

Our Water

Keeping it Clean

North Dakota Department of Health  Environmental Health Section

Precision Planning to Benefit the Bottom Line, Habitat and Water

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With harvest season nearing completion, a producer's thoughts will soon turn to, "What should I plant next year? Will my land be profitable?"

The North Dakota Department of Health's Watershed Management Program and the Pheasants Forever organization have partnered to bring precision agricultural planning to North Dakota. The pilot project is taking place in Ransom, Sargent, LaMoure and Dickey counties. A Pheasants Forever Precision Agricultural Specialist works one-on-one with producers, using data they collect on their farms during planting and harvest. The data are analyzed using a customized software program that provides agronomic and economic information. This information helps producers evaluate alternative management practices that could improve income on unprofitable acres. The North Dakota Game and Fish Department, Natural Resources Conservation Service and local soil conservation districts also are program partners that are available to provide financial and technical assistance to plan and implement alternative practices on the unprofitable acres.

For North Dakota producer Marcia Asche, the transition to a "precision agriculture" approach on her farm has been an eye-opening experience.

As a part of the family-owned Rosedale Farm, Asche grows corn, soybeans and spring wheat across 1,800 acres in Sargent County in the extreme southeast corner of the state. This is ground that Asche has come to know well over her lifetime, including those parts of each field that "just aren't as good as the others."

Pheasants Forever is in these acres. They don't make economic sense to farm, yet they can become good upland bird habitat.

Recent technological advancements began to allow Asche to monitor crop yields in real time and provide hard data on how these acres were producing. She was shocked by the large discrepancy between the

dollars her farm was investing and what this ground was doing to benefit her bottom line.

"It was a tough lesson for us to see basically how we're throwing money away, and it raised a number of questions about what we should do going forward," says Asche. "Why would we want to continue to throw money into acres that aren't producing?"

Asche and her family now employ a number of precision agriculture techniques, including variable-rate fertilizer applications that help target in-field variabilities and focus dollars on those acres with the best return-on-investment (ROI). The software used in the "precision agriculture" approach generates color-coded maps — green (profitable), yellow or orange (break-even) and red (unprofitable) — that are used to develop a plan to improve farming practices.

In a boost to the future of habitat conservation, these same maps are now being promoted by Pheasants Forever and its partners to leverage federal and state habitat programs by targeting areas of low yields that producing negative ROIs.

Asche and Rosedale Farms, with the guidance of Pheasants Forever and the Wild Rice Soil Conservation District, is one of a



Is this part of the field dragging down profitability for the entire field? Most likely, it is taking the same amount of resources and giving little back in yield.



Before: 2016 Soybean Production

Average Yield:	50.3 bu/ac
Profit:	\$110.13/ac
ROI:	31.2%



After: Incorporating Perennial Cover

Average Yield:	52.4 bu/ac
Profit:	\$118.36/ac
ROI:	37.4%

Figure 1. Adding habitat on 10 acres (areas in yellow) increased the return on investment by 6.2percent.

small group of operations in Asche’s county to couple habitat conservation with data generated from precision agriculture.

According to Ryan Heiniger, Pheasants Forever’s director of agriculture and conservation innovations, precision agriculture is data driven, it’s farmer-first, and the goal is to help producers improve their bottom line,” Heiniger, is also a fourth-generation farmer and 20-year veteran of conservation delivery. “With this approach, we talk first of the wisest use of input dollars on the best zones, and the outcomes of a better use of water, a better use of herbicide and a more sustainable use of natural resources,” said Heiniger. “The benefits to conservation are secondary, but the upside for habitat is huge.” Heiniger says the potential for coupling precision agriculture techniques and habitat conservation is significant, given that most producers already have the data needed to develop a plan.

Water Quality

There are several ways water quality is improved using precision agriculture, including:

- More efficient nutrient application, typically resulting in fertilizer inputs more closely matching crop production needs,

ensure most nutrients are used by the crop and less unused nutrients are available for transport to streams and lakes in runoff waters.

- Implementing practices that maintain cover on the soil surface and improve soil health can reduce runoff by improving infiltration rates and increasing water-holding capacity
- Some unprofitable cropland acres may have limited crop stands due to factors such as salinity and/or short-term flooding. Establishing perennial vegetation for forage production and/or wildlife habitat on these acres eliminates chemical and fertilizer inputs and keeps the soil covered throughout the year.

In Figure 1, one of the areas marked in yellow is a waterway that has been seeded back to grass, saving money on inputs and wear and tear on equipment.

The Dilemma

The crucial question producers must ask themselves is, “Why do I continue to spend resources on land that doesn’t add to my profits?” Unfortunately, that question is offset by the appearance to their peers that he/she is giving up, not farming all of the land in their care. However, if you could be more

profitable by only farming the best ground, adding a crop to the rotation, or a conservation practice, would you make the change?

In search of a producer’s perspective, the author asked the following question, “If someone would come to your farm and, using your cropping data, show you how to be more profitable the following year, would you let them visit with you?” In response were questions such as:

- What would I have to give up?
- Can I stay on the farm?
- How will it affect my crop insurance?

For answers to these questions and many more you may contact Melissa Shockman, Precision Ag and Conservation Specialist, at 701.709.0963 or mshockman@pheasantsforever.org. You may also call the North Dakota Department of Health’s Watershed Management Program at 701.328.5210.

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