

4R Nu·tri·ent Stew·ard·ship

Benefits to farms and the environment using everyday practices

Nutrient Stewardship

is defined as "the responsible overseeing and protection of something considered worth caring for and preserving [nutrients]." For generations, farmers have been considered stewards of their land.

Now, farmers throughout the Mid-Atlantic Region share how their decades-long farming practices have been formalized under 4R Nutrient Stewardship—a management concept that ensures the right nutrient source is applied to plants at the right rate, at the right place, at the right time. Like you, these farmers have a long history of making management choices that benefit soil, water, air, and crops. By using the 4Rs and with support of partner companies, these farmers are able to make smarter decisions to maximize resources and increase profitability.



Little Bohemia Creek Farms



Jon Quinn

Family Members: Caitlin Gartland
4th-generation operation with 2 active generations
Location: Kennedyville, MD
Acres: 2,500
Crops: Corn, Soybeans, Wheat, Malting Barley, Process Spinach



Work Smarter, Not Harder

For Eastern Shore farmer Jon Quinn, working smarter has led to his success navigating the fields between Kennedyville and Warwick, MD.

“Technology is a huge part of what we do,” explains Jon. “We have yield data back to 1996, and the technology has evolved in the past few years to really allow us to get the most out of it.”

Jon’s family has always been ahead of the curve on incorporating environmental conservation practices into their farming operations. Conservation was a priority for Jon’s late father, who used one of the first no-till corn planters as early as 1975. Jon is following in his father’s footsteps, having added his first yield monitor in 1995.

Today, Jon practices no-till, uses cover crops, implements variable rate planting and nitrogen application, and has buffers around most fields and lots of waterways. GPS, drones for scouting, and tablet computers are all technology tools that help maximize conservation.

Working Toward a Common Goal

Jon also attributes his success to aligning with people and organizations that have common goals. Southern States agronomist Kenny Glen is one such person with shared goals. Jon relies on Kenny to help make recommendations around fertilizers and other applications.

Jon is also appreciative of the strong tech support available through his local Hooper dealer. “You have to be patient when exploring new technology,” says Jon. “It takes some time investment up front, but in the long run, it’s worth it.”

Another place Jon looks for recommendations is The Nature Conservancy and the 4R Alliance. **“Putting the right nutrients in the right place at the right time is a no-brainer,”** says Jon. “We need to partner with environmental groups because we all have a common goal of clean water and a clean environment. The Chesapeake Bay is a great resource for me to enjoy, and I want it to be there for future generations to enjoy as well.”



Thompson Farm

Soil Health is Paramount

Aaron Thompson knows that soil health is the key to his productive crops. Nearly 20 years ago, Aaron, along with his father and brother, began implementing conservation practices such as cover crops, no-till, precision planting, and variable rate nitrogen application to name a few. The result? Better soil health.

“We used the 4Rs before they even existed,” says Aaron. **“Our farming decisions are made based on what we know works, and the 4Rs work.”**

A lot of trial and error has gone into perfecting Thompson Farm’s crop program, and it still changes from year to year. “We have a pretty good baseline in place, but we need to be ready to adjust based on weather or other factors,” Aaron explains.

Results You Can See

Each time the Thompsons pick up new ground, this becomes a benchmark for other fields where they already use 4R practices. They can always tell right away that their stewardship is headed in the right direction. Especially when they see the results the following year.

“You can really see the soil come to life. The microbes break down waste so much faster, and you can tell from the crops that the soil is healthier,” says Aaron.

While Aaron relies on his years of experience and deep connection to the land, he also seeks guidance from key advisors. Mike Twining with Willard’s Agri Service is a go-to resource for agronomy questions. Mike helps Aaron choose the right fertilizers, sometimes making special blends to manage the wide range of soil types that Aaron farms.

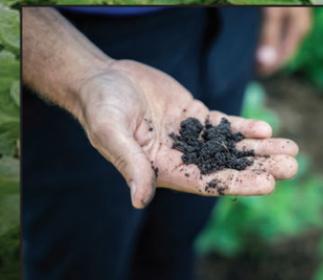
Aaron also selects the seed for each field, relying on his Channel Seed dealer, Rob Gary, for recommendations. Gary is forward-thinking and helps Aaron select the right seeds that yield well in the rain but are also drought-resistant.

Aaron feels that taking care of the soil allows it to take care of you. “You get attached to your land and take pride in it. Seeing that my decisions have made it healthier makes me want to continue investing in it.”



Aaron Thompson

Family Members: Robert, Barbara, Jon, Aaron, and Nathan Thompson
5th-generation operation with 3 active generations
Location: Hartly, DE
Acres: 1,800
Crops: Corn, Soybeans, Wheat

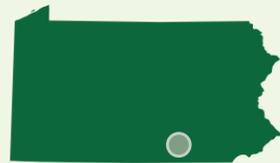


Buser Farms



Bob Buser

Family Members: Pat, Ethan, Kieren Buser, Dylan Keller
5th-generation operation with 3 active generations
Location: York, PA
Acres: 1,750
Crops: Corn, Soybeans, Wheat, Hay, Hogs, Cow/Calf Operation



Cultivating a Family Affair

As with many farms, Buser Farms is a true family business. Both sides of the Buser family have a deep history in farming and working together. "It's a great life," says Bob. "We've been entrusted with this land, and we're doing our best to take care of it."

Cultivating crops is much like cultivating the next generation—you need the right nutrients (or advice), applied in the right amount, right when and where they're needed.

"Knowing what nutrients the plant needs and putting them there is key. If you add nutrients that a plant doesn't need or spread liquid nitrogen with no ground cover, you're just throwing money and nutrients away," Bob explains. To maximize their efforts, the Busers started using a product called More Than Manure® to help keep nitrogen in their hog manure, both before and after application.

A Delicate Balance

Bob understands the difficulty that can come from balancing nutrient application. Using more than 200 soil and 30 tissue samples a year, Bob keeps a strong handle on what the crops need. For help with nutrient recommendations, he relies on Tim Hushon with The Mill and Matt Kessler from Nutrien.

"Bob is never afraid to challenge me to make him better," says Tim. **"We want to provide him, and others, with the tools to make better use of practices they are already doing."**

What's Bob's next challenge? Micronutrients. Much like family, "All the nutrients intermingle amongst one another, and all need to work together," he says. "When you add one thing, it may impact the levels of another."

Not only do these decisions influence crop performance, they also affect the air and watershed. "You need to know your soil and land so you can maintain it for the next generation," says Bob. "And you need to help coach the next generation to make the right decisions to keep the farm going."



Willin Farm, LLC

The Science of Agriculture

R.C. Willin is driven by the question of 'why?' "We really need to think deeply about the science behind plant development and understand it in order to maximize what we can achieve," he says. This philosophy is what pushes R.C. to regularly test tissue and soil samples, conduct extensive on-farm research, and strive to constantly learn about plant biology.

"Getting a better grasp on nutrient uptake gives us the ability to make better decisions and achieve better predictability," R.C. explains. "This is one reason that we're hoping to move away from a static nutrient management plan towards using predictive analytics and an adaptive nutrient management plan. With soil and tissue samples, we can address issues and measure the results very quickly."

Another tool R.C. and his family use is mapping with field health analysis. They do extensive mapping with data overlays at the end of the season, and sometimes mid-season, to ensure their applications are on track to maximize nutrient uptake and soil health.

A Solid Foundation

The practices and philosophies that R.C. employs are all rooted in plant biology. "Plants have inherent mechanisms that trigger different plant functions. We believe these may enhance mass flow uptake and nutrient partitioning, as well as promote root exudates that can make certain nutrients more readily available for root uptake," he states. "Mother Nature truly has an intelligent design in the development of these plants."

R.C.'s guiding principle is **"What's good for the environment is good for agriculture and what's good for agriculture is good for the environment."** For him, nutrient stewardship means analyzing each component that makes up a plant's nutrient

requirement, understanding plant nutrient uptake, and planning to get a positive nutrient response in different environments and conditions—this ideology embodies the 4Rs.

"We're reducing our environmental footprint by making the nutrients more available and functional to crops," says R.C. "In some ways, everyone is doing things to be better with technology, soil health, and nutrient efficiency. We're environmentally conscious and aware. We are able to correlate good ag practices that improve yield with ag practices that help the environment."



R.C. Willin

Family Members: J.C., Chad, Brent
6th-generation operation with 2 active generations
Location: Seaford, DE
Acres: 1,400
Crops: Corn, Soybeans, Wheat, Broilers



Graywood Farms



Lisa Graybeal

Family Members: R. Steve, Byron

4th-generation operation with 2 active generations

Location: Peach Bottom, PA

Acres: 1,200

Crops: Corn, Soybeans, Rye, 750-head dairy



Recycle Meets Full Cycle

Farms are known for recycling and reusing. Lisa Graybeal and her family at Graywood Farms embody this concept. From collecting rainwater for use in their flush system to bedding with peanut hulls and feeding grocery store produce waste, maximizing every resource is at the forefront of their decision-making.

“We use everything,” says Lisa, “but that’s not new. **Any tool and technology that helps us with economics, efficiency, and time is a plus.**”

Not only do the Graybeals recycle extensively, a full cycle of nutrient use is also evident on their farm. Recycled water flushes manure from the barn, which is then run through a manure separator to remove solids from the liquid. The solids are used by Terra-Gro, a compost company that leases land from the farm to make their compost. The liquid is stored until it is applied to the crops via drag line and incorporated using a soil aerator, eliminating any winter manure hauling. When the crops are harvested, they are put into feed for the cows and the cycle begins again.

A Mile from the Susquehanna

Use of good farming practices that are good for the environment is not exclusive to Graywood Farms. **“No one wants to see their soil or manure run down to the creek or road. Those are valuable nutrients and fertilizer that we want to keep on the farm, and that means keeping them out of waterways and the Bay,”** Lisa states.

This is where the 4Rs come in to play. Selecting the right nutrients and applying them at the right rate, at the right time, and in the right place ensures they are used by the plants instead of running off the field into local streams and creeks.

“The watershed is on everyone’s mind right now, but we’ve been implementing good practices for so long that it’s second nature for us,” explains Lisa. “It makes sense to do things like keep our animals out of the streams for the health of the animals. We sometimes forget that it’s healthier for the streams, too.”



Hutchison Brothers Farm

Put it to the test

Over time, and often out of necessity, trial and error give birth to progress. This is no different for Hutchison Brothers Farm. Kyle Hutchison is constantly testing new methods of growing crops on his family’s farm with a goal of long-term viability.

“As we try different processes, we have a progression of getting more information to make better decisions each year,” says Kyle. “I think we do a good job, but we can always improve. Striving to advance is what keeps farming interesting for me.”

This desire to do better is what has led Kyle to divide his corn nitrogen application into four times per year, use GPS and tools like GreenSeeker® for variable-rate nitrogen application, and plant cover crops on all possible acres. He is even experimenting with variable-rate irrigation, as well as participating in a three-year cover crop study with the University of Maryland to explore earlier planting and later kill-down dates.

Profitability = Viability

In the end, it comes down to profitability. “We have a responsibility to improve our environmental practices, but we still need to be profitable to remain a viable operation,” Kyle states. **“We’re in an environment where we need to do more with less, and that applies to nutrients, too. So we need to find ways to increase nutrient efficiency.”**

That’s where the 4Rs fit in. With input from the 4R Alliance, Kyle is able to ensure the right nutrients are applied in the right amount at the right time based on soil conditions. “We have very light soil, so we try to spoon-feed as few nutrients as possible,” explains Kyle. “It’s certainly a challenge, but we’re always determined to improve and try different practices to see what works. It’s constantly a learning process, and there may be things we don’t even know about yet. That’s why we do research—to help us make better decisions and constantly progress into increased stewardship and profitability.”



Kyle Hutchison

Family Members:

Richard, Robert, David, Travis

4th-generation operation with 2 active generations

Location: Cordova, MD

Acres: 3,350

Crops: Corn, Soybeans, Plenish® Soybeans, Wheat, Barley, Maltng Barley, Cucumbers, Green Peas, Lima Beans



4Rs – The “Right” Choice for Nutrient Stewardship

The Goal of Farmers,

agri-business partners, and the 4Rs are all the same—use resources most effectively. By following the 4R principles, farmers can make better decisions that focus on applying the right nutrient source, at the right rate, at the right time, in the right place.

The principles are simple:



Right Nutrient Source

Select the nutrient form that is most readily available to plants and balances the needs of the soil. This could include commercial fertilizer, manure, compost, organic material, or crop residues.



Right Rate

Assess plant nutrient demands and yield potential and only apply nutrients at the needed rate, maximizing profits through efficient inputs.



Right Timing

Be sure that nutrients are applied when they will be most effectively used by the plants and not lost to run-off or leaching.



Right Place

Focus on getting the nutrients directly to the plants, or even to the specific plants within the field that need them the most.

4R practices make sense. Matching nutrient applications to the needs of the crop leads to responsible oversight and care of soil, air, water, and nutrient resources. With the help of the 4Rs and its agri-business partners, you, and farmers throughout the Mid-Atlantic Region, can make smart decisions for efficiency, profitability, and stewardship.



This material is based on work supported by the U.S. Environmental Protection Agency and Chesapeake Bay Program's Innovative Nutrient and Sediment Reduction Grants, which support efforts within the Chesapeake Bay watershed to accelerate nutrient and sediment reductions through innovative, sustainable, and cost-effective approaches.

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TNC-4R-001 August 2019

