



Report on Agricultural Conservation in the Upper Iroquois River Watershed, Indiana

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Key Findings

- Producers recognize that the agricultural sector is partly responsible for water quality issues within the local and wider watersheds, through contributions to sedimentation and nutrient accumulation. Furthermore, there is acceptance that these are problems that need to be addressed.
- Many of the producers feel an attachment to the land and desire to maintain or improve soil health (more so than water quality). However, the extent to which they feel farming practices contribute to environmental degradation is difficult to assess.
- While the idea of conservation practices are generally favored in principal, there is concern among producers that they are generally costly and/or time consuming to implement and maintain. However, longstanding practices such as grassed waterways and riparian buffers have become familiar and gained acceptance with time.
- Practices which producers believe can demonstrate a time/labor saving (conservation tillage), a profit (cover crops), or a supplementary benefit such as an area in which to hunt (cover crops and riparian buffers) are among those most attractive to producers.
- Practices which are perceived to be costly to implement and/or require that a substantial amount of land be removed from production (two stage ditches and saturated buffers) are less attractive to producers. For this reason compensation such as that provided through a cost-share program is likely to be necessary to convince producers to adopt.
- Knowledge of the costs and benefits of the more novel conservation practices (two stage ditches, saturated buffers and controlled drainage) is typically lacking amongst producers. As such they are unable to form informed opinions on these practices.

Background

According to the 2013 Upper Iroquois River Watershed Management Plan, the watershed (Figure 1) is made up of 438,332 acres; 368,198 acres (84%) of which is agricultural land, with approximately 75% of that in corn and soybean production. A majority of the rural areas are farmland, which is extensively drained due to the fact that the area was once part of the nation's second largest wetland. Water quality problems in the watershed are reported to include flashiness and flooding, loss of fish habitat, excessive sediment, lack of recreation access, elevated E.coli levels, excess nutrients, and impaired biological communities.

A number of these issues are similarly recognized at the wider scale with growing public concern over nutrient related problems such as algal blooms in the Great Lakes and dead zones in the Gulf of Mexico. The intensifying pressure for producers to reduce losses of nutrients from agricultural watersheds has led to the development and promotion of a range of novel conservation practices, or Best Management Practices (BMPs). However, the Upper Iroquois River Watershed Management Plan details that:

“a lack of knowledge and information and actual use of BMPs to address the water quality issues exists and needs to be addressed to ensure an ecological and economically healthy watershed for today and generations to come.”

Although it is understood that the watershed's water quality issues are influenced by the actions of multiple stakeholders, this study – in partnership with Jasper County and Newton County Soil and Water Conservation Districts (SWCD) - focuses on agricultural producers' awareness, attitudes and experiences of conservation practices. Additionally the study considers the ways in which producers have come to learn about conservation practices, and assesses whether their informational needs are being met. Finally, the study offers a number of recommendations designed to improve the awareness and understanding of the practices, with the goal of increasing the likelihood that producers will consider voluntary adoption and reduce the extent of the current water quality issues.

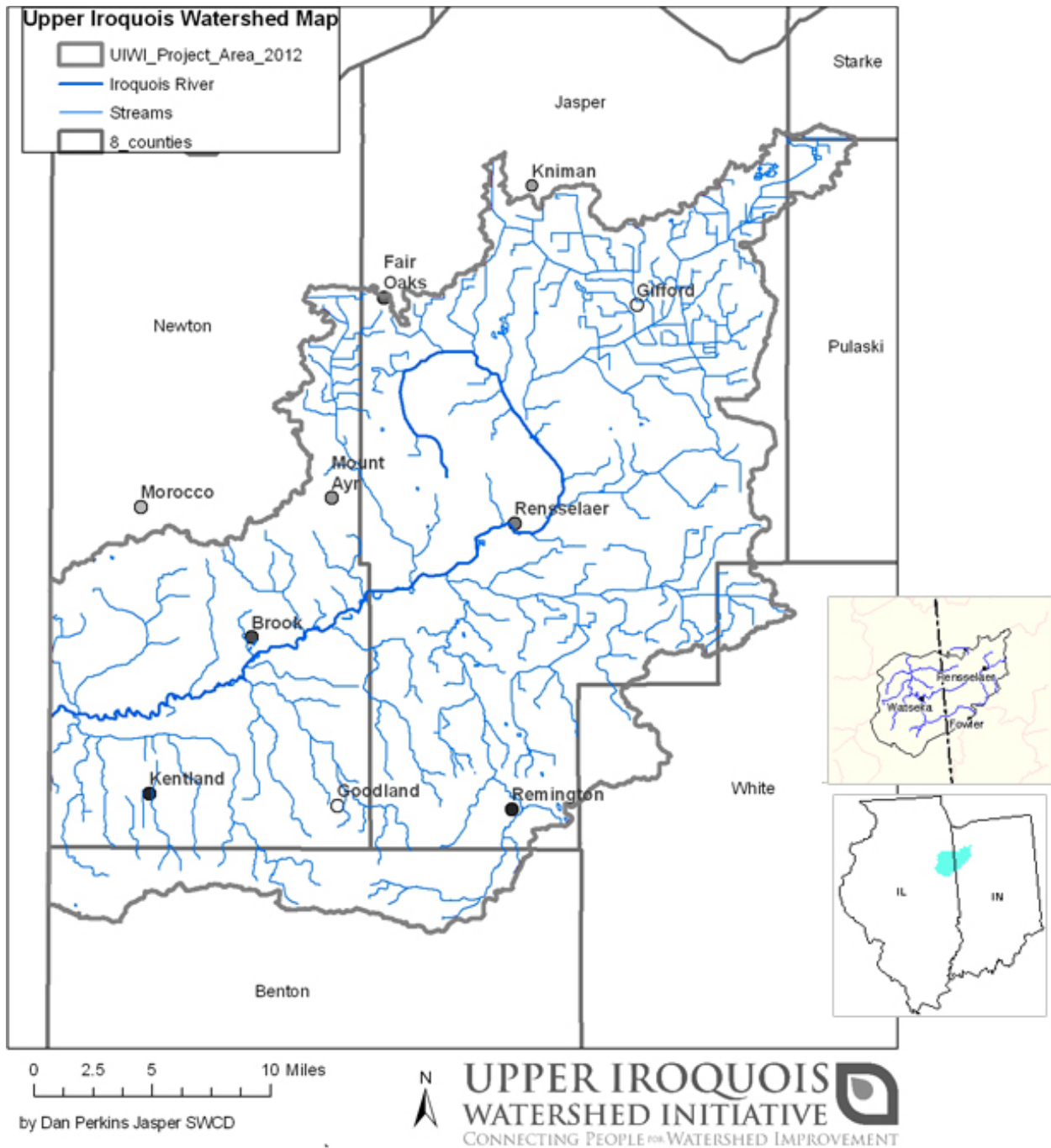
Methods

Based on the knowledge and experiences of SWCD staff, three classes of producers were identified for the study. These classes refer to producers' willingness to consider the adoption of conservation practices, and are subsequently denoted by the terms 'open', 'unsure' and 'hesitant'. Using a list of twelve producers drawn up by Jasper County and Newton County SWCD, initial contact was made via telephone with the goal of explaining the project and inviting producers to take part in an in-person interview. Eleven of the 12 producers agreed to an interview. The 11 producers included all three aforementioned classes: open (4), unsure (3), and hesitant (4).

The in-depth, semi structured interviews were carried out in-person at the farms of the participants in September 2014. The interview guide included questions covering a number of themes including; producer background and operation; conservation practices; and learning resources. There was also opportunity to explore additional avenues unique to the producer and their operation as they arose. When producers were unfamiliar with a particular conservation practice an information sheet was introduced that illustrated the practice, and summarized how it worked, and the intended benefits. The interviews typically lasted 40 minutes and were recorded using a digital voice recorder.

Audio recordings were transcribed verbatim, cleaned, and entered into NVivo – a software package for organizing and analyzing qualitative data. Emerging themes from the transcripts were refined by three researchers before participants' responses were coded (categorized into the themes). Coding was subsequently verified and reassessed by two of the researchers. The analysis allowed for the range of producer attitudes and actions to be compared, while retaining their classification as open, unsure, or hesitant producers.

Figure 1 – Map of the Study Area



Attitudes towards Environmental Protection

Producers identified excessive erosion and nutrient losses as the two most pressing environmental threats that result from the region's agricultural operations. These problems were often

recognized to impact the wider, off-farm environment, as sediment and nutrients are transported down a stream or drainage channel. Despite acknowledging that farming contributes to downstream problems such as Gulf hypoxia, assessing or quantifying the relative impact from the agricultural sector or a producer's own operation proved understandably difficult. Nevertheless, producers do recognize that these are problems that should be addressed, and that to do so would likely require a strategy focused on agriculture's contribution.

"Hypoxia concerns only come from nutrients whether that's from agriculture, industry, or residential. And I think eventually [inaudible] we'll have some severe restrictions. You're nine months away from the need of that particular nutrient. I don't think it makes a lot of sense to have it out there in the soil." – Unsure producer

"Well, you gotta decide what you're trying to conserve, whether it be wind, your soil, or washing your soil away with water, or nutrients being lost. You know, there's so many different things that that encompasses I guess, so you gotta have a plan."
– Hesitant producer

"I think it's crazy. It's almost, hate to say, I almost think the government should force you to do some things." – Hesitant producer

The desire to farm in an environmentally sustainable manner is often driven by a perceived moral obligation and personal responsibility. Producers whose farm has been in the family for multiple generations, and/or is expected to remain so often feel attached to the land. These feelings, reflective of stewardship, frequently reference a desire to maintain or even improve soil quality and health. Others expressed that their inclination towards conservation was driven by a desire to create wildlife habitat:

"I wanna take care of the soil. Like I say, it's been in my family for 150 years now. So I wanna keep it going. And I take pride in it." – Open producer

"I don't wanna have somebody complaining that I'm losing soil to 'em and whatnot. And then I would say being a hunter and kind of an outdoorsman has really sold it for me." – Open producer

"I don't think we need to depend on the government for everything... to make up your mind that you wanna do something about conservation and to be enough of an individual that you aren't concerned what your neighbors think. That's a lot of people's hang-up." – Hesitant producer

These comments indicate that perceptions from other producers can act as both a motivator for the adoption BMPs, as well as a barrier. Producers may also be dissuaded by uncertainty over a practice's effectiveness to achieve the desired outcome - practices which are not considered proven can

be viewed as a potential waste of time and money. Indeed time and money are barriers in their own right, even for the adoption of conservation practices with well recognized benefits. While practices that reduce inputs can be attractive to producers, those that negatively impact the farm business through a substantial initial investment, the removal of land from production, or by threatening yields (and therefore profitability), may be more difficult to promote:

"Most important, I guess, is profitability of the practice and then the problem is it depends on what practice. If it's easy to use or easy to implement. Sometimes you don't mind trying something if it's either not [going to] cost a lot or maybe on a trial basis." – Hesitant producer

"Oh, it's all about money. The larger you get the less time you have to look at the little things because you're more concerned about getting the crop out, getting soil worked or whatever you're doing, that sometimes the little things get lost and that little thing becomes a big thing sooner or later." – Hesitant producer

Despite such barriers there is evidence of a wide range of practices being used within the region. Here we consider producers' awareness, attitudes and uptake of a number of specific agricultural conservation practices; conservation tillage, cover crops, two stage ditches, drainage water management/controlled drainage and saturated buffers. In addition to questions on these practices, producers were also offered the opportunity to elaborate on others they were aware of, were interested in, or had adopted.

Conservation Tillage

Conservation tillage emerged as the most ubiquitous BMP in the region. All of the interviewees expressed that they had adopted the practice in some form. In the majority of cases conservation tillage actually referred to 'no-till' practices. There are instances in which the practice has been operating for a considerable number of years, and evidence to suggest that many producers are expanding the use of the practice as a result of their positive experiences.

"I pretty much went cold turkey in '85, started no-tilling everything, [...] it just kinda mushroomed after that." – Hesitant producer

"This'll be no-till completely next year. And see if that affects it 'cause my soybeans have always been no-till, but my corn was just tilled once in the spring. And I'm gonna do away with, stop doing that." – Hesitant producer

The uptake of conservation tillage appears to be driven by a combination of factors. Susceptibility to soil erosion was frequently cited as the reason why producers decided to investigate and try no-till practices in place of traditional methods. On the whole, the switch has been considered to have been very effective in ensuring that the soil remains in place.

“Well we have 80 acres [...] that’s highly erodible so we have to no-till it, so that’s kinda how we got started.” – Hesitant producer

“The first year I did no-till over here, it was right when I got the other farm. It was before we had auto-steer. The neighbor had to quit planting because the wind was blowing the dirt so bad that he could not see his marker strip. So he quit. Well, mine was no-till that year, and I could just go right along and I could see where I was at. And you could see the neighbor’s corn was blowing like hell, and there’s my corn, dirt just sitting there.” – Open producer

“And after one year of, one or two years of leaving the residue on the surface, my wind erosion problem was solved.” – Hesitant producer

In addition, producers have also found that conservation tillage (and no-tilling in particular) has resulted in savings of both time and money.

“I like farming but I don’t need to sit in a tractor cab a thousand hours a year. I’d rather go spend time with my kids or show cattle or whatever.” – Open producer

“No-tilling soybeans, that kinda got a trend there a few years ago. And it was a quicker way to get the beans in and save some fuel, so we started that pretty quickly there.” – Open producer

By providing benefits to the soil while simultaneously saving producer’s time and money, conservation tillage is now considered to be an obvious choice for many. Few disadvantages were put forward for the practice, further suggesting that it has become widely accepted in the region. However, one respondent did comment that the benefits of no-till are less assured when implemented on corn, as oppose to soybeans.

Cover Crops

Cover crops have received much attention in recent years and are fervently promoted in the study area. Consequently all producers are aware of the practice, at least in principal. Interestingly, past use of cover crops has not always been as a result of producers seeking to improve the sustainability or quality of their farms’ environment. In fact, responses indicate that a majority of cover crops users have

adopted the practice not for conservation purposes, but rather as a grazing crop, a saleable product, or even as a resource for recreation:

"I use them [cover crops] on 70% of my acres and trying to conserve water and soil, but mostly to make me money." – Open producer

"Well we always kinda had [cover crops]. We were always planting sorghum and sudex and things on wheat stubble when we get done and then we'd bail some of it for cattle for feed, and actually we used to graze it. We'd let sorghum grow up a little bit and then put cattle on it. And then being hunters, we'd leave some for the pheasants and hunt on it. So I don't know, we were always kind of doing it." – Open producer

"Really, the only reason we do it is if we want to use that cover crop for cattle feed the next spring, so it's really not for the purpose of holding the soil or anything like that." – Hesitant producer

More recent uptake of cover crops has been aided by the availability of funding initiatives such as cost-share programs that serve to reduce producers' financial risk. This has proved to be particularly important for those seeking non-monetary benefits since there remains uncertainty over how best to implement cover crops to improve water quality or accrue soil nutrients. Perhaps more so than any of the other BMPs considered, cover crops can be implemented and managed in a plethora of ways. Examples of the variations include the selection of seed type, the method for spreading/planting and terminating the crop, and the timing of planting and termination. When variations in soil type, cash crop rotation and weather are added to the equation, the complexity of successfully implementing the practice is further increased. In addition, it is accepted that it can take a number of years before meaningful benefits from cover crops come to be realized. For these reasons, those who are currently using cover crops primarily as a means to improve soil health or water quality, view the adoption of the practice as an experiment rather than an assured strategy:

"Well, I've been experimenting with them [cover crops] for probably ten years" – Open producer

"As far as cover crops, I've experimented with it a few different... some cereal rye, some annual rye, some radishes in the past. And so it's been a learning curve for me to learn just what works and timing as far as planting time, killing the crop..." – Unsure producer

"We just actually tried it one year. And it didn't work out real well. And again, it was just a matter of, we couldn't get it established early enough." – Hesitant producer

“it’s getting more, you know, crop-specific, trying to use different things to get different results.” – Open producer

The extent to which producers use cover crops was shown to vary considerably amongst the interviewees. From those reporting use, the percentage acres planted ranged from 5% to 70% reflecting that while some have had positive, and profitable experiences, others are still to be convinced that the practice can be successfully implemented into their operations.

Two Stage Ditches

The majority of producers participating in the interviews were unfamiliar with the term ‘two stage ditch’ and the purpose of the practice. The restructuring of the drainage ditch was occasionally interpreted as a means to combat flooding rather than to reduce erosion and sequester nutrients about to enter the channel.

“I don’t know who’s doing it. I haven’t seen one in this area I guess.”
– Hesitant producer

[On not utilizing two stage ditches] *“I guess I really haven’t had the problems with ditches flooding.”* – Open producer

This lack of familiarity with the practice, and the confusion surrounding its purpose and benefits are liable to reduce the likelihood of producers considering the adoption of two stage ditches. There was also uncertainty about the length of the ditch the practice would need to be applied to. This uncertainty coincided with fears that the practice would be costly to implement, and that it would require a substantial amount of land to be taken out of production – thus signaling not just an upfront cost but also a long term reduction in profitability. Although two stage ditches are designed to be more stable than the traditional trapezoidal shaped drainage ditches, producers also expressed concern that its maintenance would require additional time and money. Furthermore, where producers believed that it would be necessary to implement the restructuring of the ditch on long stretches of an existing channel, they thought it would be necessary to gain the support of all of the producers with land bordering that channel. All of these factors were considered barriers to this practice.

“You gotta have multiple landlords involved in it, and I mean you’d have to have multiple farmers and neighbors that wanna go along with doing it to a ditch. So that’s the problem.” – Open producer

“Who’s gonna pay for it and keep it like that?” – Hesitant producer

“Land prices have gone up a lot. [...] You can’t really ask somebody to give up two acres you know for what it’s worth to, to expand the ditch.” – Open producer

Once the producers were shown illustrations of the practice, and had its purposes explained, some recognition of the benefits did result. However, such recognition did not always coincide with an intention to alter existing ditches:

“To me that’s a great idea. [...] I think, if I remember right, for every foot down you need to be three foot out to get the right slope... to get the stable slope, and none of the ditches around here are like that because we just keep digging the bottom out. So that’d be a great idea.” – Hesitant producer

“If I was going to build a new ditch, I’d probably think about them, but I’m not going to change what I have.” – Open producer

The fact that respondents were so reliant on the interviewer’s explanation and diagram underlines the need to raise awareness so that producers can begin to make informed decisions about whether the benefits outweigh the drawbacks. In the case of two stage ditches, there is much work to be done on educating producers about the purpose, implementation and costs of the practice.

Drainage Management/Controlled Drainage

Drainage management (or controlled drainage) was another practice unfamiliar to and unutilized by respondents. Understandably the term drainage management was often interpreted to mean the presence of tile drainage and drainage ditches rather than the use of a control box with adjustable boards designed to regulate outflow from tile to channel. While this hindered in-depth discussion into the perceived benefits and drawbacks of controlled drainage, it did serve to highlight producers’ lack of familiarity with the practice. Even with the provision of diagrams and an explanation of the product, producers were not forthcoming in their recognition of any resultant conservation benefit. Instead, the practice appeared to be construed as a luxury that some would be unwilling to pay for.

“We do some drainage but it’s not the drainage that you’re necessarily talking about. This is just, you know, draining some of our low pockets. You can only put so much money out there and then you just kind of start at the big picture, the big problem, and work your way in the other direction.” – Hesitant producer

The need to raise awareness of drainage management, specifically referring to the use of a control box, is a necessary step in promoting the practice. Although producers demonstrate an awareness of the environmental issues drainage management seeks to address, as well as an interest in regulating water flow, at present the practice is not recognized as a solution. While cost did emerge as a potential barrier to implementing the practice, the perception was not found to be widely held.

Saturated Buffers, Riparian Buffers and Grassed Waterways

Saturated buffers were yet another of the more novel conservation practices which were typically unknown to producers, albeit it in name more so than the concept. When presented with an illustration producers frequently introduced the term 'diverter box' to refer to the point at which outflow through the tile was redirected, preventing direct flow into the channel. Despite this apparent recognition of what the practice was designed to achieve, none of the respondents had implemented saturated buffers on their operations. As with the two stage ditch, the perceived barriers included an upfront cost associated with installation, and the need to give up land that would otherwise be farmable:

"It's kind of an expensive practice. I like the idea of it, but like I say, it takes a lot of, it takes some money, and it takes a little bit of area to get it done... to properly do it."

– Open producer

"I just should have in it and I haven't. [...] I can't afford to lose money on those acres."

– Open producer

One producer who rented land also raised the issue that their landlord would unlikely to be open to the practice because reducing the amount of productive land would negatively impact the farm's value. While the benefits of saturated buffers could only be thought of in hypothetical terms, a number of producers referenced the similarity with practices they currently use for treating overland flow (as oppose to sub-surface, in-tile flow). In contrast to saturated buffers, many of the producers interviewed did have grassed waterways and riparian buffers (also referred to as filter strips). Grassed waterways in particular appear to have been commonplace on the operations for a number of decades, sometimes preceding the current producers' term.

"I have a couple of those [grassed waterways]. Yeah, they'd been put in 40 years ago." – Unsure producer

“Probably the last 20 years I put them [grassed waterways] all in. Every place possible, I’ve put them in. Soil and Water Conservation Service would pay 90% of the installation of one. And I know people who have humongous washes in their farms, and they won’t do it.” – Hesitant producer

Riparian buffers were found to be valued not only for their provision of soil and water benefits but also the habitat that they create, and the associated hunting opportunities this provides. In this sense, buffers appear to share similarities with cover crops, in that adoption is not always driven by conservation, but rather a less apparent supplementary benefit.

“Places to hunt was the main reason [for adopting riparian buffers].”
– Open producer

“The filter strips was good payment. The idea of keeping the chemicals out of the water is good, and some of the ground along the ditch bank isn't real productive anyways.” – Hesitant producer

Notably the success of both grassed waterways and riparian buffers has at times relied on attractive funding assistance. As the cost of diverting flow and adding new tile would likely be higher than addressing overland flow, it is extremely likely that such funding would be required if these producers are expected to consider saturated buffers as a means of managing sub-surface flows.

Evidently, there are a number of BMPs that producers at large are not aware of, or have not observed. This lack of awareness and exposure has implications for the likelihood of adoption, since producers are unable to make informed decisions by weighing the true costs and benefits of the individual practices. To address this issue we now consider which sources producers rely on for information about conservation practices, and their experiences with outreach efforts by promoters of such practices.

Outreach and Education

Drainage management (or controlled drainage), two stage ditches and saturated buffers remain unfamiliar to the majority of interviewees. At the other extreme, common practices such as grassed waterways and riparian buffers have been established so long that many are unable to recall precisely when or how they first learned about them. Conservation tillage such as no-till is becoming similarly common within the regional farming community, and while some profess to have always known about the practice, others can recollect their initial exposure:

"Well, we've been doing that [no-till] on and off forever, almost. Even when I was younger age we did some no till. But it seems like we kind of got away from there in some of the '90s and, but then now we're kind of going back to that direction."

– Hesitant producer

"In '85 [I] started no-tilling everything, didn't know what I was doing but got hooked up with some fellas in Illinois and attended some meetings over there and it just kinda mushroomed after that."

– Hesitant producer

Thus, while awareness and enthusiasm for conservation practices may arise through connections with other producers, more formal events also have a role to play. Awareness of cover crops has been strengthened through meetings as well as demonstration sites organized by SWCD, the Natural Resources Conservation Service (NRCS), and the Farm Service Agency (FSA).

"It was a breakfast meal, and he talked about cover crops. That was good. And I attended that. The demonstrations, I've always got them and wanted to attend [...] I haven't been able to."

– Hesitant producer

"It was like an all-day workshop. That was pretty interesting. But usually it's just a soil pit and they go out and kind of see what cover crops are working in our area and how deep they're rooting and that kind of stuff."

– Open producer

The study revealed high levels of awareness of these demonstrations as a result of advertising through a variety of channels:

"Usually it's either print in the newspaper or get an email from NRCS or FSA, or word of mouth."

– Unsure producer

"Well they usually send us a notice in the mail, and then he calls us. And there are publications, papers, [...] email, too"

– Hesitant producer

Despite the commendable effort organizers are making to engage producers, some contend that they do not have sufficient time to attend, even when the events are of genuine interest. As a result of their limited time, a number of producers described how they preferred to self-learn through the use of publications and/or internet resources:

"I've been wanting to go to a field day. There was one [...] They flew on a whole bunch of, I think, annual rye grass. And they did a dig. That was like four years ago or, I think or something like that. I was going to go to that and then there was a lot of stuff going on here, so I just let it go, didn't go to it."

– Unsure producer

I hate meetings and workshops, I probably left there thinking it wasn't a useful or good use of my time [...] I just dread doing stuff like that, so most of my information,

when we're looking for information I usually Google it and so [use] university websites that have good information." – Hesitant producer

"I would probably be more likely to read something - It's faster." – Hesitant producer

In contrast, others praised the value of demonstration sites for their potential to provide an observable practice and real-world results – elements that other learning resources lacked. The opportunity for producers to see these practices and results up-close and in the flesh was thus considered a key motivator in encouraging attendance:

"I really don't like meetings, but I like demos out in the field when I can actually physically see it. You can sit in front of a projector screen, and they can say, 'Oh here's what a cover crop will do.' It really doesn't sink in until you actually go out and see it on your own farm." – Unsure producer

"Just to get out and see it in real life is pretty beneficial to me. I mean, I can sit through a lot of meetings in a room somewhere and have soil samples, and it just doesn't do the same as getting out and seeing it actually growing or something happening on your neighbor's [farm] or getting in a soil pit or something like that."
– Open producer

Although demonstration sites have proved beneficial to certain producers, responses indicate that an interest in the practice being demonstrated is often an important precursor to attendance. In other words, attendees often have some idea of the practice's function before choosing to attend a demonstration site which they subsequently use to observe a practice and learn more about the specifics of implementation:

"Well I just kinda wanted to get in on it. Like I say, it was gaining some traction. And then I was hearing more and more about it. So I kinda wanted to get in on it and find out what was going on." – Open producer

"I think there's enough chatter about cover crop that the ones that want to try something new or want to learn... One guy that - it's worked really good for cover crops - is the seed salesman, and he had people asking about it. He said, what's going on here? What do I...? I said, 'Well, come on out. Look and see.' And he still talks about it. It's unbelievable. So this spring, he made sure he got to another one."
– Open producer

While demonstration sites are designed to show producers the implementation of a practice, many producers also pointed to the additional benefit of being able to engage with other producers who are considering, or have already adopted, a practice. These discussions

are especially valuable for practices where successful implementation is dependent on a large number of variables. For example, the aforementioned success with cover crops may be impacted by soil type, seed selection, application/planting, and termination. As the benefits of the practice are not immediately recognized, the assemblage of producers with varying types and lengths of experience is evidently a very valuable resource, supplementary to the actual demonstration.

"It's always good to visit with other farmers. And that's like I said, any of them kind of meetings, you always gain something [...] sometimes you gain information just talking to people." – Hesitant producer

"There's some conversation. 'What did you try?' 'What time did you plant?' 'Did you aerial seed?' 'Did you put in with the drain?' You know, the way you planted it. But there's some interaction, yes, as far as comparing what one farmer's practice is to another and what were the results. I think most people are trying to get a consensus of what works and what doesn't, and obviously they want to go for what works."
– Unsure producer

"You always learn from the demonstration, and new ideas from other farmers and the Soil [and Water Conservation District] people." – Open producer

"You meet other people and get them, talk with them about what they do, and they ask you. So it's good for them too." – Open producer

Despite these benefits producers also expressed some criticism towards the demonstration events they had attended (all of which happened to be on cover crops). Producers generally deemed the events too long and repetitive. As a result even those producers deemed most willing to learn about conservation practices often felt that the value of the experience was insufficient to compensate for the time they were required to commit.

"Well there's some repetition to it I'm afraid is the problem. You wanna go just to see what happens next, but then at the same time when you've seen the same effects in two or three holes, it's like - 'Well, you know I've got things to do at home. I might need to get going.' So I'm afraid that's kinda what they get into. I really think they ought to maybe try to go around and pick out a few examples of what they wanna show and just not keep going to the same thing over and over again" - Open producer

"I think, the way we've been doing it, we go to [...] I don't know how many houses. I mean, two stops is plenty. Eat lunch and go home." – Open producer

"You can't go to every one of them because it's kind of repetitive." - Open producer

"If we had less time, you know what I mean. You know, this is a two or three hour deal, not an all-day deal, maybe." – Open producer

Recommendations for Outreach and Education

- Attempts should be made to provide producers with information on BMPs through a variety of mediums. Although demonstration sites have been effectively promoted in the region, a number of producers prefer to learn on their own terms through reading publications or accessing online resources. The use of online videos by SWCD is a commendable step. Conservation staff should consider expanding these accessible resources, as well as using their existing means of outreach to highlight relevant material produced by others, such as universities.
- The breadth of information made available to producers should be expanded. At present substantial efforts are being made to promote cover crops while a number of other conservation practices (namely controlled drainage, two stage ditches and saturated buffers) receive little attention. This is reflected in the producers' lack of knowledge for the more novel BMPs. Without knowing something about these practices, producers are unlikely to consider their adoption.
- Non-conservation benefits should also be incorporated into the promotion of conservation practices. While a number of producers had adopted practices to reduce their costs or labor, to produce a usable product, or to provide habitat for hunting, it is possible that non-adopters do not recognize or appreciate these less tangible benefits.
- Producers should be made aware of any available cost share opportunities. Since perceived cost and reduced productivity are key barriers to the adoption of conservation practices, opportunities to offset these losses can be very important in producers' decision making process (as history has shown).
- The value of demonstration sites in allowing producers to observe a practice and engage with other likeminded individuals is very clear. The inclusion of a free lunch is

widely considered to be an effective incentive for producers to attend these events. However, organizers should take note of suggestions for how the events may be improved. These include reducing the overall length of the events and ensuring that they exhibit sufficient variety so as to not seem repetitive. It is hoped that such change would result in greater attendance and value, as opportunities for producer interaction increases.