

Agricultural Research Stations  
Annual Report  
Calendar Year 2022  
M. Peters, ARS Director

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## **Directors Summary**

The Agricultural Research Stations had a very successful 2022. The year was certainly not without its challenges, but the research stations continue to meet their main mission by ensuring campus Principal Investigators have access to land and bench space; thus accommodating their vast and various research, teaching, and outreach needs. Almost 1300 research projects were completed while servicing over 300 Principal Investigators. Additionally, almost 32,000 people formally visited the stations to partake in a field day or tour. Uncounted multitudes more visited the stations to walk gardens, see research plots, or take in the greatness of the animals and plants living on UW Madison's premiere outreach centers. The numerous visitors was a refreshing sight following two years where our visitor numbers were greatly reduced due to the pandemic. Another bright spot for 2022 was that collectively the stations did not have to manage through extreme precipitation or drought. An average year in this regard was a very welcome event.

The stations remain a vibrant tool in the CALS Research Portfolio. The tables included in this report show the value the ARS network brings to our College and University. Included behind this Directors Summary are individual reports from each Station and the Campus Greenhouses. Each station manager was asked to report on activity in the following areas:

- Notable Station Achievements
- Outreach/Instruction Activities
- Research Activity
- Change
- Goals for the Coming Year
- Areas of Concern and Challenges

### **Common themes and general notes from 2022:**

- The stations are a highly utilized tool by CALS researchers. They serve a multitude of Principal Investigators and produce high quality research that is resulting in publications.
- Although not completely without error, stations meet research project demands with a high level of precision. This ensures strong repeatable data is available to principal investigators. When errors are made, process improvement is sought.
- Stations are feeling immense pressure from a lack of equipment. Much of this equipment shortage is due to the lack of \$0 equipment donations that historically were provided to the stations. ARS must find ways moving forward to procure needed equipment and not rely on equipment donations to meet our station needs.
- Several stations had high impact, high dollar risk management claims in 2022. Weather, fire, and equipment failures led to many cases of damage and lost equipment. During these incidents, UW's systems showed they stand at the ready to help the stations recover. We are grateful for the support from our campus partners.
- The research stations are still a valuable asset for CALS and UW Madison. They are prepared to meet the demands of CALS faculty in 2023 and beyond.

- All staff employed in the Agricultural Research Stations network are engaged in professional development. We seek to have the best trained staff possible. This training includes diversity, equity, and inclusion learning, thus ensuring the stations are welcoming to all users.
- The stations that house animals are exemplary in their mission. By all measures, they exceed expectations of animal care and external accreditation groups have commended them for these efforts.
- Working with the CALS Safety Specialist, safety compliance and training is a major focus of the ARS sites.
- Communication with campus Facilities, Planning, and Management leaders has led to encouraging news that central campus is going to be more willing to help ARS with maintenance and repair issues.

### **General ARS Challenges**

- Supply chain pressures remain a present challenge. When equipment or chemicals can be located, rising costs of these items stress limited budget resources.
- While not a large impact in the last two growing seasons, it is worth remembering that climate change is placing real pressures on the art of conducting field research. Historically, documented climate changes and weather events have narrowed the windows in which station staff and researchers are able to get into the fields and complete their work. This is placing pressure on the stations to accommodate precision needs, and many times leaves the stations and researchers doing work in less than optimal field and environmental conditions. Future investments in the station infrastructure need to be carefully planned so the improvements help alleviate some of these climate change demands. Additionally, it is the hope that the stations are a relevant venue for future climate change research.
- Campus budget models of using centralized service assessments to revenue generating accounts is making the operation of agricultural based facilities difficult. Commodity sales do not allow for passing along the costs of centralized service assessments. It is the hope that dialogue regarding different budget models can continue.
- Access to consistent high speed data networks continues to be a struggle in meeting today's research needs. A few stations have addressed this concern, but the need to expand reliable high speed internet to all our stations remains necessary. Data science and data management remain focus of discussions with CALS IT leadership and they are proving to be a critical partner as we face the rural connectivity challenge.

### **Conclusion**

I remain optimistic that the future of the ARS network is incredibly strong. Researchers continue to report that they are happy with the services ARS provides and we generally meet all of their needs. The stations are all operating within their allocated budgets and are able to remain fully staffed. The ARS network remains a critical link in the chain of CALS' research capacities, and we welcome the challenges to keep providing essential services to our Principal Investigators.

**Research Projects and PI's using Ag Research Stations**  
**Cropping Year 2022**  
**Compiled by Jane Cahoon**  
**January 5, 2023**

<b>Station</b>	<b>Field Crop Research</b>	<b>Fruit Crop Research</b>	<b>Storage Research</b>	<b>Animal Research</b>	<b>Natural Resources/ Turfgrass</b>	<b>Campus PI's</b>	<b>Total PI's</b>
ARLINGTON	301			45		74	75
HANCOCK	141		14		2	32	59
USDFRC				9		3	7
KEMP					45	10	35
LANCASTER	38			3	2	12	15
MARSHFIELD	46			11		25	28
OJ NOER					55	3	4
PENINSULAR	12	5			2		9
RHINELANDER	10				9	2	13
SPOONER	23	2				9	15
WEST MADISON	54	5		14		42	43
GREENHOUSES	291	43			116	53	58
<b>TOTALS</b>	916	55	14	82	231	265	361

# 2022 TOURS/SEMINARS ON AG RESEARCH STATIONS

Compiled by Jane Cahoon

January 5, 2023

<u>Station</u>	<u>Field Days</u>	<u>Tours</u>	<u>Instruction</u>	<u>Seminars/ Meetings</u>	<u># of People attending</u>
ARLINGTON	5	7	9	30	2727
HANCOCK	3	10	3	27	834
USDFRC		1			35
KEMP		2	12	50	1861
LANCASTER	1	3			100
MARSHFIELD	2	26	36	48	2767
OJ NOER	2	11	5	7	317
PENINSULAR		5	5	7	698
RHINELANDER	1	4	1	2	300
SPOONER	1	2	6		340
WEST MADISON	3	6	10	23	4767
GREENHOUSES		30	30	2	250
<b>TOTALS</b>	<b>18</b>	<b>107</b>	<b>117</b>	<b>196</b>	<b>14,996</b>

## Arlington Agricultural Research Station 2022 Annual Report

### 1. Notable station achievements:

The first half of 2022 went very well. It was pretty much business as usual after a couple years of disruptions. Then disaster struck on the windy afternoon of June 26 when a hay/equipment storage shed burned at the station headquarters area. Responders from 17 area fire departments were able to isolate the fire to the hay shed and save nearby equipment and buildings. Unfortunately, the structure was a complete loss along with about 250 tons of hay and bedding, 4 tractors, a semi-truck, pickup truck, trailers, grain wagons, hay balers, hay merger, fertilizer spreader, combine grain head, and other various equipment. Luckily, no people or animals were injured, and no research studies were lost or compromised. In retrospect, putting the fire out was the easy part. The rest of the year involved fire cleanup and disposing of burnt hay, equipment, and building materials as well as working with risk management and an adjuster to replace lost equipment. This has been an enormous task with 27 items lost with a value of around \$1.7 million. It was further complicated by an equipment shortage caused by a strong farm economy and supply chain issues, and prices have increased because of inflation. We have replaced about half the lost items by the end of the year with several on order.

On a better note, we had two outstanding summer interns. The interns were diligent and efficient workers, and these characteristics allowed them to canvas the entire farm to document the conditions of the crops in each field. Their work helped to diagnose fertilizer damage to seedling corn plants and edge of field compaction issues. Also, Wisconsin Foundation Seeds (WFS) greatly increased its volume of seed cleaning this year. In large part, this was achieved by investing in seed cleaning training during the summer. Tom Steinbach coordinates the seed cleaning at WFS, and he attended two trainings at Iowa State University to learn about the precise operation of fanning mill cleaners, length graders, and gravity separation tables. With this knowledge, WFS cleaned approximately 150,000 pounds of seed for AARS, six PIs, and six area businesses.

### 2. Outreach/instruction activities:

Station visitors started to pick up after very few in 2020-21. We had over 2,600 in-person visitors and many more to the dairy, beef, sheep, and swine units. Several successful field days were held. We also were visited by Senator Tammy Baldwin and gave some notable tours including former UW System President Tommy Thompson, new CALS Dean Glenda Gillaspay, and Associate Dean Louis Macias.

2022 Arlington ARS Highlighted Tours, Field Days, Seminars, Courses			
Month	Group Name	Event	Participants
various	UW Pesticide Applicator	Commercial and Private Training	170
1/31/2022	WI Farm Experimentation	Resource Network Meeting	50
3/12/2022	WI Livestock Breeders	Annual Meeting	75
3/15/2022	Fresh market Veg. Growers	Pumpkin School	55
3/17/2022	AgrAbility	National Training Workshop Tour	25
3/30/2022	Dairy Equip Installers	Training	70
4/2/2022	Arlington Sheep Day	Arlington Sheep Day	125
4/26/2022	Midwest Rural Energy Council	Stray Voltage Investigators training	40
4/29/2022	FFA Livestock Judging	State Judging Contest	200
5/7/2022	Saddle and Sirloin Club	Badger Bonanza	60
5/19/2022	USDA Hemp Program	Licensee Training	100

5/27/2022	Senator Baldwin	Rural mental health round table	32
6/14-6/16	National Firewood Workshop	Firewood Workshop	150
6/20-6/24/22	Youth Tractor Cert. Program	Tractor Certification	40
7/25/2022	4H Livestock Judging	State Judging Contest	80
8/30/2022	Organic Field Day	Organic Field Day	75
8/31/2022	Agronomy Soils Field Day	Agronomy Soils Field Day	226
9/13/2022	Wisconsin Soybean Program	Fall Board Meeting and Tour	35
10/14/2022	Agronomy Undergrads	Station tour	11
10/15/2022	WI Dairy Goat Association	Fall meeting	60
11/2/2022	UW Extension	Ag 101 training	30
11/3/2022	AgrAbility	Advisory Council Meeting	30

### 3. Research Activity:

301 Crop-related research projects with 52 PIs supported

45 IACUC approved animal research projects with 23 PIs supported

The feed mill also provides feed for trials on campus and Vet Medicine.

### 4. Key Changes:

Earlier in the year we accomplished a long-term goal of adding precision steering to our fertilizer application tractor. This allowed for better nutrient placement because of less overlap during spring planting. Unfortunately, the tractor, spreader, and new steering equipment were all lost in the fire, leaving us the need to quickly replace the units. Despite limited equipment availability, we were able to find and purchase a larger spreader with current application technology. This new spreader gives us increased capacity, wider booms, and allows for in-season standing corn application. This unit will greatly increase our efficiency and allow for more flexibility.

### 5. Station goals for the coming year

We continue to replace lost equipment. We are still looking for a semi-truck, hay merger, hay balers, grain wagon, and grain head. The structure replacement is also in the design stage with the intention of late-spring or early-summer construction.

The UW acquisition of a 70-acre land parcel adjoining the station was completed in June. This was possible because of a generous gift from an anonymous donor to support organic research along with additional support from CALS. These fields are now included into our crop plan and the three-year certified organic transition has begun on part of the parcel. We are planning for the transition to be in three stages and to be completely transitioned in five years. During this time, we need to add culverts for field access and alleys to get around fields and provide a buffer to non-organic adjacent fields. There will also be investments needed to equipment that supports organic research as we are using much of the same equipment as when the organic program started 19 years ago with only 40 acres. Our goal is to increase the current 84-acre organic footprint to around 150 acres.

While acquiring Wisconsin Foundation Seeds has brought benefits to the station, the current facilities need some improvements related to ventilation and equipment. Options to better remove airborne dust from the cleaning warehouse are currently being explored. The seed handling system is operable, but adjusting the system is labor intensive and more ergonomic alternatives are being investigated. The outdated gooseneck trailer and gravity wagons are costly and hazardous to maintain. Upgrades to those pieces of equipment are planned for this year.



## 6. Areas of concern and challenges

The pandemic brought global supply chain issues and inflation, and we were affected like everyone else. We were able to find supplies needed to produce animal feed and support research, but input prices drastically increased. We paid 75% more for gasoline and diesel fuel in 2022 compared to 2021. Crop protection product costs were up 70% and fertilizer expenses more than doubled. Purchased feed ingredients have also increased in price with the cost being passed on to the units. Thankfully, these prices have decreased some going into 2023, but still remain much above pre-pandemic levels.

The Case Big Red program has been restricted due to a labor stoppage and CaseIH and UW policies. All parties benefit from this agreement, and we are hopeful the issues can be resolved so this great program can continue for many years. We have been proactive with short-term leases to ensure we have enough equipment to maintain station operation. We have also looked at lease-to-purchase or outright purchase to replace older equipment or tractors that may no longer be supplied by dealers for demonstration use. These come at a cost that has not been in our budget for the past decade, but we will have to plan for now.

The station had a feed mill operator position that was open for nearly a year. After several failed searches we were finally able to fill it by offering a hiring bonus. Some of the station staff are nearing retirement which will lead to employee turnover in the coming years. We've been able to fill most open positions, but applicants are usually few. There are several researchers that are planning to retire in the foreseeable future as well. New research staff will likely require a period to adjust to their program and the station, but new people and ideas may lead to better collaboration and communication.

We have done a great job maintaining station buildings with limited budgets, but deferred maintenance is catching up to us. A new system with physical plant taking responsibility should help with the cost. Many buildings, including the feed mill, from the 1960s and earlier have outlived their useful life span and need significant maintenance or replacement. Station infrastructure such as roads, parking lots, wells, water lines, and septic are aging, and maintenance costs continue to increase.

## **US Dairy Forage Research Center 2021 Annual Report**

*Leading the world in integrated dairy forage systems research*

### **Number of Research Projects:**

During 2022 we supported 4 USDA primary researchers, 3 UW researchers on farm and various collaborating scientist, post docs and graduate students from within both institutions. These scientist/researchers performed 9 dairy research trials in nutrition (6 USDA) and reproduction (3 UW) supporting the DFRC vision. These trials utilized an average of 130 cows and/or heifers per month (range 37-188). We continue to use the Jersey herd in trials comparing them to the Holstein cows. We also completed a trial started in 2021 collecting transition period data and colostrum samples for a trial collaborating with the University of New Hampshire analyzing colostrum production in Jersey cows. This is a decrease of 2 trials from 2021 with an increase in animals used. Agronomic trials continue with low lignin alfalfa, experimental work on inter-seeding alfalfa in corn silage plots and tracking how much nitrogen is lost in various stages of the growing, harvest, feeding, waste stream and crop nutrient application.

### **Outreach:**

We had only one visiting group of 4<sup>th</sup> graders for the year from St. Peter's school, this group was extremely happy to return to this annual visit following restrictions for the last couple of years. RARC trainers started monthly visits training our employees in various areas of cow and calf care. This has been a big help to DFRC, it keeps our training requirements on time and improves the readiness of our staff to prevent, diagnose and when it is necessary to treat or elevate concerns to management or the vet staff.

### **Challenges:**

Filling open positions continued to be a problem in the first 3 quarters of 2022. Terry (supervisor) and I (management) filled several shifts weekly. We did add two very good employees to the PM shift and one to the AM shift towards the end of the year.

### **Opportunities:**

Fully utilizing the 5 ACT III employees we have working at the farm. Our goals are:

- Improve retention and performance of all employees through increased interaction.
- Increase their awareness of how to deal with different personalities and to improve the effectiveness and efficiency of the whole team.
- Develop a plan for the future of DFRC in the current facilities and new facilities in the planning stage.
- Spend more individual time with new employees following up on their training and questions.

### **Accomplishments and Goals:**

- We made progress on a couple of our opportunities I listed in last year's report.

- Our heifer numbers are coming in line with our actual needs. This partially through the sale of low genomic animals and relying more on beef semen. The beef semen we are using also qualifies our calves for a premium of between \$40 and \$60 per head.
- Second, USDA was able to fix our feed loading area helping us realize a reduction in feed waste.
- I have noticed that we do a good job of hiring people, we initially train them right, but we do not follow-up with re-enforcement of protocols or additional training to improve employee animal care knowledge. To improve on this area, we have started monthly sessions where we bring in RARC trainers to spend concentrated time on techniques our employees ask for.
- Pounds of milk sold, and the quality of that milk is always a SMART goal for the year. We did not have our best year for production, but quality was very good. We look forward to increased milk production in 2023 while maintaining component and quality parameters.

Year	Yearly total	BTSCC	BFAT	Protein	Avg Bovi Sync Cows	Avg sold/ cow going in tank	Total F&P
2019	11,492,813	<b>150</b>	3.87	3.08	396	83.99	<b>5.89</b>
2020	10,961,372	<b>175</b>	3.80	3.09	356	87.65	<b>6.04</b>
2021	10,907,096	<b>207</b>	3.98	3.13	356	87.22	<b>6.20</b>
2022	10,590,486	<b>176</b>	4.10	3.18	360	83.98	<b>6.12</b>

- Our preg rate ended the year at a consistent 32% the same as 2021.
- Cases of mastitis was an area where the team improved our performance markedly over 2021. We had 120 fewer cases of mastitis this year (152) 37.1 cases/100 cows, than last year (272) 66.3 case/100 cows. The table below lays out the last 5 years of improvement. Terry was looking at some info from 2016 when there were over 800 cases.

	Cases/Yr	Cases/ 100 cows
2018	374	91.22
2019	255	62.20
2020	359	87.56
2021	272	66.34
2022	152	37.07

- Calf morbidity was a second area of improvement over previous years. We dropped 18% on calves diagnosed with scours to 14% for the year. The industry standard we had as a goal was 25%.

Year	Total Heifer Calves	Scours Diagnoses	% of Births
<b>2019</b>	<b>212</b>	<b>154</b>	<b>72.6%</b>
<b>2020</b>	<b>201</b>	<b>97</b>	<b>48.3%</b>
<b>2021</b>	<b>237</b>	<b>78</b>	<b>32.9%</b>
<b>2022</b>	<b>235</b>	<b>33</b>	<b>14.0%</b>

- I do not track employee turnover, but I do know the employees we do have are the most cohesive, high performing team we have had at DFRC in the years that I have been here. We have seen a few of the longest-term employees step up to their potential and become leaders instead of instigators.

### **Research Activity:**

Researchers are confirming that cows are very good at turning cellulosic material (non-human food sources) into milk at efficiency levels comparable to high starch (human usable food sources) diets. This is relevant to the growing population and making the best use of our land resources. We are seeing more of our studies include a period of measurement of greenhouse gas production using a new piece of equipment that measures it on an individual cow basis. Repro trials being conducted by UW researchers are looking for ways to get more cow pregnant sooner, what body condition is ideal for this and what farmers can do to improve outcomes.

### **Future Research:**

We have 1 trial continuing into 2023 that is following calves through their first lactation to determine the effect of their dams' diet on performance. These calves are the offspring of a previous transition/repro trial where the cows were feed high and low energy diets. We are starting a couple of preliminary trials on a small number of cows to analyze the best way to test the hypothesis that alfalfa can be replaced by a treated SBM protein source and larger amounts of corn silage.

## UW CALS ARS Greenhouses 2022 Annual Report

Three facilities:

- **Walnut Street Greenhouse**
  - 72 glass greenhouses, campus hot water heat, 66% air-conditioned, 15,000 ft<sup>2</sup> bench space
  - 4 growth chambers
  - 52 cold frames
- **King Hall (Soil Science)**
  - 4 glass greenhouses, campus hot water heat, all air-conditioned, 1000 ft<sup>2</sup> bench space
- **West Madison ARS**
  - 2 polycarbonate/vinyl dome-roof greenhouses, 36 irrigated benches plus floor space for taller crops, natural gas forced air heat, evaporative cooling, 4200 ft<sup>2</sup> total growing space

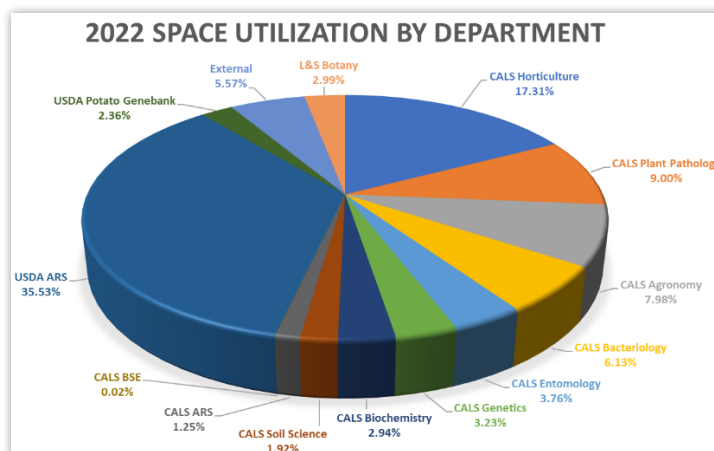


WALNUT STREET GREENHOUSE AT DAWN

PHOTO CREDIT: B. ERDMAN

### Summary of research activity

- The greenhouses served 58 principal investigators and other entities in 2022. These research groups are associated with various departments within CALS, L&S, UW Extension and USDA, as well as some non-UW organizations.
- Research was conducted on a large variety of vegetable, cereal, pulse, fiber, fruit, nut, and ornamental crops, as well as soils and agricultural research equipment.
- There are currently over 200 active greenhouse users.
- Hundreds of experiments are conducted in these facilities each year.



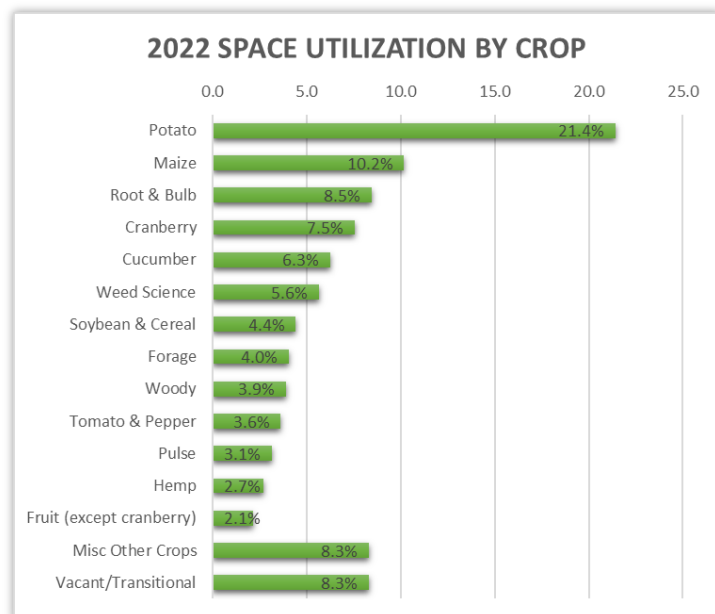
### Notable station achievements

- Installed a Cloud-based greenhouse environmental monitoring and alert system in all greenhouse spaces. This replaced a patchwork of older phone dialer alarm systems which were not dependable. Greenhouse environmental characteristics can now be monitored from anywhere via computer or smartphone. The new system also collects and stores environmental data over time and provides reports which are a valuable resource for researchers.

- Began a pilot program to rear and release beneficial insects in greenhouse spaces. The beneficial insect selected for these initial trials was *Dalotia coriaria*, the rove beetle, and has shown promise with controlling certain pest insect populations. We have been able to successfully rear these insects in a converted soil storage room, which greatly reduces costs compared to purchasing them from commercial insectaries. We are very excited about the potential benefits of further integration of biological pest controls.
- Began conversion of aging flood bench irrigation at West Madison greenhouses to a more versatile and precise drip irrigation system.
- Established a pesticide rinsate recovery and disposal program in conjunction with UW Environmental Health & Safety. Previously, pesticide rinsate was dumped into city sewers.
- Worked with the Werle weed science lab and FP&M to secure funding and correctly vent exhaust fumes from a pesticide spray chamber at the greenhouses. This alleviated a major safety risk for all people working at the Walnut Street Greenhouse.
- Collaborated with Ané bacteriology lab to install full-room humidification systems in three greenhouse rooms at Walnut Street, with the capability to expand into three additional rooms in the future. There were previously no humidity-controlled spaces at the greenhouses.
- Successfully overcame issues with failing electric motors in Walnut Street Greenhouse HVAC systems. These failures were both a threat to research and a safety risk. The path to a solution required coordination of, and cooperation between, multiple Physical Plant trades teams as well as FP&M management and outside vendors.
- Utilized inventory control, purchasing protocols, and price checking to reduce overhead and bring our accounts to a sustainably healthy balance. This allows for investment in innovation, maintenance, and talent to provide excellent support for the research being conducted at the greenhouses.

## Outreach and instruction activities

- Administered greenhouse orientation, WPS training, and specialized equipment training to new and returning greenhouse users. Training provided to over 200 individuals during year.
- Provided tours and information to prospective and current students seeking educational and career advice in the protected plant culture industry, as well as members of the public.
- Greenhouse superintendent was a panelist for the Horticulture 120 career advice discussion.



was the



## Key changes

- Installation of environmental monitoring and data capture system in all growing spaces.
- Integration of beneficial insects into pest control program.
- Hired a student worker. This was possible due to funding provided by ARS Headquarters.

## Challenges and areas of concern

### Ongoing:

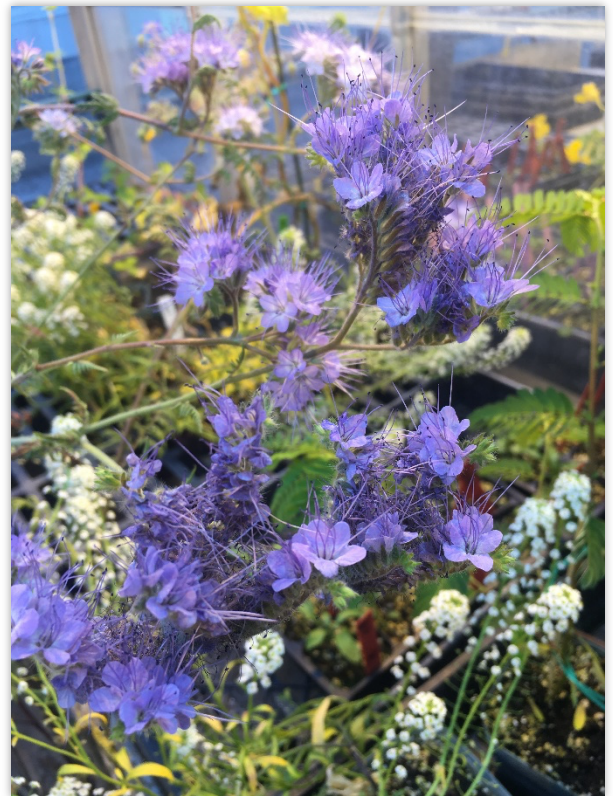
- Age of greenhouses and lack of precision and reliability in environmental controls. Current research demands a level of control over the environment which we cannot consistently offer in many of our greenhouse spaces. Some of our buildings and equipment are reaching end of life and/or obsolescence.

### Emerging:

- Greenhouse crop lighting systems are aging, and parts are becoming more difficult to obtain. There is also a significant energy cost savings in newer lighting technology. Lighting system upgrades should be a top priority in the coming years.
- Knowledge capture and transfer – Longtime greenhouse staff possess a wealth of experience related to protected culture of plants in a research context. This is highly specialized knowledge and should be preserved for the benefit of future research at the greenhouses.

## Goals for the coming year

- Continue design and implementation of robust greenhouse space assignment, billing, maintenance, inventory, and pesticide application recordkeeping systems.
- Evaluate technology options and funding sources for replacement of greenhouse supplemental lighting systems.
- Explore additional alternatives and supplements to chemical pest control.
- Seek opportunities to expand staff knowledge and skills through learning and networking.
- Capture staff knowledge – document processes and provide instruction to ensure redundancy.
- Increase functionality of greenhouse work and storage areas.
- Complete upgrades to automated watering at West Madison.
- Learn, grow, and enjoy our work while providing excellent support to research at UW-Madison.



THE BEAUTY OF RESEARCH IN PROGRESS  
PHOTO CREDIT: D. PATTERSON

## HARS 2022 Annual Station Report

### Notable Station Achievements

**Field:** It continues to be a challenge securing tractors and combines through the UW's lease program. As the season ended up, we were able to limp through the growing season with our own older tractors due to supply chain issues this year. Although we had to resort to using our older inventory this past growing season, we were only minimally affected so thankfully experienced only minor setbacks. Because of this, we started the process of purchasing a new mid-size farm tractor for the station. We also opted to control our own destiny this past fall with our corn and soybean harvest by taking our old John Deere combine out of semi-retirement so that we could ensure harvest of our general and research soybeans and corn in a timely manner. After a few repairs by the field team, it ended up doing as good a job as a new machine. We weren't as fortunate with our grading line operation this year as we experienced many breakdowns this harvest (power supply and circuit board both failed and needed replacement on our Ag-Ray automated potato grading line, specific gravity analyzers needed to be replaced due to faulty load cells, etc.) which caused a bottleneck of material needed to be graded. To rectify this situation going forward, we now keep a backup power supply and two backup specific gravity analyzers in our inventory for quick swap-outs. While these issues on the grading line resulted in it being one of our longer potato harvests this past year, this longer harvest timeframe was also attributed to us running the largest number of plots across our automated grading line this year than in any year previous (partly bolstered by Amanda Gevens' team harvesting/grading substantially more research material this year than average). Also worth mentioning is the retirement of longtime HARS field team member Douglas Klabunde in January of 2022. Doug worked at HARS for close to 30 years so we threw him a nice retirement party and crafted an article for our local newspaper to thank him for all his years of service at the station. Paul Sytsma, Field Supervisor, has been cross-functionally training staff in their roles so that not one person is solely responsible for carrying out a specific task, which comes in handy during the growing season when they get pulled in every direction. On this note, I'm happy to report that our chemical spray program ran much smoother this year now that our lead spray operator that was hired back in the spring of 2021 was able to get more time training with Paul. Finally, for the first time in his tenure of 7 years working irrigation for us at the station, Jerry Pierce stated that we had ZERO outside service calls to fix our irrigation equipment this past year (these are typically pretty pricey stops when irrigation techs need to come out to the station). This speaks volumes as to Jerry's preventative maintenance program that he's adopted in caring for our irrigation equipment.

**Storage:** We officially added a new position to the SRF staffing structure, as well as filling a position that was open due to a departure of our gardener/groundskeeper (who acts as a lab tech during the winter months). The new position is a research tech (Jamie Boyd) and adding this position has had a high value impact on our storage research program's ability to process sample evaluations more efficiently. Since Amber's transition from research specialist to SRF Manager, there has been a clear need to have another person to help maintain the high level of excellence that our clients expect. Adding Jamie's position, as well as Chris Holford accepting the gardener role, has significantly added to the capacity of projects and abilities



at the SRF. Additionally, we've paired with the Wautoma School District to bring in a youth apprentice around 16 hours a week and that has further allowed us to flex towards our full potential, while also cultivating outreach and relationships with area educators. Facility upgrades include: new furnace/AC system (financed jointly between SRF and WPVGA funds); new specific gravity scales; upgraded refrigerator to reflect growing staff numbers; replaced the battery pack in our electric forklift; upgraded the charger for the new unit to extend the overall life of the battery; installed cell phone repeater to broadcast Wi-Fi throughout SRF's alleyway. Future goals include: working to identify potential replacement or upgrade of our current compressor that powers air through all storage spaces and working to get protective channels installed in the locker spaces to protect the walls of the lockers from pallets of crates of potatoes.

**Overall Station Improvements:** After the re-roofing/re-siding of our barn was completed in late 2021, we coordinated to have a contractor replace all the remaining windows in the loft, as well as the remaining older windows and outside entry door to the 'milkhouse' portion that juts out from the main barn; we also coordinated to have this same contractor replace all of our original remaining older windows and doors in our main office building that were still in place since the building was first constructed in 1969. As you can imagine, this has greatly improved the efficiency and comfort of the building. We repainted the barn foundation and garage doors with a fresh coat of white paint, completing the remodel. New HVAC was installed in the SRF and jointly financed via the SRF's annual budget and our WPVGA SRF Maintenance Account (\$25K to work with each year); we purchased two new John Deere crew cab (4-seater) UTV's for the station and they have served us well in hauling large numbers of people out to the field and back.

### **Outreach/Instruction Activities**

HARS Field Day (July); Midwest Food Processors Field Day (July); hosted our annual Garden Show in our horticultural display garden (July); Chippewa Valley Bean Company Field Day (August); Soils class overview of farm led by UW-Madison faculty Alfred Hartemink (June); 'Bug Talk' given by Russ Groves to our area elementary schoolkids during one of their field trips to HARS;

### **Research Activity**

All in all, we ended up helping to facilitate around 155 total research projects at HARS in 2022. Of these 155 total projects, 141 were field crop research and the remaining 14 were storage research projects). We had 59 different PI's across all 155 total projects in 2022 with 32 of them being campus PI's. One new initiative worth mentioning is that Paul and I have been working with UW-Extension Forester, Tony Johnson, and have agreed to place our 30-acre woodlot that's to the south of the station into the state's Forest Stewardship Program that will provide us with the professional planning and technical assistance required to keep our woods in a productive and healthy condition. Unfortunately, this is not the case now and there is ample opportunity to start culling some of the diseased trees and spread of invasive species like garlic mustard and buckthorn in the undergrowth. The cool thing with this project is that by working with Tony in this program, he would utilize our station's 30-acre woodlot as an outdoor classroom to train current and future forestry students (facilitated by UWSP Faculty/Forester, Mike Demchik, with UWSP's College of Natural Resources Forestry Department) on healthy forest restoration and maintenance with much of this work getting completed by Mike and his students that are going to school for forestry

management, setting up a win/win for the station and his program. Interestingly enough, Mike said that because UWSP's forestry program is so large, he typically ends up training over 10% of the new foresters that graduate in the country. The program is also designed to benefit private landowners to help them better manage their woodlots, so Tony would also be utilizing our 30-acre parcel of woods as an outreach tool to bring in local landowners to show them first-hand some of the techniques and direct benefits of managing their own land.

### **Change**

Other than crop inputs being too high in price still stemming from the pandemic/inflation, we're still experiencing some supply chain-related issues in sourcing items for the station. It's gotten better but there are still too many instances where we have to wait for items on backorder which keeps things challenging. That said, we're a pretty resourceful team here at HARS and I feel we always do a good job with what we have to work with.

### **Station Goals**

- We would still like to revisit our plan to pave/blacktop the approaches going to the SRF and connect them to our existing pavement in several areas (covid got in the way of this plan).
- Purchase a new mid-size tractor for the station (already working w/Brandon & Mike Marean on this)
- Install steel channel in all of our lockers where the floor meets the wall, then apply spray foam insulation in all corners where the floor and ceiling meet the vertical walls. This will aid in energy efficiency and the lockers being better able to maintain their desired temperatures for greater success in storage projects. This will also help to eliminate unwanted water and CIPC sprout nip gas from travelling between locker to locker via where they meet at the floors and ceilings and afford them to be more liquid and airtight, so they act more independent from each other and not sharing unwanted liquids and gases due to their poor original construction.
- Create an electronic preventative maintenance database to better track preventative maintenance work performed on the SRF's potato transfer equipment and two indoor compressors to stay ahead of costly and untimely breakdowns.
- Identify replacement options for the SRF's primary air compressor that's responsible for governing all of the air and water pressure for our bins and lockers. Our existing one (circa 2006) is starting to tell us that it's not long for this world.
- Eventually we would like to update the tables and chairs in the conference room of our main office (old and no longer any cushioning)
- Similar to what we did in the conference room this past year, replace original carpeting in office area of main office building.

### **Key Areas of Concern and Challenges**

Equipment – Funds to upgrade/modernize/replace expensive aging equipment that's core to our station (new mid-size tractor for primary tillage; need to replace our primary spray coupe at some point too as it's been showing its age and costing us more money to fix when it breaks down; eventually we'll need to update our aging primary air compressor in the SRF)

## Kemp Natural Resources Station

### 2022 Annual Report

#### 1. Notable Station Achievements

- Supported just over 5,500 user-days of diverse station activity and provided 3,202 person-nights of lodging.
- Generated outside donations, including:
  - \$10 thousand donation to implement the Hamilton Roddis Memorial Lecture Series; and
  - \$22 thousand in donations to support general station infrastructure improvements and programming.
- Completed several station improvement projects, including:
  - Painted the Pavilion and Machine Shed as a part of our exterior painting maintenance rotation;
  - Removed several hazard trees from the grounds;
  - Added air conditioning in the Office/Laboratory;
  - Mounted new ceiling LCD projector in the Boathouse;
  - Installed custom fire ring in memory of John Cary;
  - Volunteer project with the Daughters of Demeter to sew new period curtains for the Cabin;
  - Built 3 custom tables to match existing Boathouse classroom tables; and
  - Improved dust collection and air quality issues in the Carpenters Shop.

#### 2. Outreach & Instructional Activities, Including Hosted Conferences/Workshops

- **Outreach**
  - Conducted 11 outreach events as part of the Kemp Summer Outreach Series with 334 attendees. This included Wisconsin Insect Fest, organized by the UW-Madison Department of Entomology, the annual Fungi Fest with 135 attendees for the two-day event, and introduced Kemp Apple School as a new learning opportunity, with support from the Peninsular Ag Research Station;
  - Hosted 6 external day-use only outreach events with just over 150 people attending in total;
  - Co-organized and implemented the ninth year of the *Science on Tap* outreach series. We held 8 events attracting 600+ people;
  - Continued a monthly radio program called *Field Notes* that airs on local public radio station WXPB. The program is a joint venture of Kemp and Trout Lake research stations, and it has been very well received. The WXPB listening audience is approximately 13,000 people weekly;
  - Organized the 2022 Hamilton Roddis Memorial Lecture in collaboration with the Great Lakes Timber Professionals Association; and
  - Prepared 2 issues of *Kemp's Point*, the semi-annual station newsletter that is distributed to over 1,000 households.
- **Instruction**
  - Supported 12 field classes involving 5 UW-Madison departments and two UW-System university. Provided 873 person-nights of instructional lodging.
- **Conferences/Workshops**
  - Hosted 15 conferences & workshops with overnight lodging and 10 day-use only conferences & meetings;
  - Provided 483 person-nights of conference related lodging; and
  - Provided for 331 person-days of day-use only conference & meeting use.

### **3. Research**

- Supported 45 research projects involving 35 principal investigators from 10 UW-Madison academic departments and 10 extramural universities/agencies;
- Provided 1,732 person-nights of research lodging;
- Attracted 11 new researchers to the station; and
- Hosted a diverse range of projects representing 5 of the 6 CALS Priority Themes: *Bioenergy & Bioproducts, Changing Climate, Economic & Community Development, Health & Wellness, and Healthy Ecosystems*.

### **4. Change**

- 2022 moved past the COVID-19 limitations and put us back on track to normal operations.

### **5. Goals for the Coming Year**

- Continue to build relationships with Kemp Station personnel, ARS administration, and community partners;
- Continue five-year maintenance plan for Kemp Station buildings and infrastructure;
- Continue outreach campaign to attract new researchers to Kemp Station;
- Increase Kemp Station's lodging use by 5%;
- Increase Kemp Station's Connor Forestry Center use by 5%; and
- Foster Kemp Station's relationships of current and new donors.

### **6. Areas of Concern & Challenges**

- Keep our budget in the black;
- Address \$150k in station maintenance projects, including replacing remaining roofs, replacing decayed structural logs, painting buildings, and replacing sliding patio doors.

## 2022 Lancaster ARS Annual Report

### 1. Notable Station Achievements-

2022 provided a well rounded and solid year of success for the Lancaster Ag Research Station. Not one area stood out as a major achievement, but overall, the station activities had a very productive year. In the crop research area, we maintained an active level of research and maintained some projects even with the loss of one of our long time and active researchers (Dr. Carrie Laboski.) Weather provided good growing conditions not only for crop research, but also our crop production acres to provide plenty of feed for our beef herd and additional sales to generate income to support our operations. The beef research also produced another successful year or working with Dr. Brian Kirkpatrick with his genetic and reproductive research projects that involve the “twinning” herd. We completed the first calving season successfully with the added number of twin births for our herd from Dr. Kirkpatrick’s research. We also were able to have another successful summer breeding season for the Kirkpatrick research project and the rest of our herd in general. Both crop and beef cattle prices are at a higher level this year which allows us to cover our added input expenses and still return some income to our Station budget for the crops and to the Animal and Dairy Science Department for the beef animals.

### 2. Outreach/Instruction Activities-

We were able to coordinate events that involved larger groups to interact with Lancaster ARS this year. On June 7<sup>th</sup> we were able to host a tour for Dr. Alfred Hartemink and other staff and students from the Soil Science Department. The group toured the station and learned about our activities and history in addition to examining various soil types at our site.

In late August we were able to host our annual Agronomy related field day that highlighted cover crops and initiating producer led local organizations. We cooperated with researchers and various area UW Extension staff to highlight several research projects on the station to the group of 35 attendees that included producers and other industry representatives. It was another successful program, and we appreciate the interest and cooperation from the researchers and Extension staff to assist with our outreach mission.

On October 18<sup>th</sup> we were able to host a private training event for a livestock feed company that included 30 beef industry professionals from Wisconsin. We were able to utilize our meeting facilities and our cattle operation to allow for educational opportunities and interaction with our station and its activities. We were compensated for the use of our facilities and our time and will hopefully reap future benefits from the successful interaction we had with the event.

### 3. Summary of Research Activity –

Agronomic Crop Projects – 35 total projects including areas of corn, soybeans, forages, small grains, cover crops, soil conservation, and fertility. 13 different faculty members from 7 different departments.

Beef Cattle and Grazing Projects – 5 total projects including cow/calf genetics, cow/calf reproduction, nutrition, and grazing plant species performance. 3 different faculty members from 2 different departments including a researcher from the USDA DFRC.

## Key Changes in 2022 –

One of our most impactful changes from 2022 was the departure of Dr. Carrie Laboski from the Soil Science department. Dr. Laboski was an active researcher that had many years of involvement with her research projects at Lancaster ARS. She was also the faculty manager for the long-term crop rotation project. This project that has continued for over 50 years includes a faculty manager as well as a Lancaster ARS crops manager. With Dr. Laboski's departure Dr. Francisco Arriaga is assuming that leadership role and we look forward to more interactions with him in this role for the future.

On the animal side of activities for the Lancaster Ag Research Station our relationship with management of the Lancaster beef herd has transitioned as the department has merged into the new Animal and Dairy Science department. Our herd that is owned by the department previously had been advised by the beef herd manager at the Station and a department faculty representative appointed by the Department Chair to oversee all the herd activities. With the department merger the new management system includes 2 other department staff members to help oversee the herd management decisions along with the Lancaster ARS herd manager. Also, through 2022 there has been development of a new cost structure for utilization of department owned animals for research purposes. The process is still developing and plans to be finalized and instituted in the near future. This will create added record keeping for management of Lancaster beef research animals.

### 4. Goals for the Coming Year –

For 2023 we hope to add some additional public events to support our outreach activities, especially in different areas such as beef and other crop areas. We have strong interaction from the pest management and cover crop areas, and we would like to build on that with diversification in our events.

Continue developing relationships with the new UW Extension Beef and Grazing Extension Specialists that started in 2022. With the leadership of Dr. Mark Renz of the Agronomy Department we are incorporating both positions into a beef grazing research project in 2023. In addition to this project, I would also like to involve these positions in other research and outreach activities based at the Lancaster station.

### 5. Areas of Concerns and Challenges-

Getting permission to deal with demolition of aging station facilities – At Lancaster ARS there are 2 aging former dairy barn structures with significant structural problems. For several years we have been trying to get approval to take down and remove these structures. Multiple rounds of inspections and questions have taken place, but with no progress to move forward. Maintenance has been minimal as these structures have been expected to be demolished by now. At some point delayed action will lead to further structural issues and even safety implications. Our addition of a machine shed allows for storage of larger equipment to replace these 2 buildings. Additional storage for other small equipment is still needed. Potential renovation of the footprint of one of these old structures could provide space to fulfill these needs.

Requests for larger agronomic plot areas to carry out agronomic research. Lancaster ARS is known for its terrain with steep slopes and contoured fields that help alleviate erosion. Historically most agronomic research projects were able to be adapted to fit our 90-foot-wide contoured fields. There is continued increase of agronomic projects looking for larger plot areas that we are not able to accommodate. There are additional land areas surrounding Lancaster ARS that could provide additional viable land options, but nothing that resides on the land that we operate now.

Decreased faculty numbers in key interest areas of Lancaster ARS such as beef, grazing, and forages. As has been mentioned previously we continue to reach out to limited new faculty to utilize station resources in these areas. These areas also represent strong interest areas in Wisconsin and especially in our local Southwest region of our state. Activity in this area also provides continued interest for important user groups and opportunities to highlight our work in outreach activities to the public in our local area and across the state.

## **Marshfield Agricultural Research Station 2022 Annual Report**

### **2022 NOTABLE STATION ACHIEVEMENTS**

- MARS hosts an intensive 2-day electrical training led by a master electrician from the Mid State Technical College Office of Continuing Education. MARS invites staff from Agricultural Research Stations to attend. In total, 30 ARS staff attend.
- The MARS farm receives a Hatch capital equipment grant for the purchase a TMR research mixer.
- The MARS farm successfully writes for funding for 30 Calan Broadbent feeding research gates to be installed in the lactating cow barn. This will add feed efficiency research capacity to MARS. The addition of 30 extra gates allows for the ability to conduct feed efficiency studies on cows, both primiparous and multiparous, throughout the year.
- One staff successfully acquires his American Association of Laboratory Animal Science (AALAS) Assistant Laboratory Animal Technician (ALAT) certification. Two other ACT complete the course.
- MARS was the host site for the WALSAA picnic and FISC reunion. These events took place simultaneously on an evening during Farm Technology Days with over 100 people in attendance. Station tours were provided.
- The station supported the research of Irish Fulbright Scholar, Conor Holohan, over a 4 month period of time. Support included staff research support and animal management, his inclusion as presenter in MARS field day/pasture walks, and use desk/office space at the farm for Conor to work.
- Upgrades to equipment included Valmar air seeder which will be used for more precise application of cover crops, seed, herbicide, low-rate fertilizer and micro-nutrients. The acquisition of ventilation fans for the calving barn, and the repair and replacement of network cable to all buildings.
- Installed a heat-tracking monitor system for cattle. The technology uses behavioral monitoring to identify cattle in heat, anestrus cattle, cows with irregular heats, and reports on pregnancy probability to increase efficiencies in the reproduction program.

### **OUTREACH / INSTRUCTION ACTIVITIES**

- Forty-four groups toured the north farm campus, totaling 782 visitors. The auditorium at the south hosted 68 groups with approximately 1985 people recorded in attendance.
- General station tours comprised 52% of north visitors. About 36% of activities taking place on the north farm fell under the category of education/instruction yet yielded 64% of all visitors at the farm.
- Supported an experiential learning opportunity for one UW Dairy Science student intern.
- Hosted several ag programs and classes for two area technical colleges: Mid State Technical College and Northcentral Technical College
- Host site for a Division of Vocational Rehabilitation (DVR) caseworker training (in conjunction with AgrAbility of Wisconsin and UW Extension. Hosted a Wisconsin Farm Bureau Emergency first responder and emergency personnel livestock training. Both events were well attended.

### **SUMMARY OF RESEARCH ACTIVITY**

- 46 field research trials covering 99.1 acres with 17 PIs from UW, USDA, and industry.
- Eleven animal research projects, involving 11 PI's from UW, USDA, and the Marshfield Medical Research Institute. A total of 466 dairy cattle were used on ACUC approved studies.
- Supported the research for 10 UW Department of Animal and Dairy Science graduate students and students in the Endocrinology and Reproductive Physiology (ERP) Graduate Training Program. Support



ranged from general assistance, data collection, data management, and troubleshooting technology transfer and cameras.

- Supported the research to evaluate animal welfare of dairy heifers using a virtual fencing collar system, solar-powered GPS technology, in comparison to conventional electric fencing system under different grazing systems for Irish Fulbright Scholar, Conor Holohan.

## KEY CHANGES IN 2022

- The UW Soils and Forage Analysis Laboratory closed in January. Labs and offices at the building, located on Yellowstone Drive in Marshfield, are no longer in use. Sheds and outbuildings at the south site remain in use by MARS although no UW staff report to or work on that site.
- The Russell Johannes Auditorium, the MARS meeting room used by organizations in the Central Wisconsin area and located in the CALS building on Yellowstone Drive in Marshfield, permanently closes to the public in November. The university building at this address is completely unoccupied and closed.
- The City of Marshfield makes good on a right-to-purchase agreement and purchases 125 acres of agricultural production land at the south MARS farm. While MARS will crop this land until land is sold to a developer, ultimately this removes significant acreage from research and field production. Approximately 7.5 acres of land owned by the Board of Regents now remain at the Marshfield site. This property includes ARS shed and outbuildings, the USDA building, the ARS residence, and parking lot.
- Congress approves 6 million for expansion of facilities at MARS north in the bipartisan Omnibus Appropriations Act for Fiscal Year 2023. This funding is earmarked for an administrative office complex. The building will include permanent office space for MARS staff, restrooms, temporary residential facilities for students and scientists, and indoor meeting space for stakeholders and community groups
- MARS agronomist and assistant superintendent, Jason Cavadini resigns his position. Efforts are underway to rehire this position.

## GOALS FOR THE COMING YEAR

- A building located at MARS south (built in 2010) was disassembled in fall 2022 and will be rebuilt at MARS north. The purpose of this building will be for chemical storage and an agronomy dry lab.
- Pursue a plan to institute solar power at the farm through what may be a collaborative effort between UW Facilities Planning and Management, the USDA and Mid State Technical College.
- Although the USDA plan to repurpose the 60' x 200' manure storage pad as a machine and equipment storage structure fell through in 2022, the USDA is committed to funding this project.
- Seek new land lease options to make up for expected lost production land at MARS south campus – this includes seeking extra acres to recapture what has been lost through a land sale.
- Support the work and research needs of one ARS funded intern at MARS – for Claudio Gratton, Entomology.

## AREAS OF CONCERN AND CHALLENGES

- With the close of the south offices, labs, and auditorium, MARS must maintain the building and property until a lease with the USDA expires in June 2028. It is MARS' goal to eventually excise its presence from this site. Until that is possible, MARS must maintain the residence, parking lot, and outbuildings, and monitor the vacant UW office building. This will require financial resources.

- The Department of Soil Science Soil and Forage Analysis Laboratory vacated the labs and offices at MARS south. Significant property was left in the building. This includes office furniture, lab supplies and equipment, and chemicals. The lab director/Dept. must make decisions about what to do with the contents of the building. MARS has contacted EHS and SWAP for assistance although the decision and responsibility for the property resides with another department.
- USDA money to install a hoop to fully cover the 60' x 200' concrete manure pad fell through in the eleventh hour of the federal fiscal year end. The project would have resulted in a covered structure for machinery storage use. This high priority need will permit machinery to be stored at the north farm, eliminating the need to transport equipment such as field equipment and research equipment eleven miles south of the main research farm to the south Marshfield farm. Close access to equipment storage is desired to reduce ag equipment drive time on public roads as much as possible.
- Tractors, skid loaders, and other equipment are getting more difficult to secure through the school lease program due to supply chain issues.
- Farm structures, and facilities are aging and in need of repair and replacement. Components such as overhead doors, canvas on hoop structures, degrading wood barn posts, broken concrete, and flaking paint are just a couple examples of repair.
- A shrinking land base with the eventual loss of the south farmland and no guarantee that land will be replaced near the north farm.

## **2022 O.J. Noer Turfgrass Research Facility Achievement Report**

### **1. Accomplishments**

Staffing at the Noer continues to be an issue. For the second year in a row, the Noer did not receive one single applicant for the Summer Staff position. The two staff members that were hired worked hard and made it possible for the conditions at the Noer to continue to be the best they can be. Audra Anderson, Office Manager, took an active role in helping with the outside maintenance.

The Noer continued to use Work Order system for repairs, project work and irrigation scheduling. The system has been working well. It has allowed ARS to keep a better record on the needs of the P.I.'s.

The after effects of Covid-19 are still present in the equipment supply chain. In 2022, the Noer did not receive the use of the extra Toro Heavy Duty Workman, used for the greens topdressing program and Soil Science Trafficking Study. The Noer was able to find ways to work around this loss. John Deere did not offer to supply a large area mower to keep the general ground mowed. Reinders, Inc. and Toro did find a way to lend the Noer the use of a \$65,000 Greensmower. The loss of the large area mower was felt well into June with all the grounds being mowed with 62" John Deere lawn tractors. After a demo day with Toro, the Noer was able to convince Reinders, Inc to supply the Noer with a used large area Mower. A Toro 4000-D with an 11-foot deck was delivered for mowing at the Noer until Mid-November. Without the assistance of Reinders, Inc. and Toro, the staff may not have been able to keep up with the mowing.

Dr. David Hogg, emeritus, Entomology continued to manage two beehives on the west edge of the property. Often bees and turfgrass management are at odds. Both hives survive the winter of 2022, but their production was greatly diminished, possibly due to the dry weather. We are hoping they both survive the winter of 2022-23.

Exacto Science installed a drought study using various products and maintenance practices to evaluate ways to lessen the water usage on turfgrass. Many of the treatments and borders are presently dead. The studies concluded too late in the year to renovate before the end of the growing season. The renovation will take place in the spring.

This past year 12 plots were killed with glyphosate this year. PI research worked on three of the plots, the other nine plots were a long-term research project funded by the Wisconsin Sports Turf Managers Association (WSTMA). Dr. Soldat, Soil Science, is conducting the WSTMA research. The project is finding ways to control creeping bentgrass in sports turf

The Noer continued to cooperate with the UW Police co K9 training at the Noer. UW Police did multiple K9 training sessions during the year. In October, the WLECHA (Wisconsin Law Enforcement Canine Handlers Association) did a two-day training at the Noer. This training brought more than 150 Canine Handlers from around the state to partake in the training session. The UW Police K9 staff was present and active during the AmFam Senior Golf Championship.

Through cooperation with the Northern Great Lakes Golf Course Superintendents Association the Noer, receive a \$5000.00 donation for irrigation upgrades and battery powered hand tools.

Working closely with the Ice Age Trail cooperated in trail maintenance and winter projects to improve the trail user's experience.

### **2. Outreach/instruction activities:**

The past season there were nine outside groups activities at the Noer. These included FFA groups, Garner Clubs and Service clubs, and WSTMA Annual Fall Meeting and Board of Directors Meeting in October.

In August, the Wisconsin Turfgrass Association returned to the Noer for their Summer Field Day. This was a special event celebrating the O.J. Noer 30 years in service to the Turfgrass Industry. Besides having the UW Turfgrass Research on display many of the people that either help establish the O.J. Noer or have keep the Noer viable attended a special presentation before the day's events began. WKOW Channel 27 from Madison did interviews for the evening news highlighting the 30-year anniversary.

This fall the inaugural Turfgrass Apprentice Program, with classes are being taught at the O.J. Noer three days a week from early November until mid-December. The classes are held Tuesday through Thursday 10:00 am until 3:00 pm.

### 3. Research Activity:

#### **Soil Science**

In 2022, the soil science turfgrass research group continued many existing research studies and initiated several new trials at the O.J. Noer Turfgrass Research Facility. Twenty-three projects were conducted at the Noer. The research studies fall into broad categories including 1) grass species and cultivar evaluations, 2) herbicide and plant growth regulator efficacy evaluations, 3) fertilizer source, rate and timing evaluations, 4) soil test calibration trials, 5) lawn ecology research, 6) quantification of ecosystem services of lawns and turfgrasses, 7) putting green cultural management trials, and 8) federally funded research on mitigating winter stress on turfgrass. These projects each have a positive impact on the economic and environmental sustainability of turfgrass management in Wisconsin and beyond. For example, one of the projects initiated this year has led to the creation of a new standard method for sampling and testing putting green soils for organic matter. As of fall 2022, the test is being offered by the University of Wisconsin Soil Testing Laboratory. Research updates and reports from the soil science turfgrass research group can be found at [www.turf.wisc.edu](http://www.turf.wisc.edu).

#### **Plant Pathology**

In 2022, the Plant Pathology program continued research on a number of different topics at the OJ Noer Turfgrass Research Facility. Research continued with the Smith-Kerns Dollar Spot Prediction Model and included projects investigating the impact of early-season fungicide applications on model thresholds and potential upper model targets for reducing fungicide reapplication intervals. Two national collaborative projects focused on dollar spot control were also conducted in 2022: one focused on the impacts of combined cultural practices on disease suppression and another focused on combining host resistance with biocontrol products to identify improved disease control strategies. Testing of plant-based and organic certified control strategies for dollar spot were also conducted in 2022. On snow mold, the impacts of fungicide timing and water volume on disease control were also assessed. Individual summary reports for the 21 research projects conducted at the OJ Noer can be found at the Turfgrass Diagnostic Lab website [www.tdl.wisc.edu](http://www.tdl.wisc.edu).

	OJ Noer Research Projects						
	2016	2017	2018	2019	2020	2021	2022
Plant Path	20	21	22	22	16	17	21
Soils	24	22	19	18	15	25	23
Agronomy	1	1	1	1	1	1	1
Entomology	1	1			1		
ARS	5	5	4	4	4	4	6
Exacto					2	3	4

Total	51	50	46	45	39	51	55
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#### 4. Station goals for the coming year

- Continue to find equipment donations for maintenance of the Noer
- Continue hosting Golf Channel and UW Police Incident Command during the AM Fam Senior Championship.
- .
- Work with AmFam to facilitate work with the Touring Pros as they attend the event
- Procure donations of seed, fertilizer, pesticide and as many additional supplies as possible
- Assist researchers to install as many new projects as needed
- Continue an outreach program to show the value of turfgrass in the local area with seminars to various groups like, Kiawana, Rotary and Master Gardener groups

#### 5. Areas of concern and challenges

- Due to the raise in pricing of fertilizers work diligent with the Fertilizer dealers to again obtain fertilizer donations for the needs of the Noer plots
- UW-Madison Safety Protocols training and adoption
- **Challenges for the coming year**
  - Staffing remains the major challenge. The 2022 growing season there was budgeted two AREO six-month staff members at 25-30 hours per week. Positions that offer less than 40 hours per week and low pay are major limitation when hiring. The Noer has been managing short staffed since September 2019. The consequences of short staffing are showing in many areas. Inquire about working with University Ridge on possible candidate sharing and possible staff sharing.
  - The past year the Noer equipment had multiple breakdowns. Continuing to get equipment donations will be a key component of the Noer success.
  - Turfgrass maintenance equipment is in very short supply due to parts supply chain shortages.
  - Target work to replace the lack of donations from John Deere
  - Hosting any public event to highlight the research done at the O.J. Noer.



## Peninsular Agricultural Research Station – 2022

### Notable Station Achievements

In 2022 PARS was honored to be a site for the WI Idea tour and a visit from the new UW Chancellor, Jennifer Mnookin. Both events allowed station staff and local industry representatives to interact with campus personnel while also sharing their views of the important role ARS plays throughout rural Wisconsin.

Two grants were awarded to PARS this year, one of which funded a three-class series for noncommercial apple grower education, and the other which will fund the purchase of a no-till drill in early 2023. Utilizing the corn planter purchased in 2021, station agronomic and forages research was expanded this year and the purchase of this drill will help to continue this growth in coming years.

Collaboration continues to be a priority at PARS where multiple events hosted at the station were led or taught by representatives of various departments and organizations. Representatives of Door County 4H and extension hosted a series of youth education outreach days that also incorporated sustainable plantings: sweet corn, a 'milpa' garden, and pumpkins hand seeded into roller-crimped rye. Excess produce from these plantings was donated locally. This was also the second year PARS hosted a Pollinator education day featuring speakers from extension, NRCS, and Door County Soil and Water, among others.

Data collection continued for the rootstock trials on the Station. There are currently three NC140 cooperative research trial plantings, all replicated at other sites throughout the U.S. and Canada. These include the 2014 Apple Rootstock, 2015 Organic Apple Rootstock, and 2017 High Density Tart Cherry plantings. 2023 will be the final year of data collection for the 2014 Apple Rootstock trial. Wisconsin's plantings continue to perform well and contribute much needed data to growers statewide.

The monitoring program for Spotted Wing Drosophila throughout Door and Kewaunee counties continued along with discussion of future research and management strategies. Despite intense integrated pest management, many growers still experience control failures and crop loss due to this invasive pest. SWD continues to be a major economic threat for cherry and small fruit growers throughout the state.

The United States Potato Genebank supplied 4373 germplasm units in 2022 to 84 domestic recipients in 21 states and 5 foreign recipients in 3 countries. These went to support efforts in anthropology, breeding, genetics, home gardeners, pathology, physiology, entomology, and education.

### Outreach/Instruction Activities

- 5 Station tours serving 140 people
- 6 Outreach events serving 280 people
- 6 Education events serving 275 people
- Assisted 65 walk/call-in requests
- Provided 14 weekly seasonal PARS webpage *Commercial Fruit Pest Updates* for apple, cherry, and grape producers
- Coordinated commercial apple and cherry scouting program covering 225 cherry & 250 apple acres (six producers) and delivered over 100 seasonal pest reports

### Research Activity

- 1 Tart cherry: 1 PARS/Horticulture

- 3 Apple: 2 PARS/Horticulture, 1 T3 Biosciences
- 1 Grape: 1 Plant Pathology
- 1 Small grain: 1 Agronomy
- 5 Forages: 3 NPM/Dairy Sciences, 2 NPM
- 6 Corn: 4 NPM, 1 NPM/Weed Sciences, 1 NPM/Extension
- 1 Kernza: 1 DC Soil and Water

## **Change**

Due to staff turnover of the USDA Genebank, PARS staff have taken on increasing amounts of responsibility regarding greenhouse maintenance and management.

## **Station Goals for the Coming Year**

- Expand the amount of research focused on agronomic crops and sustainable production.
- Expand the fruit pathology research being done on the Station in conjunction with the new Plant Pathology faculty member.
- Reestablish UW Fruit School at PARS
- Host grower field days with UW Madison faculty.
- Seek funds for forestry and invasive species projects on Station.
- Seek funds for necessary greenhouse repairs.

## **Areas of Concern and Challenges**

Necessary repairs to facilities and equipment continue to be our primary challenge due to lack of funds. As discussed with campus facilities and UW ARS administration, many of the USDA facilities we have inherited are in need of significant repairs. The steam boilers, in particular, have created significant work for PARS staff due to age and neglect.

Additionally, we are still dealing with the lack of a fruit extension specialist in the state and extension personnel locally. Without available resources toward which to direct homeowner and Master Gardener questions, Station staff have largely assumed this responsibility. The various other topics that are brought to our attention are directed to Brown County extension or to campus, neither of which are ideal. While tree fruit production is relatively small when compared with other industries, it is a vital component of the Wisconsin economy and continues to grow in popularity with the local food movement. We are concerned that the lack of a local fruit extension contact is shortsighted and detrimental to agricultural knowledge and production.

## Rhineland Agricultural Research Station (RARS) 2022 Station Report

### Notable Achievements

1. Potato breeding populations developed at the Rhineland station were essential to a publication on the genetics of maturity and skin set in potato:

Caraza-Harter MV, Endelman JB (2022) The genetic architectures of vine and skin maturity in tetraploid potato. *Theoretical & Applied Genetics* 135:2943–2951.

2. Peyton Sorensen graduated in May 2022 with an MS in Plant Breeding and Plant Genetics. Her research on the development of a genetic marker for late blight resistance utilized two populations created at RARS in 2018. Peyton gave an oral presentation about this research at the 2022 Potato Association of America meeting in Missoula, Montana.

3. PhD student Chelang'at Sitonik is using UAV images to study genotype x environment interactions between the Rhineland and Hancock Agricultural Research Stations. She gave an oral presentation in December 2022 at the NCCC215 Potato Breeding and Genetics Meeting.

4. The dual-purpose russet variety W13A11229-1rus (first selected at RARS) was officially named 'Portage Russet' at the November 2022 SpudPro committee meeting. Over 1000 pounds of seed was provided to cooperators for trialing in 2022.

5. Certified seed acreage of the new fresh market variety, Plover Russet, remained steady at 65 acres in 2022.

6. All 37 advanced clones entered into the UW Seed Certification summer field inspection were 100% disease-free and received Foundation status.

7. First successful field selection of diploid breeding lines at RARS in 15+ years, as part of a national research project.

8. In collaboration with HARS and BSE, the breeding program continues to work to develop and validate a new method for image-based measurement of chip quality. Quantifying potato chip quality with image analysis results were presented at the WPVGA Grower Education Conference February 8-10, 2022.

9. Bee & Butterfly Habitat Fund: Seed A Legacy grant recipient. Received 7.1 acres of pollinator seed to establish on acreage taken out of potato production, supporting our mission to be committed to environmental stewardship

10. Delivered 554 cwt of potatoes to the Department of Corrections, 54 cwt more than 2021.

11. WPVGA Associate Division grant recipient, awarded new gear boxes for our Zimmatic pivot.

### Outreach/Instruction Activities

1. RARS hosted a well-attended field day on July 28, 2022. The "RARS Field Day Featured Spud Research and Much More" story was featured in the September 2022 issue of the *Badger Common'Tater*.

[https://issuu.cbctater/docs/922\\_standard/28](https://issuu.cbctater/docs/922_standard/28)

2. The WPVGA Associate Division's accepted RARS proposal for new pivot gear boxes was highlighted in the August 2022 issue of the *Badger Common'Tater*. [https://issuu.com/bctater/docs/standard\\_822/40](https://issuu.com/bctater/docs/standard_822/40)

3. The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), Bureau of Agrichemical/Division of Agriculture Resource Management held a 2 day meeting October 19-20 at the



Rhineland Station titled “Compliance Section Meeting Agenda”. RARS Superintendent Becky Eddy delivered a UW-Madison potato breeding program talk to 35 participants.

4. Continue to update RARS website and Facebook page. <https://rhineland.ars.wisc.edu/> and <https://www.facebook.com/Rhineland-Agricultural-Research-Station-101222018420765>

## **Change**

1. There was 1 resignation and 2 hires at RARS in 2022. We lost Joshua Kunzman but hired Robert Arndt as his replacement. Jaden Olski was hired as a permanent full-time Horticultural Technician in October.

2. This was the first full season using the newly fabricated flat filler. The automated filler reduced the amount of labor needed by 50% and time to fill the flats by 81%. The automation is also more ergonomic and reduced overall employee fatigue.

3. Drastic measures to purge PSTVd pathogen from potato breeding material in 2018 left the program with no FY4 potato crop.

4. Additional support from our Madison colleagues expedited all field and greenhouse planting and harvest operations.

5. A small change to the placement of in field side-dress potato fertilizer, reduced leaf/shoot burn and increased overall emergence.

6. A sprayer system was fabricated onto our potato row closer. This provides the capability to deliver an in-furrow fungicide application to all seed pieces after hand planting and during row closure.

7. This was the first year with the capability to extrapolate onsite weather data from the EnviroWeather Station deployed in October 2021. <https://enviroweather.msu.edu/>

8. Resurrected the two-row Lockwood harvester. 54 cwt more potatoes were harvested in a quarter of the time.

9. Securing supplies or equipment for field and greenhouse operations was a challenge in 2022.

## **Research**

### **1. Bioenergy – 5 Research Projects, 6 PIs**

To better understand how yield limiting factors interact on marginal vs. productive soils the Great Lakes Bioenergy Research Center (GLBRC) established six experimental plot sites on low productivity marginal soils. The following conference proceedings were delivered using data collected from the Rhineland GLBRC plots:

Dileepa Jayawardena, Gregg Sanford, G. Philip Robertson, and Kurt D. Thelen. 2022. Comparative productivity of six bioenergy cropping systems on marginal lands in the upper US Midwest. Amer. Soc. of Agron. Abstracts, CD

Thelen, Kurt D., Dileepa Jayawardena, Gregg Sanford, and G. Philip Robertson. 2022. Energy crop performance across a gradient of marginal soils. Amer. Soc. of Agron. Abstracts, CD

### **2. Phytoremediation – 4 Research Projects, 5 PIs**

With RARS collaborators, phytoremediation researchers of the USDA Forest Service, Northern Research Station (USDA FS NRS) designed and implemented strategically placed phytoremediation plantings. Researchers established three tree plantings that together comprise the Northwoods Phytoremediation

Demonstration and Education Center: 1) a biomass demonstration planting consisting of *Populus* and *Salix* hybrids; 2) a rain garden collection basin consisting of native plants and *Salix* hybrids; 3) an agroforestry forest buffer strip consisting of hybrid *Populus* and *Salix* species interplanted with nitrogen-fixing cover crops.

Zalesny et al. 2022. Phytoremediation of Disinfectant Wastewater. Rhinelander Ag Research Station field day.

### **Areas of Concern or Challenges**

1. Keeping the Station performing at an efficient and successful level while continuing to deal with antiquated facilities/equipment, a reduced budget, and sufficient staff.
2. Procuring applied research interest without jeopardizing the integrity of the potato breeding program, a limited growing season, and decreased number of research faculty.
3. Finding skilled labor that can perform the physical component of small plot research.
4. Precipitation for the period of June-September was 5.4" below normal and average temperatures above normal. If irrigation seepage ponds do not continue to recharge sufficiently, RARS may have water availability issues.
5. There is a need to obtain and expand reliable high-speed internet.
6. Keeping staff morale high during times of increased workloads and low staffing.
7. Securing in-kind donations to offset operational supply costs.
8. Lacking a heated maintenance shop for tractor storage and/or to repair/update equipment during the winter months has become a challenge.

### **Station Goals for 2023**

1. Efficaciously complete RARS mission to support existing and facilitate new research. RARS anticipates broadening our research portfolio by adding hazelnut and organic potato variety trials. The USDA Forest Service would also like to initiate a research project on the effects of detergents on the recently established phytoremediation tree plantings.
2. Increase the awareness of RARS utilizing social media, our website, and event avenues.
3. Continue to work on determining opportunities for improving operational efficiency.
4. Continue to build on-farm sustainability for long-term success by exploring new rotational crop options and alternative pest management initiatives in the greenhouses. We are extremely interested in the pilot program that Walnut Street Greenhouses has begun to rear and release *Dalotia coriaria*, the rove beetle in their greenhouse spaces.
5. Continue to promote professional development with all staff, allowing for them to seek opportunities to expand their knowledge and skills through learning and networking.

## **Spooner Ag Research Station**

### **2022 Report**

**Phil Holman, Superintendent**

#### **6. Notable station achievements:**

The Spooner Ag Research Station (SARS) hosted 25 agronomic or horticulture research trials for 15 different principal investigators. Seven of these are new trials started in 2022. Being located four hours from Madison, SARS staff do much of the planting, management, data collection and harvesting in coordination with project staff.

Nine of the trials were variety testing for the corn grain, corn silage, soybean, barley and oats variety testing or development programs. Variety trial results are disseminated statewide through UWEX publications, internet sites and two state farm newspapers. Genetic lines were tested in miscanthus for winter survival and potential biofuel production.

Soil pH trials were done on a range of soil pHs for corn and corn silage yield. Also, a four-year liming application and tillage trial was initiated. This trial will be intensively soil sampled yearly by depth to determine liming effects in no-till and chisel/disk tillage systems. A boron fertilizer products/rates on alfalfa was conducted and SARS conducted a fertility trial with a waste product from a food digester. Soybeans had two additional management trials with artificial intelligence management decision making and testing of different biological seed treatments.

Three fields are maintained for organic crop research. The Seed to Kitchen vegetable trials, spring wheat variety trial and winter wheat variety trial were projects on the organically managed fields. The Seed to Kitchen project had a melon variety trial in a CAT tunnel (plastic hoophouse style) and duplicated the melon trial outside, a squash variety trial, a carrot variety trial, and tomato variety breeding trial evaluation in a High Tunnel greenhouse. The melons, carrots and tomatoes were graduate student projects. A notable side benefit of the Seed to Kitchen project is the positive publicity gained from donating produce to area food pantries and non-profit agencies. Separate from the vegetable trial is the demonstration garden in conjunction with area Master Gardeners and UWEX.

Two new long-term plantings are a table grape variety evaluation and a five-acre field size hazelnut (Go First Hazelnuts) planting were planted in 2022.

Facility wise, a hailstorm in early May damaged all shingle roofs, greenhouse panels, high tunnel greenhouse plastic and a few windows. Over \$80,000 of repairs were done in conjunction with UW Risk Management. Additionally, vandals cut and stole some of the electrical cable for one of the center pivot irrigation systems. Local police watched closely following then but the perpetrators were never caught. Campus police conducted a station safety review and have made suggestions for overall station public safety. In a planned project with campus facilities, seven new windows were installed in the office public meeting room.

## **7. Outreach/instruction activities:**

SARS hosts many meetings held by the UW-Extension Ag Agent meetings related to the demonstration garden. The Twilight Garden Tour was a highlight in late August, drawing over 200 visitors.

## **8. Research Activity:**

Joe Lauer, Agronomy, Wisconsin Corn Grain Variety Trial (Dryland, Silt Loam & Irrigated)  
Joe Lauer, Agronomy, Wisconsin Corn Silage Variety Trial (Silt Loam & Irrigated)  
Shawn Conley, Agronomy, Wisconsin Soybean Variety Evaluation (Silt Loam & Irrigated)  
Shawn Conley, Agronomy, Artificial Intelligence Management in Soybeans  
Shawn Conley, Agronomy, Biological Seed Treatment Evaluation in Soybeans  
Lucia Gutierrez, Agronomy, Oats and Barley Variety Breeding Line Trial  
Lucia Gutierrez, Agronomy, Organic Spring and Winter Wheat Variety Breeding Line Trials  
Erin Silva, Plant Pathology, Early Cover Crop Seeding into 30" and 60" row Corn  
Carrie Laboski, Soil Science, Corn Grain and Silage Yield Response to pH Level (pH plot area)  
Carrie Laboski, Soil Science, Viresco Digester Sludge Byproduct Fertilizer Value Trial  
Carrie Laboski, Soil Science, Lime-Time Lime Rate of Effectiveness Evaluation Trial.  
Erik Sacks, University of Illinois multistate Miscanthus Variety Hardiness Evaluation  
Julie Dawson, Horticulture, Seed to Kitchen Vegetable Variety Trials  
Yoana Newman, UW-EX Forage Specialist UW-River Falls, Boron Product and Rate Effect on Alfalfa Yield  
Kevin Schoessow, UW-EX Ag Agent & Area Master Gardeners, All America Display Garden  
Jason Fischbach, Ashland/Bayfield UW-EX, Hazelnut Production Trial  
Amaya Atucha, Multi-location Table Grape Variety Evaluation  
Kevin Schoessow, UW-EX Ag Agent, Garden Demo of Wine Grapes  
Farmer Led Council, Soil Quality and Cover Crops research area with Inter-seeding Cover Crops for their Effects on Corn Grain Yield

## **9. Changes:**

- New projects and the facility work listed in the achievements.
- The new/used conservation style corn planter worked well for more acres of reduced tillage planting.

## **10. Station goals for the coming year**

- Increase number of agronomic research trials.
- Explore different crops and cropping systems to reduce costs or increase income
- Utilize more acres of reduced tillage and/or no-till row crop production

## **11. Areas of concern and challenges**

- Attracting Student Interns and LTE employees

## 2022 West Madison ARS Annual Report

### 1. Notable 2022 Station Achievements

To start the year, 300 hrs of labor were invested (from Hort and WM) in cleaning up/restoring damage to the hoophouses (HH) caused by a strong windstorm in mid-December 2021 that flipped/lifted(?) one unit and moved it over 600' away; further, three hoophouse roofs destroyed in that storm were replaced/reattached. Thankfully the HH units stayed intact for the 2022 season.

Crop production was good again this year. Besides corn, wheat, oats, soybeans as well as alfalfa were grown to expand the crop rotations and homogenize fields going into research. Winter rye was seeded in fall to provide ground cover but also harvested before flowering stage to produce clean (weed-free, seed-free) mulch that in high demand by small scale farms/gardens. While corn yields were down slightly due to less-than-ideal pollination conditions in August, small grains, soybeans and alfalfa were excellent.

The display garden again provided gorgeous beauty for visitors and passersby. At the entrance of the garden, over 1,000 plants of salvia and begonias welcomed visitors. Another 5,000 ornamental plants further up in the garden were planted/maintained/evaluated for industry and greenhouse businesses. We also continued to provide Master Gardener Volunteers (part of UW Extension) opportunities to acquire service hour requirements for their certification. With the volunteers and summer interns' help, we provided a very beautiful setting to enjoy by everyone (and nonhumans too).

The campus food waste program was re-evaluated and resumed with stricter requirements (i.e. select cafeterias with a zero-tolerance expectation for contaminants). Nearly 100 tons have been delivered by Grounds since July. It has been a well-coordinated process of campus truck drivers inspecting and weighing each load then our crew adding in carbon (wood chips, corn stalks) to blend the material to temper the odor and moisture. When enough material was on site to form a management unit (i.e. ~300' windrow), we began to turn it with our pull-type windrower to mix and aerate to start the composting process. As winter arrived early, we will resume monitoring the heating and other metrics in the spring.

After two years and shared cost investment with Agronomy, we finally got seed dryer “#5” online. This donated unit, along with the other outside seed dryer (“#4”) expands the seed drying capacity greatly as they both are modular units with stackable seed drying boxes. This completes the dryer facility upgrade, which began with two new furnaces added inside in 2018.

Our fence line maintenance project (5 miles worth) is underway to improve the station's street appeal with the most publicly visible stretches along Pleasant View, Mineral Point Rd, and Elderberry Road nearly accomplished before cold and deep snow halted the work in mid-December. The goal is to remove brush and the lowest wires to aid in mechanical mowing for easier long-term maintenance.

### 2. Outreach Instruction/Activities

Several **tours** to 161 visitors were given around the station and in the display garden. Most notable was the visit by Sen. Tammy Baldwin and Rep. Mark Pocan with Senate Ag Appropriations Sub Committee that Heidi Zoerb arranged for a press release/promotion for the federal funding won for the germplasm facility to be built on site. Another significant tour was an NRCS training for agency staff on micro-irrigation scenarios that we had in use (i.e. dripline, sprinklers, silos). Three **field days** included one for organic Small Grains one for organic vegetables, both in the field; and one for the Commercial Growers of Wisconsin on ornamental flowers in the display garden; and two hemp **workshops**, hempcrete and hemp textiles, were held under the lean to; all told about 100 people attended. **Conference room** users totaled 726 mostly for meetings and workshops but also included some significant parties such as a retirement recognition for Phil

Dunigan and a welcoming reception for Dean Glenda Gillaspy. **Instructional** activities to over 200 participants included several in-person, hands on training events including fruit crops class pruning; soil science/soil horizon evaluation in soil pit; plant pathology class on disease scouting; and equipment use/observation for BSE on field tillage, silage harvest, and combine experience; finally, campus police used our facility to train for public mayhem scenarios.

### 3. Summary of Research Activities

The station met the multiple needs of researchers, both on station and at the campus livestock units on several fronts. 1500 tons of silage and haylage and 45 tons of straw were produced for livestock research and maintenance, and silos were refilled quarterly, as research schedules allowed. Most acres used for on-station trials are in use to improve crop genetics or are variety trials for both field and food crops: Field and sweet corn, small grains, tomato, peppers, carrots, seedless table grapes, hazelnuts were examples of crops studied. Other applied crop research included production treatment comparisons on celery, beets, no-till rye, wine grapes using organic fungicides, and raspberries and strawberries testing pest-repelling mulches.

A unique user of the station's space was a group at the Space Science and Engineering Center who set up a highly instrumented trailer (<https://www.ssec.wisc.edu/sparc/>) to gather atmosphere data during polar vortex conditions in winter. They launched weather balloons as well. Our open fields during winter time, without building interference, and close proximity to campus was ideal for their needs.

Several other unique projects included novel crops/ideas. Two hemp trials were established, one for herbicide screening for fiber/seed production; the other a genetic improvement trial for CBD oil. Pennycress as biodiesel source has evolved since first trials were run in 2019 and for this 5<sup>th</sup> year of trialing, they have selected a variety to test further with a date of planting study followed by soybean production the following year as a system. A pilot project to develop a low-input weed control strategy beneath the grapevines was started in October by preparing the soil in the empty 30' panels beneath the existing vineyard trellis and then dormant seeded to a perennial grass cover crop. If successful, new vineyards would then be established after an in-row cover crop has already been established.

### 4. Key Change in 2022

With the retirement of the hort tech at Arlington's Horticulture Farm greenhouse, and no one consistently being onsite to monitor the aged facility, we needed to find an alternative to start/care for the plants for the display garden. Thankfully, we were allowed to use the greenhouses at West Madison to start seeds (3 benches in March) and to up-pot thousands of bedding plants (11 benches) from mid-April to late May. This option was greatly appreciated and provided us convenience and efficiency to get to the plants for regular care and monitoring. It was also ideal to have this tremendous volume of plants on site as we began staging them outside during hardening off before transplanting in the display garden. We hope this is doable each year as we move forward.

We also added a groundskeeper position to the WM roster. With this position filled, not only were we able to improve precision and assistance for horticulture research crops/plots, we added aesthetic improvements to display gardens and grounds, and were able to maintain regular mowing frequency of more than a mile of city sidewalk terraces along the fields south of Mineral Point Rd. In the spring of 2023, additional duties will include greenhouse duties for display garden's 8,000 4" pots in 650 trays and garden layout.

### 5. Goals for the Coming Year

- Balance budget amidst the phasing out of the Big Red Case IH farm equipment program.
- Renovate the asphalt pad for agbags

- Upgrade the furnace/ventilation system in the chemical management facility
- Hire and train interns in the display garden on practical, applied projects.
- Continue cooperation among other ARS units: WSGH bench space at WMARS for 6 weeks late Spring); snow plowing/mowing OJNoer; sharing trucks and implements with DFRC, AARS.

## 6. Areas of Concern and Challenges

No respect from high speed and high volume of traffic on Mineral Point and Pleasant View all day long— need ‘Caution! Farm ahead’ signage or flashing lights similar to what pedestrians use when crossing streets.

A no U-turn sign at our crossing at Mineral Point would be nice, too



Glitches with campus compliance training – poorly written software – awkward to find it, transcripts not updated regularly; clunky for non-savvy computer users. Likewise, getting safety training compliance/awareness from department personnel that use the station/equipment.

Since the pandemic, we continue to receive disruptions with campus services: Invoices are paid late affecting our reputation from vendors; Lack of flexibility with purchasing policies; lax campus police attention (‘you’re not our jurisdiction’) in four separate incidences (tent, wallet, truck/trailer through fence, suspicious dump of property).

Maintaining weed control/weed seed spread especially near/in research plots or in tight rotations following research crops that lacked a strong canopy or had uncropped/unmanaged areas.