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A 33 Year Old Native Seed System In The Upper Midwest: The Evolving Role Of Stock Seed Production And Stakeholder Communication [Poster]

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A 33-year old native seed system in the Upper Midwest: The evolving role of stock seed production and stakeholder communication

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BACKGROUND

PURPOSE AND HISTORY

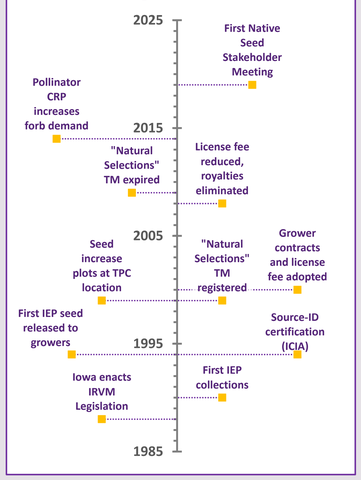
The Tallgrass Prairie Center (TPC) Plant Materials Program at the University of Northern Iowa (UNI) aims to increase the availability and affordability of regionally appropriate, Source-Identified (SI) native seed for roadsides and other restorations.

We serve a linking role within the native seed system in our region by:

1) **developing SI foundation stock seed that is regionally adapted and genetically diverse for the native seed industry.**
2) **fostering communication across the native seed supply chain.**

A plant materials program, originally named the Iowa Ecotype Project (IEP), was initiated in 1990 at UNI, in partnership with several agencies and with funding from the Iowa Living Roadway Trust Fund. The State of Iowa enacted legislation in 1988 declaring Integrated Roadside Vegetation Management (IRVM) to be in the public interest. This stimulated demand for regionally adapted native seed. Iowa's remnant prairies were too fragmented to support wild collection for large scale restoration. Few species of native seed, primarily cultivars, were available for purchase. Public funding of SI stock seed development reduced risk to growers and communication among partners influenced demand for new species, helping to foster a diverse native seed market in the region.

Program Timeline



PARTNERS

Iowa Living Roadway Trust Fund (LRTF) administers annual competitive grants, funds stock seed production and stakeholder communications through TPC Plant Materials.

Iowa Crop Improvement Association (ICIA) has provided 3rd party certification of Source-Identified native seed in Iowa since 1994.

Iowa DOT purchases seed for roadside revegetation using a bid process with a preference for SI seed.

Iowa Roadside Management (IRM), at TPC/UNI applies for federal grant funds to distribute native seed to county roadside programs annually. SI seed is preferred in the bid process.

Private native seed producers in Iowa and neighboring counties may participate in the SI seed certification program and purchase stock seed from the TPC.

PERSONNEL

- **Program Manager** – plans and implements all stages of plant materials development and communications activities; manages grants
- **Undergraduate Assistant** – 15-20 hrs/wk during school year, 30 hrs/wk in summer

FACILITIES AND EQUIPMENT

UNI provides access to approx. 65 acres of land for seed production and research.

Offices, meeting spaces, and equipment are housed on the UNI campus.

1800 ft² climate-controlled greenhouse

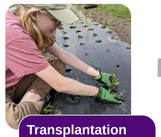
Equipment for plot preparation, maintenance, and harvest

Seed cleaning laboratory

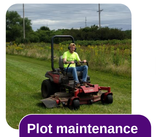
PLANT MATERIALS DEVELOPMENT

Remnant Accessions
- Locate remnant plant populations
- Collect seed at maturity
- Sample from many maternal plants
- Partner with other organizations
- Dry, clean, and store seed

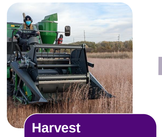
Plug Propagation
- Break dormancy and germinate seeds
- Aim for equal representation of remnant accessions
- Avoid selection
- Maintain healthy greenhouse environment



Transplantation
- Prepare fields
- Hand transplant plugs into rows
- Train students and volunteers to maximize transplant survival



Plot maintenance
- Mow/trim
- Weed and rogue
- Scout for pests/diseases
- Plots and records inspected by ICIA



Harvest
- Gauge maturity
- Hand or mechanical harvest or combination
- Harvest repeatedly as seed matures

Conditioning seed
- Dry and clean seed
- Check outputs of each step to avoid unintended selection

Storage
- Stock seed stored at 4°C/45%RH
- Reserved Gen1 and remnant seed in -20°C freezer

Release to private growers
- Provide available species list
- Growers request stock seed
- Package and ship available seed

Commercial production
- Fields and records inspected by ICIA
- Bags labeled with yellow tag
- SI seed available for restoration
- SI seed preferred in Iowa DOT and IRM bids

GUIDING PRINCIPLES

Conserve the integrity and diversity of the native plant germplasm we collect and increase:
- Collect seed from multiple remnant prairies across a latitudinal zone.
- Collect from numerous, well-spaced maternal plants across each population.
- Maintain ICIA-specified separation distances between production rows of the same species from different zones.
- Be aware of and avoid selection at all stages of production.

Select species of potential value in roadside revegetation and other reconstruction projects:
- Widespread in Iowa
- Persistent in remnant prairies or in other unplowed sites
- Likely amenable to agronomic increase
- Member of important and/or underrepresented functional groups

Educate future practitioners, create and share technical information.
- Native Seed Production Manual
- Technical Guides

SEED BANK MANAGEMENT

- Remnant accessions are packaged in Mylar pouches and stored in a -20°C freezer.
- Stock seed is stored in controlled environment room at 4°C and 45% relative humidity.
- Samples of seed from each Generation 1 stock seed lot are reserved and stored separately in a -20°C freezer.
- Samples of seed lots are sent to a public seed laboratory for purity and viability testing.
- Gen1 seed is used to refresh stock seed by growing a second generation when supplies or viability decline.

Left: Seedlings of *Amorpha canescens*, leadplant, grown from reserved 2003-05 Gen1 seed. These seedlings will be transplanted into a production plot in May 2023.

OUTCOMES

Remnant prairie accessions
- 3000+ collections
- Over 100 species

Functional group diversity (some species in >1 category)
- Warm season grasses (9 species)
- Cool season grasses (7 species)
- Sedges (17 species)
- Legumes (8 species)
- Other forbs (53 species)
- Shrubs (4 species)
- Hemiparasites (2 species, in progress)

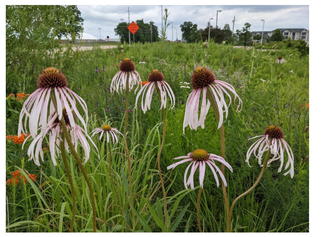
Future targets: additional spring and fall flowering species, native cool season grasses, hemiparasites

Stock seed provided to commercial growers (1994 – 2022)
- 89 species
- 162 regional ecotypes (zones)
- 1394 pounds
- 20 growers (4 currently participating in Iowa SI certification)

From 2007-2015, commercial growers produced around 100,000 pounds of Iowa SI seed per year.

Seed mixes containing certified SI seed have been planted on Iowa roadsides for nearly 30 years. The seed mixes IRM provides to county programs include approximately 85% Iowa SI seed.

Scale of impact:
- 25-30,000 acres of county roadsides
- Over 50,000 acres along state and federal highways



STAKEHOLDER COMMUNICATIONS

CONTEXT AND ACTIVITES

Demand for forb seed increased dramatically from 2015-2018 due to rapid expansion of CRP Pollinator Habitat plantings. Price spikes led to scrutiny of seed quality by Iowa DOT and ICIA, who were not aware of competition from CRP participants, and changes to seed testing requirements with unintended consequences.

To improve communication among native seed stakeholders, with a specific focus on the SI seed supply, the TPC:
- Hosts annual stakeholder meetings at UNI (starting in 2019).
- Publishes a newsletter, the Native Seed Scoop.
- Manages a Google Group to serve as an online forum for members.

OUTCOMES
- Improved understanding of the regional native seed supply (for both SI and uncertified seed) and the strengths and vulnerabilities of the system
- Opened channels of communication among seed producers, consumers, regulators, and staff of agencies with influence on policy and standards

SYSTEM STRENGTHS
- The interaction among private growers, publicly funded programs, and public and private seed consumers has resulted in a robust native seed supply.
- Public funding facilitates native plant materials development, information exchange, and networking.
- Bid preferences by two major seed purchasers (IRM and Iowa DOT) create demand for SI seed.
- Government conservation programs have created stronger demand for mostly non-SI native seed with increasing diversity over time.
- Diverse native seed is available for seed consumers of different types, working at a variety of scales.
- Diversity within several functional groups enables reasonable substitutions in seed mix design.

SYSTEM VULNERABILITIES
- In-state demand for SI native seed is primarily from Iowa DOT and IRM program at TPC; however, some Iowa SI seed is sold into neighboring states.
- Demand from Iowa DOT fluctuates depending on size of projects, completion dates; largest highway corridor projects have been completed.
- Native seed demand in Upper Midwest is dominated by USDA conservation programs which do not generally prefer or require SI seed.
- Seed testing requirements for Iowa SI seed are more stringent than for other seed markets; cost of additional testing drives smaller producers out of bid process for Iowa DOT and IRM.
- Fewer seed producers participating in SI Certification over time.
- Staff turnover in partner organizations and agencies erodes established communication networks and can weaken the system.

FOR MORE INFORMATION

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Tallgrass Prairie Center website: tallgrassprairiecenter.org

IOWA LIVING ROADWAY TRUST FUND

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