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## Ag Retailers Sell Products and Services to Keep Phosphorus and Nitrogen on Cropland: 2017 Yahara Baseline Survey Results

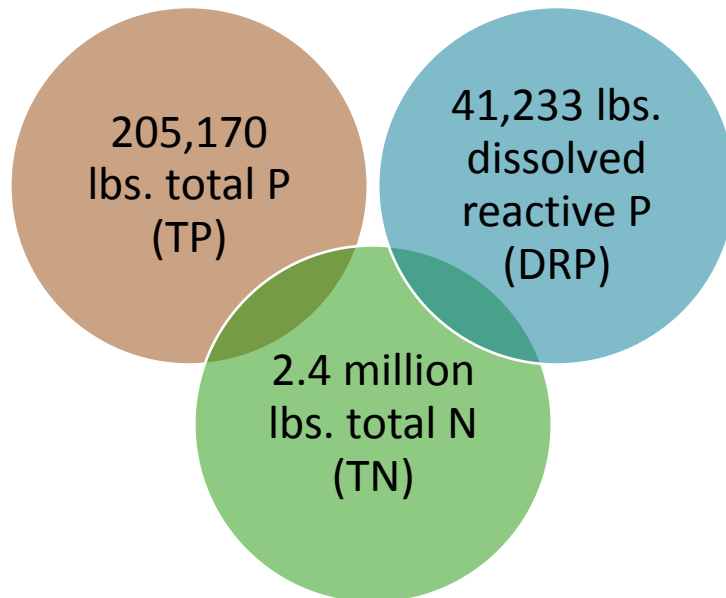
In 2018, with support from Clean Lakes Alliance and the McKnight Foundation, the Partnership for Ag Resource Management (PARM) expanded to the Yahara River Watershed its project to identify, promote, track and report on products and services that reduce phosphorus (P) and nitrogen (N) losses from cropland. The PARM project was piloted in the Sandusky River Watershed, Ohio in 2011, expanded to the Great Lakes Basin (GLB) in 2015 and the Mississippi River Basin in 2018. Since 2011, PARM has gained 68 ag retailer participants who represent more than four million acres within the GLB. The 2017 season survey, developed in collaboration with the University of Wisconsin-Extension, is the first issued to ag retailers in the Yahara River Watershed to obtain baseline information on serviced acres implementing products and services that keep nutrients out of waterways.

According to Public Health Madison & Dane County, beach closings from blue-green algae have been on the rise since 2013, with a record 164 days in 2018. Every two years, Section 303(d) under the Clean Water Act requires states to provide a list of waters that are not meeting water quality standards. In 2018, each of the Yahara River Watershed lakes including the Yahara River were listed as impaired. Additionally, each of the lakes and the Yahara River, with the exception of Lake Wingra, exceeded acceptable phosphorus levels.

Annual survey results help communicate ag retailers' voluntary efforts to solve local and basin-wide water quality problems – without additional regulations. These efforts are reported to stakeholders, regulators, industry and the public to provide transparency in the role ag retailers and their customers take to protect our shared resources. By increasing sales of cover crops, variable rate application, soil sampling and other services, ag retailers can contribute to cleaner water for drinking, recreation and commerce, and improve profitability for agribusinesses and farmers.

## Yahara Baseline Survey highlights

- Thirteen out of 18 total ag retail locations participated (76%), reporting on 2017 product and service sales. These locations represent 183,500 serviced acres within the Yahara River Watershed.
- Compared to GLB ag retailers, Yahara River Watershed ag retailers had higher percentages of serviced acres implementing the following products and services:
  - Rotational soil sampling
  - Weather consideration before fertilizer application
  - Foliar N feeding
  - Sidedress N application
  - Topdress N application
  - N-loss inhibitors
  - Split application of N
- The most common specialized P applications were topdress P and foliar P feeding. N-loss inhibitors and split N application were the most common specialized N applications.
- Based on averages from peer-reviewed publications, product and service sales reported by participating Yahara ag retailers retained on fields and out of waterways an estimated:



The following products and services are included in the above estimates: cover crops, soil testing, VRT, light incorporation of P fertilizer, N-loss inhibitors, subsurface preplant, strip-till and split N application.



## Promoting products and services

Our 4R-approved *Phosphorus Loss Reduction Handbook for Agronomists* is available for free download at <http://partnershipfarm.org/agronomist-handbook/>, along with new fact sheets on nitrogen-use efficiency and enhanced efficiency fertilizers. PARM will be releasing a *Handbook* specific to the Yahara River Watershed in 2019.

Free P-loss wallet cards with helpful tips for agronomists and farmers are also available for free download. More than 25,000 cards have been distributed to date. Visit <http://partnershipfarm.org/ploss-reduction-wallet-card/> to place your order.

**Phosphorus (P) loss from any field is possible. Fields with any of the following conditions may be at higher risk. Your special attention can help prevent P losses.**

- ▶ Soil test levels are above maintenance.
- ▶ Areas with high surface runoff potential:
  - Poorly or imperfectly drained soils.
  - Sloping fields.
  - Fields with less than 30% crop residue cover on soil surface.





[nutrientstewardship.com](http://nutrientstewardship.com)     [partnershipfarm.org](http://partnershipfarm.org)

**4R Nutrient Stewardship for Green Crops and Blue Lakes**



<b>Do</b>	<ul style="list-style-type: none"> <li>▶ Inject or band phosphorus (P).</li> <li>▶ Lightly incorporate (2-3") P applications; ag retailers can notify customer when applications are made.</li> <li>▶ Follow recommendations for setbacks.</li> <li>▶ Broadcast P for one crop year at a time only.</li> <li>▶ Soil test at least every three years.</li> <li>▶ Apply at University recommendations.</li> <li>▶ Plant cover crops.</li> <li>▶ Consider variable rate application.</li> <li>▶ Consider reduced tillage: no till, strip till.</li> </ul> 
<b>Don't</b>	<ul style="list-style-type: none"> <li>▶ Broadcast without light incorporation.</li> <li>▶ Broadcast application before heavy rain.</li> </ul>

*Ag retailers driving stewardship and sustainability*



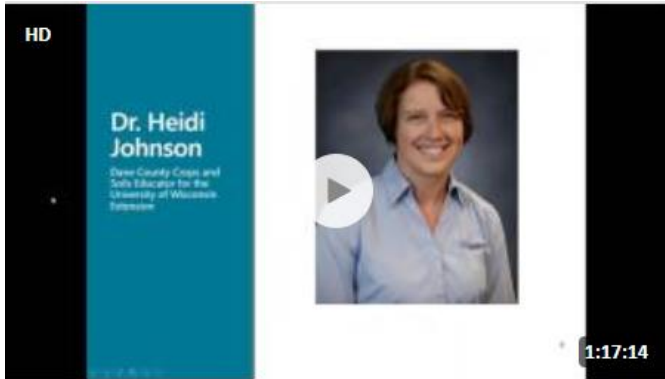
**PHOSPHORUS LOSS REDUCTION HANDBOOK FOR AGRONOMISTS**

2nd Edition  
 published by the IPM Institute of North America, Inc. Revised November 2017

[www.partnershipfarm.org](http://www.partnershipfarm.org)

PARM offers a library of recorded webinars at <http://partnershipfarm.org/webinars/> that help ag retailer staff understand the latest research on nutrient management, and how to effectively promote beneficial products and services. CCA and CPag continuing education credits are available for viewing these recordings online.



**Cover Crop Seeding Options: What You Need to Know**

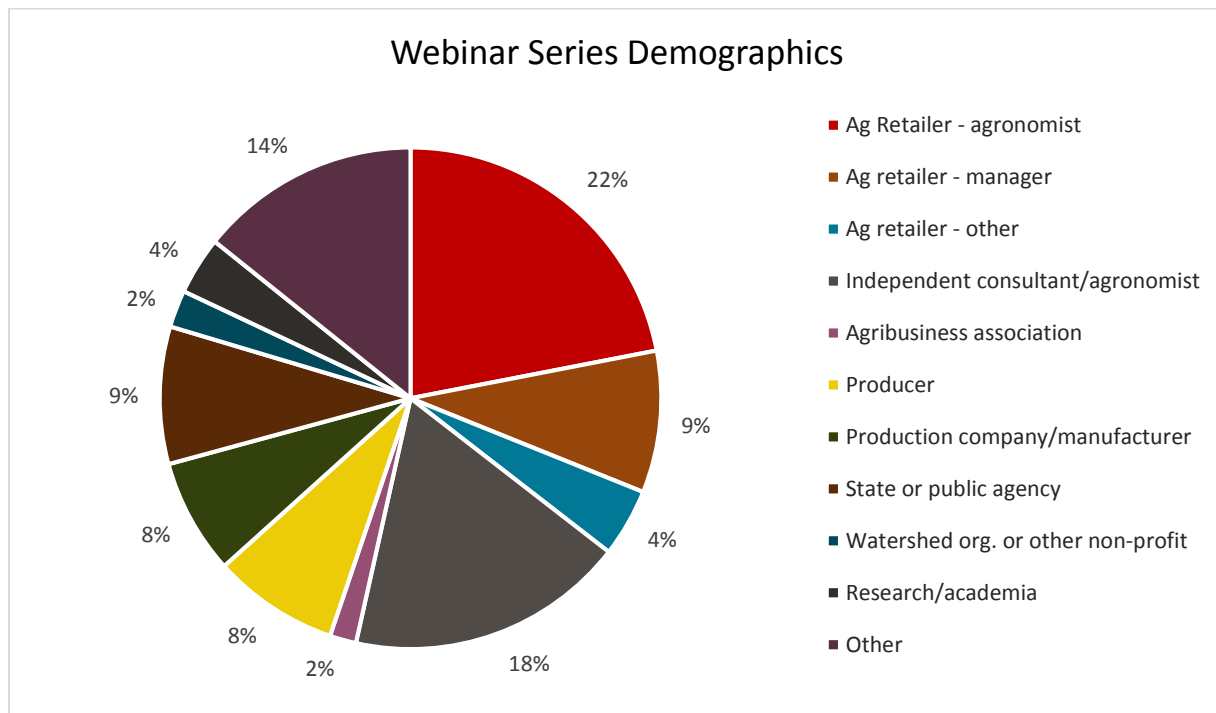
To receive CCA CEUs for watching this video, watch through this link:  
<https://attendee.gotowebinar.com/register/7673903251216452866> This webinar was hosted by the Partnership for Ag Resource Management on



**Nutrient Management in the Age of Digital Agriculture**

To receive CEUs for watching this video, watch through this link:  
<https://attendee.gotowebinar.com/register/1732599822871800065> If you are watching this video more than two weeks after the webinar took place,

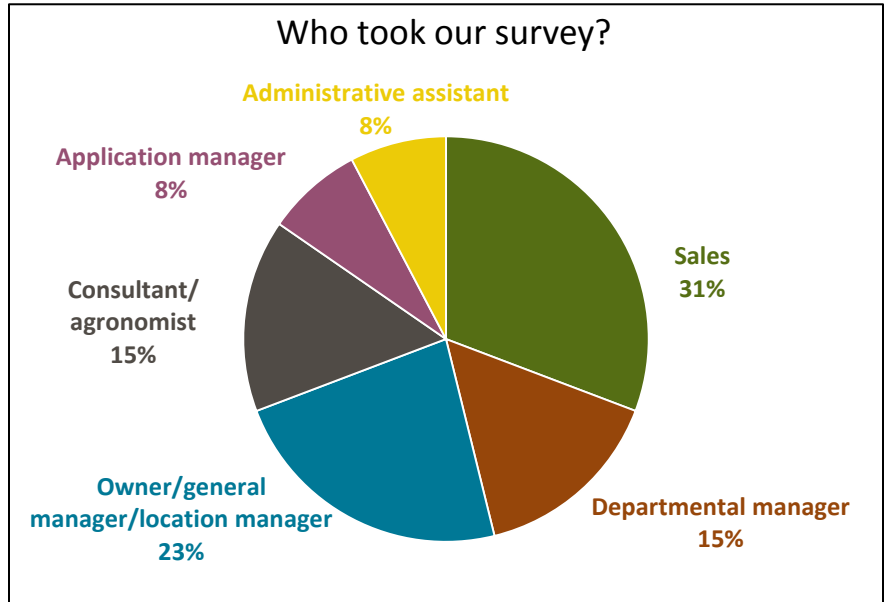
Webinar participants range from all sectors and US states. Ag retailer-employed agronomists and managers as well as independent consultants make up approximately 50% of viewers. Live and on-demand participants average over 400 per webinar.





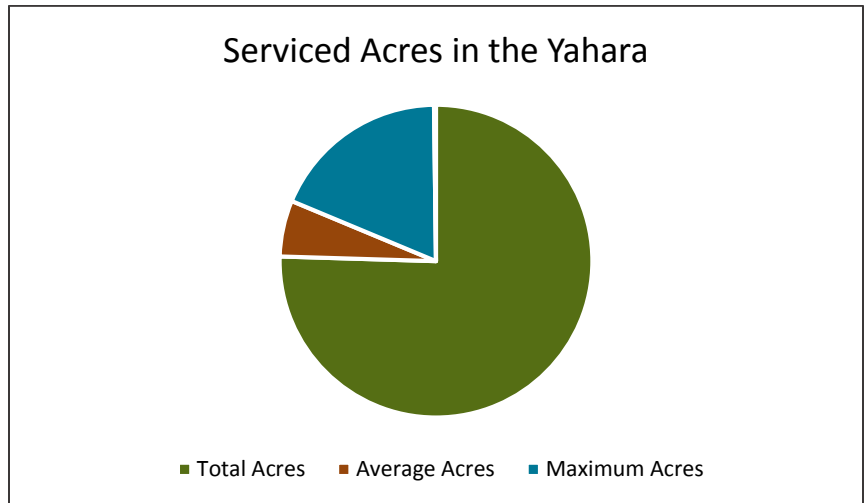
## Survey results overview

Thirteen ag retail locations participated within the Yahara River Watershed in Wisconsin. Thirty-one percent of surveys were completed by sales staff, followed by owner/general manager/location managers (23%). The participant numbers are a positive indicator that water quality is a priority for ag retailer staff at participating locations.



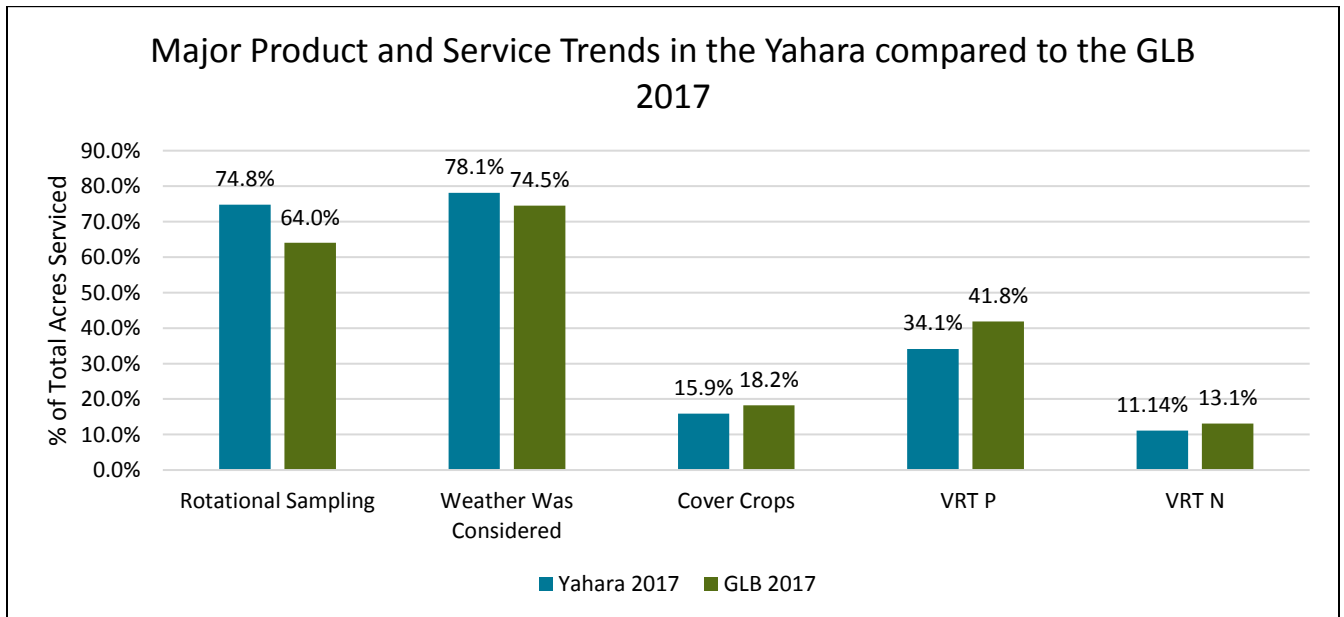
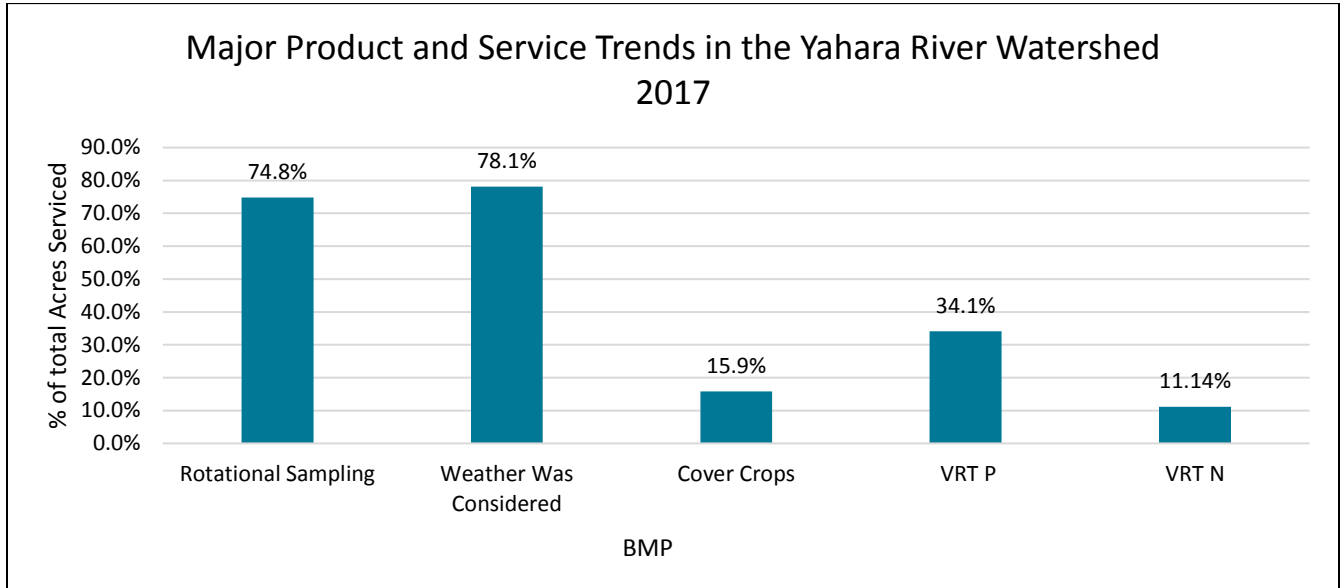
Participants reported 183,500 total serviced acres in the Yahara River Watershed in 2017. The average number of acres serviced per ag retailer location was 14,115.

	Yahara Acres
Sum	183,500
Average	14,115
Maximum	45,000
Minimum	500

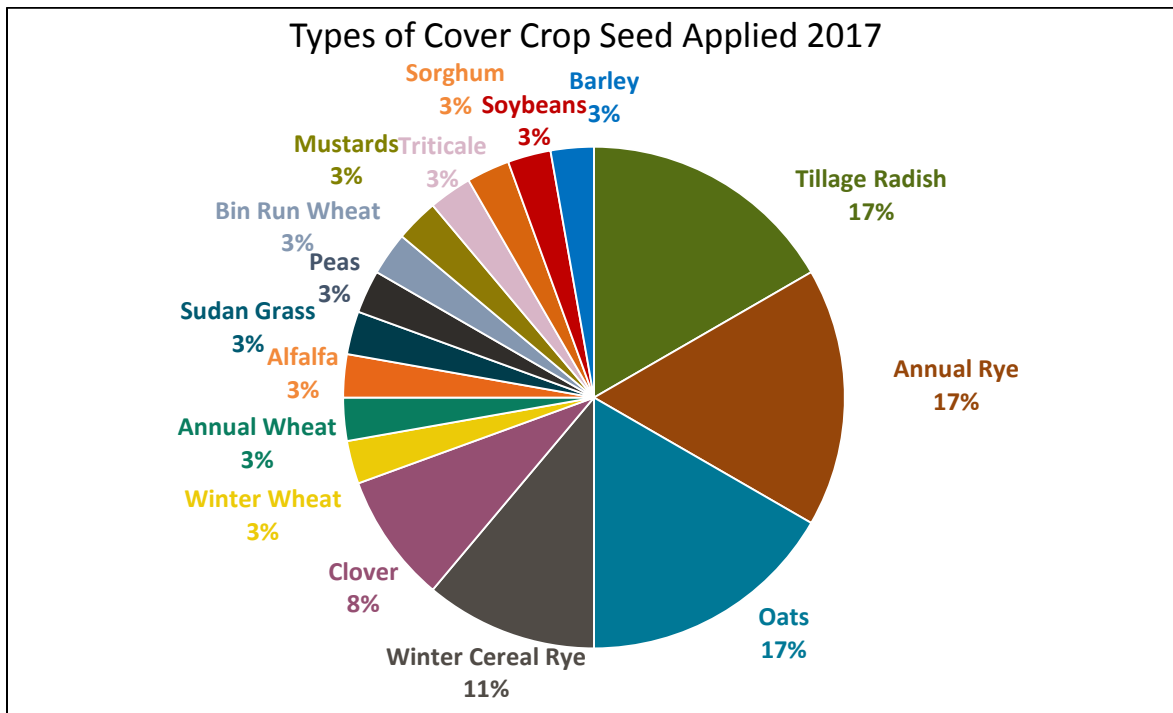


## Yahara River Watershed sales trends

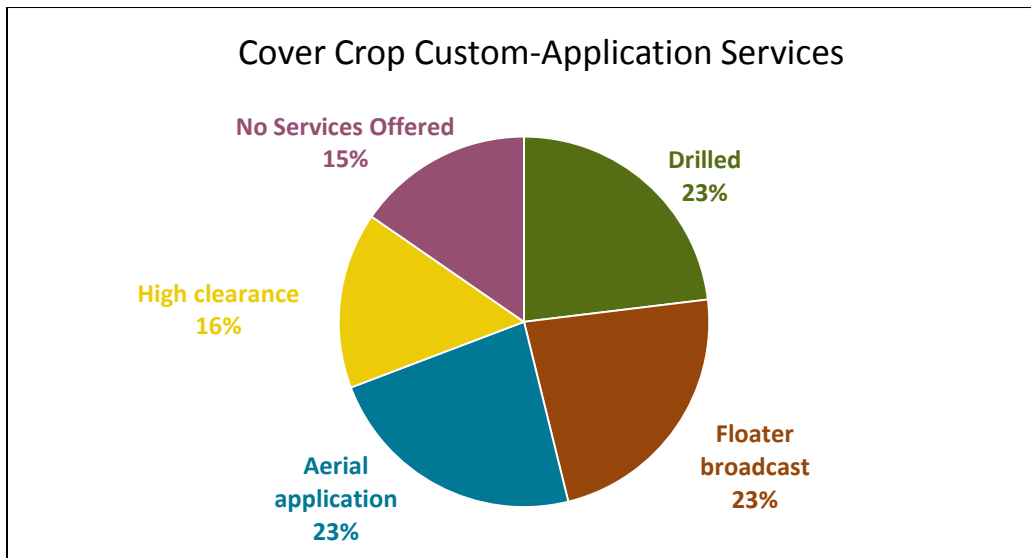
Yahara ag retailers reported similar or higher percentages of serviced acres implementing beneficial products and services compared to participants in the GLB. Respondents reported weather consideration before fertilizer application on 78.1% of acres serviced and rotational soil sampling on 74.8% acres. Compared to the GLB, use of cover crops, variable rate technology for phosphorus (VRT P) and nitrogen (VRT N) application were slightly lower.



The most common cover crop seeds applied in the Watershed were tillage radish, annual rye and oats, with 17% reported use on serviced acres for each. Winter cereal rye seed was reported on 11% of serviced acres and clover on 8%. Thirteen locations reported \$782,000 in 2017 cover crop seed sales. The average amount of cover crop seed sold annually among Yahara ag retailers was \$60,153.

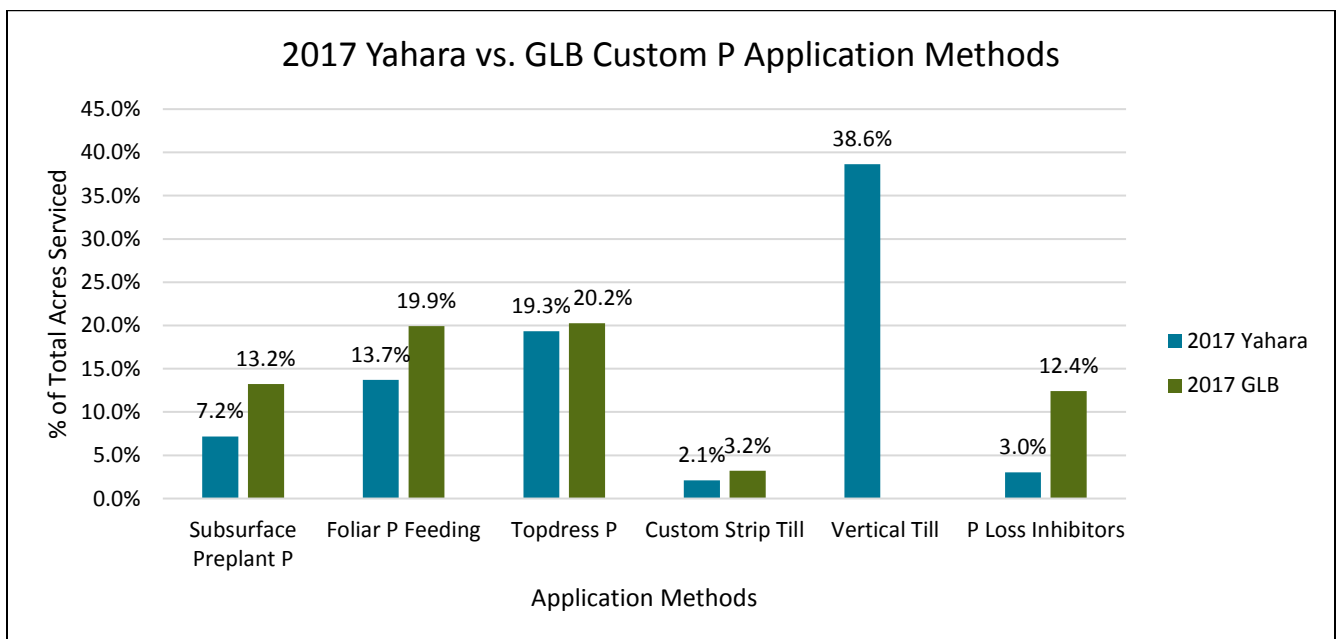
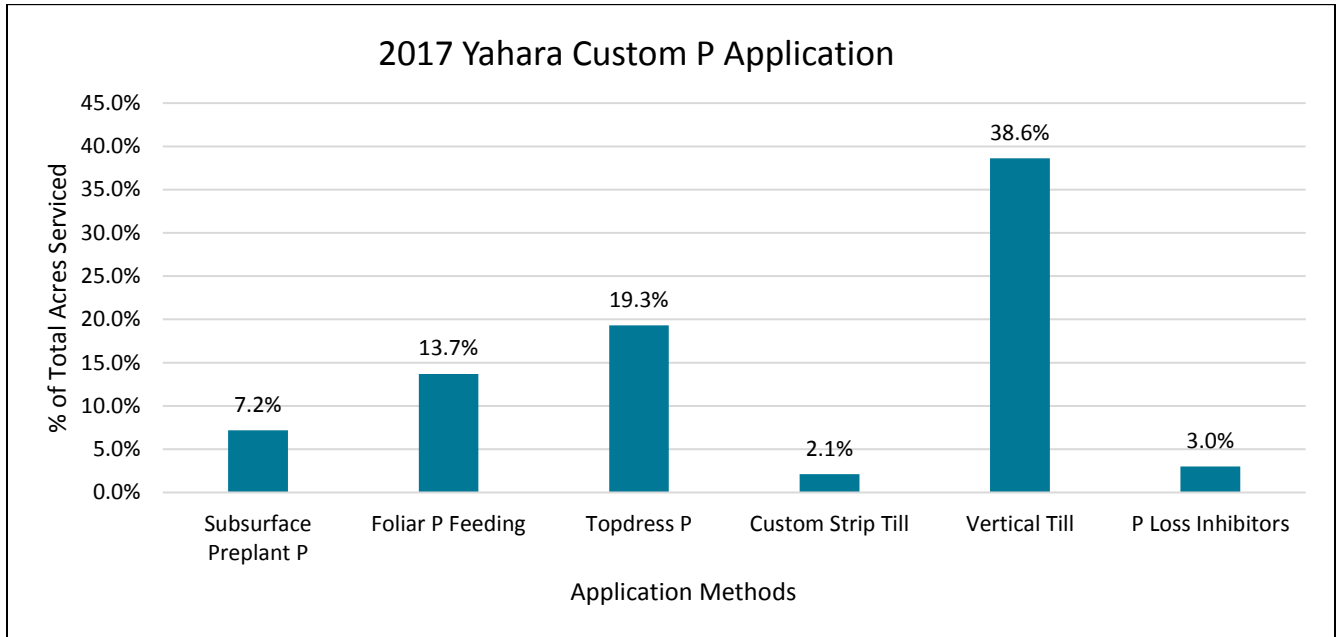


Yahara ag retailers reported high percentage use of drilled, floater broadcast and aerial cover crop application services. Fifteen percent did not offer custom-application services.



Many Yahara ag retailers offer specialized application methods for both P and N. Vertical tillage, topdress P and foliar P feeding application were the most common, with 38.6%, 19.3% and 13.7% usage across all reported acres, respectively. Compared to the GLB, Yahara ag retailers reported slightly decreased percentages in all custom P application methods.

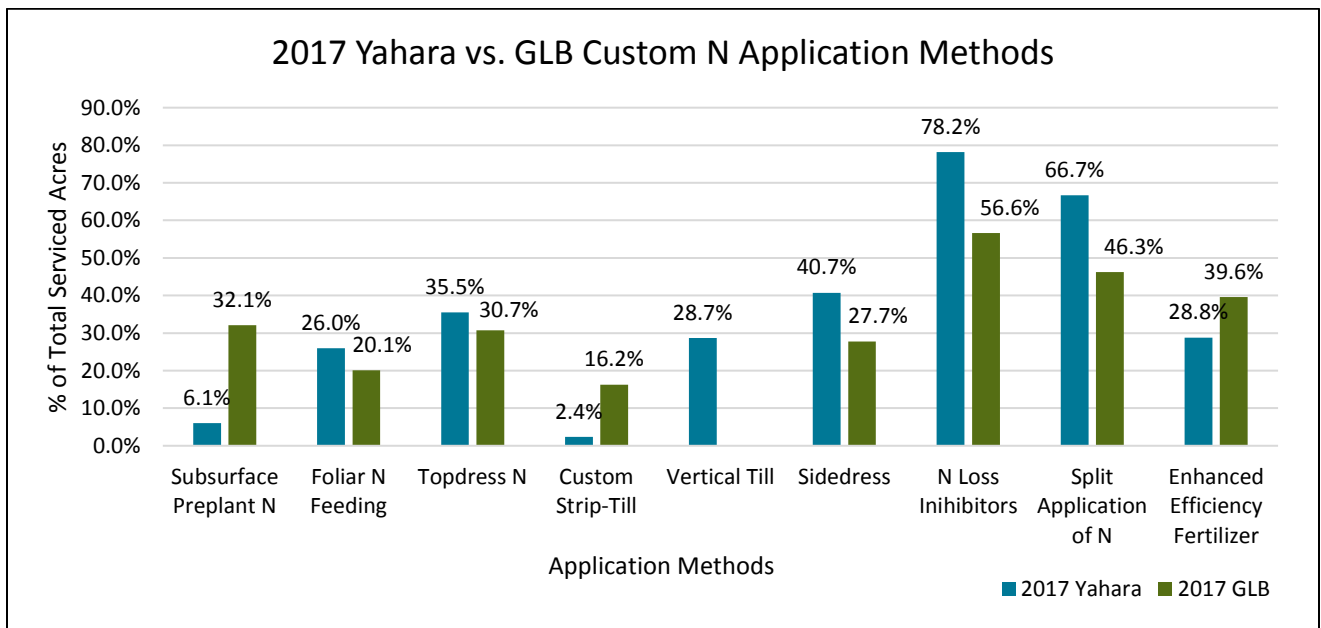
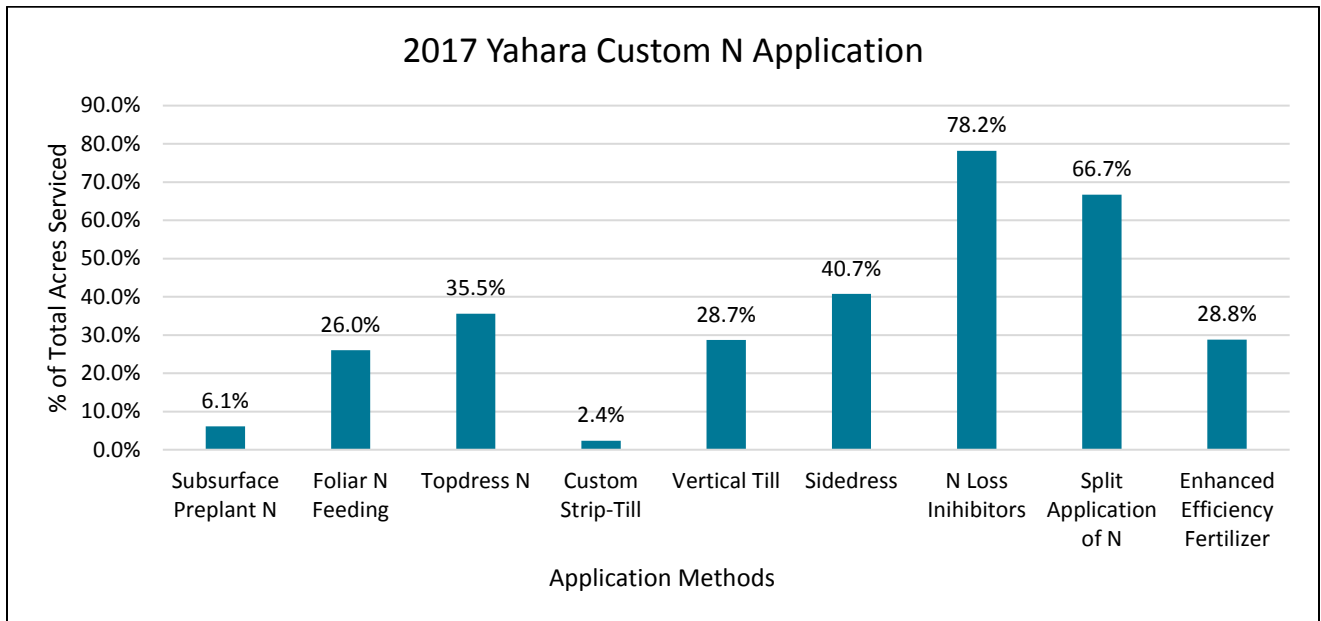
This survey was the first to collect vertical till usage for both P and N applications. This data was not collected in the 2017 GLB survey.



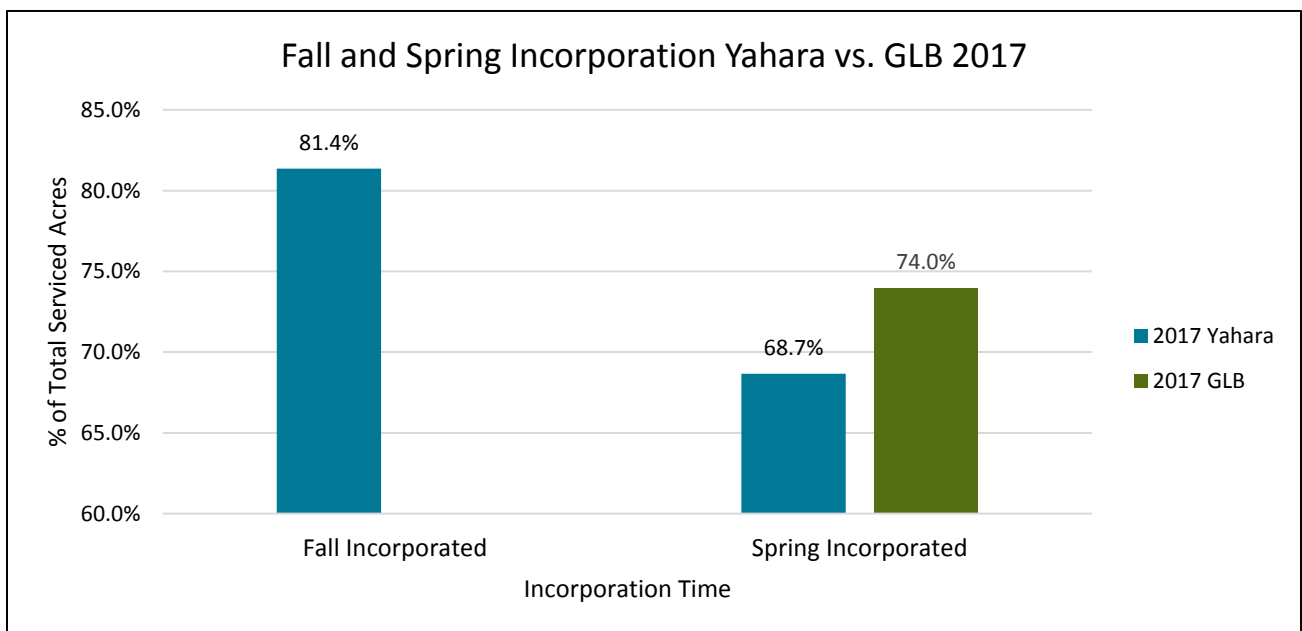
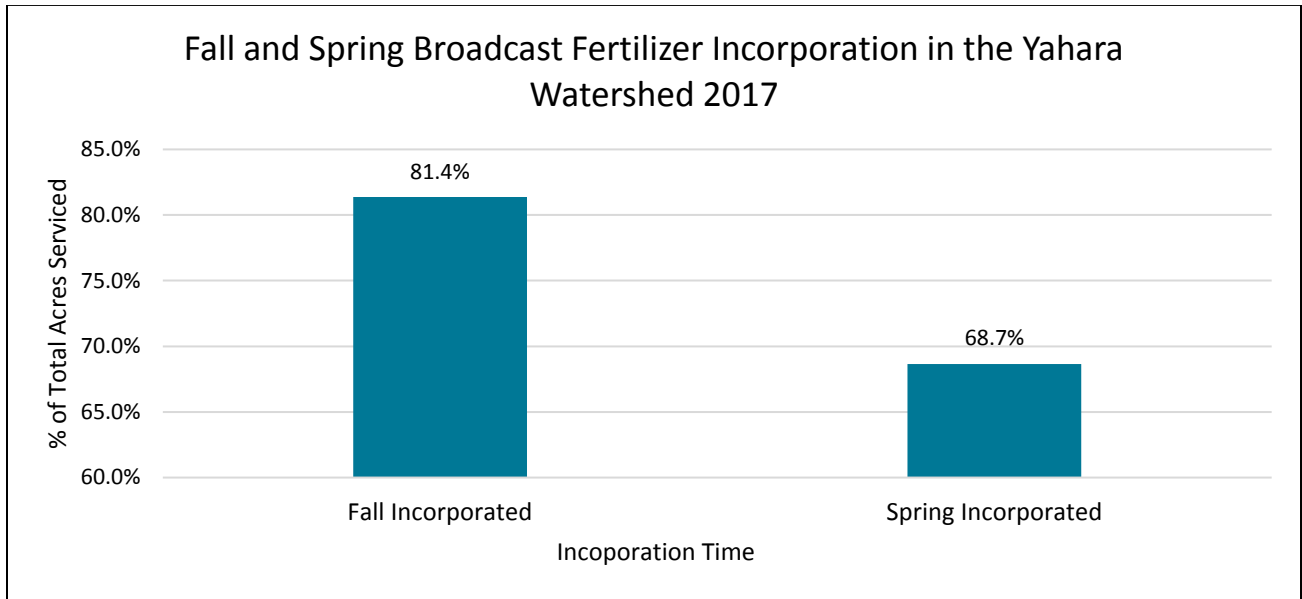


N-loss inhibitors were the most common custom N application practice in the Yahara River Watershed (78.2%), followed closely by the split application of N (66.7%). Compared to the GLB, Yahara reported a higher percent of acres using N-loss inhibitors, split application of N, sidedress application, topdress application and foliar N feeding.

Gypsum application and plant tissue testing constitute 13.3% and 11.9% of acres serviced in the Yahara, respectively. These services were reported at a higher use compared to the GLB, with 8.8% and 12.0% of serviced acres reported, respectively.



Light incorporation (2-3") of broadcast into the soil can reduce P-losses, especially DRP, which is immediately available to aquatic algae. Light incorporation is preferred compared to tillage, which can increase risk of sediment and particulate P-losses. In 2017, a reported 81.4% of fall broadcast and 68.7% of spring broadcast acres were incorporated in the Yahara River Watershed. Spring broadcast applications of P were incorporated on 74.0% of GLB acres serviced by participating ag retailers in 2017. Due to an error in GLB the survey, fall incorporation of broadcast fertilizer was not included.



\* An error in the 2017 GLB survey was found for fall incorporation.



A majority of responding ag retailers reported making a profit on products and services offered. The most profitable were custom P or N applications of topdress, sidedress application and foliar P-feeding with 100%, 90% and 81.8% of those surveyed reporting profits, respectively.

Yahara Profitability of BMPs 2017	I am not breaking even		I am breaking even		I am making a profit		I do not know		I do not offer this service		Total
	Count	% offering	Count	% Offering	Count	% Offering	Count	% Offering	Count	% of Total	
Cover Crops	0	0.00	3	33.33	6	66.67	0	0.00	4	30.77	13
Rotational Soil Sampling	0	0.00	5	45.45	5	45.45	1	9.09	2	15.38	13
VRT single nutrient application (N or P)	0	0.00	1	9.09	10	90.91	0	0.00	2	15.38	13
Subsurface Preplant	0	0.00	2	50.00	1	25.00	1	25.00	9	69.23	13
Topdress Application	0	0.00	0	0.00	13	100.00	0	0.00	0	0.00	13
Sidedress Application	0	0.00	1	10.00	9	90.00	0	0.00	3	23.08	13
Foliar Feeding	0	0.00	1	9.09	9	81.82	1	9.09	2	15.38	13
Gypsum Application	1	14.29	1	14.29	2	28.57	3	42.86	6	46.15	13
Custom Strip-till	0	0.00	1	50.00	0	0.00	1	50.00	11	84.62	13



The most profitable precision ag services reported were grid or soil sampling and VRT single nutrient application with 81.82% and 72.73% of ag retailers reporting profits, respectively.

Yahara Profitability of Precision Ag Services 2017	I am not breaking even		I am breaking even		I am making a profit		I do not know		I do not offer this service		Total
	Count	% offering	Count	% Offering	Count	% Offering	Count	% Offering	Count	% of Total	
Yield Monitor with GPS	0	0.00	0	0.00	4	57.14	3	42.86	6	46.15	13
Yield Monitor without GPS	0	0.00	1	14.29	2	28.57	4	57.14	6	46.15	13
VRT single nutrient application (N or P)	0	0.00	3	27.27	8	72.73	0	0.00	2	15.38	13
UAV or drones	4	57.14	0	0.00	0	0.00	3	42.86	6	46.15	13
Satellite/aerial imagery	4	40.00	2	20.00	1	10.00	3	30.00	3	23.08	13
Grid or Zone Sampling	1	9.09	1	9.09	9	81.82	0	0.00	2	15.38	13
GPS guidance in herbicide applications	1	11.11	0	0.00	5	55.56	3	33.33	4	30.77	13

## Yahara retailer sales trends impact nutrient-loss reductions

What do these sales mean in terms of reducing the amount of P and N that leaves cropland and enters waterways? Our review of published studies provides some insight:

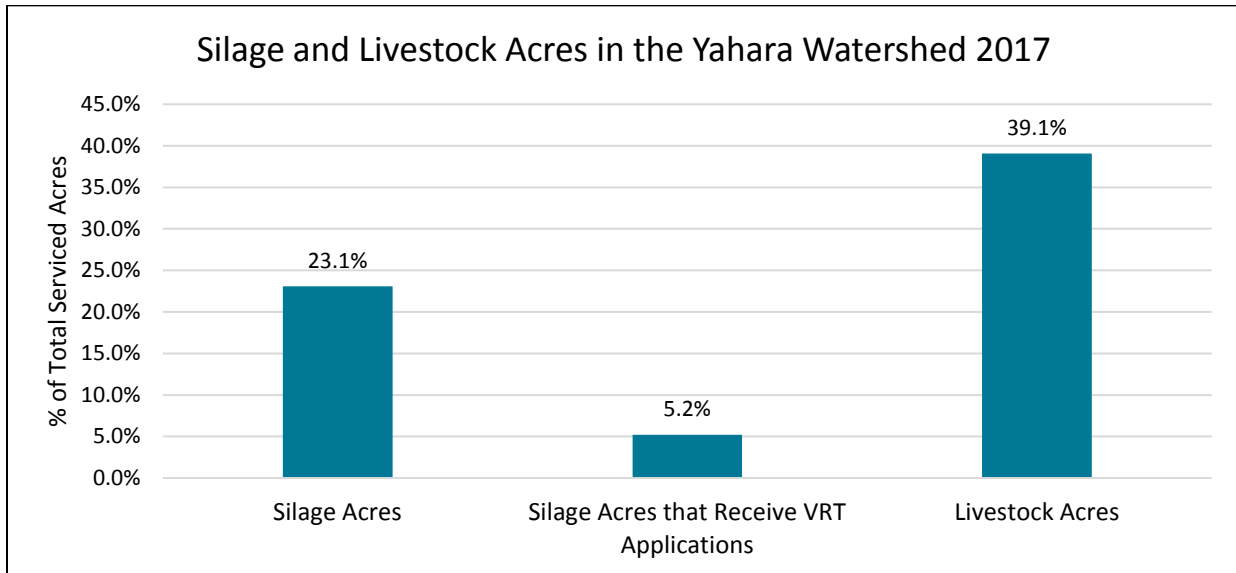
Product/Service	TP-loss reduction (lbs/acre)	DRP-loss reduction (lbs/acre)	TN-loss reduction (lbs/acre)
Cover crops	0.69	0.02	6.89
Soil tests/apply at Extension recs	0.36	0.12	5.30
Variable rate applications	1.01	0.09	7.14
Custom banding	0.55	0.17	11.57
Apply in rooting zone (strip till)	0.55	0.15	1.11
Notify farmers after P applications to lightly incorporate (2-3")	.71	0.16	11.13
Nitrification inhibitors	-	-	3.75
Split N application	-	-	5.44
Enhanced efficiency fertilizers	-	-	23.25

Published numbers are variable based on soil type, slope, proximity to surface water and other factors, but these rough averages allow PARM to communicate nutrient-loss reductions from ag retailer sales to stakeholders, industry leaders and the public.

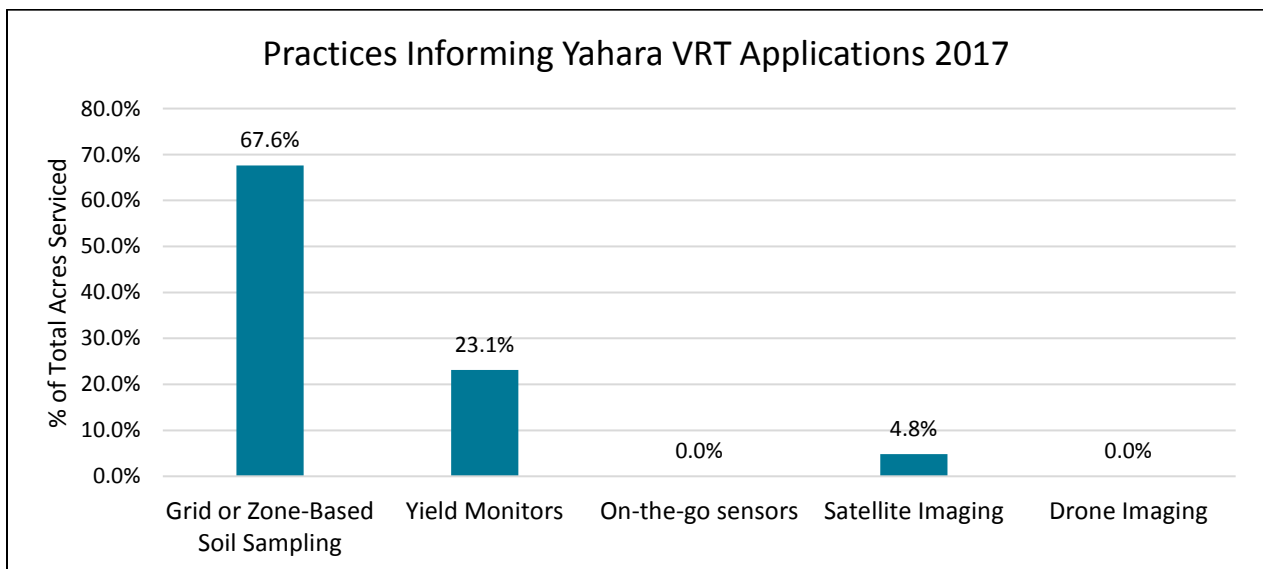
**Using these estimates, ag retailers who responded to our survey reduced 205,169.55 pounds of TP, 41,233.03 pounds of DRP and 2,411,052.73 pounds of TN. From just VRT alone, participants reduced TP losses by 63,553.31 pounds and TN losses by 146,007.97 pounds.**

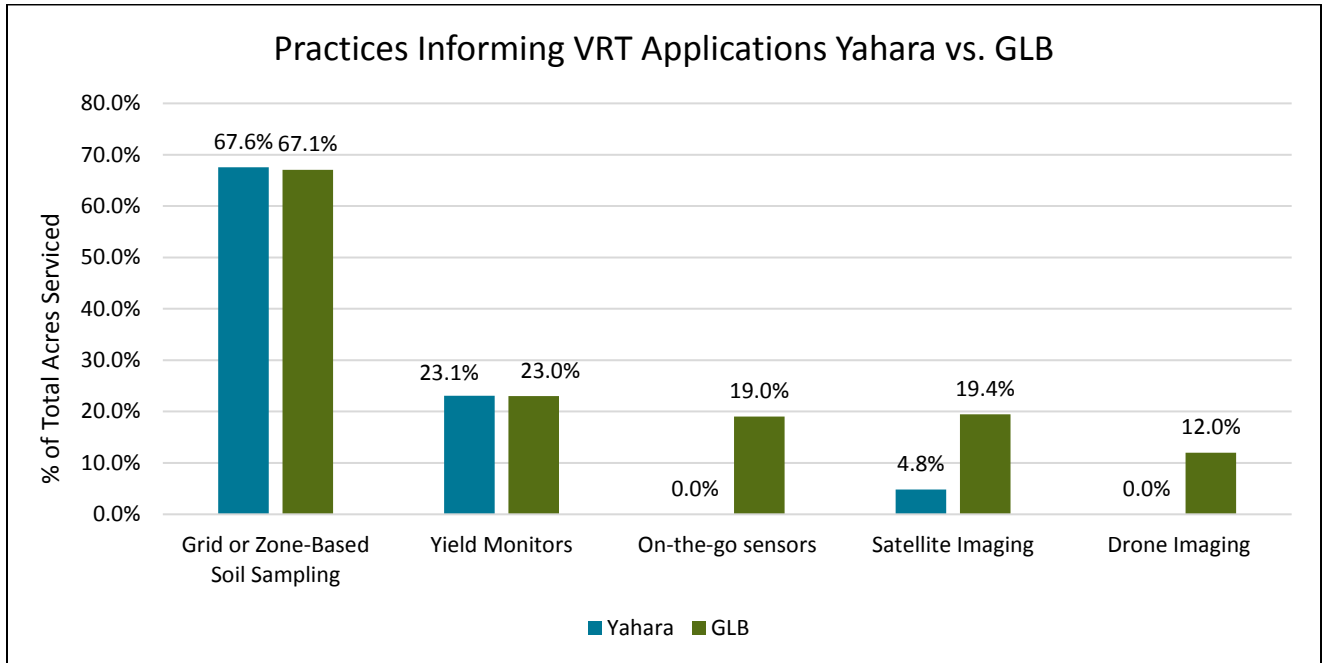
## Yahara River Watershed precision ag services and barriers

The 2017 Yahara survey was the first to report on silage and livestock acres. Thirty-nine percent of reported acres were dedicated to livestock and 23.1% of serviced acres to silage. Of all silage acres, 5.2% received VRT applications.

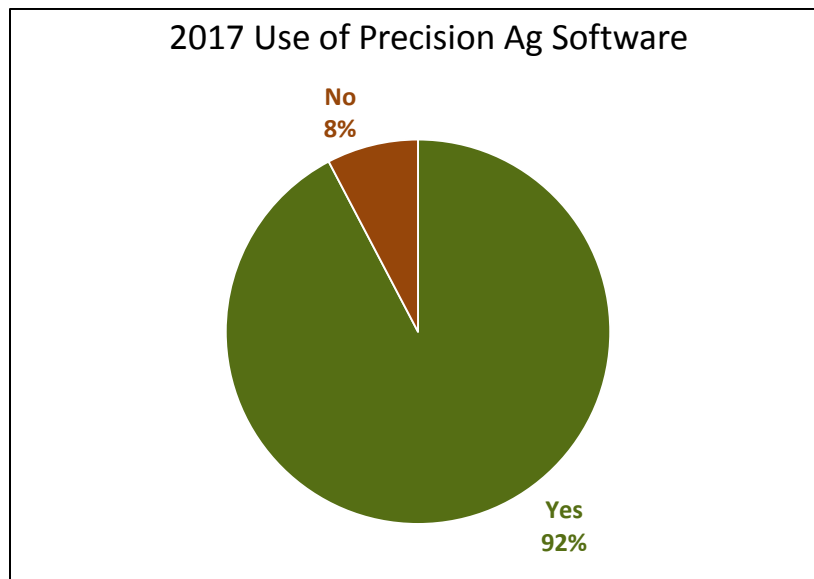


The most common practice informing variable rate applications in the Yahara Watershed was grid or zone-based soil sampling, followed by yield monitors at 67.6% and 23.1%, respectively. Percent of serviced acres in the Yahara applying these practices are comparable to the GLB. In the Watershed, use of on-the-go sensors, satellite imaging and drone imaging were lower than reported in the GLB.

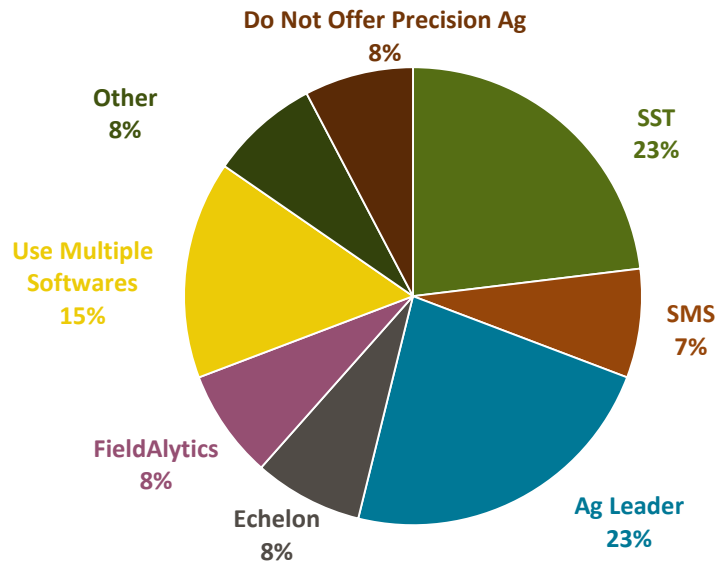




Ninety-two percent of the Yahara ag retailers surveyed use precision ag software. The top programs reported were SST and Ag Leader, both with 23% reported use. Fifteen percent of respondents use multiple precision ag software programs. This differs from the GLB where the top three programs in use were SST (19%), SMS (12%) and Mapshots (12%).

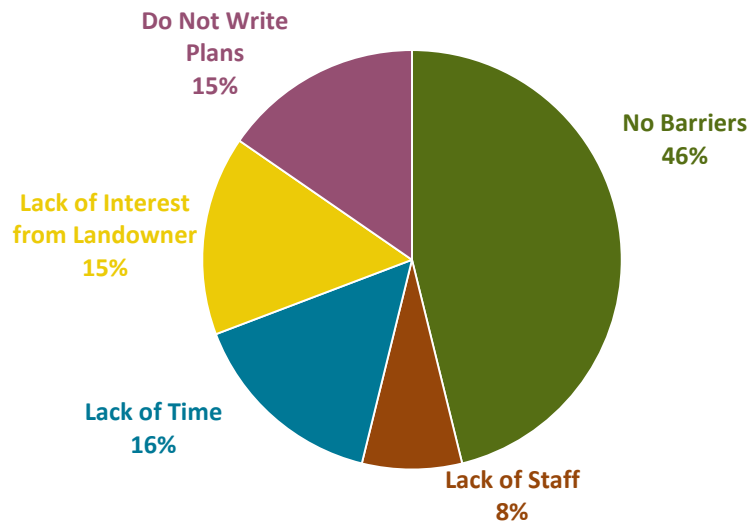


### 2017 Precision Ag Software Trends in the Yahara Watershed



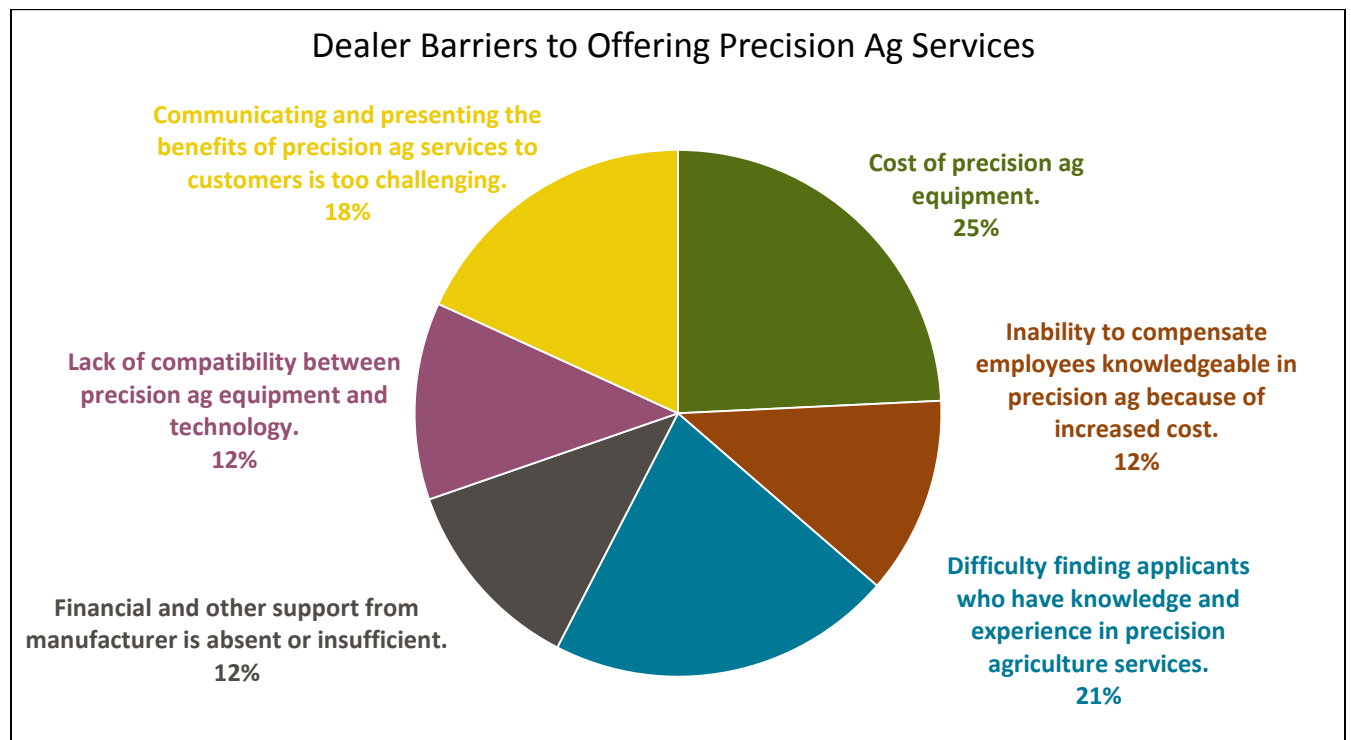
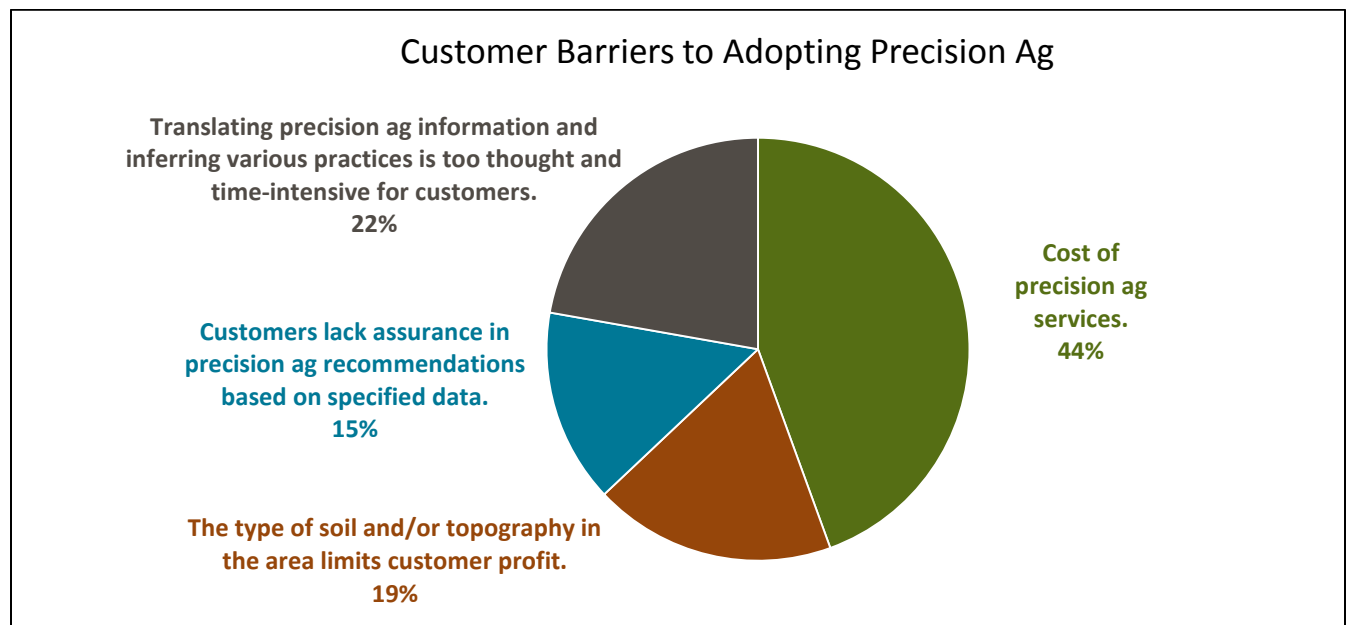
Ag retailers were asked about experienced barriers with offering certain products and services. Forty-six percent of Yahara River Watershed ag retailers reported they did not experience barriers to writing nutrient management plans for clients. The most common barrier reported in writing nutrient management plans for clients was lack of time at 16%. Lack of interest from the landowner was also a common barrier (15%).

### Barriers to Writing Nutrient Management Plans





When asked about customer barriers to adopting precision ag services, 44% of ag retailers reported cost as the most common response. Similarly, ag retailers reported the cost of precision ag equipment as the most common dealer barrier. Difficulty finding applicants who have knowledge and experience in precision agriculture services was also a common barrier faced by ag retailers.





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## Many thanks to our participating Yahara River Watershed ag retailers!

Landmark Services Cooperative	Cottage Grove, WI
Premier Cooperative	Mount Horeb, WI
WS Ag Center	Darlington, WI
Randan Agri-Service, Inc.	Middleton, WI
Wilbur-Ellis	Edgerton, WI
Middleton Farmer's Cooperative Co.	Middleton, WI
United Cooperative	Deerfield, WI
Nutrien Ag Solutions	Deforest, WI
Landmark Services Cooperative	Evansville, WI
The DeLong Co., Inc.	Janesville, WI
Insight FS Arlington	Arlington, WI
Midwestern BioAg	Blue Mounds, WI
Insight FS	Marshall, WI

## A special thank you to our contributing members:



**Nutrien**  
*Ag Solutions*<sup>™</sup>

## Additional thanks to our participating Great Lakes Basin ag retailers!

Ag Plus, Inc.	Churubusco, IN
Ag Pro Farm Service LLC	Corunna, MI
Ashland Crop Service Inc	Ashland, OH
Berkey Farm Center	Berkey, OH
Brickner Farm Service	Fostoria, OH
Carolina Eastern Crocker, LLC	Stafford, NY
Carolina Eastern Vail	Oriskany Falls, NY
Centerra Co-op	Sullivan, OH
Centerra Co-op	Andover, OH
Centra Sota Cooperative	Watkins, MN
Central Ohio Farmers Co-op, Inc.	Marion, OH
Ceres Solutions	Clay City, IN
Ceres Solutions	West Point, IN
Conserv FS	Waterman, IL
Crop Production Services	Eaton, OH



Crop Production Services	Attica, OH
Crop Production Services	Dunkirk, OH
Crop Production Services	Marion, NY
Crop Production Services	Dixon, IL
Crop Production Services	Saline, MI
Crop Production Services	Chalmers, IN
Crop Production Services	Linwood, MI
Crop Production Services	Upper Sandusky, OH
Crop Production Services	Cohocton, NY
The Delong Company, Inc.	Clinton, WI
Diversified Agri-Services Inc.	McCutchenville, OH
Gaerte Ag Service LLC	Defiance, OH
Georgetown Ag	Georgetown, OH
GROWMARK FS, LLC	Knowlesville, NY
GROWMARK FS, LLC	Gainesville, NY
GROWMARK FS, LLC	Caledonia, NY
GROWMARK FS, LLC	Kennedy, NY
Helena Chemical Company	Fowler, IN
Helena Chemical Company	Continental, OH
Heritage Cooperative	Upper Sandusky, OH
Heritage Cooperative	Sycamore, OH
Huron Bay Cooperative	Teeswater, ON
JENNINGS GOMER EQUITY	Gomer, OH
Legacy Farmers Cooperative	Arlington, OH
Legacy Farmers Cooperative	Arcadia, OH
Lima Elevator Company Inc.	Howe, IN
Luckey Farmers, Inc.	Woodville, OH
Luckey Farmers, Inc.	Bradner, OH
Lucknow District Co-Operative, Inc.	Lucknow, ON
Lyon County Farm Service J.V.	Ghent, MN
Mercer Landmark	Ohio City, OH
Michigan Agricultural Commodities	Middleton, MI
Midwestern BioAg	Milledgeville, IL
Mid-wood, Inc. / Bascom Agronomy	Tiffin, OH
OHIGRO Inc.	Waldo, OH
Prattville Fertilizer and Grain	Pittsford, MI
Precision Ag Services Inc.	Wauseon, OH
Rio Creek Feed Mill	Algoma, WI
Rudd Spray Service	Watertown, NY
S&S Jerseyland Dairy	Sturgeon Bay, WI
Silver Creek Supply	Kenton, OH



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The Andersons  
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