260-0041

J.R. Simplot Company

Brandon De Los Reyes
brandon.delosreyes@simplot.com
208-760-9933



Lori Hamann

lhamann@simplot.com
208-235-5670 | fax 208-235-5669

KALO

Mike Edens
medens@kalo.com
208-830-1107



Ryan Lewis

rlewis@kalo.com
970-775-3710

Tim Tackes

ttackes@kalo.com
406-370-7253



SUSTAINING MEMBERS

Koch Agronomic Services

Justin Sieck
justin.sieck@kochind.com
970-568-6135



Teresa Wilson
teresa.wilson@kochind.com
270-533-1997 | fax 270-533-2000

Tom King
thomas.king@kochind.com
605-339-3983 | fax 605-339-1182

Koch Fertilizer LLC

Ty Smith
Ty.smith@kochind.com
316-285-4618



Lallemand Plant Care

Nathan Wright
nwright@lallemand.com
612-308-3014



Robert Todd
rtodd@lallemand.com
208-906-5054



Miller Chemical & Fertilizer, LLC

Henry Hooker
henryhooker@millerchemical.com
813-326-3025



Montana Sulphur

Zach Weimortz
Zach@montanasulphur.com
406-318-9995



Mosaic

Lea Ann Flaagan
leaann.flaagan@mosaicco.com
701-205-5836



U.S. SENATOR STEVE DAINES



Steve Daines

*United States Senator
For the State of
Montana*

Montanans have all been hit hard by inflation—and Montana ag is no exception. With reckless spending from this Administration and input costs going up, Montana ag is facing challenging times, and families are paying more at the grocery store.

Despite the out-of-control inflation crisis and our country entering a recession, President Biden and Congressional Democrats passed a massive tax and spend spree bill that will make economic matters worse for Montana's ag operations.

First, President Biden said he wouldn't raise taxes on low and middle class Montana families, but the massive tax and spend bill does the opposite.

The reckless "Build Back Broke" bill would increase taxes on millions of low and middle class individuals according to the nonpartisan Joint Committee on Taxation, not to mention small businesses and family-owned farms and ranches.

That tax hike will be used to pay for disastrous policies including spending \$45 billion to send over 80,000 new IRS agents to audit Montana families and small businesses to assert control over your lives and finances.

Additionally, Montana ag businesses are still experiencing outrageously high energy costs. To make matters worse, this spending bill would impose billions in taxes and fees on American-made oil and gas production, and hardworking Montanans will be stuck footing the bill for higher costs.

Their dangerous tax and spend proposal also spends \$369 billion on Green New Deal policies to appease radical environmental groups at the expense of Montana families. This includes raising taxes on Montanans to subsidize electric cars for the ultra-rich. In fact, individuals making up to \$150,000 will be eligible for a \$7,500—paid for by taxpayers—to buy expensive EVs. It's simply not fair.

As your voice in the United States Senate, I will keep fighting back against these wasteful spending policies that will raise taxes on hardworking Montana farmers, ranchers and small businesses and will work to find commonsense solutions that will lower costs and support Montana ag.

Congressional Comments continued on page 26

Congressional Comments continued from page 25

U.S. REPRESENTATIVE MATT ROSENDALE



Matt Rosendale
US Representative
For the State of
Montana

Across the board, the barriers to entry to working as a farmer or a rancher in America have been steadily increasing. Regardless of commodity, input costs have been rising, with seemingly no end in sight. As prices have increased, profit margins have decreased, and producers are left wrestling for whatever dollars are left to be had.

The Land Values 2022 Summary Report published in August by the US Department of Agriculture's National Agricultural Statistics Service, shows that agricultural land values have increased by an average of \$420 nationally over 2021, the largest numerical increase since the survey first began in 1997 and the largest percentage increase (12%) since 2006.

The US average farm real estate value was reported at a record \$3,800 an acre. In Montana, real estate values rose 11% over 2021 to \$1,030. Cropland tells a similar story, rising sharply in 2022 to a national average of \$5,050 an acre. This represents a 14% increase over the previous year, and a numerical increase of \$630 increase per acre.

Cash rent values mirror the rising land values, increasing by an average of 5% between irrigated and non-irrigated cropland, and a staggering 7.7% on pastureland. Margins for producers who rely on rented land are jeopardized by even marginal changes in rental values. The higher the rates rise, the fewer acres farmers can afford to rent, reducing their annual production output. Fortunately for producers who own their land, their equity has increased, but for those just starting out or reliant on the acres they rent to make ends meet, these increases can become an unreach barrier to entry.

Cattle producers are facing increased strain. Between drought and higher input costs, inventory numbers are falling rapidly. From the inputs used to make fertilizers, to the inputs needed to produce beef, costs for producers are continuing to rise and are cutting into the bottom line. Drought conditions compound these effects, with a substantial increase in pasture and rangeland with unfavorable ratings across the country, the West being one of the most heavily impacted.

For those who rely on stable agriculture input costs in order to make ends meet, any increase in the required costs can be the difference between continuing to work and closing their doors. While nearly everyone in the country is facing increased costs of living across the board, agriculture producers face dire consequences. While there is no "quick" legislative fix, Congress must act in the interest of agriculture producers across Montana, and across the Country, before these stark increases become irreversible. ■

SUSTAINING MEMBERS

NACHURS

Ray Morkrid
rmorkrid@nachurs-alpine.com
406-779-6385

NACHURS®

Tyler Rice
trice@nachurs-alpine.com
740-223-3868

Novozymes

Chris Berg
chjb@novozymes.com
406-868-8765



Oro Agri USA

Corp. Office
stekunoff@oroagri.com
559-442-4496



Dan Galbreath

509-660-0850

Jarrold Linne

linne.jarrod@gmail.com
559-442-4496

Pocock Trucking

John Pocock
john@pococktruck.com
208-359-1401 | fax 208-656-0580



Praireland Ag

Jesse Mallard
jessem@prairielandag.net
208-965-0725



Troy Schrader

troys@prairielandag.net
701-371-4356

Scotts Co.

Michael Diamond
michael.diamond@scotts.com
206-305-1622



SUSTAINING MEMBERS

SUL4R-PLUS, LLC

Peter DeQuattro
PDequattro@SUL4R-PLUS.com
618-979-5035



Sustainable Oils

Keith Horton
keith.horton@sus oils.com
406-750-2917



Syngenta Crop Protection

Johnnie Scott
johnnie.scott@syngenta.com
406-453-5004



Spencer McIntosh

spencer.mcintosh@syngenta.com
406-453-5004

Tessengerlo Kerly Inc

Nicole Drake
nichole.drake@tkinet.com
208-310-0710



Victoria Marsh

victoria.marsh@tkinet.com
509-460-0570

Tilleman Motor Company

Craig Tilleman
craig@tillemanmotor.com
406-808-7865



UPL NA Inc

Chris Barge
christopher.barge@upl-ltd.com
406-380-0505



Craig Codr

craig.codr@upl-ltd.com
406-780-0265 | fax 406-322-5133

Rick Liesener

rick.liesener@upl-ltd.com

Steve Vining

steve.vining@upl-ltd.com

Safety First - Always

Cell phones can be a dangerous distraction in the workplace. Just like other workplace distractions, cell phones can cause us to lose focus on the task at hand. When used inappropriately these devices can get employees in trouble as well as potentially cause serious injury. A lot of our members have warehouses with forklifts and machinery that require the operators full undistracted attention to operate this equipment safely and without incident. It only takes a split second of distraction for things to go wrong, in some cases a life-threatening accident or injury.

To avoid committing unsafe acts, we must make safety our top priority in every task we perform.

We must adopt an attitude that our primary goal is doing every job as safely as possible. Maintaining this attitude will help us recognize situations where use of cell phones would not only interfere in our ability to perform our tasks without injury, but also hinder us from completing our jobs in a timely manner.

We must be able to recognize and reject the excuses we often make for texting or making calls while we know it is unsafe and/or prohibited by policy. If you are on the receiving end of prohibited or unsafe texts or calls at work, don't respond. Wait until it is safe to do so. Don't put your, or a coworker's safety at risk over a simple text message or phone call.

Similar to other safety issues, putting a stop to dangerous texting or other distracting phone use requires a culture of refusing to participate. When employees help to create this type of work environment, they create a safer workplace for everyone. ■



Burt Brawley

Board Member
Montana Agricultural
Business Association

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Points to Ponder

ADVERSITY AND BEING RESILIENT IN AGRICULTURE



Marcus Weatherhead

Treasurer

*Montana Agricultural
Business Association*

2022 was a year in agriculture we'll one day all look back at and realize that it was a time in our world that changed everything. Between handling supply and dealing with current market conditions all of us that deal in the agricultural world had a mountain to climb and adversities to overcome. Being that I'm an "import" (which we're not terribly thrilled about the term, but anyways)

to Montana and the reason I find myself raising a family in this great state is because of the culture and the quality of people, especially in agriculture, I had an interesting perspective on how people faced different issues throughout the year. With pricing, delivery dates, and communication changing by the hour it felt like we were all scrambling for accurate information that we can provide our partners and producers. Adversity is nothing new to Montana agriculture between the impending drought, grasshoppers, consumer preference and regulations but it felt like these new challenges were adding to already leaning Jenga blocks.

When I think of the word Adversity, especially when it pertains to agriculture, I think of the word resiliency. Resiliency defined by most of the world is the capacity to recover from certain difficulties or adversities. I think with the "American" spin on the classic definition it would be more aptly be defined as the ability to advance (not just recover) after facing certain adversities. Montana agricultural professional's ability to reprogram themselves so that

the atomic stress of changing information does not overwhelm them, and they can handle the challenging information effectively and efficiently was the difference between not just recovering but advancing so the blocks don't come tumbling down. The resiliency of the people in the agriculture business and their ability to handle the adversity they face year in and year out I truly believe made the challenges we faced in 2022 a little easier to overcome and advance the business and especially the integrity of the agriculture business moving forward.

Being able to watch manufacturers, retailers, distributors, and competitors working together to get the producers in Montana the products and services they need to get the crop in the ground was a true moment of pride that I had. Montana's culture of being a good neighbor and earning a little sweat equity I think really helped everyone understand that we're all trying to accomplish the same outcome and that is raising the best food, feed, fuel, and fiber we possibly can. The pride that I felt this year watching the leaders in this agricultural community come together to help one another out is not forgotten on me and I hope others felt the same way. I know it will continue to have me, and hopefully others, raise the bar of expectation, work ethic, and integrity of the people I work with and the next generation to come. Continuing this culture will not make facing adversity easy by any means but I truly believe it will add to the resiliency of this agricultural community so that when the next challenge inevitably comes, we'll be ready!

I hope everyone has a great holiday season as these festivities are right around the corner! ■



MSU College of Agriculture Update

By Dr. Mary Burrows, Associate Director of the Montana Agricultural Experiment Station

Since 1893, the Montana State University College of Agriculture and the Montana Agricultural Experiment Station have been working to support Montana agriculture through research, teaching, and engagement. The University recently announced its research expenditures for the year 2021-22, and of \$200 mil MSU-wide, the COA and MAES represented \$48 mil. For every dollar of in state Legislated funds awarded to MAES through the agency budget process, the COA generates an additional \$2.85 for research. Much of this research supports your communities, landscapes, and businesses. MSU's crop varieties are locally adapted, have the characteristics our buyers want, and have been widely planted. Of Montana's winter wheat acreage, MSU developed varieties account for nearly 65% of that total, with MSU spring wheats accounting for over 45% of total acres. One of our newest varieties is Dagmar spring wheat, which has increased tolerance to the wheat stem sawfly.

In August, we welcomed the largest class of students in the history of the College of Agriculture, with the current enrollment at 2033. MSU also welcomed the second largest class, with the total student enrollment reaching 16,688. Both the college and MSU are prioritizing student experience, learning and retention as a priority. Our student ambassadors in collaboration with the Dean's office held an industry networking event in October. We want to thank all the organizations that attended the event and recruited our students. As we continue this event in the future, we look forward to working with more employers in the state.

Building on recent successes, private University partnerships were forged with funding from Northwest Farm Credit Services and the Cenex Harvest States Foundation. These donations allowed MAES to hire

four new non-tenure track faculty focused on Precision Agriculture research, education and outreach. They ran a precision ag 'bootcamp' with 30 attendees this past summer. The gifts also allowed MAES and COA to develop a Precision Ag Farm to assist researchers. Precision agriculture will, through technological research advancements, increase crop and livestock quality and yield while reducing expensive inputs, stimulating rural economies and attracting young Montanans to agriculture.

Through outstanding support from producers, Agricultural commodity groups and Legislators, the 2021 legislature invested \$5 Mil to replace the aged and outdated house used as Wool lab with a new modern research-appropriate facility. This new wool lab will be a joint facility with the Veterinary Diagnostic Lab and Agricultural Analytics Lab, also funded by the 2021 Legislature. This building will be a joint effort between MSU, the Montana Department of Agriculture and the Montana Department of Livestock and is currently in the design phase. The facility will be built in Bozeman next to the Marsh Lab. Also funded were modern chemistry and instrumentation laboratory facilities for five of our Research Centers, and they are in the queue for planning. We are supporting Legislative requests for additional funds needed to complete those projects due to increases in building costs. We are also asking for long-term support of the research and extension efforts in precision agriculture.

We have several new faculty in the College including our four new precision ag faculty: Paul Nugent, Jasmine Neupane, Shirin Samani, and Gaurav Jha. New hires also include the Winifred-Asborjornson Endowed Chair in Plant Sciences Venu Mendu, geneticist Lavanya Mendu, winter wheat breeder Sue

College of Ag continued on page 31

SAVE THE DATE!

MONTANA AGRICULTURAL INNOVATION AND TECHNOLOGY SUMMIT

“To fuel Montana’s agriculture economy through science and technology innovation.”

**JANUARY 24, 2023
GREAT FALLS, MONTANA**

The Montana Agricultural Business Association, Montana Department of Agriculture and Montana State University are eager to announce a very exciting initiative – the Montana Agricultural Innovation and Technology Summit.

ABOUT THE SUMMIT

The Montana Agricultural Innovation and Technology Summit will bring together innovators, entrepreneurs, agriculture producers, agricultural industry product development professionals, and capital investors with the primary goal of moving agricultural technologies from the lab and into the hands of agriculture producers and their markets.

THE SUMMIT WILL:

- (1) Facilitate the commercialization of agricultural research conducted by Montana entrepreneurs and Montana Universities into viable businesses
- (2) Develop talent, entrepreneurship, and business growth in Montana
- (3) Unlock the potential to accelerate innovation in agriculture technology
- (4) Accelerate economic development through building, attracting, and retaining agriculture technology companies.

OPPORTNITIES FOR PARTICIPATION AND SUPPORT

A call for presentations, sponsorship support, and attendance will be coming in the next few weeks! If you or others in your group are interested in participating, please send an email to MTAGTECHSUMMIT@GMAIL.COM so that we can make sure you get all of the materials. These materials will also be available from our partners. ■

SUSTAINING MEMBERS

Verdesian Life Sciences

Brandon Neuman
brandon.neuman@vlsci.com
919-825-1901



Westbred

Erik Fevold
erik.fevold@bayer.com
701-205-5889



Nathan Clemens

nathan.clemens@bayer.com
509-570-8696

Wilbur Ellis

Bill O'Haire
bohaire@wilburellis.com
406-727-4500 | fax 406-761-8543



Joel Stokes

jstokes@wilburellis.com
406-397-3194

Rick Anderson

randerso@wilburellis.com
406-248-1176

Ryan Helmer

rhelmer@wilburellis.com
406-650-1134

Winfield United

Curt Droogsma
cddroogsma@landolakes.com
406-860-1330



Jim Elliot

jelliot@landolakes.com
406-750-4057

Yara Belle Plaine

Dean Anderson
dean.andersen@yara.com
403-506-9514



CORPORATE SUSTAINING MEMBERS

Bayer Crop Science

James Curry
james.curry@bayer.com



Kerry Yates
kerry.yates@bayer.com
406-727-5641

Roger Broadbent
roger.broadbent@bayer.com
406-788-4251

.....

CHS

Brent Riggin
brent.riggin@chsinc.com
406-759-5978



Brian Foran
brian.foran@chsinc.com
406-462-5428 | fax 406-463-5418

Clint Volbrecht
clint.volbrecht@chsinc.com
406-773-5853 | fax 406-773-5606

Darius Wendland
darius.wendland@chsinc.com
406-355-4154 | fax 406-355-4399

Dave Normandy
david.normandy@chsinc.com
406-265-2275 | fax 406-265-8750

Don Soper
donald.soper@chsinc.com
406-265-2275 | fax 406-265-8750

Garret Nygard
garrett.nygard@chsinc.com
406-873-4642

Gary Frisen
gary.frisen@chsinc.com
406-567-2273 | fax 406-567-2274

Jake Hamlin
Jake.Hamlin@chsinc.com
(651) 280-7432

Jared Stenberg
jared.stenberg@chsinc.com
406-379-2275

College of Ag continued from page 29

Mondal, watershed hydrologist Tim Covino, plant and ecosystems ecologist Andrew Felton, Extension Beef Specialist Sam Wyffels, and two Horticultural faculty at the Western Agricultural Research Center, Andrej Svyantek and Zhuoyu Wang, who will focus on specialty crop production and value-added processing. Two other faculty will start in January, Claire Luby (horticulture, Plant Science & Plant Pathology) and Dan Atwater (rangeland ecology, Animal & Range Sciences).

The MSU College of Agriculture and Montana Agriculture Experiment Station would like to express our continued gratitude for your support of our research and outreach programs over many years. Without critical stakeholders like you, we would not be able to conduct the interdisciplinary and cutting-edge research that supports Montana's agriculture sector. Your continued support and partnership are vital to the college as we continue to strengthen our ongoing research and educational programs, and expand to new areas such as precision agriculture to align with MSU's grand challenges and national agricultural agenda on agriculture innovation. The people of the state are the reason for our land-grant mission, and we value our commodity boards, industry partners and advisory groups for all that they do in helping to shape and direct the questions we seek to answer every day to maximize benefit to Montanans and the field of agriculture. Please don't hesitate to get in touch with any of us with questions, feedback, or ideas for future projects. Our best ideas come from you. ■

SARC continued from page 19

of Dr. Ken Kephart. His research centered around variety development and local adaptation of wheat, barley, and pulse crops in collaboration with on-campus breeding programs. A search for a faculty member is planned in the near future. Please reach out to me, Kent McVay, should you have suggestions on the discipline, research directions or other ideas to incorporate into this very important position at SARC. ■

MABA Washington DC Trip

SEPT 12-15, 2022



Tim Tackes

*Board Member
Montana Agricultural
Business Association*

Krista Evans, Jake Yates, and I represented MABA on a trip to Washington DC from Sept 12 to Sept 15th, 2022. This was my second time as part of the MABA Washington DC delegation and was really the first time in several years where there was more of a “post-pandemic feel” around DC. All federal buildings and sites are now back open to the public. We were able to tour the capital building with Senator Tester’s staff – WOW, what a humbling and awe-inspiring experience! When we met with our state representatives, we still had to be met by their staff outside the building and escorted inside to their offices, but this was more for security purposes than stopping virus spread. The week we were in DC, was

the week of the national rail workers strike deadline. This was the center of almost every discussion. It was refreshing to see both Republicans and Democrats concerned and working together toward preventing a rail strike that would cripple the American economy and devastated Montana agriculture. Unfortunately, this kind of inter party cooperation is not the norm in DC right now.

The 1st full day in DC we teamed up with the Nebraska Ag Business Association and their representatives to meet with CropLife America, Ag Retailers Association, American Seed Trade Association, Biotechnology Innovation Organization, and National Grain and Feed Association. We heard what issues these groups are fighting for on our behalf in DC and then we got to give them input on issues important to agribusiness in our states. Last year while meeting with these national organizations, there was one message that was loud and clear – We all need to work together to enact any kind of change. This year the message was a bit different. Every national organization stressed the importance of having “boots on the ground” meaning every conversation needs to start with local people and groups like MABA working through our local and state government officials. They stressed that change needs to start from the ground up and personally asked us to have discussions with our congressional representative on issues affecting not just our states but all of US agriculture. It is awesome to have these meetings along with other states’ ag organizations, like Nebraska. Even though Montana doesn’t raise much corn or soybeans, we all have related ag business issues and voicing concerns as unified state organizations does pull some weight.

CORPORATE SUSTAINING MEMBERS

CHS (continued)

Jared Stenberg
jared.stenberg@chsinc.com
406-353-2490



Jeri Engstrom
jeri.engstrom@chsinc.com
406-654-2022 | fax 406-654-2253

John McFarland
john.mcfarland@chsinc.com
406-667-2316 | fax 406-667-2397

Josh VanWechel
darius.wendland@chsinc.com
406-355-4154 | fax 406-355-4399

Ken Slezak
kenneth.slezak@chsinc.com
406-434-5225

Lance Johnson
lance.johnson@chsinc.com
406-265-2208

Larry Cook
larry.cook@chsinc.com
651-402-2065 | fax 888-295-1806

Les Billington
les.billington@chsinc.com
406-777-5441 | fax 406-777-3920

Mark Lalum
mark.lalum@chsinc.com
406-755-7400

Mark Morrell
mark.morrell@chsinc.com
406-357-2280 | fax 406-357-2805

Mary Werner
mary.werner@chsinc.com
406-786-3221 | fax 406-786-3220

Neil Mauws
neil.mauws@chsinc.com
406-622-5966 | fax 406-622-5969

Russell Alisch
russell.alisch@chsinc.com
406-265-2275 | fax 406-265-8750



CORPORATE SUSTAINING MEMBERS

CHS (continued)

Ryan Lammers
ryan.lammers@chsinc.com
406-265-2275 | fax 406-265-8750



Tim Kipp

Timothy.kipp@chsinc.com
406-873-2081

Tom Burtchett

tom.burtchett@chsinc.com
406-231-3431 | fax 406-622-5969

Tom Gilead

tom.gilead@chsinc.com
406-378-2306 | fax 406-378-2307

Wendy Majerus

wendy.majerus@chsinc.com
406-654-2022 | fax 406-654-2253

CHS Ag Partners

Chase Anderson
chase.anderson13@chsinc.com
406-778-2929 | fax 406-778-3292



Corteva AgriSciences

Caroline Silveira
caroline.a.silveira@corteva.com
916-345-0313



James Baguley

james.allan.baguley@corteva.com
406-407-0827

Marcus Weatherhead

Marcus.weatherhead@corteva.com
406-690-3946

FMC Ag Products

Daniel Skoczylas
Daniel.skoczylas@fmc.com
509-592-7202



Katie Ratzburg

Kathryn.ratzburg@fmc.com
406-320-2239

The next day we were very fortunate to be able to meet face to face with Senator Daines, Senator Tester, and Congressmen Rosendale. Most all our representatives understood the issues we presented to them and made us feel like they will fight for our industry on capitol hill.

We presented the following current topics we felt were important to the future of Ag Business in Montana.

TRANSPORTATION ISSUES

- **Rail:** The impending (at the time) strike. BNSF has a captive customer base in MT and often their timely service (or lack of) and demurrage policies lead to labor shortages and unsafe working conditions for ag retailers (especially true in our grain and fertilizer sectors). We learned of the Rail Freight Free Market Act, currently proposed in congress that would address a lot of these issues to make the railroads more accountable and share some of the burden with their customers. We recommended to our congressional delegation to support the act.
- **Truck:** Driver shortage is affecting every level of Agriculture. We discussed one item to specifically help MT ag and that is to remove the Canadian border crossing COVID testing and vaccine requirements.

AG LABOR SHORTAGE

There is a shortage of workers at every level, and in every sector of the agriculture industry.

DEFENDING FIFRA

and the need for science-based regulations/registrations for our pesticides – ensuring the analysis is risk based and not hazard based as we are currently seeing.

THE MEXICAN DECREE

banning the use of glyphosate and all glyphosate resistant traits by 2024 and all the potential implications this will have on crops and products shipped into and out of MT, not to mention the precedent it can set for actions like this in the US.

It was an incredible and enjoyable week for this rural MT country boy! It showed me that no matter how small or insignificant I may feel, individuals and groups like MABA are heard and do make a difference for our members. ■

MONTANA SOILS ARE BECOMING ACIDIC:

WHY, HOW, AND WHAT YOU CAN DO?

In the past, cropland with acidic soil, meaning low pH, was uncommon in Montana. However, in the recent decade or so, soil acidification has become a major problem on some farms. Soil test reports across Montana indicate that 24 of 56 counties have at least one farm with pH <5.5. Montana farmers are experiencing tremendous yield and economic losses due to soil acidity. The soil acidification is expected to worsen unless we adjust our standard agronomic practices and soil testing procedures.

Why and how are Montana soils becoming acidic?

In Montana, the major cause of soil acidification is application of ammonium-based fertilizers, including urea. Specifically, in Montana, the use of ammonium-based fertilizer has nearly tripled since 1985 to optimize crop yields and avoid protein discounts. Hydrogen ions released during the nitrification process of these fertilizers lowers the soil pH. The extent of soil acidification depends on the type of nitrogen fertilizer, nitrate leaching rate, soil type and plant nitrogen uptake. Our data indicate that for every 100 lbs N/ac applied, pH can drop by 0.044 units on a silt loam whereas the pH drop can be up to 0.14 units on a sandy clay loam.

Another reason for soil acidification is crop residue removal that is enriched in alkaline compounds and can buffer or slow down the soil acidification rate.

How does acidic soil affect crop yields?

Acidic soils affect plant growth in multiple ways:

1. Aluminum toxicity, which is part of clay and is toxic to plants, dissolves into the soil solution (pH < 5.2).
2. Reduced nitrogen fixation (pH <5.5)
3. Fungal diseases increase
4. Herbicide persistence changes
5. Nutrient deficiencies

All these factors decrease yields, and sometime cause complete crop failure.

CORPORATE SUSTAINING MEMBERS

FMC Ag Products (continued)

Kirk Sager
kirk.sager@fmc.com
509-770-0302



Sam Lincoln
sam.lincoln@fmc.com
701-301-7604

Nutrien
Brian Mark
brian.mark@nutrien.com
306-280-0790



Jake Yates
jake.yates@nutrien.com
406-696-7942

Mike Baune
mike.baune@nutrien.com
509-551-8510

Nutrien Ag Solutions
Austin Orcutt
Austin.Orcutt@nutrien.com
406-450-4897



Casey Odom
casey.odom@nutrien.com
406-633-3463

Dan Kolar
dan.kolar@nutrien.com
406-350-0456

Jeremy Jensen
Jeremy.Jensen@nutrien.com
208-490-6210

Jonathan Sykes
jonathan.sykes@nutrien.com
406-946-1277

Katelynn Emerson
katelynn.emerson@nutrien.com
406-460-0379

Kelly Bronec
kelly.bronec@nutrien.com
406-836-0731



CORPORATE SUSTAINING MEMBERS

Nutrien Ag Solutions (continued)

Kristie Pulst
kristie.pulst@nutrien.com
406-621-0015



Lyle Benjamin
lyle.benjamin@nutrien.com
406-799-0423

Mitch Ereaux
Mitch.Ereaux@nutrien.com
406-390-7630

Nathan Haynie
Nathan.Haynie@nutrien.com
406-647-2569 | fax 406-259-8618

Ryan Holt
Ryan.Holt@nutrien.com
406-899-9635

Sam Davison
samuel.davison@nutrien.com
406-788-8316

Timothy Hartwell
timothy.hartwell@nutrien.com
406-460-1153

.....

Syngenta Crop Protection
David Flakne 
dave.flakne@syngenta.com
608-770-3525

.....

Western Plant Health Assn.
Renee Pinel 
reneep@healthyplants.org
916-574-9744 | fax 916-574-9484

Sharon Halligan
sharonh@healthyplants.org
916-574-9744

How to accurately characterize soil acidity?

Our observations indicate that a) soil pH is generally vertically stratified with low pH mainly concentrated in the upper 3-4" of soil and b) pH distribution and hence plant growth across a field is usually not uniform (Fig. 1). It is recommended to scout the fields periodically and take samples from spots with unexplained crop growth issues. For accurate identification of soil acidity:

1. Sample 0-3" instead of 0-6".
2. Don't composite soil samples across a field. Data suggest that a field with an average soil pH of 6.5 to 7.0 can have pH less than 5.5 on up to 60% of the field.

Researchers at MSU are also testing if drone imagery could be used to map soil acidity. They observed strong correlation of Normalized Difference Vegetation Index with soil pH in one study.

What to do about soil acidification: Research updates

Mitigation: Liming products such as sugarbeet lime, aglime, prilled lime, and liquid lime can increase soil pH. Questions exist about the effectiveness, longevity, practicality, mode and rate of application, and economic feasibility of these products.

Key findings from liming trials established in 2017(Fig. 2):

1. Improved pH levels observed in lime treated areas 4 years after lime application.
2. A yield bump of up to 20 bu/ac observed in durum wheat, whereas pea yield increased by about 10 bu/ac when soil pH increased from 5.8 to 6.4.
3. In our trials, soil pH decreased in 2021 from 2018 and 2019 (Fig. 3), regardless of liming rate.

Upcoming experiments:

Studies are being established this fall to:

1. Test the effectiveness of different liming products: sugarbeet lime, aglime, and prilled lime.
2. Identify the best mode of lime application: tilled, not-tilled, and seed-placed.
3. Calculate the economics of applying different liming products.

Effectiveness of different liming rates (1, 2, 4, and 6-ton lime/ac) to raise soil pH and increase yields over time is being evaluated. Re-

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Acidic Soils continued from page 55

searchers at MSU are also testing the vertical stratification of soil pH and soil buffer methods to formulate lime recommendations.

Adaptation: Adapt to soil acidity by using an acid-tolerant crop variety or applying phosphorus fertilizer even if soil phosphorus levels are above sufficiency levels. Greenhouse experiments are being conducted to identify acid-tolerant pulse varieties this year.

Prevention: Prevent soil acidification by increasing nitrogen use efficiency (4 Rs), growing legumes and perennials, leaving crop residues on field, and using less acidifying nitrogen sources. Low N use crops and perennials are being evaluated to reverse the soil acidification at a MSU research farm.

Acknowledgements:

We would like to thank the funding sources: Montana Fertilizer Advisory Committee and Western SARE.

For more info on this topic: <https://landresources.montana.edu/soilfertility/acidif/index.html>

Figures:



Fig. 1. Variability of safflower growth caused by low and variable soil pH. Image courtesy: Dr Scott Powell.





Fig. 2. On-farm liming trial in Chouteau County showing effect of adding lime on lentil. Image courtesy: Dr Richard Engel.

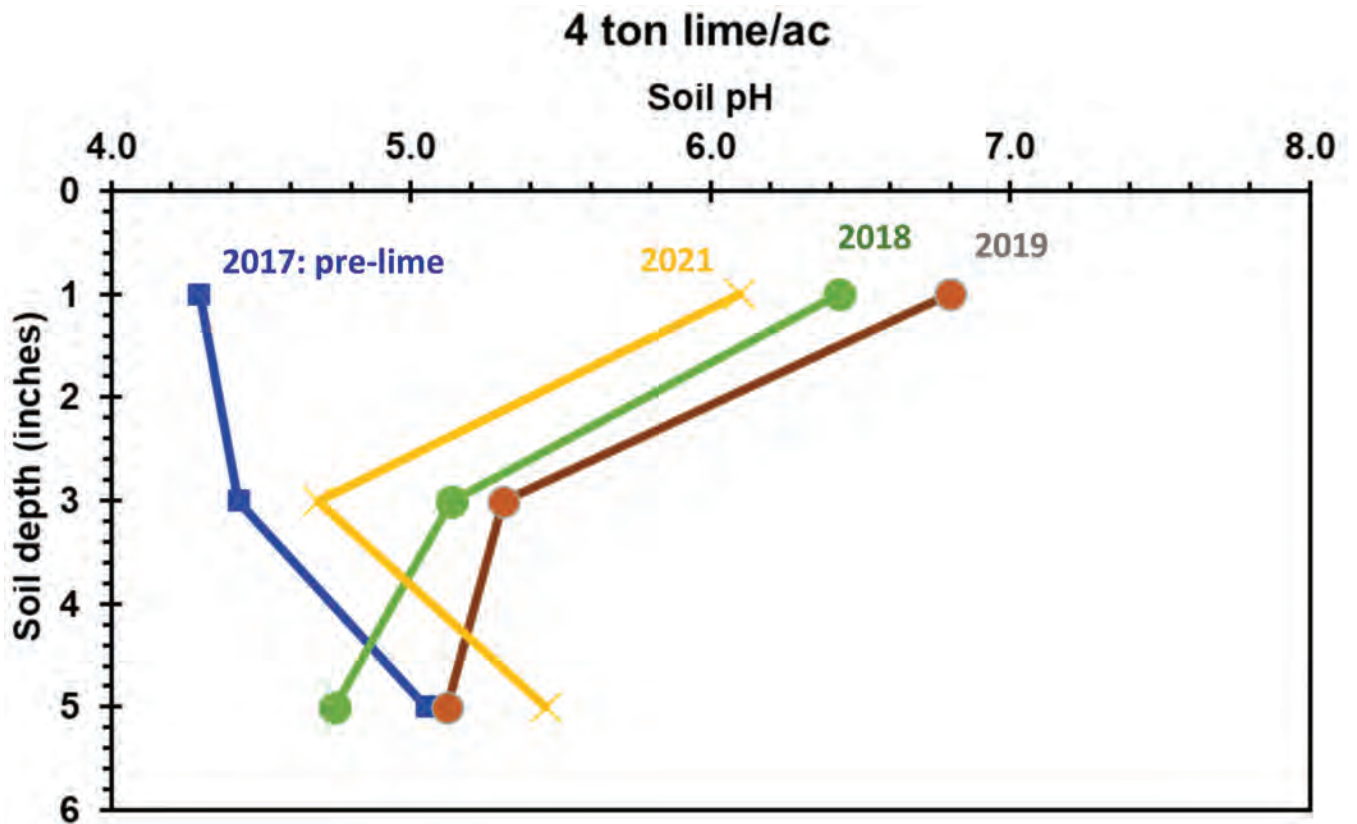


Fig. 3. Efficiency of beet lime (4 ton/ac) to increase soil pH over the 4-year period at a site near Ft Benton, MT.



Cultivating the Future

In Silicon Valley — and across the country — the next generation of innovators and investors are helping to develop the next generation of agriculture technology.

They've discovered surprising solutions to one of our biggest challenges: growing more food with fewer resources.

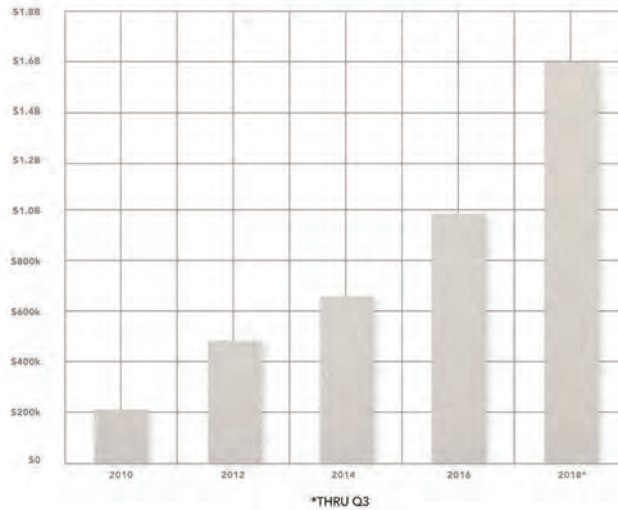
Growing Investment in AgTech

In 2018, \$1.6 billion in capital was invested in agriculture technology¹ – up roughly 60 percent since 2016.²

These companies aren't just developing new technologies to grow food more sustainably, they're supporting jobs and growing the economy, too.

¹Finistere Ventures, 2018 AgTech Investment Review
²Finistere Ventures, 2017 AgTech Investment Review

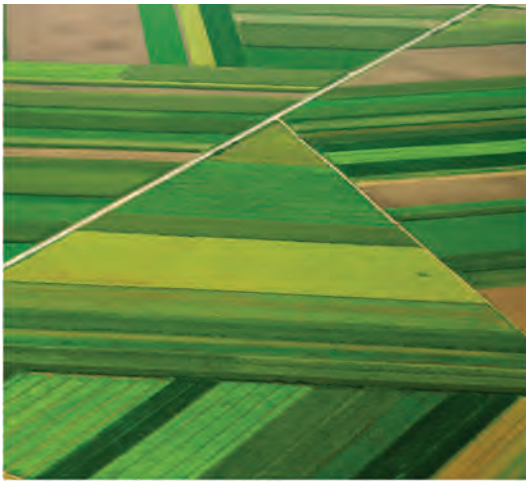
THE LAST DECADE OF INVESTMENT IN AGRICULTURE TECHNOLOGY:



Deal activity in AgTech and Food Tech startup investments increased by 11% in 2018.³

³AgFunder, 2018 AgriFood Tech Investing Report





Gates Invests to Fight Climate Change

Multiple startups are developing plant-nourishing microbes that will help reduce greenhouse gas emissions from farming.

This work has drawn attention from high-profile investors, including **Jeff Bezos, Michael Bloomberg, Meg Whitman and Mark Zuckerberg.**

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AgTech helps farmers and scientists capture data from their fields and draw important insights from that data.

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Innovating for a Better Planet

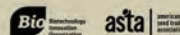
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These advancements are beneficial to growers—large and small—to consumers, and to the planet as a whole.



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