

Native Seed Producers Panel

On April 16, 2021, the Tallgrass Prairie Center (TPC) at the University of Northern Iowa hosted a panel discussion involving several seed producers from Iowa and neighboring states to discuss their current production challenges and problem-solving approaches.

Areas for potential research and suggested action items for a Native Seed Growers' Working Group were identified (see list items 4 and 5, below).

The TPC Plant Materials Program is funded by Iowa's Living Roadway Trust Fund and the University of Northern Iowa.

1 INTRODUCTIONS

Introduction and welcome by Dr. Laura Jackson, TPC Director

Introduction to the TPC Plant Materials Program and objectives of this meeting by Laura Walter, Plant Materials Program Manager and facilitator of the panel discussion

Goals of the meeting:

- Provide a forum for information sharing among native seed growers
- Give seed consumers more perspective on the challenges of growing native seed

2 PANELIST SELF-INTRODUCTIONS

2.1 BILL JOHNSON, BIOLOGIST WITH THE IOWA DNR PRAIRIE RESOURCE CENTER

- Public sector seed producer
- Has produced over 100 species for use on public land in Iowa, develops production methods, and supplies seed for planting around 1800 acres per year
- Grows seed in several types of production settings
 - o Forbs direct seeded into native grass (little bluestem) stands
 - o Single species row plots for production of forbs
 - o Diverse, combine-harvested fields sprayed with clethodim to reduce competition from grasses and increase forb yields
 - o Single species combine-harvested fields of native grasses

2.2 BILL BUMAN AND DAUGHTER CHELSEY BUMAN OLSEN, BACK YARD DESIGNS, HARLAN, IA

- Started growing a few native species in 1999-2000
- Currently produce around 50 native species in any year, mostly forbs and flood-irrigated sedges; also have corn, beans, and livestock
- Interested in selling more nursery stock due to interest generated through Facebook page
- Start seedlings in greenhouse, use mechanical transplanter to plant fields

- Innovative practices
 - o Setting plants into existing grass
 - o Hydroponics for wetland species like turtlehead, lobelias
 - o Build own custom seed cleaning equipment

2.3 KEITH FREDRICK, MINNESOTA NATIVE LANDSCAPES (MNL), 20 YEARS' EXPERIENCE WORKING WITH NATIVE PLANTS

- MNL is a full-service restoration company; Keith's role is in production of seed, plants, and mulch/erosion control products
- Manages 200-acre farm with 140 fields, producing 88 species, all local ecotype, mostly sourced from within the county
- Focused on cool season grasses, asters, sedges, goldenrods, and milkweeds
- Produces both plants and seed
- Company has added two "sister farms" that are managed differently due to different soils and slopes
- Production methods
 - o Start fields using transplants
 - o Mechanize production as much as possible – spraying, cultivation, combining

2.4 MATT SHEAFFER, TAYLOR CREEK RESTORATION NURSERY, NOW PART OF RES (RESOURCE ENVIRONMENTAL SOLUTIONS)

- 350 acres of production beds in sandy soils in Rock County, Wisconsin
- Seed team and plant and propagation team cater to customers who value local genetics and high diversity
- Producing 210 species, but have 600 species in inventory available for sale
- Recently started a contract grower program with three other growers in the area
- Provide most of the seed and plants for customers' projects "in house"
- Production methods
 - o Solid stand grass fields
 - o Six-row, 30-inch spacing row crop system for most forbs
 - o Develop methods that are compatible with conventional field equipment
 - o Experimenting with cover crops and companion crops
 - o Shifting to direct seeding for seed production rows
 - o For weed control, use spring burns, mechanical cultivation, and herbicides
 - o Moving to earlier retirement of production beds
 - o Harvest from combine directly into seed corn drying bins; a modular, scalable approach
- Challenges
 - o Inconsistent yields make sales projections difficult
 - o Insufficient research into the effects of supplemental fertility for forbs
 - o Labor shortage
 - o Trying to decrease herbicide use through fine-tuning mechanical cultivation

2.5 NATE GINGERICH, TAYLOR CREEK RESTORATION NURSERY

- Collects seed from off-site remnants for starting production fields
- Constantly adding species with goal of being a “high diversity nursery”
- Company has a regional outlook with 2-3 local genotypes of each species, adds complexity to production system
- Works with woodland crops grown under shade structure and specialty wetland species in rubber-lined raised beds
- Interested in polycropping strategies, less controlled production situations, sees value in mistakes

3 DISCUSSION SUMMARY

3.1 QUESTION 1 – INFORMATION SHARING

Native seed production is part of a competitive industry. If you’ve taken on the risk and investment of developing successful production techniques, there’s probably only so much you can afford to share about that process. On the other hand, information sharing could accelerate innovation and strengthen the native seed market in general. Where do you fall on this? How much information sharing is good for your organization or business?

KF

- In working with recently added “sister farms,” noticed that the same solutions are sometimes invented independently by different producers

MS

- Twenty years’ experience in vegetable growing industry with deep/informed level of sharing, but that is a larger industry with more consistent demand
- Native seed industry is smaller, gains are hard-fought, but sees potential for small groups of 4-8 growers willing to share while acknowledging that there will be secrets
- Growers are geographically spread out so field days are harder to do

CBO

- Quotes Bill Buman: “Secrets don’t make friends”
- Suggests setting up a forum like Ag Talk, but acknowledges that market is competitive

BJ

- Public seed producers (e.g., DNR, TPC) have roles in developing and sharing methods, though may not be as innovative as commercial producers

3.2 QUESTION 2 - INNOVATIVE GROWING PRACTICES

This is a fairly young branch of agriculture/horticulture without a lot of support from agencies like the extension service. How do you figure out solutions to problems in production? What kinds of information are most useful to you? What kinds of research would be helpful?

NG

- Looking at the developing successional ecology in soil under the crop could help address questions about stand aging.
- Some of growers' hesitancy about information sharing is due to the high rate of failure when trying new techniques like poly-cropping.
- Companion cropping eliminates some of the "go to tools" for preventing weed contamination.
- A looming question for crops not in traditional agronomic cultivation is the effect of plant competition (from companion plants) on seed production.

KF

- A lot of trial and error goes into new practices and finding the best ways to grow these plants.
- It would be useful to have a better list of the pests and diseases that effect native plants in monoculture production systems.

BJ

- Growers could use more information on new mechanical and chemical ways to control weeds.
- Growing forbs with little bluestem allows annual burning, reduces disease carryover, and extends the productive lifetime of the stand.

KF

- Flaming off forb monoculture plots with a propane burner also reduces year-to-year disease transmission, but is more expensive.

NG

- One outstanding question is: What are the long-term implications of using herbicides on our crops, including effects on crop longevity?

3.3 QUESTION 3 – DEALING WITH WEEDS

What are the most important weed issues you deal with? What approaches do you use for managing weed issues? What would you like to try?

BB/CBO

- Water hemp is our biggest nightmare, though Palmer amaranth is not here yet.
- Goats preferentially eat water hemp and other weeds from sedge fields (and potentially from milkweed fields), noticeably reducing weed pressure. They fully digest seeds and do not disperse seeds through their manure.
- Cultivate between rows using a field cultivator on a Cub tractor.
- Using plastic mulch laying as another means of weed suppression, and setting plants into plastic. Conditions in western Iowa are often too dry for consistent establishment of direct-seeded plots.

MS

- Developing a weed species list for each crop, so that weeding effort can focus on species that are impossible to clean out of the crop
- Involves transferring information from the seed refining team back to the field production team

BB/CBO

- Color sorter is a different way to remove weed seed
- Weeds and natives vary in how susceptible they are to static, so a static electricity sorter might be effective for some combinations
- Different noxious weed regulations by state make selling native seed complicated

KF

- Gravity deck (and sometimes indent cylinder) works fairly well for separating pigweed from similar sized native seed

3.4 QUESTION 4 – CONNECTING DEMAND WITH SUPPLY

There can be a disconnect between planned seed mixes and species that growers can reliably produce. Examples - Upland wild timothy, *Muhlenbergia racemosa*, good seed production, but little demand. Prairie straw sedge, *Carex suberecta*, poor germination, but high demand. What can we do about this?

BJ

- No matter how much diversity we produce, land managers always want more
- Evolution of CRP is another example – from non-native grasses, to native grass with few forbs, to pollinator mixes
- Asking for more species is a good thing
- How to create demand is a tough question, but field trials and demonstration plots could generate interest

KN

- Promote new species by highlighting their key functional characteristics

NG

- Sometimes “if you build it, they will come,” but sometimes not
- Bank seed and move on if no demand, grow it out later if someone wants it
- Each project demands unique diversity

MS

- Growers could collaborate on promoting species that aren’t being specked in mixes, and this could be communicated to decision makers who set the specs
- Growers have the experience in the field to know whether species can be produced at scale

3.5 QUESTION 5 – SEED TESTING VARIABILITY

Since native seed is sold based on Pure Live Seed (PLS), seed tests that determine PLS are high stakes. We also know that there is a great deal of variability in seed test results. If a grower sends seed from

one seed lot to three different seed labs, the results from each lab can vary considerably. How do you (or your buyers) know which results to trust? How much does this affect your business? What do you see as solutions to this issue?

KF

- Purity estimates are usually accurate and consistent among labs. Weed tests are also consistent except when there is a very small number of weed seeds in a lot, resulting in random variation among samples.
- Germination and dormancy results are more variable.
- Subjective observations of germination in the greenhouse suggest that lab estimates of PLS are underreporting viability. Growers use best practices for breaking seed dormancy, which should improve germination.

MS

- Seed tests carry a surprising weight on business profitability, and this is in the hands of a third party.

3.6 QUESTION 6 (FROM THE ONLINE AUDIENCE)

Is anyone observing lack of pollinators or issues with pollination or fertilization that affect seed yield?

CBO/BB

- Have observed variation from year to year in bumble bee numbers
- Buy bumble bees and mason bees, rent honey bee hives to improve pollination
- Strongly supportive of the pollinator program in CRP

KN

- How could you separate the effect of pollinators from the other factors affecting seed production?
- Has observed interesting pattern in alum root, where seed set is higher in small patches than in large plots and wondered if it was related to pollinators

MS

- There are some crops that look great in the field but produce empty or undeveloped hulls, but why?

3.7 QUESTION 7 – EMERGING OPPORTUNITIES

What do you see as emerging markets: Urban gardens, utilities, solar gardens, others? Are these opportunities for existing growers or niches for new growers?

BJ

- More people are moving out from urban areas onto small acreages and looking to convert mowed grass to native vegetation

- Growers could provide ready-to-go mixes for these consumers, who are likely to view local ecotype as higher quality

KN

- Agrees that lawn replacement is a growth area
- Combined use, using native plantings for grazing livestock, is also on the increase

CBO

- Programs like the pollinator program and roadside plantings are catchy to the public eye
- Appreciation of beauty through natural landscaping, photography, and social media sharing help open up the market

4 UNANSWERED QUESTIONS/AREAS FOR POTENTIAL RESEARCH

- How does the developing successional ecology in soil under the crop affect stand aging?
- What is the effect of plant competition (from companion plants) on seed production?
- What are the long-term implications of using herbicides on our crops, including effects on crop longevity?
- Why do some apparently healthy crops produce little filled seed?
- How can we separate the effects of pollinators from the other factors influencing seed production?

5 ACTION ITEMS FOR WORKING GROUP

A small group of regional native seed growers with an interest in information sharing could form to work on the following:

- A list of pests and diseases that affect native plants in monoculture production systems
- A list of weed species for each crop that are difficult or impossible to clean out in seed conditioning
- A list of ways to control weeds in each crop, including mechanical, chemical, and cultural methods
- A list of suitable companion plants or cover crops for different crop species
- Collaborative promotion of species that can be produced at scale but are not often included in project specifications
- Better understanding of seed test variability and its consequences by all stakeholders