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TAPS Program Evaluation - Producers

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Executive Summary

The most predominant theme in evaluating the TAPS program is that *no two farms are the same*. Each has a plethora of factors influencing the decision making for their agricultural enterprise: geography, weather, family dynamics, finances, world view, etc. The adoption of new management strategies and technologies as a consequence of participating in the TAPS competition varies because each farmer and farm operation is different. However, all participants want to break even and stay in business, and many are worried about the longevity of their natural resources.

I grew up in the Republican basin and I can remember when they said Harlin will never fill again. You know, I look at the dams to the west of that valley and a lot of them haven't filled again. So, it's constantly a fight for how far we can get this water to go. And, you know, we hope Mother Nature don't cycle two years like this at us. But we've got to be able to manage through it when we do.

To balance all these contextual factors, flexibility on the farm is key. Being flexible can include trying new things—things that save them time, money, and resources. This makes the TAPS program a valuable tool for agricultural producers as they try out new technologies and management strategies before implementing them on their own farms, because it allows them the ability to experiment without having to incur risk.

The unique circumstances of individual operations can be challenging to consider as educators look to impact behavior change within the farming population. It is therefore recommended that the TAPS team re-evaluate their vision and mission statements, asserting clear long-term goals for their participants, and specific learning objectives to be accomplished for each competition. The creation of a logic model would assist with the creation of desired and measurable outcomes of the TAPS program and a clear pronouncement of the intended population.

Introduction

The mission statement of the Testing Agricultural Performance Solutions (TAPS) program is:

To fully engage agriculturalists, scientists, educators, students and industry in an innovative endeavor, to TAP into the University of Nebraska's potential to facilitate and create an environment for all stakeholders to work together in finding solutions through innovation, entrepreneurialism, technological adoption, new managerial applications, improved techniques, and cutting edge methodologies for Nebraska's future farms, farm businesses, and farm families to maintain profitability, sustainability, and productivity.

This mission is carried out through several interactive real-life farm management competitions in farm production. In Nebraska, four competitions are held: sprinkler corn, Subsurface Drip Irrigated (SDI) corn, sorghum, and winter wheat. Competitors make production and marketing decisions for their TAPS “farm”, which includes three plots representative of a contemporary farm for each crop. These decisions are made on a password-protected online portal for each competitor. Onsite program staff then execute participants’ decisions on their plots. Management decisions include:

1. Hybrid selection
2. Seeding rate
3. Crop insurance
4. Nitrogen management
5. Irrigation management
6. Grain marketing

Plaques and cash prizes are awarded at the end of season for the following three categories of each competition: most profitable, highest input use efficiency, and greatest grain yield.

TAPS competitions bring together UNL scientists and extension professionals, producers, industry leaders, agriculture students, government regulators and agency personnel aiming to become part of a highly engaged network focused on evolving profitability and input-use efficiency.

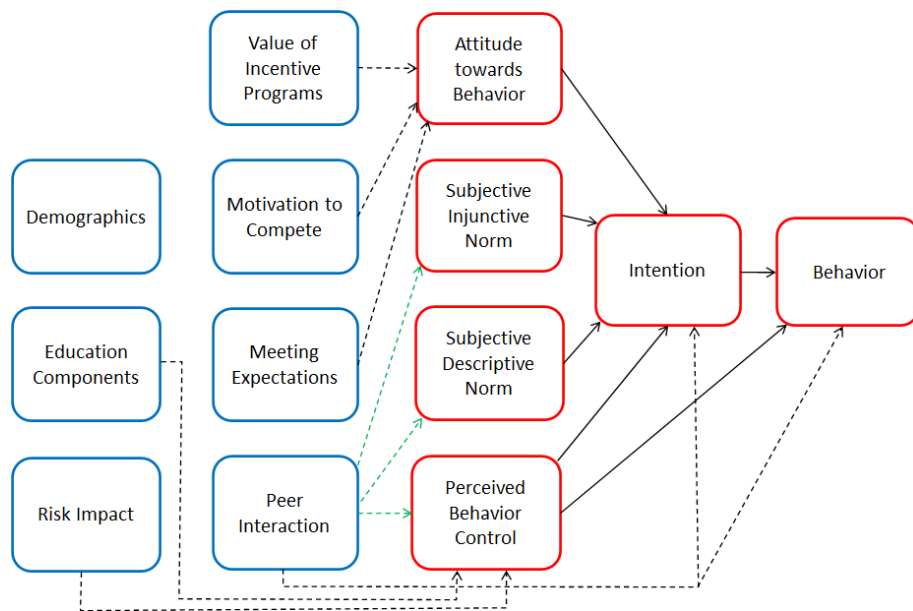
TAPS allows producers to use their preexisting knowledge while also developing new proficiencies to demonstrate their farming skills/knowledge in the competition. This is done without having to incur risk on their own operation. The program also offers a variety of educational components, ranging from peer-to-peer learning to industry leaders providing state-of-the-art information and technology to the participants.

TAPS is unique compared to traditional farming competitions in that the top prizes go to those who are most profitable and the most efficient users of water and nitrogen. This is intended to encourage stewardship and forward thinking.

Information about the program is distributed widely through a number of media sources, a monthly digital newsletter, social media presence, and presentations given by the TAPS team. As a result of the popularity of the competition, other states are now replicating the program. Due to the expansion of the competition and to ensure the quality and the longevity of the TAPS competition, this report examines the impact of the program on producers and their operations.

Methodology

To evaluate the effectiveness of the TAPS competition, a convergent mixed methods design was used to answer the research question: what is the impact of the TAPS project on participants and their operation? In this design, both quantitative survey data and qualitative interview data are used to gather complementary information on the same topic: the adoption of new management strategies and technologies by agricultural producers. Having both data sources helps to better illuminate the impact that the TAPS program has on participants and their operation.



TAPS Behavioral Model

This program evaluation investigates the impact of the TAPS program on its participants, specifically examining grower attitudes, motivations, and decision-making processes and their resulting behavior change. Survey and interview questions specifically gauge growers' perceptions of adopting new technologies and management strategies through the following concepts:

- 1) Attitude towards adoption
- 2) Injunctive norms (approval of fellow farmers)
- 3) Descriptive norms (if others are adopting)
- 4) Perceived behavioral control of behavior (if they have skills, equipment or can acquire them)
- 5) The value of incentive programs
- 6) The motivation to compete
- 7) How TAPS did or did not meet expectations
- 8) Peer interaction
- 9) Demographic variables
- 10) Experiential education
- 11) Risk impact

Survey Procedures

An online survey was developed to fit two groups of TAPS participants: agricultural producers and non-ag participants. The language for the producer survey centered on the adoption or change in attitudes/beliefs regarding new technologies and management strategies *on the land that they farm*. Non-ag participants were labeled as "others" and their questions focused on how TAPS impacted their relationships with producers, as most of them were educators, industry members, or agency personnel. In this way, both groups were asked about the same concepts, but questions were applicable to their role. Online surveys were open to TAPS alumni of two years or greater from August 2022 through December 2022. Only producer data is included in this report.

Interview Methods

Only agricultural producers who had participated in the TAPS competition two years or longer were included in the pool of participants chosen for interviews. This time designation allowed participants enough time to implement the things they had learned. These were TAPS “alumni” because the competition currently has no limit to the number of seasons participants can compete. Emphasis was placed on possible interviewees who would share their opinions of the project unabashedly. A list was provided by the TAPS program manager. Twenty-six producers were interviewed.

Interviews were held mid-August 2022 in Nebraska and Kansas at locations of participants choosing and Zoom, if needed for scheduling. Most interviews included only individual producers, but a few were inclusive of a participant’s entire TAPS team. It was the idea that because they competed as a team, they would give feedback as a team. Interviews lasted approximately one hour in a location of the participant’s choosing.

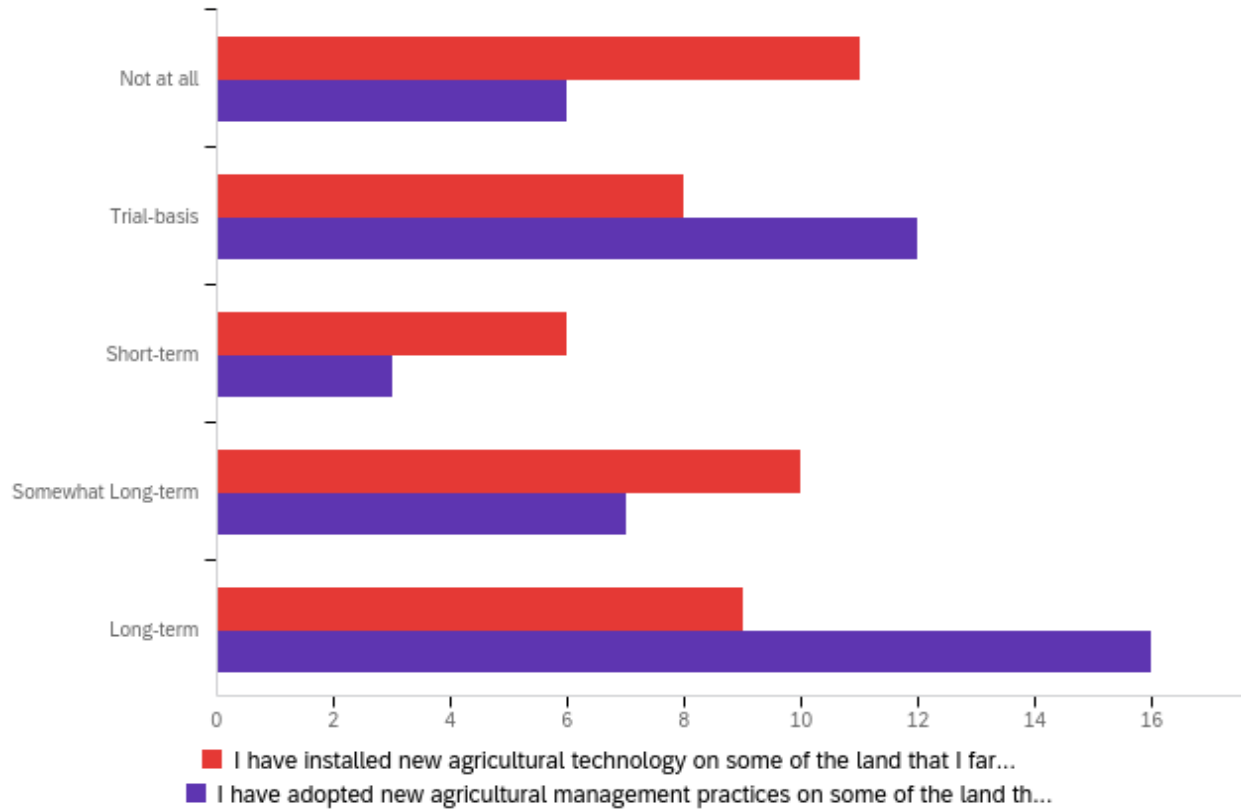
All interviews were audio recorded and transcribed. Taguette, an online software program used for qualitative research, was utilized in the coding process. Transcripts went through one round of deductive coding—where we looked for the specific concepts contained within the research model. This was followed by each deductive category being inductively coded to let ideas emerge for each concept.

Findings

This section combines quantitative and qualitative results under each variable/concept of interest. Forty producers completed the entire survey, and 26 producers were interviewed.

Behavior

In the online survey, producers were asked if they have installed new agricultural technology or management practices on some of the land that they farm since participating in the TAPS program. Of the 44 producers that answered these two questions, 86% have adopted new ag management practices on at least a trial basis on some of their land and 75% have adopted new ag technology on at least a trial basis on some of their land.



Interview data can be used to help explain some reasons behind those who have not implemented changes on their farms since participating in TAPS. Interviewees were asked regarding behavior: What are some of the new management strategies and technologies that you have adopted on your farm since participating in TAPS?

Most producers interviewed have adopted new technologies or management strategies since participating in TAPS. The few who have not adopted new management strategies or technologies on their farm; 1) are experimenting with TAPS to see if the tech is truly viable before adopting it, 2) have specific operational details - the techs/strategies - that don't make sense (geography/lack of water/money), or 3) were early adopters and adopted before TAPS participation. The following list was compiled from the interview responses of specific things participants have adopted:

- Seeding rates
- Various pivot technologies
- Soil moisture probes
- Using less nitrogen/cut back on N inputs
- Split application of fertilizer/Spoon-feeding nitrogen/N placement as needed

- *An application or two split applications of fertilizer. Through our pivot, we realized the benefit that we got on that TAPS corn, we got a yield boost, realized...it wasn't going to cost us any more money to put it out in the middle. It was going to cost us time, which everything you do is extra cost in time, but it wasn't going to cost us any extra money and it was going to give our corn an opportunity to have that fertility midseason as opposed to frontloading or anything like that. So, it changed the practice with our nitrogen management, I would say probably the most.*
- Valley scheduling™
- Marketing strategy

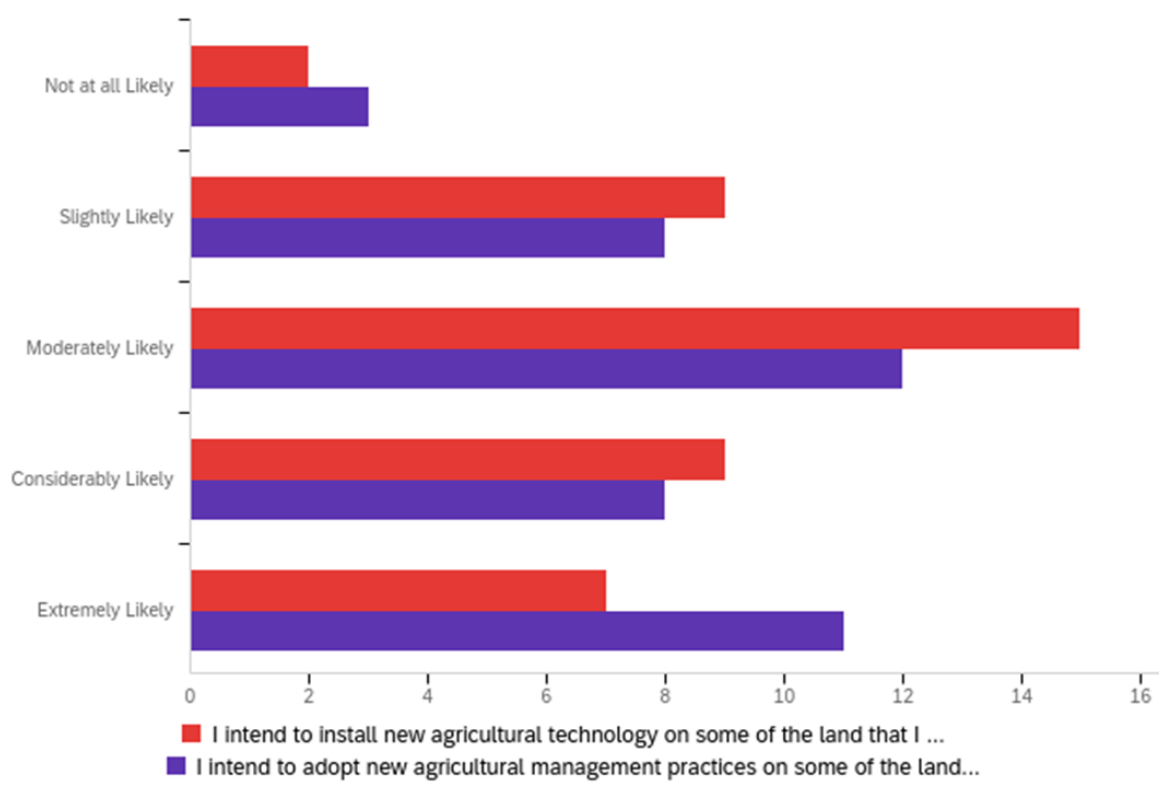
Many of the farmers interviewed found experiences with their fellow teammates helpful in marketing. While most farmers are confident in their farming abilities, they acknowledge being relatively inexperienced in marketing.

One of the participants ... has a Ph.D. in economics... Anyway, he kind of helped us with the idea of setting a parameter on when we should start marketing grain throughout the year. And of course, that TAPS program gave us 'til around the 1st of December to make a decision on marketing our crop. We sat down as a group and decided what the probability was at certain prices, you know, what the likelihood of corn was going to be at a certain date. And so, we said, all right, if corn is X, we want to sell 20%. And if it goes to the next level that we had picked, sell another 20%. So, we could. And the TAPS program is based on 3,000 acres of irrigated corn. And, you know, the average yield was 240 bushels an acre... So, we had a lot of grain to market.

I think the main one for me has been with marketing in terms of looking at it from start to finish rather than just at towards the end. You know, when I started in a drought, I didn't think I'd have a crop, so you can't really market it. But in learning some of the tools and experiencing how some other people have marketed and not, I'm not a big hedger or anything, I pretty much stay within my comfort zone with what we have. But I understand it better each year and how to use my insurance coverage to try and make sure I'm getting the highest price for at least 30 to 40% of it that I can.

Intention

Intention is a subset of behavior. In this regard, we asked interviewees if they intended any future changes for their farm: I intend to install new agricultural technology/management practices on some of the land that I farm within the next couple of years.



Most survey respondents answered they were at least moderately likely to adopt new technologies (78%) and management strategies (78%).

An overwhelming outcome from producer interviews is that they MUST adopt new management strategies/technologies because efficiency is required to keep their operations viable. What are their intentions about future changes on the farm? Change is constant and required. They are open to adopting new ways of doing things *when it makes sense*.

The one time they work for me is the final irrigation. Is there enough [moisture] for that bean crop to finish? And this year, the answer is no. I still need like five inches, and it's almost done. I mean, it's nice to know that your crop is suffering, I guess... Then it just is kind of mean... But, I'm big within our NRDS and so I'm always watching for different ways to use our water in terms of different timings. And could the fertigation be more important. It just takes me so long to get around now that I almost miss my window to get that fertilizer on. So, not a lot of fun things we get to try. We try to stay ready just in case there's an opportunity to. But I haven't had many opportunities yet.

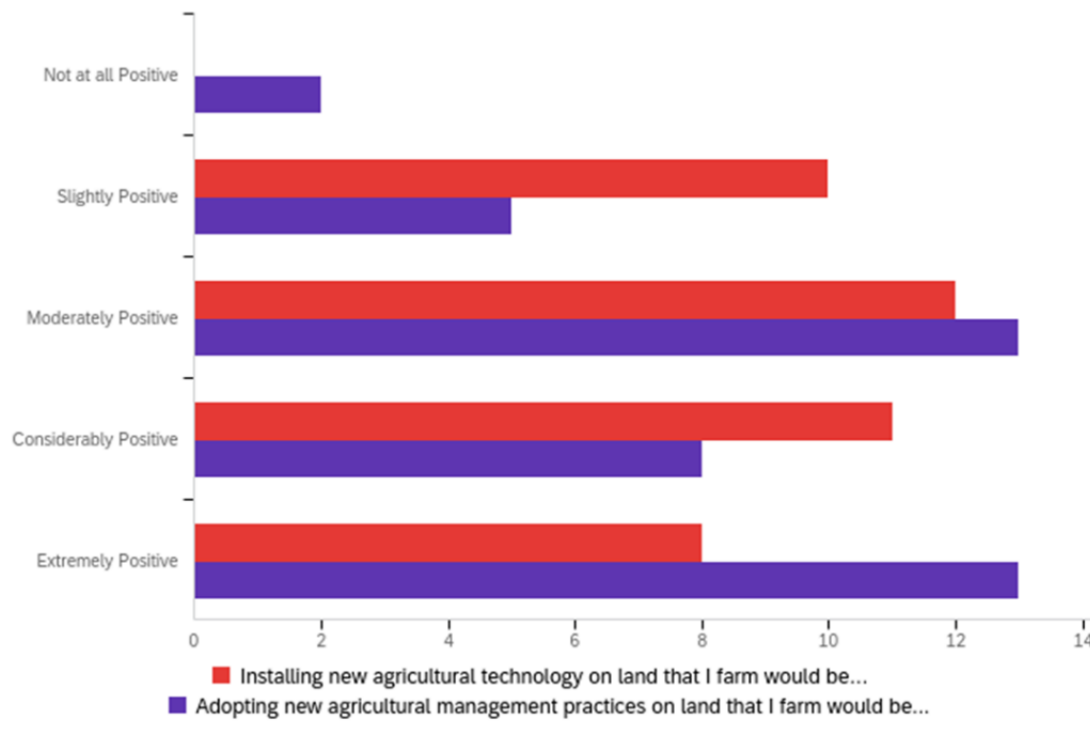
This quote is an example of producers being willing to try new things, but not having the right geography for the technology/management strategy to be applicable. There were many similar sentiments.

Interviews with producers showed that they are not necessarily going to take something home and use it the first year. They use TAPS as an opportunity to watch what everyone else is doing. At the end of the year, if they see something that worked well for someone else in the program, they are willing to experiment with it themselves. If that experiment goes well, they might implement it at home.

I said, the first year we did, I didn't do that. The second year after I digested all this information is when I implemented some of that.

Attitude

Attitude is a precursor to intention to act and behavior. If a person's attitude toward a behavior is positive, they are more likely to adopt that behavior. We asked TAPS producers how positive they found new agricultural technologies and management strategies. A large majority of respondents found installing new agricultural technologies (78%) or management practices (85%) at least moderately positive.



During interviews, producers were asked to describe their thoughts about adopting new management strategies on the land they farm, including technology. Their attitudes were positive overall. They are willing to try new things and, as mentioned above, feel that they must

keep up with an ever-changing industry. *“If it’s profitable, if it has an ROI, I’m willing to try anything...”*. New technologies and management strategies can save farmers inputs, time, and money.

Also, and importantly, participating in TAPS has promoted an attitude change in some: seeing is believing.

Attitude change

You know, the first year I think I put on 240# of nitrogen, and I figured I wasn’t going to be anywhere close to where I needed to be. The person that won it went with 180#. So, it blew me out of the water. So that’s kind of when everything changed, the way I looked at things.

Easier on their dime

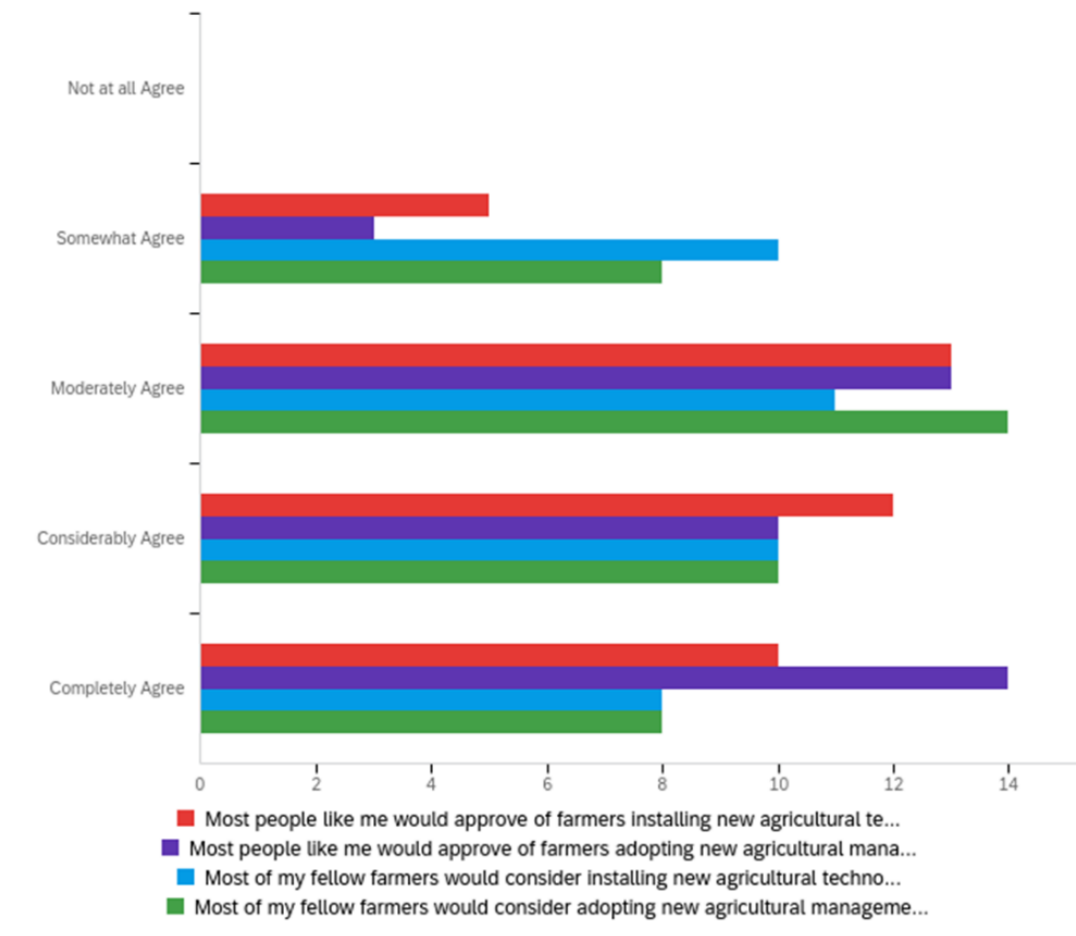
It’s a lot easier to try it at the TAPS level, and then if it kind of works up there, then we feel like we can try it on our farm. We usually don’t go whole farm-wide; we’ll try something on a pivot maybe, or a little bit of dry land or something like that. But it’s a lot easier to try something on their dime, I guess.

Keep up or get out

I think if you’re not looking for new strategies or new ways, then you won’t succeed. I think you’ll just plateau. And in the current environment and the current economies and everything, you will go backwards faster than ever. And so, we’re always looking. They don’t always fit here, whether it’s size or usually it’s moisture. Cover cropping is not an option here because we don’t have the soil moisture. But I know what blend I’d use, and we know what time we try to put it in if we ever had that chance. And we look at it as, could we put some in the terrace channel? I mean, it’d be like a ten-foot swath that just might catch enough rain to grow. Could we experiment with that?

Yeah, some things work, some things don’t. But you have got to adapt or you’re not going to stay around too long. I don’t think business-wise.

Social Norms



Both injunctive and descriptive social norms were examined: one item asking if fellow farmers would approve of specific new management practices/technologies and the other item asking if other farmers would consider adopting themselves. All 40 respondents to these survey items at least somewhat agreed that others like them would approve of farmers installing new technologies or adopting new practices and perceived that their fellow farmers would consider adopting if they could afford it.

Producers that participated in the interviews were asked: “Do you think your fellow farmers would approve of you adopting new management strategies, including new technologies? Why do you think that is? And do you think your fellow farmers would seriously consider adopting new management strategies, including new technologies? Why do you think that is?”

Interviewees reported that their fellow farmers would approve of their adopting new techniques and would consider adopting new management strategies and technologies themselves *if it makes sense*. A few mentioned not caring about the opinions of their neighbors, but acknowledged neighbors are watching “over the fence” and if they see that a new strategy is working, they will inquire and will consider adopting it themselves. Why? Because new technologies or management strategies can save a producer inputs, time, money, etc. “...It's a dollars and cents thing: it's gotta pay. And then if it does pay, it's easily adopted”. To compete and make money, they must adopt new ideas.

I think everyone. Well, maybe not everyone, but most farmers recognize that new technologies are a constant part of farming and typically they do add value. I think the expense obviously has always been a detractor with adding new technologies, but I think that's part of the game, I guess.

The quality of grower we have today. They're well educated. They have good management skills. And if they see something that makes good sense to them, they'll adopt very quickly.

I would like to think so, anyway, if it makes me a better farmer. Fellow farmers: I don't know... If you're a better farmer, there's more competition for them anyway. That's kind of how it goes.

I think other people would see and hear from me that it's worth it and maybe attempt to do the same thing. Well, what's better for me is better for them as well. It's just more sustainable for everybody.

Yeah, I think of the people that are our age, that are back farming, are looking at a lot more of this stuff. They are farming a lot more acres. They're going to be a lot more efficient. So, they're kind of looking at bringing in new practices and stuff that's going on, not just saving time, but also helping increase their bottom line because it's pretty competitive in the marketplace to pick up more land. And you've got to be pretty successful wherever you farm if you're going to make your either payments or make your cash rent payments. It's competitive so...

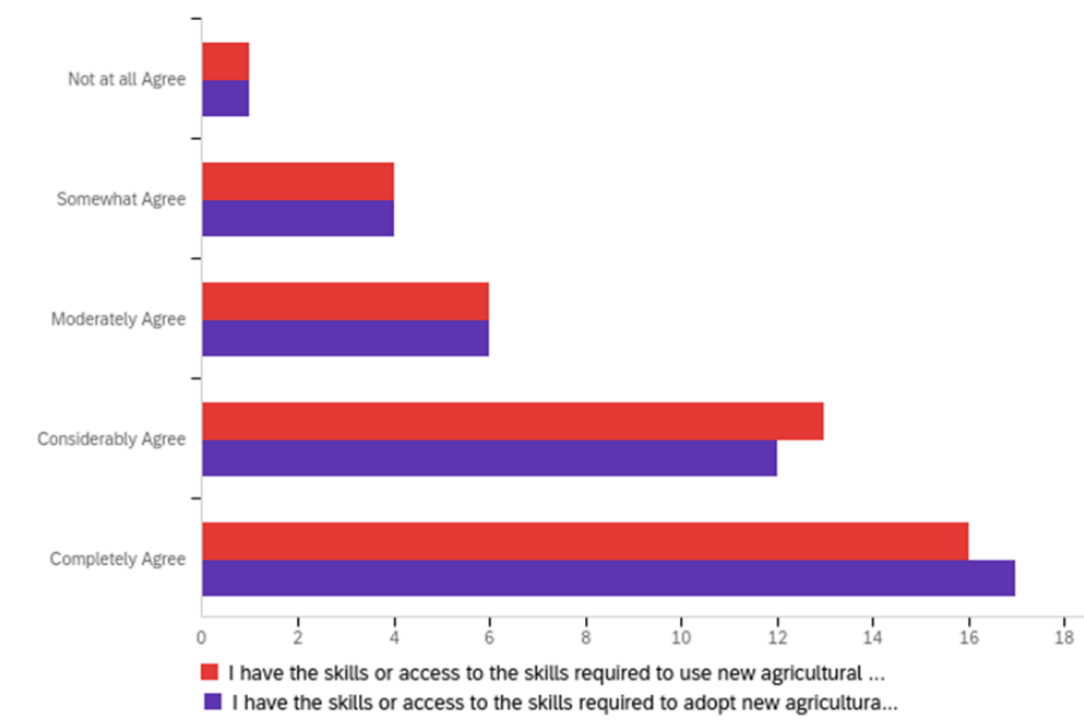
They've pretty well figured out that I'm a different cat, but they do follow me, you know? I mean, there's a lot of them that call and ask for advice. And I'll guarantee you half the neighbors watch everything I do anyway... Watch the guinea pig.

Yeah, I think so. Just so they don't have to be the guinea pigs.

They know that every one of us has to be good stewards of both [nitrogen and water] or we're not going to have either. So, it's no longer the fight over who gets the best yield, because we're worried about them doing a better job and getting that piece of ground. We all know this has got to be done to keep farming in Nebraska. And there's a lot of

focus on it. Some people say, oh, no one pays attention to that and it's not such. I mean, people are starting to take note of if we don't get it right, we won't have it.

Perceived Behavioral Control



Producers were asked how much they agree with the following statements: I have the skills or access to the skills required to use new agricultural technology/management practices on land that I farm. Of the 40 people who responded to this question, only one did not agree. Most (72.5%) considerably or completely agreed.

Interviewees were asked: Do you think you have the skills and equipment, or can acquire them, to adopt new or emerging technology/new management strategies? Explain.

Producers interviewed expressed having the skills and tools to adopt new management strategies or technologies. They can “keep up” and learn—it is part of trying new things. “You know, I've got the skills if I'm willing to take time to learn them.” Cost was the only thing mentioned as prohibiting tech adoption or having to “sort through the muck” of choosing between the vast array of technology companies and options.

You find the way to make it work or you don't. You know, if it's cost prohibitive, you don't do it.

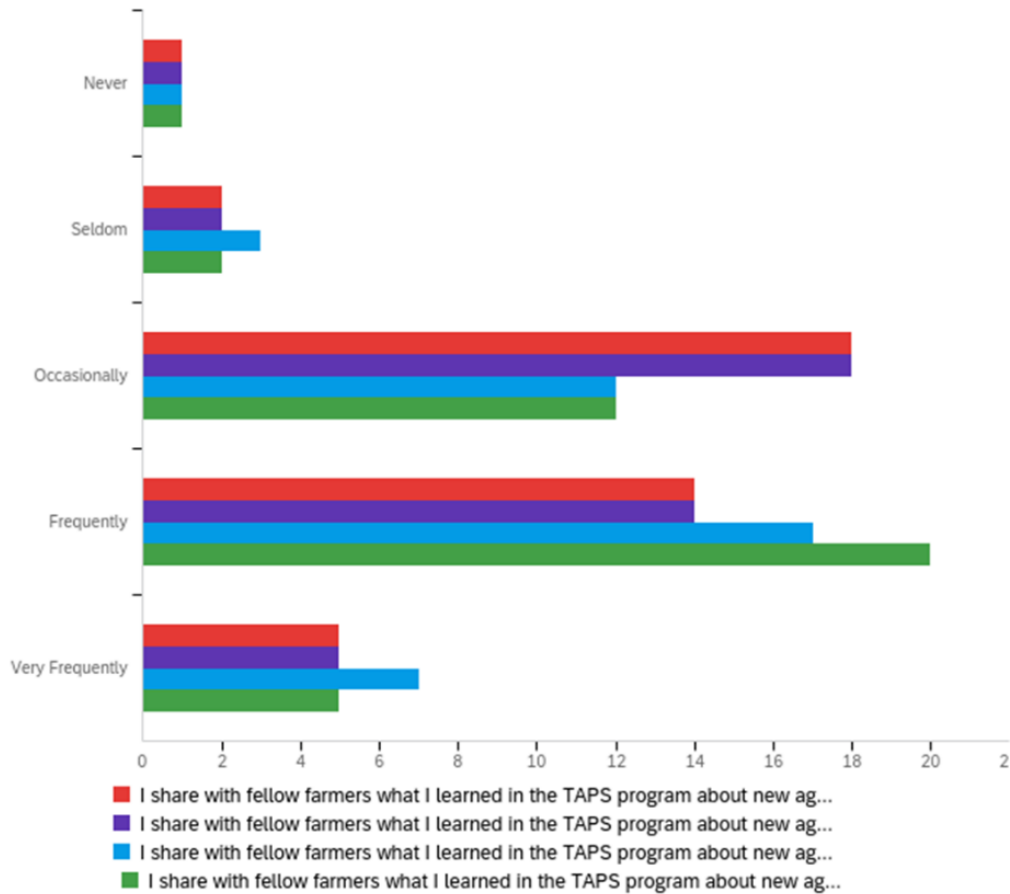
Well, yeah, I'm not always the first one to adopt it, but I won't be the last. Let somebody else do the trial and error and I'll jump in right behind them. Usually how I operate.

Just being open minded. Willing to try. I like to see a lot of research and do like to look up a lot of different plots and test on it, just so I'm not jumping headfirst without having a little bit of data to back it up.

But you got to continue to grow... Continuous education. It's very easy to get complacent. I feel like I got it figured out, what I'm doing is working. There needs to be a continuous education. You are never, never at the point where you don't need to learn more. You can always get better. And it's one of those little things. And sometimes just hearing things you heard a long time ago, but you forgot about.

Peer Interaction

Producers were asked how often they share with fellow farmers what they learned in the TAPS program about new agricultural technology/management strategies and then again what they share with fellow farmers when asked. Thirty-seven of 40 producers (93%) reported sharing at least occasionally what they have learned about new ag technology and management practices. When asked, 90% shared what they learned about new ag technology with fellow farmers and 93% shared what they learned about new management practices with fellow farmers.



Interviewees were asked: describe how you and your peers exchange information, new technologies, experiments, or skills.

As expected, agricultural producers still prefer one-on-one communication. Coffee shop talk might be dwindling, in exchange for the younger generation’s preference to “beer thirty” in the shop, but it’s the camaraderie that continues to be important. However, there is an interesting concept to highlight: “keeping it close to the vest”. This refers to the pressure of competing against your neighbors and how it can inhibit a real sense of community and the sharing of ideas.

Social media and online forums are gaining popularity. Not only can Google provide the answer to almost any question, but some producers are members of online farming forums or have active, farmer social media groups. Online resources are especially important for some of those interested in regenerative farming methods, who may struggle with finding local peers/networks that think like them. The TAPS farmers interviewed for this project were a

diverse group, varying from those who are in the process of retiring out of the business—handing decision-making power over to the next generation, to some patiently waiting to make decisions, to those who are a bit more progressive and looking at regenerative approaches—not following the status quo, so to speak.

How do these farmers exchange information? The most common answer was watching over the neighbor's fence and then calling or stopping if something looks good.

Just somebody stops by your farm or, you know, if we see something going on or something that we might be working towards, we'll just go out to another farmer's area and just either watch them work or we just talk. But honestly, it's mostly it's just sitting around for a cup of coffee in the morning and just kind of talking about each of our experiences and how can we help each other and, you know, further each other by just helping out.

Kind of randomly. You know, it was a lot more so prior to COVID. Because there was a lot more of just hanging out around pickup beds a little bit, you know. And then it kind of really died off and it still isn't back. There's still a group of coffee goers. But, if you catch somebody on the way out to coffee, you can have a decent conversation. Otherwise, it's just all, you know, piss in the wind kind of stuff. Oftentimes at trade shows, I'll catch some people and you just happen to be standing there. If there was something I was researching and it was at a trade show or something, I'd try to just kind of hover nearby. And when I saw somebody I knew that either had it or was thinking about it, I'd try to make sure that I made contact with them later.

It's more a convening around/through the industry partners and those exchange of ideas. And at that point, that then becomes a relationship plus a recommendation. And that's really that's how it grows. It's giving the industry stakeholders more tools to talk about or more relevancy to the producer they're going to talk to. You're going to know whether you can look at a producer and say, well, Pullman Farms is doing this...or, hey, I know we've been around Zach and Rick and we see what they're doing... I know a lot of its watching across the fence, but more importantly, regulatory agencies want to have the confidence to cost share or implement strategies that help their producers. And the NRD is a good example. And DNR another good example...

And then outside of that (close network of trusted people), we also have a seed business. So that has probably put us on more of a platform that we talk with a lot more growers. And if they see something, whether it's a publication about TAPS or our name pops up somewhere, we talk about, well, we tried that on this and...

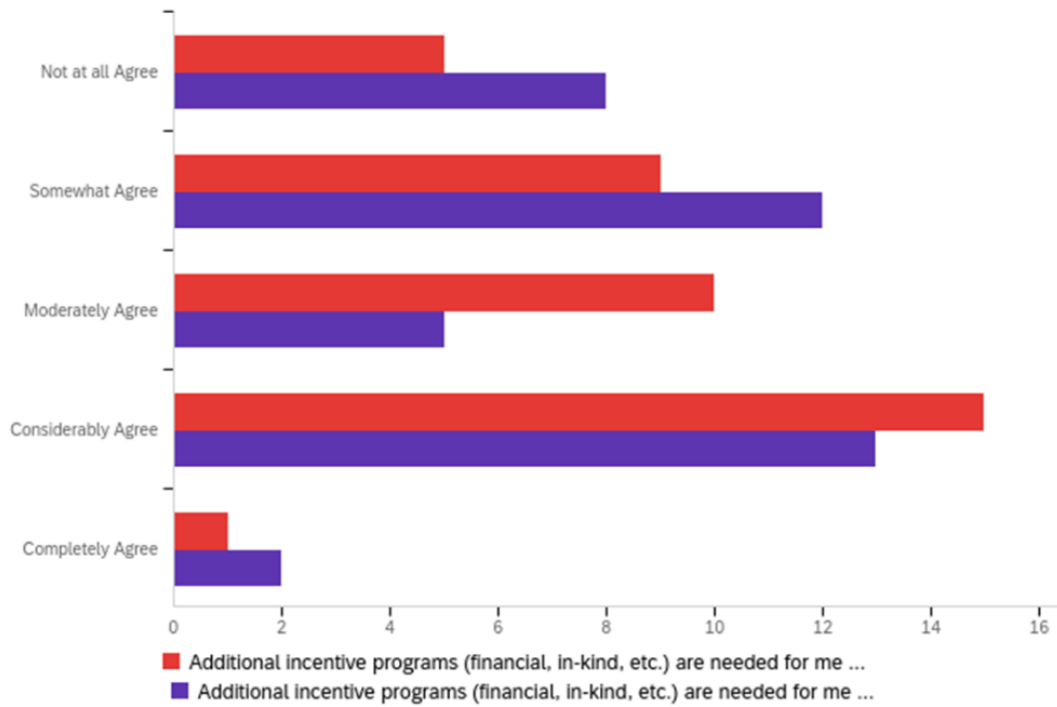
If somebody asks, I will tell them. I've probably hurt myself by being so open, but I don't like that farmers are so closed about things.

We'll just talk about things that we try, not necessarily selling the farm in terms of something that we do. Farmers do struggle with that a lot. They play it pretty close to the vest.

As far as skills go and things like that, that's just usually one-on-one communication. I mean, we still actually talk to each other. They pick up the phone call or we go face-to-face, we go see them. I hate text messages. I really do. I abhor--actually hate it. Now practices and trials and experiments and things like that, you know, that gets a little touchy depending on how you're dealing with the farmers. Because industry as a whole, we all try to work together to try to get one front to threats coming to us from the outside. You know, like EPA rules, the Sierra Club or whatever, coming out trying to attack agriculture and hurt us: we provide a united front. Now, the other side of it, though, is the internal I don't know, infighting is not the good word for it. Say this piece of ground here would come up for sale. I'm interested in it, I want it, my boss wants it... But if I got something that is going to give me a ten, 15-bushel edge over Jon or the other guy down the road, a lot of times, there is not a lot of incentive for me to say, hey, Mr. Neighbor, hey, guess what? I can you know; I'm doing this, and I'm make another 15 bushel an acre... Because that's money in my pocket that gives me an edge to either bid more for rent or to actually be able to pay more for the ground. If I give that up on that side of things. So, there's two rules of thumb on how on how that works. And I can't say that there's a right or wrong answer to that about whether you should share or whether you shouldn't share because there's pros and cons of each one out of it. When it comes to trials and trying things, there's a lot of stuff that farmers keep close to the vest. You know, with all the nuances, like you said, all the intricacies, what we got in start going into micronutrient packs folia feeding, you know, doing growth stimulates growth regulator, stuff like that on there, some type of secret nutrient packed stuff. You had a lot of guys that do a lot of different things. I think that they've got the secret, well, they aren't going to come out and tell you. They're not going to tell me what's in their pack. They'll tell we got to we got a micro pack on this, you know, but they're not going to tell you what it is. Farmers are secretive. They're independent because they want their businesses to succeed, and they want to do better than their neighbor.

You troubleshoot all your problems down at the coffee shop? The financials are not discussed. I found that the people in Argentina. They have their neighbors get together. They may be a huge farmer and they're talking about buying, making a major investment in their equipment or something like that. They will discuss among themselves the pros and cons of making that decision. Which if it's being done (here), I haven't been part of it. I think people are pretty protective of that. And it's kind of unfortunate in a way. And I suspect we're in a local community like Grant or any others where you have family farms and so forth. If I share too much information and a piece of land comes up for sale next to me and I really want to be able to buy it rather than having help my neighbors getting a financial position so he can compete.

Value of Incentives



Sixty-five percent of respondents at least moderately agree that additional incentive programs (financial, in-kind, etc.) are needed for them to install some or selected new agricultural technology on land that they farm. Fifty percent of respondents at least moderately agree that additional incentive programs (financial, in-kind, etc.) are needed for them to adopt some or selected new agricultural management practices on land that they farm.

The ideas regarding whether incentives are helpful varied throughout the interview responses. Some thought, yes, because they can help cost-share, but then others thought the paperwork to be a hinderance, while others felt that sometimes the government is paying them to do something that makes no sense.

So that incentives might help people to try something. And then if it works out well then maybe adoption. Or if you are on the fence about something it might help to change your mind.

And you know if it scientifically proves itself or has theory, I'm there and willing to try it versus people that maybe don't have to see it and want someone else to prove the theory. And then are they still willing to do it themselves or will they need incentivized to do it? I see both camps. I work with both camps. And there's nothing wrong with either

one. It's just the way they're wired. So, is incentivizing good or bad? I'm neutral on it. I think it probably is needed to move a percentage of the population.

I am all for them. I think a lot of things, especially when it comes to farming, needs to be incentivized to get guys to again, want to try something new, get out of the same old rut they've been in. Or again, I shouldn't even say a rut, just the success that they've found with the years of farming, just doing the exact same thing over and over. I think you have to have those incentives to potentially move the needle along with those guys.

Convenience/Time savings

Regarding what other reasons they might have to adopt a new management strategy or technology on the farm, participants' said convenience or time savings. Or, if what they are doing is no longer working, there is incentive to change and try something different.

Make my life easier and if I can work less and make more money... Time management.

I feel like a lot of technologies are all evolved around trying to make the farmer's life just a little bit easier, make the day go a little bit quicker, checking this thing a little bit quicker. So that would be kind of where I'm at.

Well, either I see it's going to make me money or save me time or both. Or it's going to provide me some other benefit in some other way. So that's the reason. I mean, I don't adopt something because they're going to give me money to do it. It's got to show it's going to actually help my operation because you can have somebody say they're going to give me \$20 an acre to try something but ends up costing me \$50 because I tried it... obviously that dog don't hunt. I mean that I'm losing 30 bucks an acre. It's still got to make sense. They still got to pencil out. And bottom line for what it comes down to me and all the technology, all those questions, it's got to kind of cash flow for me. It's got to pencil out that it's going to help me in some way on my farm.

Science/Evidence

Some stated that keeping up with the science as another reason they might have to adopt a new management strategy or technology on the farm.

I'm neither here nor there on it. Sometimes that's the piece that will push someone to try something new. Every person has a different learning style, and I guess I'm a more scientific learner, so I'm going to let the data tell me what I should try versus be incentivized to do it. I think it's going to have to justify itself on its own. Some people aren't willing to do that, and it maybe is needed on parts to get somebody to say, okay, I'll try it because there's less risk involved this way.

The incentive would be to show that there's a value there. And then get in and actually use the technology. That's the trouble with all the technology we have is there's so much out there you don't know what's going to be the most valuable to you and your farm. So, getting in and using it and see how it can be of value to you. I guess incentives don't necessarily drive adoption to me. It's actually using the product and having success with

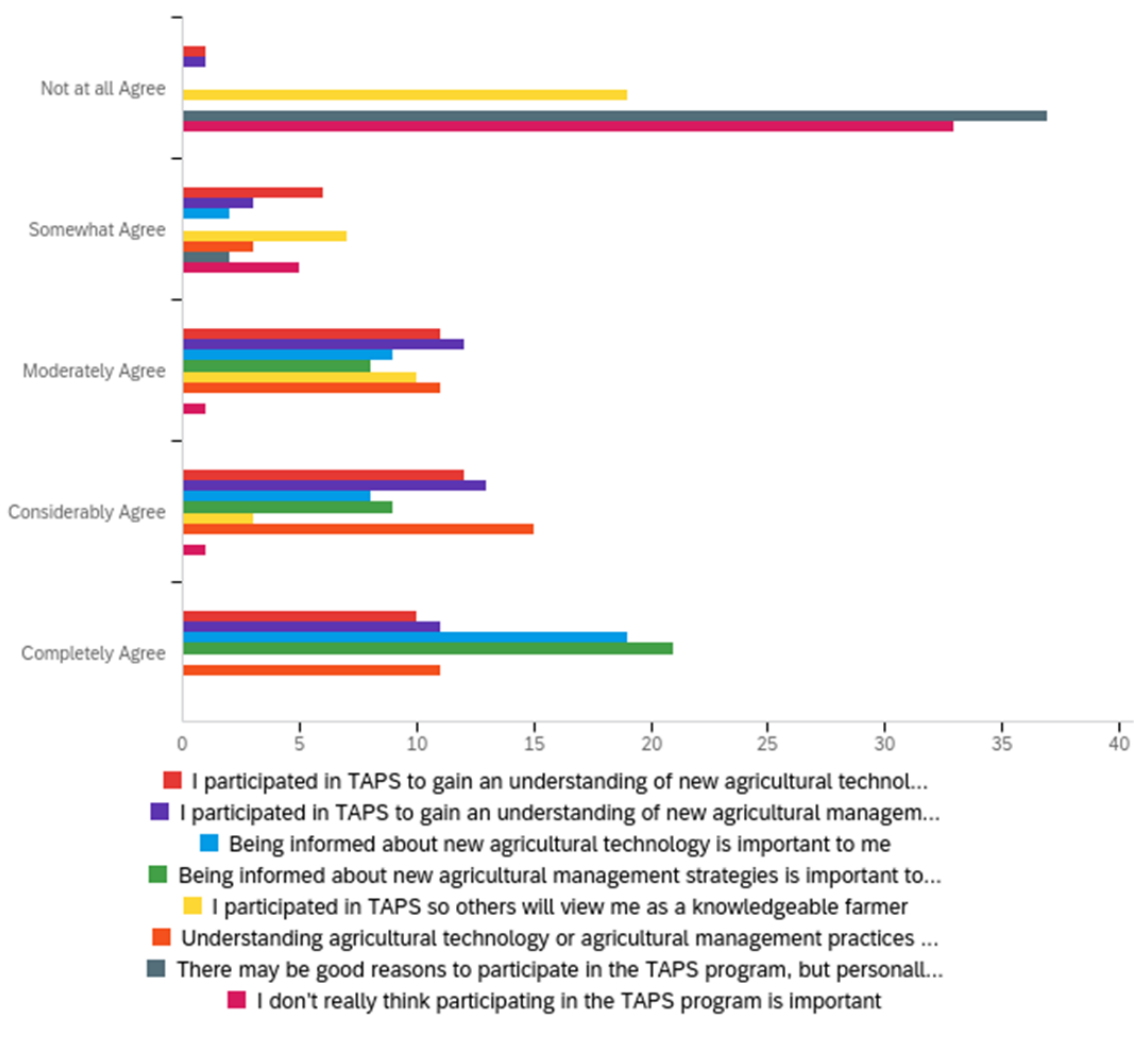
it. I think having some good evidence that it works has more influence than the share of incentives. Unless it's an extremely expensive item.

To be more sustainable

Trying to be more sustainable as a business is another incentive for adopting new management strategies or technologies on the farm.

I think you're just trying to make farming more sustainable or trying to feed more people with less acres. So, we're going to have to adapt... We aren't doing the same things we were doing ten years ago when I started farming. So, in ten more years, I don't know what it's going to be. To adapt and change is the only way you're going to be sustainable, in my opinion.

Motivation to Compete



At least 83% of respondents at least moderately agreed that they participated to gain an understanding of new ag technology and management practices as well as participating to be better informed about new ag technology and management practices. Just 33% at least moderately agreed that they participated so others would view them as knowledgeable farmers. All but two agreed that there are good reasons to participate in TAPS. Regarding not thinking participating in TAPS is important, five somewhat agreed, one moderately agreed, and one considerably agreed.

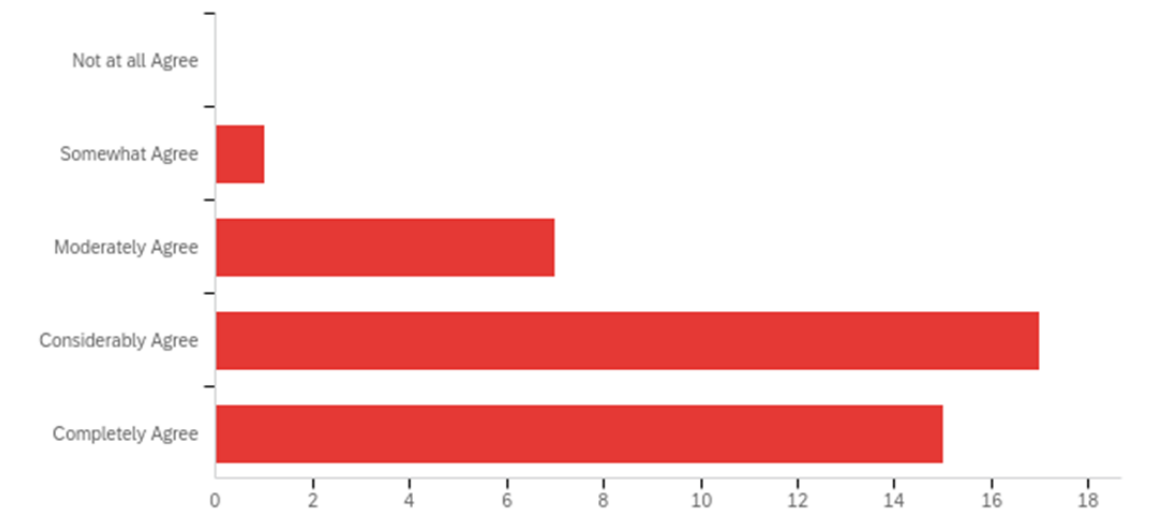
A majority of those interviewed have been in the competition for several years, some even since inception. Accordingly, most people's motivation to compete was Daran or Chuck—someone they knew getting them involved. When pressed a bit more, there were some who wanted to see how they stack up against the competition. They all think they are the best, so why not try it. "Just wanted to see. You always wonder if you're I don't know... the best. I think every farmer thinks you're the best farmer. And this kind of shows who the best farmer, best marketer... it is a competition." Similarly stated, *"It was just to challenge myself. I want to see where I stack up against the other guys"*.

Others like the idea of being able to experiment with no risk on their farm and the aspect of learning cutting-edge techniques.

... I knew if I wanted to make some changes with the farm that I needed a lot more data and it needed to be something significant, backed by UNL, that my father and I would trust and [he] wouldn't be able to just poke holes through... And thus far, he's been very receptive with it.

Many continue to compete because they get something out of the program each year. If they are still learning, they will continue to compete.

Meeting Expectations



Of the 40 people who completed the survey, 80% considerably or completely agreed that participating in the TAPS competition met their expectations. Interestingly, of those interviewed, few had expectations of the program going into it, but had expectations of their ability to win. Most mentioned enjoying their experience. Several discussed not making it to field days and banquets—taking responsibility and acknowledging “you get out of it what you put in”.

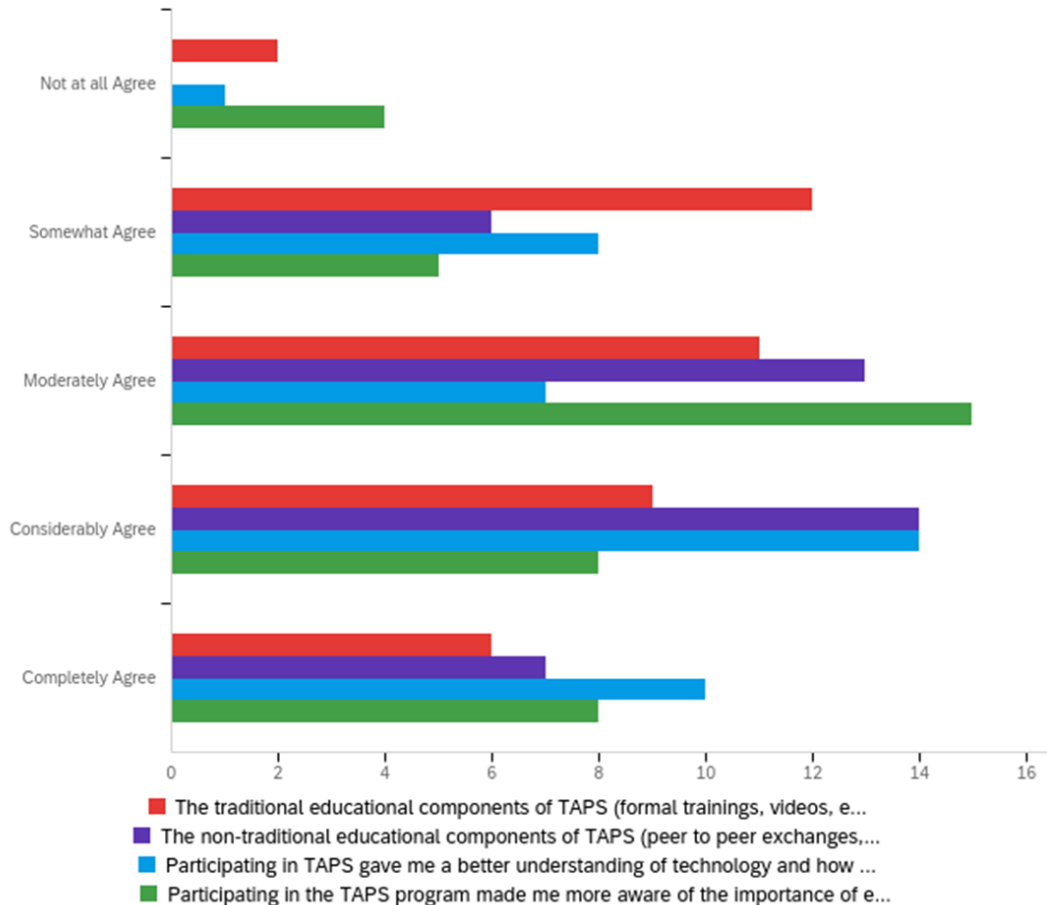
My expectations weren't much. And it's been a great learning tool. I mean, I think of the network of people that I have acquired from TAPS and the extension of that network to that many more. If my grandkid has less nitrates in his water than I did, it's a win. You know, if he's still got water to irrigate with, it's a win. So that's probably the biggest thing for me is utilization of resources and ability to fine tune profitably if those pieces are all involved. It's a win for everybody.

The next quote connects back to the discussion of early adopters having changed their behaviors prior to participating in TAPS – it's not cutting edge to some of them as they have already adopted the technology (or management practice) and some participants believing that TAPS didn't provide cutting-edge technology. This sentiment has to do with their progressive farm management.

Oh, it was good, but a little different, than what I was expecting overall when I first came into it. I was expecting to have all these new technologies at my fingertips that we don't have on farm and, to trial these new different things... I guess for what we use on our farm, there's not a lot of new technologies that I don't have access to. It allows me to try

different companies that I don't use here on the farm just to test them out and to try them out. But as far as something I never heard of, leading cutting edge, I haven't had that experience and I was kind of expecting that. I guess when I came in, I had a little loftier goal of say, oh, this is going to be a testing ground for companies, new products that they want to see before they really release it, you know? I was expecting that. And I maybe I shouldn't have. I'm not certain if that's the way they advertise it, but that's just kind of what I was expecting.

Experiential Education



Sixty-five percent of respondents at least moderately agreed that the traditional educational components of the TAPS competition were valuable. Eighty-five percent at least moderately agreed that the non-traditional components of TAPS were valuable. Seventy-eight percent at least moderately agreed that participating in TAPS gave them a better understanding of technology and how to use it as well as made them more aware of the importance of environmental sustainability.

What is the most valuable educational component of TAPS? The end of the year printout/booklet! Mentioned by nearly everyone interviewed. “That booklet is a Bible! That is very, very good information.” Other than the booklet is the experiential education piece (which is the entire experience). Participants learn by doing—from their own choices (good and bad), but also the comparison of what everyone else was doing on their plot. They learn by watching the success of others. “Seeing the data at the end, seeing everyone’s decisions and how it affected the outcome”.

You get to see what other people are doing because, you're comparing your plot with somebody else's, and they have that all summarized. So, if you see some issues in there that one [person] is doing and that you may want to adopt, I would. I suppose you're evaluating/comparing different growers -- does that make sense?

Just being able to put everything together like it's the whole package so you can see what you're doing with water and nutrients and hybrids and just add it all together and seeing what you get for an output.

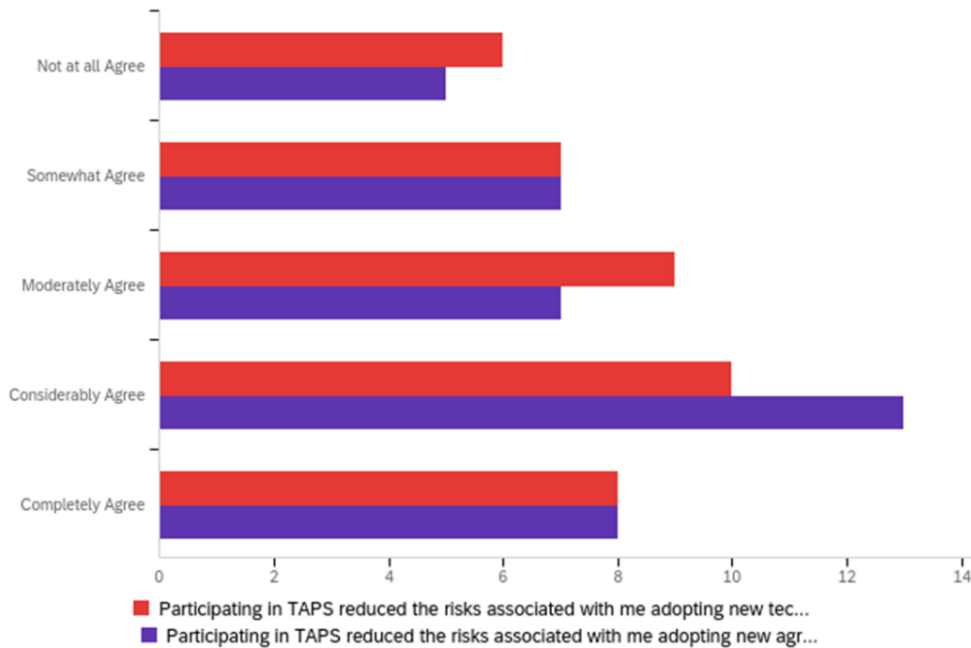
That meeting at the end of the year is probably the most educational or eye opening for me because you do get to see what other people did. You get to hear about what other people did. Why was he the most profitable? Why was he the highest yield? And you look at the timing of the of the application of water, the timing of the application of fertilizer or, hey, he used six and a half inches of water. I used eight. He beat me by 20 bushels. Where did he water? What day range maturity did he have out there? Why did that work so much better than what I did?

All of the data—it is just so rich in data. And those are things that you just cannot even put a price tag on at all. And so, to me, it's just all about those numbers. And again, I do call some years for just rotational purposes, but being dry land and where we're at, it's not the healthiest for my farm. So, I love even just digging into a lot of the corn numbers and stuff like that too, and just see maybe how I could play around with that on my farm also.

That booklet is a Bible that is that is very, very good information. And every year is different. So, some things that worked on here might not work the other, but that book is very, very good information.

Farmers want hard data—they are data driven, so regarding the future of the program, they would like to see how things play out for the experimental plots and maybe to have some more of them.

Risk Impact



Sixty-eight percent and 70% respectively at least moderately agreed that participating in TAPS reduced the risks associated with adopting new technology and new ag management practices.

Most people don't like taking risks with their financial future. One of the producers shared something inciteful: "And it's a risk to step out of your comfort zone." Taking a risk pushes people out of their comfort zone, but risk is a requirement in farming. Especially regarding the adoption of new management strategies or technology. Marketing is also risky. Having said that, they will not, nor should they bet the farm on it. The biggest theme in this section is that they try things small-scale at home: strip trials, maybe one field with experimental factors. TAPS helps them to mitigate some of the risk by trying it out first—not risking it at home. "Sorting out the muck" came up again regarding research, "Oh, there's always risk. That's why you got to sort through the muck to truly know if it's going to work or not." Doing their research before implementing something new is important. Also, many people want to see someone else doing it first. If it can be a proven winner, they feel more secure about trying it. Farmers are playing the long game. They will try new things, take on risk, but it must make sense on their operation, can't break the bank and must be productive,

otherwise why use it? As mentioned above in the discussion on adopting new technology, what is considered cutting-edge technology is dependent on each producer and their operation. The contextual factors impacting decision-making on the farm are very specific to that farm.

So that being said, you know, not trying anything has just as big a risk as trying something. You just have to do your research and you have to do your homework. You can't do anything foolhardy. Everything has their own risk and own reward... You have to know what you're getting into before you try it and you have to try it on us on a small scale, in my opinion.

A producer who also sold farming technology corroborated these ideas, “What we found is that they watched what happened the first year. If they see something, they would try it. And by the third and fourth year, when they felt they had confidence in the data they were getting. And that's true with soil probes”.

I don't like taking new risks, but I think because I am somewhat younger and more apt to accept change, that I would maybe be more apt to take on risk compared to some people. But I'm kind of in the same boat. If it's worked and it's done well, one way I'll maybe try one field or I'll try a little bit of one hybrid rather than just change all at once. But at the same time, if the reward out weights the risk, I would try it on a small scale to start with. And if it works, implement more.

And so that's the thing. You have to be careful. We add new technology on that. You don't—it's like running an experiment—you don't experiment on the whole farm. You can't experiment the whole farm. Just things go south. That's a lot of exposure. We got a lot of money out there and same with a lot of the tests, like try to keep the testing small if you can. Try different stuff and you got to be able to measure it.

Well, anything you do is a risk. I mean, staying the same is a risk. You're either growing or you're dying. You know, the world is not static, the world's dynamic. And so, you have to be trying new things and trying to better yourself every year. You can't do the same thing. And there's too many guys that have been around, you know, to say, “oh, this the way my grandfather did, this is when my dad did it... So that's the way they've always done it; that's what I'm always going to do...”. We don't we don't have that luxury. We got to try and find and drill and make ourselves better managers to be more profitable so that we can afford to expand our operation. We don't have that base there. So, I mean, we're riskier anyway with the way we are. So, we have to have a sharper pencil than the more established farmer to be able to survive.

I'm the younger generation of our group and probably take on a little more risk. I'm not afraid of trying something. I guess risk doesn't scare me. As long as it doesn't break the bank. In our situation when you're talking about a field isn't going to make or break us if it breaks even... We don't need that field in order to make our payments or in order to continue on to the next year. So, I view risk a little bit differently because of the situation that we're in. I'm just not overly afraid of trying something, because even if it does fail,

we learned that that's something that we don't do anymore. That's not going to work out in the long term. At the very least, we figure out something we can't do.

I think risk is part of it. I think everyone has their own level of risk and I don't know that I'm necessarily always going to be the first person to try new technology, but if I see in the old reports or whatever it may be that something's working or has potential to. Add value, then I think I'd be pretty quick to take that risk and try it.

You know, and that is the beauty of TAPS: I almost feel like it's like a farming simulator or just it's kind of a game where I have zero risk in this whatsoever. And so, I can play around with any of my numbers. I can potentially pump up my seeding rate by double something I wouldn't normally necessarily do on my farm. But it'll show me great numbers that maybe I want to see over again. I can't remember how many, how much bigger I made all of my seeding this year, but it was considerable versus my first year. And so, to me it's just an absolute blast that I get to play around with all these numbers. And again, my hands are clean. I've got no risk in a vault at all.

Discussion and Recommendations

To balance the plethora of factors impacting decision-making on the farm, flexibility is key. Being flexible can include trying new things - things that save them time, money, and resources.

The survey responses and interviews with alumni show participating in the TAPS competition to be a very useful experience for producers. Participants use the competition two-fold. First, as a place to experiment with new management strategies and technologies and secondly, as a place to learn by watching others. Program coordinators must keep in mind that because farming is a “long game”, producers will not be rushing into adopting new tech and management strategies. It will take many of them a couple of years to ponder and experiment before deciding whether it is a legitimate resource and applicable to their operations. So, when measuring the impact that TAPS has on participants’ farms, it will likely take multiple years for them to lower their nitrogen levels or water usage. In measuring the behavioral impact of TAPS, it may be more beneficial to look at least 3- or 5-year benchmarks. Change is likely to begin in the first year of competing, but with a change in attitude or increase in knowledge, as participants consider the team that won and how that team’s decisions compared to their own and the associated production outcomes.

While producers were very satisfied overall with their TAPS experience, some shared things that would be valuable to the program going forward. These ideas and others are described below.

More Science

Producers are very interested in the experimental trials put on by the TAPS team. They would like to see how those trials turned out and see it added to their end-of-year booklets. They mention “sorting through the muck” of technological options and some mentioned the university piloting different brands/tech against each other to help discern.

More Locales

A few participants mentioned having a TAPS program closer to home due to the differing geographic factors and the convenience of a closer proximity to activities.

Regenerative Ideas

It may be beneficial to those early adopters and participants interested in regenerative methods to have access to university data on regenerative topics or to be put in contact with appropriate farmer groups. TAPS could also consider the creation of a regenerative competition.

Mission Statement

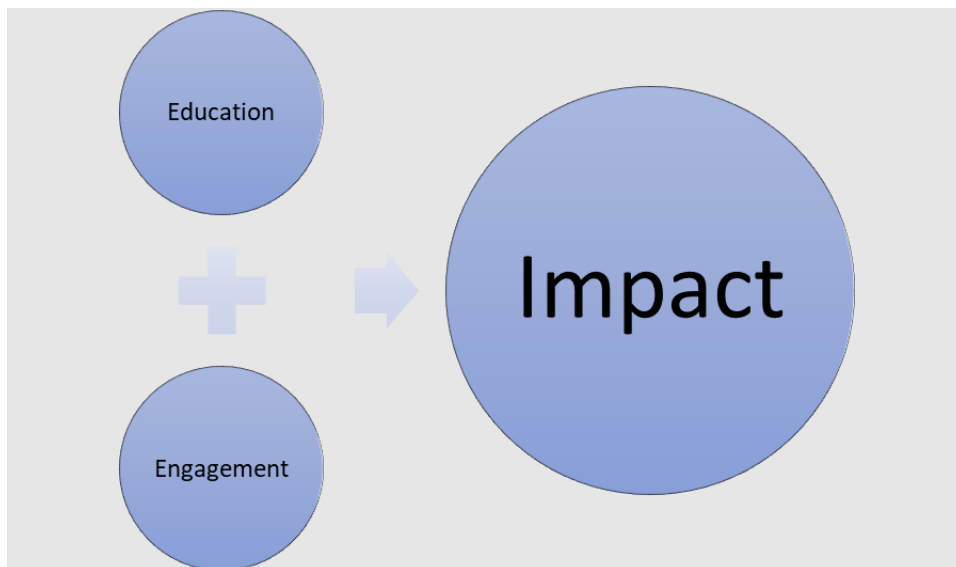
From an organizational standpoint, it is recommended to switch the mission statement of the TAPS program to a vision statement. A new mission statement can then be created. While vision and mission statements are similar and linked because they give an organization direction, they differ in scope. Bowen (2018) states:

Vision statements drive the long-term goals that determine where the organization would eventually like to be in the competitive landscape. Mission statements are more concrete and specific to an organization’s competitive advantage; they are used to prioritize activities... Another way to conceptualize this difference is that a vision statement specifies where an organization is going, and a mission statement gives an organization direction on how to get there.

As it currently stands, the TAPS mission is not measurable, but is instead grandiose in scope. This is fine for long-term desired results, but not the actionable steps on how to get there (mission). Highlights are added for emphasis.

*To fully **engage** agriculturalists, scientists, educators, students and industry in an innovative endeavor, to TAP into the University of Nebraska's potential to facilitate and create an environment for all stakeholders to work together in **finding solutions** through innovation, entrepreneurialism, technological adoption, new managerial applications, improved techniques, and cutting edge methodologies for Nebraska's future farms, farm businesses, and farm families to **maintain profitability, sustainability, and productivity.***

Graphically, the future mission statement could look like this:



Devising a mission statement will require indicating the means to accomplishing the vision. If the current mission paragraph is turned into a vision, it must be asked: how is this achievable? What are the action steps that TAPS executes to assist participants in obtaining/enhancing profitability, sustainability, and productivity in their farm enterprises?

In evaluating the TAPS program, a guiding question should be: is the mission being accomplished? Will the mission evolve as conditions change? Knowing this will help future program evaluations.

Additional questions to consider are: What are the programs educational objectives and how will TAPS direct its educational curriculum to ensure profitability, sustainability, and

productivity on farm businesses? Are these truly the program goals? Are they measurable? Are they realistic?

References

Bowen, S. A. (2018). Mission and vision. In R. L. Heath & W. Johansen (Eds.), *The International Encyclopedia of Strategic Communication*. Wiley.