

Winter 3-5-2022

## Irvine Prairie Planned Work

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**IRVINE PRAIRIE**

**Winter Meeting | March 05, 2022**



**Tallgrass Prairie**  
CENTER

C. Irvine, B. Pippert, L. Jackson, L. Walter, A. Phillips, C. Teator, J. Meissen

University of Northern Iowa.

Zoom Meeting ID: 941 6111 5277 • Passcode: 561650

# Planned work

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## 2022



# 2022 Irvine Prairie Restoration & Management Work Plan

Restoration and management work in 2022 will consist primarily of new planting and conversion of grass waterway/headlands to prairie vegetation. Some plug transplanting will occur. Tasks to support 2022 operations follow:

## Spring (April 1 - June 30)

### Prescribed Burning

Approximately 25 acres of Irvine Prairie planted in 2018-2019 will be burned as part of the long-term management of the site. Work is dependent on favorable weather.

Operator: JM, TPC staff and volunteers

Equipment: 2 pump engines, 4 backpack sprayers, 2 flappers

Location: Throughout South Tract West Unit

Timing: March-May

### Spring Seeding

Approximately 9 acres of Irvine Prairie will be drilled or broadcast in early spring by TPC staff using a 6ft Truax native seed drill or broadcast spreader. One seed mix will be planted across the northeast corner of Irvine Prairie (see Map 4). Seeding will be conducted as early as feasible to promote dormancy breaking in seeded forbs.

Operator: JM/AO

Equipment: Truax Drill (6ft) or Broadcast spreader

Location: Throughout 2022 Work Area (see Map 2)

Timing: April

### Supplemental Plug Planting

Plug planting may include container-grown Virginia bunchflower that was initially collected from a nearby ditch. Dormant plants entering their fourth growing season will be dibbled into large plugs with a sedge or grass companion plant to aid in forming transplantable plugs. Planting locations are currently unknown, but will likely focus on wetter sites near the northwest and southwest corners of Irvine Prairie, though some species suited for drier soils are also being propagated. Species to be transplanted into suitable, strategic locations include cardinal flower, white turtlehead, prairie alumroot, spotted Joe Pye weed, American water horehound, winged loosestrife, woolgrass, swamp lousewort, and two species of rosette panic grasses. We will dig and transplant bare root material of Canada anemone from a retired TPC seed production plot. Additionally, we are attempting to grow out small samples of locally collected seed of needle-and-thread grass (from a Benton County roadside) and hairy hedgenettle (grown at TPC from plants rescued from the ditch adjacent to Irvine Prairie). We recently purchased additional dibbles to make volunteer transplanting events run more efficiently.

Operator: LFW

Equipment: Volunteer labor, hand tools

Location: TBD

Timing: late April-early June

## **Invasive Grass Mowing**

Problem perennial grass areas found in old waterways should be mowed to promote uniform growth in preparation for a spring herbicide application.

Operator: JM

Equipment: Any mower set to 4 in. cutting height

Location: Past waterways

Timing: pre-green up (April)

## **Invasive Grass Herbicide Application**

After invasive perennial grass areas have had time to regrow, they should be sprayed with appropriate herbicides at label recommended rates. Spot spraying will minimize off-target effects in established vegetation.

Operator: JM

Equipment: Any mower set to 4 in. cutting height

Location: Past waterways/headlands

Timing: mid-May

## **Parking & Staging Area Layout**

Mark boundaries of parking and staging area. Move rocks into final position and mow all areas.

Operator: JM/BP

Equipment: TBD

Location: Parking and Staging Area

Timing: TBD

## **Cool-season Grass Conversion Experiment Establishment**

Mow main waterway to prep for herbicide applications. Treatments will include zero, one or two applications of herbicide prior to seeding. Seed in mid-late May.

Equipment: Backpack sprayer, mower, Truax research drill (4ft)

Location: Main waterway

Timing: early April-mid May

## **Establishment Mowing #1 (2022 Areas)**

All early plantings benefit from mowing relatively early in the season to encourage light penetration to the soil surface. This mowing will cover ~15 acres. Depending on the equipment available, rotary disc mowers or other hay mowers are ideal for avoiding vegetation matting, which can impede light penetration to soil surface.

Operator: BP

Equipment: Hay mower ideal, brush hog OK, mower at ~6 in

Location: 2022 Work Area (see Map 1)

Timing: late June

## Local Ecotype Seed Collection

Potential target species for local ecotype seed collection include Illinois tick trefoil, false boneset, heavy sedge, smooth blue aster, Scribner's panic grass, and partridge pea. Locations of nearby remnant populations will be obtained through a scouting trip in early to mid-May. Location information will be collected using GIS apps to facilitate returning to the populations for seed harvest. We will communicate with the Benton County Roadside Manager regarding our seed collecting plans. Seed will be cleaned, stored, and used to produce greenhouse-grown plugs in spring 2023 for direct transplantation at Irvine Prairie and/or for establishment of seed increase plots with the goal of producing enough viable seed to be included in a future Irvine Prairie seed mix.

Operator: LFW

Equipment: GIS software, TPC seed lab and greenhouse equipment

Location: TBD

Timing: May - October

## Summer (July 1-September 1)

### Invasive Species Spot Herbicide Application

Various invasive plant species may be sprayed with appropriate herbicides at label recommended rates. Spot spraying will minimize off-target effects.

Operator: JM

Equipment: Backpack sprayer

Location: Throughout Irvine Prairie

Timing: July-August

### Establishment Mowing #2 (2021 Planting Areas)

A second mowing should occur when weed or cover crop reaches approximately 2ft in height. Plan to mow at the end of July. This mowing will cover the 15 acres, planted in 2021. Depending on the equipment available, disc or sickle mowers are ideal for encouraging light penetration to soil surface.

Operator: BP

Equipment: Hay mower ideal, bush hog OK, mower at 4-6in

Location: Throughout 2021 Work Area (see Map 1)

Timing: late July

### Establishment Mowing #3 (2021 Planting Areas)

A third mowing may not be necessary, but should occur when weed or cover crop once again reaches approximately 2ft in height. Plan for a final mow mid-late August. This mowing will cover the 15 acres, planted spring 2021. Depending on the equipment available, disc or sickle mowers are ideal for encouraging light penetration to soil surface.

Operator: BP

Equipment: Hay mower ideal, bush hog OK, mower at 4-6in

Location: Throughout 2021 Work Area (see Map 1)

Timing: late August

## Fall (September 1 - December 1)

### Seeding Establishment and Vegetation Outcomes Monitoring

In order to assess the success of the planting areas, formal monitoring needs to be undertaken. Information derived from monitoring will be used to identify areas for reseeding next year, and plan for future management prescriptions.

Operator: JM

Equipment: GPS, Sampling frame, datasheets

Location: Throughout Irvine Prairie

Timing: September

### Invasive Grass Spot Herbicide Application

After invasive perennial grass areas have had time to regrow, they should be sprayed with Roundup at label recommended rates. Spot spraying will minimize off-target effects.

Operator: JM

Equipment: Backpack sprayer

Location: Past waterways

Timing: October

# 2022 Irvine Prairie Outreach Work Plan

Outreach work in 2022 will involve reaching out to more UNI Faculty, finding ways to more efficiently meet the need for field trips and group tours, informing and inspiring the public to explore Irvine through print and electronic communications, and improving the visitor welcome area. Tasks to support 2022 operations follow:

## Research

### Promote Irvine Prairie to UNI Faculty

*We will continue to cultivate existing research partnerships with UNI Faculty members. Printed copies of the existing Irvine Prairie brochure will be distributed as widely as possible on campus, and a plan will be developed for updating the brochure periodically. Faculty members with research interests aligned with Irvine Prairie will be invited to tour the site and brainstorm possibilities.*

Personnel: LJ, AP

Materials: Printed brochures

### Visual Documentation of Restoration

*Tile line videos will be taken annually. TPC staff will reach out to the Geography Department (Dr. James Dietrich) regarding possible drone footage of prescribed burns.*

Personnel: AO

Materials/Equipment: Tile camera

2022 Work Area

Timing: April



## Education

### Involve K-12 Students in Restoration Work

*Craig Hemsath has confirmed an interest in continuing to bring Union High School classes to Irvine Prairie in late spring to assist with transplanting. We will finalize plans for this event after the prescribed burns are complete.*

Personnel: LW, JM, AmeriCorps

Materials: Transplants, dibbles, marking supplies, watering supplies

### Field Trips and Tours

*We will continue to staff field trips when requested and staff time allows. We will explore the possibility of involving volunteer docents in this role in the future by inviting volunteers to assist with field trips and developing a plan for volunteer training. We will reach out to Benton County Conservation naturalists to discuss ways they could partner with Irvine Prairie for nature programming and school field trips. We will prepare plans and sets of materials for group activities to make future events run more smoothly.*

Personnel: LW, AmeriCorps, volunteers

Materials/Equipment: Varies by activity type and season but may include sets of insect nets, field guides, binoculars, seed collecting supplies

## Community Engagement

### Communication

*A plan for regular updates to our print communications will be developed. We will continue to use the Irvine Prairie web pages and Facebook posts to publicize and share information about Irvine Prairie. We will seek opportunities to publish information and articles about Irvine in mainstream local and/or statewide publications. We will use the species lists from the research reports to create printable checklists of plants for the website. Staff members will take photographs of the landscape, flora/fauna, and activities at Irvine throughout the seasons for use in electronic and print publications.*

Personnel: AP (lead), all staff and AmeriCorps

Materials/Equipment: NA

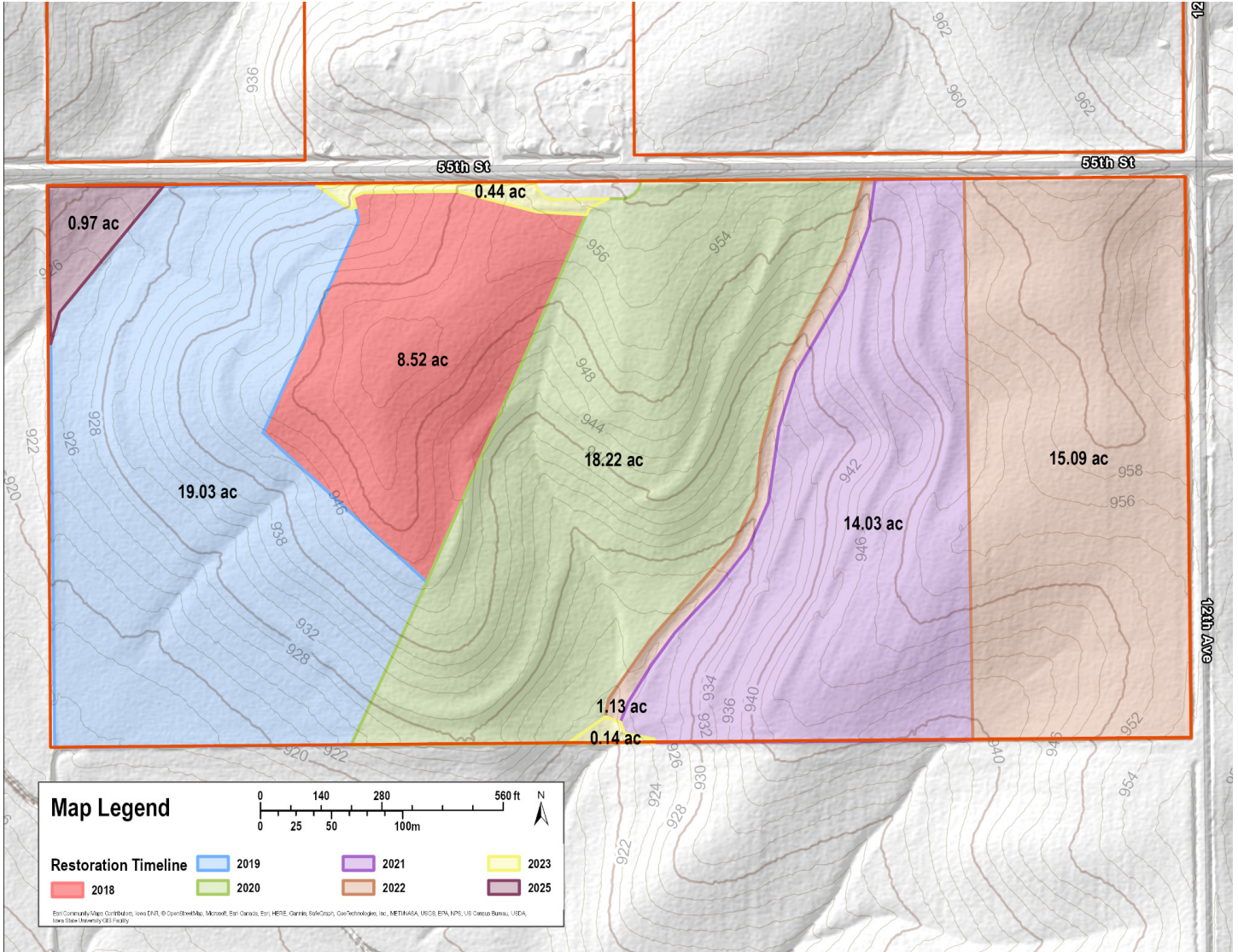
### Logistics

*This work is focused on improving the visitor welcome area: staging and parking areas. We will purchase and install a bench and plant surviving bur oak saplings from the fall 2021 transplanting event. We will investigate and select designs, locations, and contractors for constructing an information kiosk and a wall to hide the portapotty (if this can be done in a way that is compatible with servicing the toilet).*

Personnel: MW, KN, LJ, AP

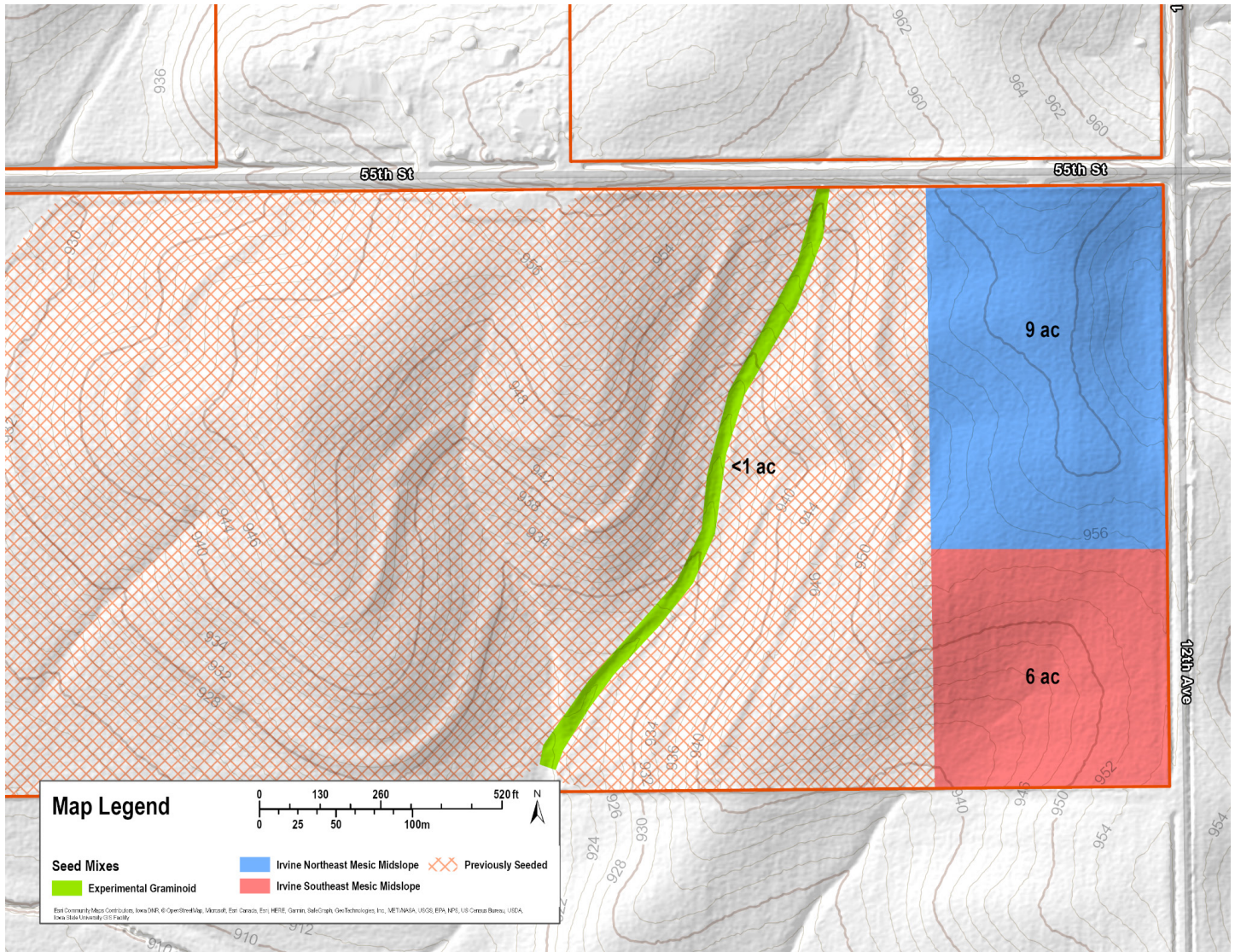
Materials/Equipment: spades for planting bur oak saplings

# Maps and Supplemental Materials



Map 1 — Restoration timeline





**Map 2 — Seeding areas and seed mixes planned for 2022 operations**

Seed Mix	Site	Year	Total seeds/ ft <sup>2</sup>	Total PLS lbs./ac
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**Northeast  
Mesic  
Midslope**      **Irvine Prairie**      **2022**      **65.71**      **7.504**

Common Name	Scientific Name (ITIS)	Seeds/ft <sup>2</sup>	PLS lbs./ac	USD/ac	Source Verified	Seed Source(s)
big bluestem	<i>Andropogon gerardii</i>	1.00	0.272	\$2.72	Y	Z1, IA
sideoats grama	<i>Bouteloua curtipendula</i>	3.00	0.944	\$9.46	Y	Houston, Crawford County, MN, WI; Houston County, MN
arctic brome	<i>Bromus kalmii</i>	0.25	0.085	\$4.05	Y	Otter Tail County, MN; Pope County, MN
Bicknell's sedge	<i>Carex bicknellii</i>	1.00	0.161	\$28.90	N	Z2, IA; Z1, IA
shortbeak sedge	<i>Carex brevior</i>	1.00	0.094	\$11.26	Y	Z1, IA
heavy sedge	<i>Carex gravida</i>	0.25	0.057	\$28.24	N	Z1, IA
troublesome sedge	<i>Carex molesta</i>	0.50	0.054	\$9.81	N	Z2, IA
Canada wildrye	<i>Elymus canadensis</i>	0.25	0.110	\$1.10	N	Kossuth County, IA
Virginia wildrye	<i>Elymus virginicus</i>	0.25	0.162	\$0.98	Y	Tama County, IA
prairie Junegrass	<i>Koeleria macrantha</i>	1.00	0.014	\$5.72	Y	Z1, IA
marsh muhly	<i>Muhlenbergia racemosa</i>	0.32	0.011	\$3.00	N	Z1, IA; Unspecified County, IA
switchgrass	<i>Panicum virgatum</i>	1.00	0.170	\$1.35	N	Houston County, MN
little bluestem	<i>Schizachyrium scoparium</i>	4.00	0.712	\$9.52	Y	Wabasha, Vernon, Buffalo County, MN, WI; Madison, Union, Riggold, Taylor County, IA
Indiangrass	<i>Sorghastrum nutans</i>	2.00	0.473	\$5.68	Y	Z2, IA
composite dropseed	<i>Sporobolus compositus</i>	5.00	0.454	\$4.54	Y	Z1, IA
prairie dropseed	<i>Sporobolus heterolepis</i>	0.25	0.045	\$7.16	N, Y	Unspecified County, IA; Kossuth County, IA
common yarrow	<i>Achillea millefolium</i>	0.08	0.002	\$0.24	Y	Faribault County, MN
leadplant	<i>Amorpha canescens</i>	1.00	0.152	\$25.84	N, Y	Unspecified County, IA; Adair, Madison, Webster, Winnebago County, IA
candle anemone	<i>Anemone cylindrica</i>	0.10	0.010	\$10.46	N	Madison County, IA
pale Indian plantain	<i>Arnoglossum atriplicifolium</i>	0.10	0.023	\$3.49	Y	Madison County, IA
white sagebrush	<i>Artemisia ludoviciana</i>	1.03	0.011	\$6.44	Y	Allamakee, Madison County, IA
swamp milkweed	<i>Asclepias incarnata</i>	0.10	0.057	\$5.68	Y	Madison County, IA
prairie milkweed	<i>Asclepias sullivantii</i>	0.01	0.006	\$9.28	N	Kossuth County, IA
common milkweed	<i>Asclepias syriaca</i>	0.20	0.136	\$12.24	N	Houston County, MN
butterfly milkweed	<i>Asclepias tuberosa</i>	0.10	0.063	\$20.29	N	Unspecified County, IA

<b>whorled milkweed</b>	<i>Asclepias verticillata</i>	0.10	0.025	\$12.18	Y, N	Cherokee County, IA; Allamakee County, IA
<b>Canadian milkvetch</b>	<i>Astragalus canadensis</i>	1.00	0.160	\$4.81	Y	Allamakee County, IA
<b>largeleaf wild indigo</b>	<i>Baptisia lactea</i>	0.05	0.080	\$14.44	Y, N	Allamakee County, IA; Houston County, MN
<b>false boneset</b>	<i>Brickellia eupatorioides</i>	0.20	0.017	\$8.29	N, Y	Allamakee County, IA
<b>New Jersey tea</b>	<i>Ceanothus americanus</i>	0.11	0.040	\$6.06	Y	Union County, IA
<b>partridge pea</b>	<i>Chamaecrista fasciculata</i>	0.23	0.232	\$1.86	Y	Madison County, IA
<b>stiff tickseed</b>	<i>Coreopsis palmata</i>	0.10	0.027	\$25.48	Y	Kossuth, Madison County, IA
<b>white prairie clover</b>	<i>Dalea candida</i>	1.00	0.143	\$5.72	Y	Kossuth County, IA
<b>purple prairie clover</b>	<i>Dalea purpurea</i>	2.00	0.363	\$8.41	Y	Kossuth, Union, Madison, Greene County, IA; Madison, Union, Greene, Kossuth County, IA
<b>showy ticktrefoil</b>	<i>Desmodium canadense</i>	0.20	0.099	\$4.46	Y	Z3, IA
<b>Illinois ticktrefoil</b>	<i>Desmodium illinoense</i>	0.05	0.032	\$9.55	Y	Z, IA
<b>pride of Ohio</b>	<i>Dodecatheon meadia</i>	0.36	0.016	\$19.83	N	Unspecified County, MN; Brown County, WI; Lafayette County, WI
<b>tall cinquefoil</b>	<i>Drymocallis arguta</i>	4.98	0.059	\$12.67	Y	Webster County, IA
<b>pale purple coneflower</b>	<i>Echinacea pallida</i>	0.19	0.095	\$4.29	Y	Madison County, IA
<b>button eryngo</b>	<i>Eryngium yuccifolium</i>	0.20	0.073	\$4.37	Y	Z1, IA
<b>flowering spurge</b>	<i>Euphorbia corollata</i>	0.31	0.107	\$45.12	N	Unspecified County, IA
<b>flat-top goldentop</b>	<i>Euthamia graminifolia</i>	1.03	0.008	\$8.01	N	Winona County, MN
<b>northern bedstraw</b>	<i>Galium boreale</i>	0.21	0.008	\$12.21	N	Winona County, MN
<b>plain gentian</b>	<i>Gentiana alba</i>	1.99	0.039	\$15.51	Y	Allamakee County, IA
<b>sawtooth sunflower</b>	<i>Helianthus grosseserratus</i>	0.05	0.010	\$5.51	N	Clayton County, IA
<b>stiff sunflower</b>	<i>Helianthus pauciflorus</i>	0.03	0.023	\$8.29	Y	Kossuth County, IA
<b>smooth oxeye</b>	<i>Heliopsis helianthoides</i>	0.50	0.216	\$6.18	Y	Z1, IA
<b>Richardson's alumroot</b>	<i>Heuchera richardsonii</i>	2.03	0.008	\$12.31	Y	Madison County, IA
<b>spotted St. Johnswort</b>	<i>Hypericum punctatum</i>	0.27	0.001	\$1.18	N	McHenry County, IL
<b>roundhead lespedeza</b>	<i>Lespedeza capitata</i>	0.15	0.051	\$2.30	Y	Kossuth County, IA
<b>tall blazing star</b>	<i>Liatris aspera</i>	0.10	0.017	\$19.66	Y	Greene, Guthrie, Madison, Ringgold, Union County, IA; Z1, IA
<b>prairie blazing star</b>	<i>Liatris pycnostachya</i>	0.14	0.036	\$7.14	N	Kossuth County, IA
<b>great blue lobelia</b>	<i>Lobelia siphilitica</i>	2.00	0.011	\$6.19	Y	Z1, IA; Madison County, IA
<b>wild bergamot</b>	<i>Monarda fistulosa</i>	0.83	0.032	\$4.08	Y	Madison County, IA
<b>biennial beeblossom</b>	<i>Oenothera gaura</i>	0.01	0.010	\$2.36	N	Houston County, MN



wild quinine	<i>Parthenium integrifolium</i>	0.25	0.097	\$9.75	Y	Kossuth County, IA
Canadian lousewort	<i>Pedicularis canadensis</i>	0.05	0.004	\$6.58	N	Unspecified County, MO
foxglove beardtongue	<i>Penstemon digitalis</i>	3.01	0.063	\$9.46	Y	Madison County, IA
downy phlox	<i>Phlox pilosa</i>	0.08	0.011	\$16.18	N	Kossuth County, IA
whorled mountainmint	<i>Pycnanthemum pilosum</i>	1.11	0.016	\$7.71	N	Menard, Logan County, IL
Virginia mountainmint	<i>Pycnanthemum virginianum</i>	2.39	0.030	\$22.16	N	McLeod County, MN
pinnate prairie coneflower	<i>Ratibida pinnata</i>	0.80	0.073	\$3.64	Y	Kossuth County, IA
prairie rose	<i>Rosa arkansana</i>	0.02	0.018	\$4.22	N	Allamakee, Houston County, IA, MN
blackeyed Susan	<i>Rudbeckia hirta</i>	0.99	0.029	\$0.88	N	Madison County, IA
sweet coneflower	<i>Rudbeckia subtomentosa</i>	0.97	0.062	\$7.39	N	Iowa County, WI
fringeleaf wild petunia	<i>Ruellia humilis</i>	0.02	0.008	\$2.22	N	South County, IA
wholeleaf rosinweed	<i>Silphium integrifolium</i>	0.02	0.055	\$10.94	Y	Ringgold County, IA
compassplant	<i>Silphium laciniatum</i>	0.02	0.083	\$24.76	Y	Kossuth, Greene County, IA; Greene, Kossuth County, IA
gray goldenrod	<i>Solidago nemoralis</i>	2.99	0.027	\$4.81	Y	Ringgold County, IA
stiff goldenrod	<i>Solidago rigida</i>	0.75	0.050	\$2.99	Y	Kossuth, Ringgold County, IA
showy goldenrod	<i>Solidago speciosa</i>	1.00	0.029	\$12.83	Y	Black Hawk, Greene County, IA
white heath aster	<i>Symphotrichum ericoides</i>	1.01	0.014	\$11.37	Y, N	Kossuth County, IA; Greene County, IA
smooth blue aster	<i>Symphotrichum laeve</i>	1.50	0.074	\$18.58	Y	Z1, IA
New England aster	<i>Symphotrichum novae-angliae</i>	0.75	0.031	\$15.45	Y	Z1, IA; Z3, IA
skyblue aster	<i>Symphotrichum oolentangiense</i>	0.99	0.034	\$10.15	N	Kossuth, Greene, Madison County, IA; Ringgold County, IA
purple meadow-rue	<i>Thalictrum dasycarpum</i>	0.10	0.025	\$4.33	N	Winneshiek County, IA
longbract spiderwort	<i>Tradescantia bracteata</i>	0.17	0.048	\$27.00	Y	Madison County, IA
bluejacket	<i>Tradescantia ohioensis</i>	0.18	0.062	\$18.58	Y	Madison County, IA
hoary verbena	<i>Verbena stricta</i>	0.20	0.019	\$1.94	N	Madison County, IA; Unspecified County, IA
prairie ironweed	<i>Vernonia fasciculata</i>	0.50	0.057	\$8.53	Y	Madison County, IA
Culver's root	<i>Veronicastrum virginicum</i>	0.80	0.003	\$2.19	N	Northern County, IA
prairie violet	<i>Viola pedatifida</i>	0.20	0.019	\$20.53	Y	Madison County, IA; Madison, Ringgold County, IA
meadow zizia	<i>Zizia aptera</i>	0.10	0.023	\$8.23	Y	Blue Earth County, MN
golden zizia	<i>Zizia aurea</i>	0.50	0.124	\$18.57	N	Z1, IA
common oat	<i>Avena sativa</i>		10.132		NA	NA
rice hulls	NA		12.952		NA	NA

Seed Mix	Site	Year	Total seeds/ ft <sup>2</sup>	Total PLS lbs/acre
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Southeast Mesic Midslope	Irvine Prairie	2021	93.32	10.028
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Common Name	Scientific Name (ITIS)	Seeds/ ft <sup>2</sup>	PLS lbs./ acre	Cost (USD) / acre	Source Verified	Seed Source(s)
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big bluestem	<i>Andropogon gerardii</i>	1.50	0.409	\$4.09	Y	Z1, IA
sideoats grama	<i>Bouteloua curtipendula</i>	6.00	1.888	\$16.48	Y	Unspecified County, IA; Houston, Crawford County, MN, WI
arctic brome	<i>Bromus kalmii</i>	1.00	0.340	\$15.63	Y, N	Otter Tail County, MN; Houston County, MN
yellowfruit sedge	<i>Carex annectens</i>	1.00	0.030	\$7.60	Y	Z, IA
Bicknell's sedge	<i>Carex bicknellii</i>	0.50	0.080	\$14.40	N	Z2, IA
shortbeak sedge	<i>Carex brevior</i>	1.00	0.094	\$11.30	Y	Z1, IA
heavy sedge	<i>Carex gravida</i>	0.10	0.023	\$11.20	N	Z1, IA
troublesome sedge	<i>Carex molesta</i>	0.98	0.107	\$19.31	Y	Z1, IA
Canada wildrye	<i>Elymus canadensis</i>	0.24	0.106	\$0.85	Y	Crawford, Allamakee County, WI, IA
Virginia wildrye	<i>Elymus virginicus</i>	0.25	0.162	\$1.09	Y	Tama County, IA
prairie Junegrass	<i>Koeleria macrantha</i>	4.00	0.054	\$19.04	Y, N	Z1, IA; Columbia County, WI
marsh muhly	<i>Muhlenbergia racemosa</i>	1.00	0.034	\$13.01	N	Houston County, MN; Z1, IA; Z, IA
switchgrass	<i>Panicum virgatum</i>	1.00	0.170	\$1.35	N	Houston County, MN
little bluestem	<i>Schizachyrium scoparium</i>	8.00	1.424	\$17.08	Y	Madison County, IA; Wabasha, Vernon, Buffalo County, MN, WI
Indiangrass	<i>Sorghastrum nutans</i>	1.50	0.355	\$4.26	Y	Z2, IA
composite dropseed	<i>Sporobolus compositus</i>	9.01	0.817	\$8.17	Y	Z1, IA
prairie dropseed	<i>Sporobolus heterolepis</i>	0.50	0.091	\$14.75	Y, N	Madison, Union, Kossuth, Guthrie, Greene County, IA; Kossuth County, IA; Unspecified County, IA
meadow garlic	<i>Allium canadense</i>	0.30	0.107	\$32.20	N	Kossuth County, IA
leadplant	<i>Amorpha canescens</i>	0.50	0.076	\$15.89	N	Unspecified County, IA; Adair, Madison, Webster, Winneshiek County, IA
Canadian anemone	<i>Anemone canadensis</i>	0.10	0.034	\$11.92	N, Y	Madison County, IA; Johnson County, IA
candle anemone	<i>Anemone cylindrica</i>	0.10	0.010	\$10.39	N	Madison County, IA
white sagebrush	<i>Artemisia ludoviciana</i>	0.99	0.011	\$6.19	Y	Allamakee, Madison County, IA
swamp milkweed	<i>Asclepias incarnata</i>	0.10	0.057	\$5.67	Y	Madison County, IA
prairie milkweed	<i>Asclepias sullivantii</i>	0.04	0.026	\$33.26	Y	Kossuth County, IA
common milkweed	<i>Asclepias syriaca</i>	0.30	0.204	\$21.45	N, Y	Allamakee County, IA; Madison County, IA; Houston County, MN

butterfly milkweed	<i>Asclepias tuberosa</i>	0.20	0.127	\$39.20	N	Kossuth County, IA; Unspecified County, IA
whorled milkweed	<i>Asclepias verticillata</i>	0.10	0.025	\$11.78	N, Y	Northeast County, IA; Cherokee County, IA
Canadian milkvetch	<i>Astragalus canadensis</i>	1.00	0.160	\$4.80	Y	Allamakee County, IA
largeleaf wild indigo	<i>Baptisia lactea</i>	0.05	0.080	\$12.01	N	Z1, IA
longbract wild indigo	<i>Baptisia leucophaea</i>	0.01	0.020	\$12.74	N	Goodhue County, MN
false boneset	<i>Brickellia eupatorioides</i>	0.25	0.022	\$7.09	N	Allamakee County, IA
New Jersey tea	<i>Ceanothus americanus</i>	0.20	0.072	\$10.73	N, Y	Union County, IA
partridge pea	<i>Chamaecrista fasciculata</i>	0.30	0.303	\$2.42	Y	Madison County, IA
stiff tickseed	<i>Coreopsis palmata</i>	0.10	0.027	\$14.90	N, Y	Z, IA; Houston County, MN; Kossuth, Madison County, IA
white prairie clover	<i>Dalea candida</i>	1.00	0.144	\$5.47	N, Y	Unspecified County, IA; Kossuth County, IA
purple prairie clover	<i>Dalea purpurea</i>	1.00	0.182	\$4.54	Y	Kossuth, Union, Madison, Greene County, IA
showy ticktrefoil	<i>Desmodium canadense</i>	0.05	0.025	\$1.13	Y	Z3, IA
Illinois ticktrefoil	<i>Desmodium illinoense</i>	0.05	0.032	\$9.50	Y	Z, IA
tall cinquefoil	<i>Drymocallis arguta</i>	4.98	0.059	\$26.55	N, Y	Unspecified County, IA; Z, IA; Webster County, IA
pale purple coneflower	<i>Echinacea pallida</i>	0.12	0.061	\$2.76	Y	Madison County, IA
button eryngo	<i>Eryngium yuccifolium</i>	0.17	0.062	\$3.69	Y	Z1, IA
tall thoroughwort	<i>Eupatorium altissimum</i>	0.60	0.033	\$3.26	Y	Allamakee County, IA
flowering spurge	<i>Euphorbia corollata</i>	0.18	0.060	\$30.65	N	Webster County, IA; Unspecified County, IA
flat-top goldentop	<i>Euthamia graminifolia</i>	1.04	0.008	\$8.63	N	Winona County, MN; Houston County, MN
northern bedstraw	<i>Galium boreale</i>	0.50	0.020	\$22.01	N	Yellow Medicine County, MN; Blue Earth, Redwing County, MN; Winona County, MN
plain gentian	<i>Gentiana alba</i>	3.01	0.059	\$20.82	Y	Allamakee County, IA
closed bottle gentian	<i>Gentiana andrewsii</i>	1.99	0.019	\$8.31	N, Y	Jasper, Polk County, IA; Madison County, IA
sawtooth sunflower	<i>Helianthus grosseserratus</i>	0.05	0.009	\$5.41	N	Clayton County, IA
stiff sunflower	<i>Helianthus pauciflorus ssp. pauciflorus</i>	0.07	0.053	\$15.63	N	Kossuth County, IA
smooth oxeye	<i>Heliopsis helianthoides</i>	0.14	0.061	\$1.52	Y	Z1, IA
Richardson's alumroot	<i>Heuchera richardsonii</i>	2.04	0.008	\$12.36	N, Y	Madison County, IA
spotted St. Johnswort	<i>Hypericum punctatum</i>	2.01	0.009	\$8.89	N	McHenry County, IL
roundhead lespedeza	<i>Lespedeza capitata</i>	0.10	0.034	\$1.52	Y	Kossuth County, IA
tall blazing star	<i>Liatris aspera</i>	0.10	0.017	\$16.14	Y, N	Greene, Guthrie, Madison, Ringgold, Union County, IA; Z1, IA
prairie blazing star	<i>Liatris pycnostachya</i>	0.25	0.062	\$11.37	Y, N	Z1, IA; Kossuth County, IA



great blue lobelia	<i>Lobelia siphilitica</i>	2.02	0.011	\$5.14	Y	Madison County, IA; Z1, IA
wild bergamot	<i>Monarda fistulosa</i>	1.50	0.058	\$3.97	Y	Madison County, IA
biennial beeblossom	<i>Oenothera gaura</i>	0.01	0.010	\$2.88	N	Northeast County, IL
wild quinine	<i>Parthenium integrifolium</i>	0.16	0.062	\$6.20	Y	Kossuth County, IA
Canadian lousewort	<i>Pedicularis canadensis</i>	0.05	0.004	\$3.18	N	Grant County, SD; Z1, MO
foxglove						
beardtongue	<i>Penstemon digitalis</i>	3.01	0.063	\$10.33	N, Y	Z, IA; Madison County, IA
downy phlox	<i>Phlox pilosa</i>	0.05	0.007	\$6.98	N	Kossuth County, IA
whorled mountainmint	<i>Pycnanthemum pilosum</i>	0.99	0.015	\$6.83	N	Menard, Logan County, IL
Virginia mountainmint	<i>Pycnanthemum virginianum</i>	1.01	0.012	\$7.03	Y, N	Z1, IA; McLeod County, MN
pinnate prairie coneflower	<i>Ratibida pinnata</i>	1.00	0.091	\$4.55	Y	Kossuth County, IA
prairie rose	<i>Rosa arkansana</i>	0.05	0.055	\$14.45	N	Madison County, IA; Houston County, MN; Allamakee, Houston County, IA, MN
blackeyed Susan	<i>Rudbeckia hirta</i>	1.00	0.030	\$0.89	N	Madison County, IA
sweet coneflower	<i>Rudbeckia subtomentosa</i>	1.00	0.064	\$7.62	N	Iowa County, WI
fringeleaf wild petunia	<i>Ruellia humilis</i>	0.20	0.104	\$27.52	N, Y	Unspecified County, IA; Madison, Ringgold, Union, Polk County, IA; South County, IA
wholeleaf rosinweed	<i>Silphium integrifolium</i>	0.03	0.068	\$13.60	Y	Ringgold County, IA
compassplant	<i>Silphium laciniatum</i>	0.02	0.082	\$24.74	Y	Kossuth County, IA; Kossuth, Greene County, IA
gray goldenrod	<i>Solidago nemoralis</i>	5.99	0.054	\$9.32	N, Y	Unspecified County, IA; Ringgold County, IA
stiff goldenrod	<i>Solidago rigida</i>	1.00	0.067	\$3.99	Y	Kossuth, Ringgold County, IA
showy goldenrod	<i>Solidago speciosa</i>	2.01	0.057	\$25.87	N, Y	Black Hawk County, IA; Black Hawk, Greene County, IA
white heath aster	<i>Symphotrichum ericoides</i>	1.00	0.014	\$11.34	Y, N	Kossuth County, IA; Greene County, IA
smooth blue aster	<i>Symphotrichum laeve</i>	1.20	0.059	\$12.22	Y	Z1, IA
New England aster	<i>Symphotrichum novae-angliae</i>	0.49	0.020	\$11.50	Y	Z1, IA
skyblue aster	<i>Symphotrichum oolentangiense</i>	1.80	0.061	\$18.36	Y, N	Greene, Kossuth, Madison County, IA; Kossuth, Greene, Madison County, IA
purple meadow-rue	<i>Thalictrum dasycarpum</i>	0.25	0.062	\$11.61	N	Winneshiek County, IA
longbract spiderwort	<i>Tradescantia bracteata</i>	0.10	0.027	\$13.55	N, Y	Madison County, IA
bluejacket	<i>Tradescantia ohiensis</i>	0.18	0.062	\$18.47	Y	Lucas, Ringgold, Madison, Union County, IA; Madison County, IA
hoary verbena	<i>Verbena stricta</i>	0.20	0.019	\$1.91	N	Allamakee County, IA; Unspecified County, IA; Madison County, IA
prairie ironweed	<i>Vernonia fasciculata</i>	0.60	0.068	\$10.21	Y	Madison County, IA
Culver's root	<i>Veronicastrum virginicum</i>	3.97	0.014	\$14.15	N	Z1, IA; Northern County, IA

<b>prairie violet</b>	<i>Viola pedatifida</i>	<b>0.20</b>	<b>0.019</b>	<b>\$18.60</b>	<b>Y, N</b>	Ringgold, Madison County, IA; Madison, Ringgold County, IA; Madison County, IA
<b>meadow zizia</b>	<i>Zizia aptera</i>	<b>0.30</b>	<b>0.068</b>	<b>\$25.00</b>	<b>N, Y</b>	Blue Earth County, MN
<b>golden zizia</b>	<i>Zizia aurea</i>	<b>0.25</b>	<b>0.062</b>	<b>\$9.28</b>	<b>N</b>	Z1, IA
<b>common wheat</b>	<i>Triticum aestivum</i>		<b>15.000</b>		<b>NA</b>	NA
<b>rice hulls</b>	NA		<b>25.000</b>		<b>NA</b>	NA