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## Report: Native Seed Stakeholder Meeting 2020

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# NATIVE SEED STAKEHOLDER MEETING

MARCH 4, 2020

AT THE UNI CENTER FOR ENERGY AND ENVIRONMENTAL EDUCATION

REPORT PREPARED BY LAURA FISCHER WALTER, OCTOBER 2, 2020



**After 30 Years  
of Iowa Ecotype Seed**

**What's ahead for the  
native seed market?**

- Sustaining a diverse native seed market
- What's new at NRCS?
- Quality assurance
- Research on seed mixes and establishment
- Past, present, and future of source-ID seed



**Tallgrass Prairie**  
— CENTER —

**UNIVERSITY OF NORTHERN IOWA**

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



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**Disclaimer:** The following report is not a word-for-word transcript of what was said at the meeting but has been summarized and reorganized using notes taken by meeting participants and observers. Please contact Laura Fischer Walter ([laura.walter@uni.edu](mailto:laura.walter@uni.edu)) if you notice errors in any part of this report.

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## HOST – THE TALLGRASS PRAIRIE CENTER

The Tallgrass Prairie Center (TPC) is a part of the College of Humanities, Arts and Sciences at the University of Northern Iowa. Our mission is to restore native vegetation for the benefit of society and the environment through research, education, and technology. TPC staff work toward this mission through the activities of four key programs: Iowa Roadside Management (IRM), Research and Restoration, Prairie on Farms, and Plant Materials.

The meeting was held on Wednesday, March 4, 2020 at the Center for Energy and Environmental Education on the UNI Campus.

## ACKNOWLEDGMENTS

The Living Roadway Trust Fund (LRTF) provided funding for this meeting. The LRTF was established by the Iowa Legislature in 1988 to fund research, demonstration projects, monitoring, and education in support of establishing and maintaining native vegetation along roadside rights-of-way.

UNI students and staff, Green Iowa AmeriCorps members, and the staff of the CEEE provided invaluable assistance in planning, preparing for, and organizing this meeting.

We are very grateful to all meeting participants for listening and sharing their time and ideas toward the common goal of a healthy, diverse, and sustainable native seed marketplace.

## ATTENDEES

There were 27 invited participants from Iowa and other Midwestern states (Indiana, Minnesota, and Wisconsin). In addition, the TPC director, TPC staff members, AmeriCorps associates, and UNI students participated in organizing the meeting.

Meeting participants represented various stakeholder groups with connections to the native seed system of Iowa and the Midwest region:

- Seed consumers – need access to diverse, regionally appropriate, and affordable native seed to meet demand for restoration in various contexts.
- Seed producers and service providers – need to sustain business viability while responding to changing policy and demand for native seed and services.
- Researchers, policymakers, conservation practitioners, and educators – need communication channels to connect research with policy and practice and improve public awareness of the need and potential for seed-based restoration.
- Seed analysts and certification agencies – provide third-party quality assurance of seed germinability and source (provenance) and affect seed prices and access to specific markets.

See Appendix – List of Meeting Attendees for a complete listing of participants and their affiliations.

## SYNTHESIS OF OUTCOMES

**Our objectives were to bring diverse stakeholders together to explore answers to these questions:** How can we sustain and improve the native seed system in Iowa and the Midwest? What can and should each of us do to ensure its future? How can we partner to get this done? Participants came together to offer perspectives that both aided in answering the conference's primary questions and raised new ones. The outline below shows emerging answers from the panel discussion and breakout sessions that fell under four broad categories.

### I – RESEARCH NEEDS

Native seed consumers desire better predictability for how well and cost-effectively plantings perform in different contexts. This requires more information on how individual species respond to site conditions and establishment/management techniques, how well they provide desired ecosystem services, and how efficiently they can be produced. Many of the following are topics of current research at academic institutions. This research requires funding and time to develop research plans, collect and analyze data (often over periods of several years), and disseminate information through presentations, publications, and/or searchable online databases.

- Monitoring and evaluation of new and existing planted stands is needed to examine the role of various factors potentially affecting project success – seed quality, seed mix design, seeding rate, establishment practices, weather, soil characteristics, seed predation, weed introductions, and management practices. This ideally requires accurate and complete records of actual seed mixes and practices used. It could provide information to guide practices and germinate future research questions.
- Identifying species that rarely establish in conservation plantings could foster development of strategies to improve their establishment, or they could be pruned from species lists for certain sites and objectives.
- Developing seed testing rules for more native species could reduce some of the variability in seed test results. This effort depends on the sharing of testing methods and results by seed labs and vetting by seed testing organizations.
- Developing seed production protocols for species that are poorly or not at all available could help increase the diversity of species used for particular functions (e.g., flood resilience and pollinator nesting/overwintering habitat). This research could be carried out collaboratively by academic institutions and native seed producers.
- Quantifying the impacts of native plantings in terms of soil health and other measures of ecosystem functioning would help in communicating about the benefits of native vegetation to consumers and policymakers.

### II - COMMUNICATION AMONG STAKEHOLDERS

Improved communication among policymakers, large seed consumers, and native seed producers could aid in anticipating market trends, increasing availability of needed species, and stabilizing prices.

- Explaining native seed testing methods, variability, and results more effectively to producers, consumers, and policymakers could improve trust among stakeholders.
- Assisting clients and policymakers in considering ecosystem services in discussions of seed cost could encourage the use of more diverse and multifunctional seed mixes.

- Improving communication among conservation planners, seed and service providers, and landowners could make more projects successful.
- Creating and disseminating lists of species recommended for particular sites or objectives such as pollinator habitat could lead to greater use of diverse species with known ecological functions.
- Communication with large seed consumers could identify emerging restoration needs (e.g., flood resilient vegetation) and target new species for production.
- Sharing seed production protocols for hard-to-produce species could increase supply and reduce seed cost.

### III - EDUCATION AND OUTREACH

Education and outreach needs include staff training, dissemination of information to native seed consumers, building public awareness and acceptance, and marketing to targeted groups.

- Agencies that work with native seed could increase and improve staff training in areas such as plant identification, functional characteristics of species, seed mix design, ecotypes, monitoring and evaluation of projects, and/or client communication.
- Educating customers on management practices would improve the project outcomes. Successful projects are highly effective “advertisements” for conservation plantings.
- Better education is needed on what the yellow tag for source-identification means, when it is required (or not), and why. Tagging more of the eligible seed, even when it is not required, would help educate seed consumers and the public about the availability of Iowa-source seed.
- The native seed market could become more diversified and resilient by identifying new markets, more effectively connecting producers with consumers, and finding niches for new or smaller producers.
- The market for native seed can be strengthened in the long term by building public interest in native plants in urban and rural, public and private settings; changing cultural norms about how landscapes should look and function; communicating the value of native plantings in addressing environmental problems; and engaging with particular consumer groups such as women in farming.

### IV – INTERSECTIONS OF RESEARCH, PRACTICE, AND POLICY

In the absence of published research, policymakers rely on direct communication with researchers, conservation practitioners, and seed producers to guide decision-making. Meeting more of the identified research needs will require funding and partnerships among agencies and academic institutions.

- More information is needed in how seeding rates affect stand establishment, diversity, and functions at different sites. The existing guideline of 40 seeds/square foot is a convention that does not achieve the greatest possible diversity or desired functions under all conditions.
- The native seed pricing system based on Pure Live Seed creates incentives for both seed dealers and seed testing labs that drive down the reliability of seed tests. Blind-referee testing of seed labs would encourage more rigor and consistency. Testing methods should be consistently reported on seed labels to improve comparability of results, and seed laboratories should photographically record their results to allow independent verification. Policymakers should understand that the inherent diversity of native seeds (both within and among species) makes it impossible for seed testing to be as consistent for native species as it is for crops.

- Reexamining the three zones defined for the Iowa Ecotype Project thirty years ago could enable better alignment of seed purchasing practices with information from research on seed sourcing. This could also open up the market for Iowa source-identified seed to areas in surrounding states that are within the same ecoregion.

#### FOLLOW-UP

We aim to work on these issues by:

- ❖ Continuing to host annual meetings of diverse stakeholders to promote open discussion and facilitate networking.
- ❖ Promoting more frequent communication through a newsletter and email list.
- ❖ Exploring the formation of a working group to characterize specific issues and create an action plan.

We welcome your participation. If you would like to be involved in future meetings or communications or have questions or suggestions, please send an email to [laura.walter@uni.edu](mailto:laura.walter@uni.edu).



## INTRODUCTION AND WELCOME

Dr. Laura Jackson, PhD, TPC Director

Around the country and around the planet, wherever you go and no matter what ecosystem that you're in, there are people like us that are working very hard to restore nature. They're scrounging for resources often times, they're searching for the best science to support their work, they're summoning everything in their power to protect nature and restore it and to leave the world a better place for our kids and our grandkids. The upper Midwest is really no different, but a couple of things set it apart from many other regions of the world in my experience.

One thing that sets us apart is the sheer magnitude of the loss of nature in our region. We have the dubious distinction of being the most altered landscape on the planet: 99.9% of Iowa prairie lost so far. We could lose more. Continued threats to the remnant prairies that we have include not just conversion to more agriculture or urban sprawl, but the impacts of hydrologic change, ag runoff, and the unending march of even more diabolical invasive species. And so that's the first thing that really distinguishes us, just the sheer magnitude of the conservation work that we have before us.

The second thing that really distinguishes us compared to other places is the extent to which we rely on seed - large-scale farm production of native seed - for our restoration efforts. When you go to other places, that's not necessarily the case. It might be more transplants. It might have more to do with restoring hydrology or it might have more to do with encouraging natural regeneration processes in one way or another, but here in the Midwest, seeds are king. Native seed production and planting seeds is much more important here than it is in many other parts of the country and the world.

So seeds are at the center of almost everything we do, and we know that we can trace this back to the groundbreaking 1988 Iowa legislation that supports the use of diverse perennial native plants as one of many important techniques to manage our roadsides in a more ecologically friendly and diverse way. And it was the leadership of the Iowa Department of Transportation that carried out that legislation, gave it form and substance, and figured out how to use the Living Roadway Trust Fund in a way that would pursue the goals of that legislation. Those were important events in the development of this native seed industry and the demand for source-identified native seeds and locally produced seeds.

Then we also have to point to the gradual evolution of the Conservation Reserve Program, which began in 1985 with a modest option to plant monocultures of switch grass and has evolved into something that becomes more and more closely related to prairie restoration. That has been a significant change in the markets for native seed leading to where we are today.

Now, we're seeing new things like the interest in among urban homeowners, utility rights of way, and solar arrays to plant habitat using native seeds due to declines of monarch butterflies and other wild or domestic pollinators. So here we are to focus on seeds, to connect with one another from different parts of the universe that is involved in native seed production - buying, regulation, and so forth - to learn from one another and to support successful, diverse, resilient, tallgrass prairies.

## 30 YEARS OF IOWA ECOTYPES – WHAT’S NEXT?

Laura Fischer Walter, TPC Plant Materials Program Manager

This year marks thirty years since the first remnant seed collections were made for the Iowa Ecotype Project. Just as it is for a person, turning thirty is a time to celebrate accomplishments, reflect, and look forward.

Travel back 30 years, plus two more, and it’s 1988. Iowa’s Legislature adopted Integrated Roadside Vegetation Management into the Iowa Code and established the Living Roadway Trust Fund to develop technical expertise, build public awareness, and support specific IRVM programs and projects. The Code stipulates that IRVM should “Emphasize the establishment of adaptable and long-lived vegetation, often native species, matched to the unique environment found in and adjacent to the roadside.”

The resulting seed demand was too large for hand-collection by enthusiasts, and collection at that scale from remnants could endanger the persistence of remaining prairie communities. Buy-in from native seed growers was essential.

At the time, few native species were available, and the few that could be purchased were often cultivars from out of state. Cultivars were not desired in spite of having desirable traits for forage production. Selection for those traits results in a narrowed gene pool not necessarily conducive to producing diverse and long-lived vegetation.

The Iowa Ecotype Project met the need for defining suitable native seed for roadside restorations in a way that was both biologically defensible and economically feasible for private native seed growers. The IEP settled on three ecotype zones based on latitude with the intent to capture regional adaptations to season length, temperature, and plant-pollinator interactions. Each ecotype was produced from pooled collections from several remnants across a zone to with the goal of producing adaptable, long-lived restoration populations. This is still recognized as a best practice for preserving genetic diversity from fragmented ecosystems.

In 1990, the first three species collected for the Iowa Ecotype Project were sideoats grama (*Bouteloua curtipendula*), Canada wildrye (*Elymus canadensis*), and roundhead bushclover (*Lespedeza capitata*). A network of collectors contributed accessions from remnant populations across the state. Early collectors included Keith Franzen, Kirk Henderson, Charly Stevens, Barb Busenbarrick, Pauline Drobney, Brad Woodson, and Jimmie Thompson.

There was a recognition early on that independent certification was needed to ensure that seed marketed as Iowa-source was derived from Iowa remnant populations. This need was met by the Iowa Crop Improvement Association implementing the Yellow Tag program for Iowa source-identified seed in 1994.

From the early 1990s through 2015, the Iowa Ecotype Project/Natural Selections added 3-4 new species per year in most years. We have collected more than 3,000 remnant seed accessions over 30 years, many of which are stored on site in our seed bank freezers. We have produced 145 regional ecotypes of 80 species of Iowa source-identified seed which have been released to nineteen private native plant growers, mostly small, family-owned businesses. Native seed growers produced nearly 1 million pounds of Iowa Ecotype seed during the years from 2007-2015 when ICIA tracked production. More than 50,000 acres of roadsides in our state have been seeded with native seed mixtures using mostly Iowa ecotypes. And more than 1 million acres in our state are enrolled in NRCS conservation programs that either recommend or require native seed, some of which is Iowa ecotype seed.

Our system's diversity, longevity, and public-private partnership is seen as a potential model for other regions. We've come a long way. Along the way there have been some bumps, and hopefully we've learned some lessons from those that we can apply toward our future. Those of you who work in production of native seed know that you have challenges every year, but every year's different, every species is different, and even the seasons vary from one time to another. It takes time to build up your supplies and to scale up to commercial production. We know that regulations, especially changes in those regulations, can produce new hurdles. Changes to policies and programs have ripple effects across the whole seed supply chain, and it takes time for that system to adjust.

We also know the writing good policy takes time. It takes information from research and input from seed producers and consumers. We know that supply and demand fluctuations cause challenges to both growers and consumers of seed. We've seen a reduction in the participation in the yellow tag program in the state of Iowa over the past decade or so, and we seek to understand that and see if there are ways that we could turn that around.

Our meeting about this time in 2019 focused on the aftereffects of the pollinator CRP boom. From 2015 to 2017 across the Midwest, tens of thousands of acres were planted in diverse, forb-rich native seed mixtures, and this had ripple effects across the native seed industry. Prices spiked for high demand forbs for all seed consumers, not just those in the CRP, but also for other large consumers like the DOT. Sometimes what was planned wasn't planted because of substitutions that were made due to changes in prices. More out of region seed made it into those mixes, and we ended up with the introduction of a new weed into the state in some conservation plantings. With increasing seed prices, changes to the seed mixes, and the weed introduction, one response was an increased scrutiny of seed quality on the part of large purchasers. The big take away from that meeting was that all parts of our native seed system are interdependent even when not aware of their connections.

Some recommendations came out of the last meeting, and I hope we'll follow up on some of these today. One of the ideas was that there should be more careful roll-out of new programs to enable the native seed supply to better adjust to rising demand. This was an acknowledgement of the lag time that exists in native seed production. We also found that communication could be improved across all parts of the seed-supply chain: that producers could share more information among themselves, and that there could be more clear and direct channels of communication between people in agencies that provide seed demand, seed dealers, and landowners and other direct users of native seed.

With all the different interests in the room, one of the questions that emerges is what common values bring us together? I've taken the liberty of assuming that we have a common value of wanting to see more native plants on the landscape for all of the benefits that they provide. Here are some of the benefits that I see: conservation itself as a value, pollinator habitat, improved water quality, opportunities for recreation - things that get young people to stay in our state and our region, wildlife, hunting, fishing, photography, intrinsic beauty, climate mitigation, and business, making a living, providing livings for other people through jobs, and strengthening our rural communities. For all these reasons, we need diverse, regionally appropriate seed as the basis of our restoration efforts.

**Our objectives for today are to explore answers to these questions:** How can we sustain and improve the native seed system in Iowa and the Midwest? What can and should each of us do to ensure its future? How can we partner to get this done?

## PANEL DISCUSSION



## SUMMARIES OF PREPARED STATEMENTS

Topic: Opportunities and challenges in the native seed system

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*SEANA GODBOLD, CHIEF LANDSCAPE ARCHITECT IN THE OFFICE OF DESIGN AT THE IOWA DEPT OF TRANSPORTATION*

The DOT sees opportunities to perform inventories to monitor the many plantings done over the years. We have utilized a variety of seeding techniques and seed mixes and would like to have more information on establishment success. When there are bad results, we plan on considering various potential causes including poor seed viability, installation by different contractors, climatic changes, and flooding. We wish to see if what is growing in the right of way is what the program has aspired to since its inception 30 years ago.

The DOT faces challenges in managing numerous projects around the state that involve different contractors and local conditions. Several projects in western Iowa were delayed due to flooding last year, which affected the timeline for projects in other parts of the state. That, in turn, affects the annual seed purchase. While the DOT would like to be more consistent in their seed purchase from year to year to help stabilize the market, there are factors, like flooding, that we cannot control.

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*ALAN LANG, USDA/NRCS RESOURCE CONSERVATIONIST AND IOWA NRCS CONSERVATION RESERVE PROGRAM MANAGER*

Our region has the opportunity to discuss issues around how we use the seed supply because we have a diverse and reliable network of seed production. The way we use seed in CRP has changed greatly since the mid-1990s, and we will continue learning and improving our seed mixes and seeding techniques. We need to learn more about how individual plant species respond and how well they provide targeted ecosystem services consistently and within cost parameters. This information could help us to better predict the results of seed mixes.

Public awareness of issues of water quality and beneficial insects provides more opportunities for the use of native plants. In the past, introduced species have been used for soil erosion and water quality purposes where diverse native plants could address those functions and provide habitat for pollinators.

Precision agriculture gives us the opportunity to identify unprofitable locations that are not suitable for row crop production and could benefit from native plants. Soil health is a strong focus for the NRCS. They are interested in learning more about how native plants change the microorganisms in the soil and improve soil health.

The generation currently growing up in Iowa has an opportunity that was lacking for decades: exposure to what prairie is and can look like, and they are gaining an appreciation for its beauty. Students are having their senior pictures taken in prairie, and couples have wedding engagement photos in prairie.

Sometimes the opportunities themselves create the challenges, such as when the native seed industry had to respond to rapidly increasing demand for forbs for pollinator plantings. The USDA continues to talk about anticipating the market for native seed, both broadly and focused on forecasting demand for specific species.

A big challenge for the NRCS is getting farmers, landowners, and land users to be comfortable with establishing and managing prairie. People who have worked their whole lives to battle weeds may worry that native plants will be a weed patch and a threat to crop land. It is both a challenge and an opportunity to reach out more to get them comfortable with the use of native plants within farming systems.

There was a lot of discussion about seed cost during the development of the most recent Farm Bill. It is a challenge to conservation planners and the native seed industry to help clients weigh seed cost against the added ecosystem services that native species provide, in comparison to introduced species.

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*SARAH NIZZI, FARM BILL POLLINATOR CONSERVATION PLANNER, XERCES SOCIETY AND NRCS PARTNER BIOLOGIST*

The public is more interested in native plants, prairie, and pollinators than they have been in the past. When they realize that they can help by planting native plants, this presents the potential for greater demand.

There are challenges associated with creating the plant and habitat diversity needed to support pollinator populations. Many pollinator mixes have focused on providing spring, summer, and fall blooms, but the insects also need nesting and overwintering habitat. Many suitable species are available in the Iowa native seed market and could be included in mixes.

Xerces Society would like to see more options available for spring and fall blooms in the native seed market. Some of these, especially the early spring prairie species like prairie violet and prairie phlox, are challenging to propagate and difficult to establish in a prairie planting. How can we support growers in figuring out how to get more of these diverse species out on the landscape?

Trying to communicate and advocate about the importance of diversity is both an opportunity and a challenge. There is an assumption among producers and conservation planners that diversity comes with an outrageous cost. However, seed mixes can be created that are diverse, high quality, and functional for a wide variety of wildlife while also fitting within a reasonable budget.

Conservation planners must work to help customers overcome the challenges to implementing habitat restoration projects. Planners need to have conversations upfront to clarify a client's objectives, make sure the goals are accomplishable, and connect them to resources and services they need. Successful projects strengthen the future of conservation programs. If plantings do not go well, clients will tell their neighbors, and that will set back the goals of the programs. We need to be constantly working, educating, and advocating for the things we care about.

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DAN ALLEN, *FOUNDER OF ALLENDAN SEED COMPANY*

There are lots of challenges in supplying enough seed for the market and figuring out what species of seed are needed. Seed supplies are dependent on prior demand. Nobody grows seed that they do not think they can sell. If the market dries up for a year or two, seed supplies wane.

CRP is the major driver of seed supplies. Many CRP contracts are being issued this year, so higher demand is projected for seed next year. Seed growers will increase supplies this year to meet next year's demand.

Sarah mentioned early spring prairie species like prairie violets and prairie phlox. Prairie violets are just like milk cows: you have to go out and milk them every morning. You must be attentive to those species or they lose the seed almost as soon as they are ready.

#### QUESTION AND ANSWER SUMMARY

*Questions from meeting participants and answers from panelists and other attendees are condensed and edited for clarity. To see a video of the entire discussion, please visit the "Serving the Native Seed Supply Chain" on the Plant Materials Program pages at [www.tallgrassprairiecenter.org](http://www.tallgrassprairiecenter.org).*

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#### QUESTION 1 - SUPPORTING GROWERS' INVESTMENT IN NEW SPECIES

[Gil Waibel] Growers invest two to three years in acquiring, propagating, and producing a new species. If new information comes out that the species is not as good as we thought and demand dries up, then the grower is stuck with it. **If we want more diversity in the market, how can we support growers' investment in new species?**

#### DISCUSSION

[Dan Allen] **When the IEP started 30 years ago, Daryl Smith made a commitment to include the first 15 or 20 different species in the bids for the county roadside program. That got the market started.** Eventually, we could go out on our own with one or two species outside that spectrum. Sometimes, we donated seed of new species to the roadside project, and some of those species got adopted into the bidding for later years. Some of the cost of research and development just falls on the producer.

We have a different system than out west where the BLM drives everything in the native seed market. If the BLM requests a species, and someone grows it, they've got no place else to go with it. **In the Midwest, we have a decentralized market with demand from CRP, the DOT, the Tallgrass Prairie Center, and surrounding states.**



[Al Lange] This brings up questions about what species we are selecting for. For native seedings within the practice standard we use for most prairie restorations (Conservation Cover Practice 327), we use the NRCS native seeding calculator which includes nearly all available native species. Conservation planners can include any native species in the mix, but are we choosing the right ones? **We don't specify that a particular species is excluded or necessary in certain conditions, but we would like to have the knowledge to do this. If we did, how quickly could the industry respond to the change in demand?** Other states define their mixes very closely, so that when you are doing a CRP practice in some neighboring states, that's the mix you use. That could help stabilize the industry, but it might limit the diversity that we think is important.

[Seana Godbold] **The DOT always specifies different planting plans for different projects.** We put together our seed purchase every year with the species we want and the pounds of each type. When we get the bids back, if a species is cost prohibitive, we evaluate whether to buy it or not. **In general, we have been fortunate in that we can put down what we want without worrying about the availability of those species.** The exception was the year when prices generally went up due to competition with CRP for pollinator species. It's nice to have this flexibility and to be able to be diversified with our seed mixes. We don't hear a lot from suppliers about issues with our seed purchases other than just seeing how the prices come back.

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## QUESTION 2 - BRINGING NEW SPECIES TO MARKET

As an organization, one of the opportunities and strengths of the Xerces Society is our ability to bring new species to market, to identify a species that has particular pollinator or other conservation value, and work with specific growers over years to develop a supply for it, and we are a guaranteed buyer. **Here in Iowa, what capacity does either the DOT or NRCS have to bring a new species to market?**

### DISCUSSION

[Seana Godbold] **If we foresee a challenge, we could start looking at what we could gain from species that we are not finding in the market.** Some of the wetland sedges are harder to get ahold of, and I'm open to engaging in discussion to make sure these species are available. I think we'll have more flooding projects in the future, making us rely more on the deeply rooted native grasses than forbs. Increased flooding is presenting different challenges than we've seen in the past 30 years. We want to make sure we get the best species out there for the climate, the ecosystem, the integrity it must fulfill, and what the engineers expect.

[Al Lange] As representing the USDA and NRCS, I'm very cautious about using the term "bring to market." I also recognize that the market reacts to decisions we make within our policies and practice standards. **A new plant species would only be approved if supported by science, and then the market could respond.** We are constantly looking for research and talking with researchers around the state about their experiences with different plants and evaluating if we have the right types of plants or if there are types that are missing from our practice standard.

[Dan Allen] **Anytime you can guarantee a market, we'll grow that species, that's easy. It does put it on the shelf for any other marketplace to be picked up if they so desire, but that's how the market works.**

That's what we did here [with the Iowa Ecotype Project]. We started out with basic prairie material and put them on the shelf. Then, it moved from the Tallgrass Prairie Center county roadsides to the DOT, and then became available to CRP. That stimulated Pheasants Forever and other organizations looking for more highly diversified material. Policy had an influence. That's how the market evolved.

[Rick Shafer] **I believe that seed producers are already producing the species that everybody knows will be realized in a 10-year CRP contract.** We know what grows and doesn't grow. In a 15-year contract, you could add a new species that will be realized in that term, but most terms are 10-year contracts. A more diverse mix could actually hurt its integrity. With 40 seeds per square foot, the more species you add for diversity, the more you water down what else is there. If you have a personal project that you're willing to intensely manage, put some rare species in. But it would be tough to find a mass market for a new species.

[Daryl Smith] There are a lot of market-driven processes to deal with. Over the last thirty years or so, I learned that **if there's a market there, it's amazing how rapidly growers can provide seed, but if there's no market there, it's amazing how long it takes for it to become available.**

[Pauline Drobney] We all do cost-benefit analysis when purchasing native species, but we also need to discuss function. We need to look holistically at the process and results. **If we don't have the right sets of species in a mix and substantial enough quantities or proportions, we can expect problems.** One example that is documented through research is that cool-season grasses and graminoids suppress exotic weedy species of concern.

**If you don't put a seed out there, whether it's a conservative rare species or not, it won't be in your planting.** Forty seeds per square foot is just a convention that we have developed. Scott Weber, who managed seed mixes for the Wisconsin DNR, believes that it's too many seeds per square foot and results in excessive competition. **The seed you put down and what you have in that mix to compete with it makes a big difference on what you get in a planting.**

[Al Lange] The discussion about the 40 seeds per square foot comes up at least once a day in my world. Recently, the Prairie Strips Program has opened up the possibility of using prairie strips as end rows, but the field border practice requires a 60 seeds per square foot seeding rate. We couldn't find any good science supporting that requirement, and thought it was limiting participation by increasing seed costs by 1.5 times, so we are amending that standard to 40 seeds per square foot. In Minnesota, they have some restorations where they are using up to 300 seeds per square foot. **It's a great conversation, but 40 seeds is where we're at, and it seems for the near term that's where we're going to stay.**

[Bill Johnson] **One way to reduce the seeds per square foot but keep the diversity is to put seed in the right spot in the field.** You plant wetland edges with moist soil species, dry ridges with dry species, instead of throwing them across the whole area. That's probably not functional for CRP because it makes planting more time consuming, but it's the easy way to reduce the seeding rate.

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### QUESTION 3 – DIVERSITY IN SEED MIXES AND RESULTING PLANTINGS

[Al Lange] Going back to Rick's point that you know what plants are going to perform well in a 10-year period. **Do we [NRCS] need to narrow our scope for 10-year programs to a few plants that we know respond correctly and can be economically produced?**

#### DISCUSSION

[Al Lange] I think if we go there, Pauline's concerns will be realized, and we won't realize the benefits that we could if we continue to allow for more diversity. That's where we are right now: we are allowing it to be open. We are trying to use the best science we can to gauge what species are appropriate. For now, that's the coefficient of conservatism. Species with a high coefficient should be in a long-term program; low numbers should be in a short-



term program. **We need to continue to question, apply the best science, blend science with real world experience, and respond in the way that we develop seed plans and the seeds that we use.**

[Sarah Nizzi] **If people aren't managing their lands effectively, that's another possible reason why some of the more conservative species aren't being realized.** It's part of our job to educate those that are implementing diverse prairie that continual management is necessary to ensure that you have diversity. Another reason could be that the seed mix is not suitable for the site. You may not see the species that were in your seed mix, because they're not appropriate for your soils.

Even in short-term plans, we can't just put in early successional species with a low coefficient of conservatism. The mix won't meet the standards and specs if it has more than 33% of early successional species. The [NRCS] calculator has this built in, and it ensures that you will have diversity.

[Laura Jackson] **This is a crucial question about streamlining seed mixes or keeping them broad and open.** It could have implications for those of who are wanting to do longer term restorations with lots of diversity. If demand drops off through CRP, then we may lose our ability to get those species.

**In terms of science, one thing that's not done enough is knowing what the seeding specifics are and then sampling to see if the plants are there.** We had a three-year project where we sampled vegetation in 45 CP-42 CRP sites in our area. We know the seed mix, the seeding rate for every species in those plantings. There are some species that are in every seed mix but never show up, ever. It's not that they're bad species, but here in Iowa, in year three, they are not working. I think we could prune these species from the list for a particular area.

One thing I worry about is that it could become a self-fulfilling prophecy. **If you always pick the species that are showy, inexpensive, and pop up like toast, you could end up thinking that these are the only species that work.** We could end up throwing the baby out with the bathwater and narrowing it down to six or seven species like we see in other states. I think we need to find species based on research that really are not working and leave them out of the mix and spend that money on things that are more successful. But I would hate to see us go all the way to the other side.

[Pauline Drobney] Some species don't show up until much later than three years, and they may not be appropriate or useful in a shorter-term situation. However, **some research suggests that some of the species aren't showing up very quickly because we don't have the mycorrhizal fungi in the soil.** Maybe some of the research we need to be engaging in is how to farm mycorrhizal fungi.

[Stephanie Frischie] **At Xerces we have regional recommended pollinator plant lists that include the workhorse species that serve their intended ecological function, establish readily, and are available commercially.** They are easy to recommend and use, but there are only so many of them. There is another tier of species that provide additional functions such as nesting habitat or overwintering sites. They could be recommended for sites where the land managers or owners are ready for more diversity.

[Al Lange] Sarah [Nizzi] is currently working on producing example plans to attach to the seeding plan supplement we developed last year. Some of our planners were worried that the seeding plan supplement would take away their influence over the seeding, and that we were just going to go to a list of workhorse species. The supplement provides a description of the needs for the project, in varying degrees of specificity, and as long as the seed mix fits the description, we will approve the species in that mix. We rely a lot on seed growers for what ends up in the seed mix. **Eventually, the market itself could consolidate around the workhorse species, and we may lose availability of some of those other plants that we may need in certain situations.**

[Rick Schafer] **In CRP, you're also dealing with a landowner who wants to see results.** Those species that aren't realized in CRP dilute the seeds per square foot of the other species in the mix. If you're reconstructing your own prairie as a personal project, it's like a different ecosystem that we're talking about.

[Dan Allen] **We really are inoculating the landscape to some of the old prairie species.** There's a significant percentage of CRP acres that starts with a 10-year contract, then gets renewed, and never goes back into production. That acreage is inoculated back to original native material or whatever seed we put out there.

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#### QUESTION 4 - OPPORTUNITIES FOR PRODUCING WOODLAND SPECIES

[James Cronin] There are some woodland dependent [invertebrate] species that need early spring ephemeral flowers. **Is there an opportunity for producing those woodland plants?**

#### DISCUSSION

[Dan Allen] **There doesn't seem to be a market demand to stimulate production of those species.** It's not coming across my desk.

[Sarah Nizzi] **The low demand could be due to the way people are doing woodland and savanna restorations.** Very few of them are over-seeding. If people are inter-seeding to restore savannas, most of the seed they use is from prairie species. The woodland spring ephemerals are very resilient and often come back on their own, so that could be playing a part. **Is anyone propagating those [woodland] seeds, or has experience or research?**

[Dan Allen] **We're working with several species of woodland plants that we don't have commercially available.** If the demand comes through, we have the seed stock to work on it.

[Seana Goldbold] **The DOT doesn't have a lot of woodland spaces, but I would consider woodland plants for pockets where we could put them.** They are some of my favorite plants. There are sites with a lot of established trees within some of our rest areas where we could use them.

[Pauline Drobney] There are some fire-dependent woodland and savanna species on the market right now. In terms of the spring ephemerals, we need to keep in mind the appropriateness of woodland in a particular place. In the past, there was a practice that involved planting trees, and some of the places they were planted were prairies. **We are a state that was historically dominated by tallgrass prairie, so it makes sense that our demand for seed, and the species that are available, are dominated by native prairie and sedge meadow species.** For the savannas that persist while degraded, we need to proceed cautiously and think about managing and using prescribed fire to see what's there before over-seeding.

[Al Lange] Native shrubs provide great nectar resources earlier than some of our prairie plants, but it's very hard to convince landowners and farmers in CRP to include shrubs in the mix. This is one of the challenges I identified earlier. **We may identify a plant community type that could provide benefits we need, but we need willing people to do that.** Planting trees and shrubs on what was crop land is contradictory to the culture of agricultural production in our state. We have to convince our landowners that it's a good thing for them on their farm.

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#### QUESTION 5 – SOURCES OF INFORMATION FROM RESEARCH AND DEVELOPMENT

[Bill Johnson] This is a question for Dan. **When you have those species that are difficult to grow, where do you go for help with those species: your own research and development area, a network of growers, or the Tallgrass Prairie Center?**

## DISCUSSION

[Dan Allen] We pretty much have to figure everything out on our own. We'll call on any resources we can think of, but there's not much production research going on anywhere on this material.

One thing I want to know about is where the research is on soil health and carbon sequestration and how big bluestem and native prairie affect that. I hear about digging holes, lining it with plastic, and filling it full of wood chips. But I don't hear anybody trying to adapt native prairie to sequestering carbon.

[Al Lange] **When we're writing policy and guidance on native prairie restoration, our national requirements are that we base our decisions on land grant university and research information.** When we don't have that, we call around, try to get people together, and talk it through. After that meeting is over, we might have just as many unknowns as we did going into the meeting.

We've been doing this for like 30 years, and now we're taking next steps and moving to the next level. We're getting participation of farmers, which then creates these difficult situations we're trying to address - weed control, diversity, establishment, long-term maintenance. I'm looking to this audience for support when we're trying to make those policies.

[Tim Youngquist] I'm coming out of the Agronomy Department at Iowa State. **The questions that were brought up are being researched at ISU or UNI, but the demand for answers comes much quicker than the research.** We're looking at a variety of different sites, different soil types, and different rainfall conditions. It takes years to do that research and then come up with the kind of recommendation that you can take out into the world. Everything that you're talking about are areas of active research, but it's going to take years to get good answers.

[Pauline Drobney] There is a **Prairie Reconstruction Initiative** that involves the U.S. Fish and Wildlife Service, The Nature Conservancy, Minnesota DNR, Iowa DNR, and other organizations. There are a lot of questions that we need answers to in planting prairies from scratch, and this is a crowd sourced way to learn. **It provides a database where people can enter detailed data about a restoration project: site history, planting process, seed mix, seeding rates, time of year, equipment, and management through time.** There is a published monitoring protocol that has come from this group. If an entity monitors through time, there will be an automated analysis that will give answers to some questions about your plantings. The idea is that at some point in the future, when we have a critical amount of data in this database, we'll seek funding to do monitoring at a large number of sites and try to tease out what things led to what sorts of results.



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#### QUESTION 6 – NEXT STEPS

[Laura Walter] What I'm hearing from everybody is that basically we are constantly experimenting even if it's not in a scientifically controlled way. We have a landscape full of experiments now, and to have a place to collect information about those and to have a standardized protocol for monitoring them is an exciting thing.

I think we're starting to come to a conclusion to this conversation. I'm hearing two main themes: that we need to know more through research, and we need to be able to translate what we know to the end users of this native seed system. **I would like to pose a concluding question to the panelists: What do we need to do now?**

#### DISCUSSION

[Sarah Nizzi] I'm going to continue educating people and setting them up as best I can. **Having successful projects is what I can do to ensure that we can continue doing what we value** and think we should be doing.

[Al Lange] Going forward, **we need to take the science we know and see if we can apply it.** We [NRCS] have to take practical approaches. The zone seeding that Bill mentioned is the right thing to do, but it comes down to practicality. Do we have the knowledge and the contractors to be able to do it at the scale we need in CRP?

**We also have to keep chasing the unknowns.** There more unknowns than knowns at this point, and that's very exciting. New knowledge isn't always going to come out in the form of a scientific paper, and sometimes we have

to rely on experiences. We need to keep invigorating groups like this to keep our discussion going. **We're trying to improve our communication and make connections between planners and landowners and people in the native seed industry, and I hope we can continue that process.**

[Seana Godbold] I'm working with Iowa State on **getting more research on natives in the right of way and how they're really affecting things**. The soil profile that I'm trying to plant into is a completely different environment compared to a CRP or backyard planting. I need to make sure that my team players know how to get that stuff in the ground and ensure that the construction happens in the way that it's supposed to, and then follow through with research to get the numbers that everybody wants to know.

With 30 years of plantings out there, we have plenty of test sites that we can look at. We've done some research at the rest area in Elkhart, but we could take it to the next level and look at some of the factors that have been brought up here.

There's a lot of education on our side, too. **We need to get the engineers bought in to why I'm doing what I'm doing and also make the maintenance guys understand what we're doing and why we're protecting it.** When we achieve certain indicator species, we think we've really struck gold because all of a sudden we have vibrant compass plant coming up in a certain area of the right of way, and then our spraying contractors come along and spray it.

## BREAKOUT SESSIONS

### QUALITY ASSURANCE AT MULTIPLE LINKS IN THE CHAIN

Facilitator: Laura Jackson, TPC Director

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#### SUMMARY OF DISCUSSION:

There are many layers to the seed quality issue. Seed consumers need reliable measures of seed quality to guide purchasing decisions and for calculation of seeding rates. Differences in test results come from the sheer diversity of native species, the inherent variability within species of unselected native seeds, and variations in testing methods and interpretation of results. All parties desire improved standardization, but it is not clear how best to achieve that or who would provide the time, expertise, and funding to do so.

The PLS-based pricing system, in its current form, creates incentives that drive down the reliability of seed tests.

There are facets of seed quality that are not considered in typical tests for purity and germinability, and there are numerous other factors, besides seed quality, that influence vegetation outcomes.

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#### SOURCES OF SEED TESTING VARIABILITY AND POTENTIAL SOLUTIONS

- The diversity of native species and the inherent and desirable variation within those species in characteristics such as dormancy present challenges to seed testing procedures and result in testing variability.
- Many native species lack official testing rules, resulting in variation in the testing methodology. Even one issue, dormancy and how to measure it, is complicated by the time required for assessment. The TZ (tetrazolium) test is often used for assessing dormancy by testing seed lots for viability either before or after germination trials.
- TZ has potential to increase testing uniformity due to the simple chemical nature of the test (tissue that is capable of respiration turns pink), and is desirable to seed dealers for the shorter turnaround time, but variation is still possible in interpretation of results, particularly with reference to different seed structures.
- There should be a stronger focus on increasing the capacity to develop rules for more species. A new working group, a partnership among the Kew Millennium Seed Bank and the professional organizations of seed analysts (AOSA, SCST, and ISTA), is working on a searchable online database of recommended testing protocols for wild species that do not have rules. The website, currently under construction, is found at <https://wild-seeds.net/>. The effort has received sponsorships from large native seed dealers.
- The dominant seed testing companies do not share their methods by submitting rules proposals to professional associations, though this would be the first step in developing new testing rules and would help ensure repeatability.
- Laboratory reporting of seed testing methods to seed dealers and consumers would aid evaluation of potential causes of test variability. Keeping photographic records of results would enable independent verification of reported results. Customers need to ask labs for methodology and proof of results.

- Blind-referee testing to assess seed lab quality would encourage greater rigor, even if lab names were not reported. It is not clear which entity would carry this out.

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#### NATIVE SEED PRICING STRUCTURE AFFECTS SEED QUALITY TESTING

- The current pricing structure, based on PLS, creates an incentive for seed producers to purchase testing services from labs that provide the most favorable results. Seed companies compete with one another based on PLS price, and thus cannot afford to lose business by choosing a more rigorous seed lab. The difference in income resulting from the difference in two seed tests is borne entirely by the seed producer/seller.
- Labs risk losing clients if they report accurate results on seed viability or weed content that are “bad news” for the client’s business.
- If native seed were sold by the pound, as is seed corn for instance, discerning customers would use seed test results to compare seed quality and would consider the source of the seed test as one measure of reliability. We speculate that seed companies might then benefit financially from using labs customers consider reliable. This would require seed companies to report the source of the seed test to customers as well as the seed test results.

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#### GENETIC CHARACTERISTICS AND GENETIC VARIATION WITHIN A SEED LOT ARE TESTABLE ASPECTS OF QUALITY

- For some species, there are genetic variants (e.g., differences in ploidy) that can affect whether a population could reproduce in a restoration. It is possible, though expensive, to develop and carry out genetic tests for these variants. This is unlikely to happen unless the crop is of high value.
- Common garden experiments can reveal the genetic variation in a plant population, but this requires time and access to facilities and expertise. It is not practical for the large numbers of species in the native seed market.

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#### SEED QUALITY IS ONLY ONE AMONG NUMEROUS FACTORS THAT DETERMINE THE OUTCOME OF A PLANTING

- Seed buyers need to understand that there is not a 1:1 relationship between seed germinability and planting outcome. Vegetation outcomes are influenced by several factors besides seed quality including weather, soil characteristics, and seed predation.
- There are many levels of seed quality to look at such as poor species substitutions during periods of high demand, misidentification of species, and introduction of weed seeds in the mixing process. These are aspects of quality that can dwarf issues of germinability.

## OPEN DISCUSSION OF CRP AND NRCS PROGRAMS

Facilitator: Alan Lange, NRCS State Office

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### UPDATE ON THE SEEDING PLAN SUPPLEMENT

- The Seeding Plan Supplement is a sheet attached to the seeding plan that helps communicate about site conditions, goals, and plans for the planting. It includes the following information: name, county, type of CRP planting, seeding dates, seeding purpose, hydrology, ecotype, and nurse crop. It is completed by the conservation planner, prairie restoration professional, or NRCS/USDA representative.
- Contact information provided in the Supplement gives seed dealers the ability to communicate directly with the conservation planner about seed mixes through email and thereby prevent mistakes.
- So far, seed dealers are not seeing this form frequently, and when they do, they are finding it incomplete or with errors.
- Conservation planners need to be aware that completion of the Seeding Plan Supplement is mandatory and need training on how to correctly complete it.
- Incorrect selections on the Supplement can result in mixes with different prices, possibly putting the CRP contract at risk. For example, some planners have checked the “local ecotype” box when not required, which changes the mix and increases seed cost. Local ecotype is only required for CRP within 1 mile of a known remnant prairie.
- Most people present approve of the Supplement and believe the form could be edited to make it less error prone.

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### QUESTIONS AND SUGGESTED TOPICS FROM PARTICIPANTS

- How are NRCS seed mixes created?
- Update on fire as a mid-contract management practice
- Update on new NRCS programs
- Seeding rates (ran out of time)
- Seed propagation and planting dates for the 327 Standard (ran out of time)

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### HOW ARE THE DIFFERENT SEED MIXES CREATED?

- Seed mixes are tailored to address the ecological issues of an area.
- Decisions start at the USDA in Washington, D.C. and trickle down to Iowa. Standards are intentionally left broad at the federal level to allow states flexibility. If policies were too rigid, it would prevent localities from adjusting mixes to local conditions and changing needs.
- NRCS is about to launch a master list for all conservation program lands and policies into a single easily searchable document.
- Drop down menus in the NRCS Seed Mix Calculator only show species available to that specific mix, and will not allow other species to be chosen, catching problems before they are planted. Sample plans communicate the mixes the planner prefers overall such as economy mixes and custom mixes.
- Species that are considered ecologically acceptable for Iowa are those with a statewide native range.
- Growers can provide custom mixes with a higher diversity than the statewide species mixes.



- Under revised standards, CP-42 mixes can be up to 50% grass: both 10:30 and 20:20 ratios are now allowed. Conservation planners and seed dealers will need to communicate with landowners about the differences in those mixes and how that affects prices.

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#### FIRE AS A MID-CONTRACT MANAGEMENT PRACTICE

- Although fire is considered a best practice, it is no longer a mandatory practice and reimbursements are no longer given. Haying and grazing are other options for mid-contract management.
- Conservation planners differ on the necessity to plan and plant firebreaks with cool season plants. The utility of firebreaks is disputed and depends on maintenance (mowing) by the landowner.

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#### NEW USDA PROGRAMS

- STRIPS – CP-43
  - CRP handbook, Ex. 11, defines national policy.
  - Seeding requirements are coming out soon. Native grass and forbs must be used if available in the market. Use caution with the “Big 5” native warm season grasses in the mixes. Two flowering plant species are required for each season. CP-2 is not allowable.
  - STRIPS allow flexibility in including linear plantings (30-120 feet wide) on up to 25% of area within farmland that remains primarily in row crop production.
  - More information about the implementation and usage of prairie strips is available through ISU STRIPS <https://www.nrem.iastate.edu/research/STRIPS/FAQ2>
- S.H.I.P.P (Soil Health and Income Protection Program)
  - This program provides short-term (3-5 year) contracts for perennial cover for the least productive acres on a farm. There are 50,000 acres available with 50% rental rates.
  - NRCS is about to “roll out” seed mixes for this program. Native plants will not be required, and mixes will likely include non-native cool season grasses. No seed cost share will be provided.

## PAST, PRESENT, AND FUTURE OF SOURCE-ID SEED

Facilitator: Laura Walter, TPC Plant Materials Program Manager

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### WHAT IS THE BASIC STRUCTURE OF THE IOWA SOURCE-IDENTIFIED SEED SYSTEM?

- Primary demand for yellow tag seed comes from the Iowa-DOT and Iowa Roadside Management, which purchase about 85-90% source-identified seed.
- The certification program is administered through the Iowa Crop Improvement Association, a non-profit agency.
- Growers/suppliers pay fees for field inspection and bag tags. They are also required to send samples of seed to an approved list of seed testing labs for germination and purity testing.
- The original remnant source of the seed must be documented with ICIA, or growers can obtain Iowa Ecotype/Natural Selections seed from the Tallgrass Prairie Center for a fee.
- CRP is the bigger demand driver in the native seed market in Iowa. The NRCS only demands source-identified seed for specific situations (long term plantings and those within a mile of a known remnant prairie).
- Seed source is more important to public land managers such as the DOT and DNR. Iowa DNR requests yellow tag when buying seed, and they grow their own for parks' use. The NRCS and Army Corps of Engineers request source identification for some bids.

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### HOW WELL IS THE YELLOW TAG SEED CERTIFICATION SYSTEM WORKING?

- Many aspects of the program are functional. The cost of tags (per bag) and field inspections (based on the number of plots and acreage) is reasonable. Field inspections have improved, but better training of inspectors on plant identification may still be needed.
- Some seed consumers appreciate or demand the additional information about seed source that the yellow tag system provides.
- It would help the certification system be sustained long-term if all seed that is eligible to be yellow-tagged were tagged, whether or not the consumer required source-identification.
- The variability of seed test results has led to a breakdown of trust among native seed growers, seed testing labs, consumers, and industry regulators.
- The restriction of yellow tag seed testing to university labs results in long turn-around times compared with samples submitted to commercial labs. Indiana Crop Improvement, one of the accepted labs for yellow tag, has a dedicated lab for native seed testing, eliminating competition with crop species. Commercial labs are favored by growers due to their use across the native seed industry and more rapid and favorable results.

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### IS THE CURRENT MARKET FOR YELLOW TAG SEED SUSTAINABLE?

- The major consumers of source-identified seed in Iowa are the Iowa DOT and the Iowa Roadside Management (IRM) program at the TPC. In both cases the bidding process is weighted to favor yellow tag. The fewer producers competing for these bids, the greater the perception that there is not fair competition. How could we increase participation in the program?
- The extra cost of complying with seed lab restrictions can be borne by larger producers but is one factor causing smaller growers to leave the yellow tag system. For those who win DOT bids, the extra expense is

worth it, but not everyone can win the bid. Some smaller growers sell their source-identified seed to larger seed dealers through bulk transfer agreements. The seed dealers then pay for the required seed tests and yellow tags and bear the risks and benefits of bidding for the Iowa-DOT and Iowa Roadside Management seed purchases.

- Farmers participating in conservation programs will not choose yellow tag if it is priced higher, unless it is required. The way the system is currently set up means growers cannot bring the price of yellow tag seed back down from 20% above the open market, pricing yellow tag seed out of the market for customers other than the DOT and IRM.
- The market within the three Iowa Ecotype zones is not adequate to sustain commercial production of any of the species. Even the Iowa DOT and IRM purchase and use seed from any Iowa Ecotype zone in their mixes. Using ecoregions as the defining areas of our ecotypes instead of the original Iowa Ecotype Project zones could open the market to areas outside Iowa within the ecoregion.

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#### IS THERE A NEED TO DO MORE MARKETING AND EDUCATION FOR SOURCE-IDENTIFIED NATIVE SEED?

- We need to explain what yellow tag is to the general public: who needs it or not and why. Even conservation planners at NRCS offices may not understand when yellow tag seed is required, and when it is not. Training field office staff on seed sourcing could help address misconceptions.
- If more eligible seed (from certified fields) were yellow-tagged, would that increase the visibility of the program and help educate seed consumers and the public about the availability of Iowa-source seed?
- Monarch conservation efforts show that rural yards are important in demonstrating aesthetics of native plants and communicating urgency of conservation. Many farmers still think of native species as weeds. Getting native flowers into flower beds on farms and urban yards can change that perception.
- The demographics of farming are changing – more farms are managed by surviving women who tend to be more conservation minded but need encouragement and education. Women landowners and farmers' wives could influence decisions of what is planted for conservation programs.
- The TPC had a past marketing campaign called Plant Iowa Native. Other states have native plant marketing and education campaigns sponsored by nonprofit organizations such as the Grow Indiana Natives project of the Indiana Native Plant Society and Grow Native! of the Missouri Prairie Foundation.
- A redesign of Natural Selections tag that accompanies yellow tag (on seed grown from TPC foundation seed) could make it more attractive and help with marketing.
- Possible collaborators on marketing and education: NRCS; Pheasants Forever; Women in Ag Learning Network; Women, Food and Agriculture Network; Women's Learning Circles; native plant and prairie nonprofits

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#### HOW IMPORTANT IS THE YELLOW TAG SYSTEM FOR SOURCE-IDENTIFICATION?

- Without yellow tag, growers could still provide information on county of origin, but there would be no third-party certification to back up what the grower says.
- Ecologically, there is value to sourcing seed properly. The DNR would contract with private seed suppliers to grow out ecotype seed, if yellow tag were not there. A funding source would be necessary to guarantee the contract, but grants are typically for a couple of years, and it is hard to ramp up production of native species on that time scale. From a grower's perspective, there is not always a predictable outcome in native seed production. It would be risky to sign such a contract.

- Other states have versions of yellow tag, including Minnesota. We could look at their systems to see if and how they are dealing with similar issues.

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#### WHAT IS THE ROLE OF THE TPC IN THE SOURCE-IDENTIFIED SEED SYSTEM?

- The TPC has a role in developing new source-identified ecotypes and working out production issues before releasing seed to growers. It can take 10 years for a grower to bring a new species into full-scale production. The TPC has a reputation for reliable plant identification and for working to preserve genetic diversity of ecotype seed.
- The TPC needs to manage and periodically refresh existing ecotypes in the seedbank so that viable seed is available to growers for replanting production fields.
- The TPC can act as a mediator on questions regarding best practices. Questions remain about how much genetic change there is in a field over generations and whether this could affect restoration success through genetic adaptation of wild plants to agronomic production. Currently in Iowa, there is no limit on the number of generations in production. It takes at least 2-3 generations to get production up to commercially viable scale.

## RESEARCH ON SEED MIXES AND ESTABLISHMENT

Facilitator: Justin Meissen, TPC Research and Restoration Program Manager

General objective: Create the most biodiverse, ecologically functional tallgrass prairie that we can within resource, biological, and knowledge constraints.

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### SUMMARY OF TPC RESEARCH ON FUNCTIONAL DIVERSITY OF SEED MIXES

- Balancing restoration goals and cost effectiveness
- Creating seed mixes that include diversity in plant phenology, height, growth form
- Grass:forb ratios are important for establishment and functionality

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### CONNECTING THEORY AND PRACTICE AS A FRAMEWORK FOR RESEARCH INTO RESTORATION AND MANAGEMENT PRACTICES

- Ecological site descriptions (ESDs) – NRCS is developing provisional ESDs that incorporate information on the soils, hydrology, climate, and vegetation states of a site; provides more fine-grained information than Major Land Resource Areas (MLRA) and could lead to fine-tuning of conservation planning decisions.
- State and transitions models – How can we tailor management practices to sustain desired states or initiate transitions from less desirable states to more diverse, native communities?
- Restorations trajectory modeling – How can we increase monitoring of restored plant communities and use this information to guide management practices toward desired outcomes?

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### APPLICABILITY OF RESEARCH TO INTERESTS OF DIFFERENT STAKEHOLDERS

- Planners and practitioners need information from research to guide practice.
- There is interest in re-examining existing practices, impacts, and recommendations for establishing and managing prairies in conservation programs: seeding rates (40 seeds/square foot), mowing, disking, and grazing.
- Existing published research provides guidance regarding the ability of native plant populations to sustain wild seed harvest for species/ecotypes not available in the market.

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### CHALLENGES AND OPPORTUNITIES THAT COULD BE ADDRESSED THROUGH NEW OR ADDITIONAL RESEARCH

- Restoration needs to be successful in diverse soils and locations.
- How can we improve the match of seed mixes and establishment practices to specific sites?
- How to stabilize highly erodible and/or disturbed planting sites while allowing successful establishment of long-lasting, diverse native plantings?
- How could knowledge about mycorrhizae and other soil microbes be applied at scale in restoration?
- How much seed remains dormant in the soil?
- What practices (e.g., interseeding rates, mowing, grazing) would be most successful in transitioning nonnative cool season grass stands to more native plant diversity?
- What kind of plant community could be established and sustained in the novel environment under solar installations? How well would it support pollinators and provide other ecosystem services?

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EDUCATION AND DISSEMINATION OF RESEARCH RESULTS AND RECOMMENDATIONS

- Research needs to be done in a way that is transferable to practice.
- What are the best ways to communicate information from research to important audiences, such as conservation planners, landowners, land managers, technical service providers, and native seed producers?
- How can we best help landowners manage their land in a way that is cost efficient yet still within the realm of what we know is ideal?
- How much will the market-based system for native seeds respond to new information from research?
- How can we quantify the ecosystem services provided by prairie plantings to better inform decision-makers about the costs and benefits? Suggestions: monitoring soil health metrics, infiltration rates in prairie plantings

## EVALUATION SURVEYS

Out of 27 attendees, 19 (70%) returned evaluation surveys at the end of the meeting. We appreciate the responses and use them to improve the content and organization of future meetings.

## RATING SCALE QUESTIONS

Ninety-five percent (95%) of respondents agreed or strongly agreed that the meeting objectives were clear, meeting structure was efficient, and time allotted for discussion was appropriate. Notably, sixty-three percent of respondents strongly agreed that the topics were relevant, and an additional 32% agreed with the statement, though not “strongly.”

Only 16% of respondents *strongly* agreed that significant progress was made toward meeting objectives, though 68% agreed that progress was made. Another 16% chose “neither agree nor disagree.”

## FREE RESPONSE QUESTIONS

Respondents valued the opportunities for networking, open discussion, diverse perspectives, and information exchange. Suggestions included inviting new voices to the panel discussion, trying different structures for the breakout sessions such as lightning rounds, and improving the articulation of actionable items. The open discussion format, broad topics, and diverse perspectives make reaching specific action items challenging in a one-day meeting. This suggests that there may be a need for follow-up meetings and/or a working group to identify and move forward on particular goals and tasks.

Suggestions for future topics of discussion included the following:

- Producer roundtables: What are the challenges and best practices for reliable seed production? How do you get started with native seed production and yellow tag certification?
- Emerging markets: What works in solar arrays, wind farms, and utility corridors? How can producers connect to new and existing seed consumers?
- Communication and outreach projects: What is successful? What are some real world examples?
- Establishment: What seeds work where? What species do not work in CRP? What’s the effect of varying seeds/square foot?
- Seed quality: How is seed tested? Why do tests vary? What do tests mean?
- Yellow tag certification: Are there gaps or loopholes in the yellow tag system, and, if so, how do we fix them? Should we re-examine the current ecotype boundaries? How can we increase participation of producers and consumers?
- Species for future propagation: What are the gaps in the native seed supply? How can we get more challenging species into the market?
- Seed sourcing: How important are ecotypes? What are best practices for sourcing seeds for a changing climate?
- Follow-up on this meeting’s topics and discussions

## APPENDIX – LIST OF MEETING ATTENDEES

First name	Last name	Business or Organization	Email Address
Dan	Allen	Allendan Seed Company	allendan@allendanseed.com
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