

Pollinator GARDENS

Design Guide



Gardening for Pollinators

Pollinators are at the heart of these gardens! Bees, butterflies and other pollinators need pollen, nectar and vegetation to live. These gardens are designed for them!

Gardens Designed for Pollinators

The gardens pictured here include many different flowers that will bloom throughout the growing season. Planting flowers so something is blooming from spring through fall provides a continuous source of food for pollinators. The native plants selected for these gardens provide pollinators with particularly high value nectar and pollen. In addition to planting native plants with high value nectar and pollen, there are other steps you can take to support pollinators.

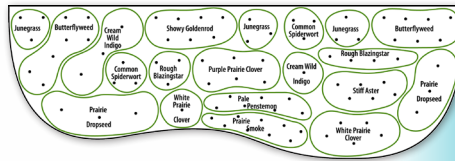
Cluster plants of the same species together for efficient foraging. When the same flowers are grown together, pollinators don't have to travel as far between blossoms. This makes collecting nectar and pollen easier.

Once the garden is established **leave some bare areas of soil for nesting**, particularly at the base of flowers and grasses. Many native bees nest in bare soil often at the base of their favorite plants.

Avoid the use of insecticides, they not only kill pollinators, but sub-lethal doses can affect their foraging and nesting behaviors and suppress their immune system. Systemic insecticides, insecticides taken up into plant tissue, are of particular concern. The toxicity of systemic insecticides can persist in pollen, nectar and plant tissue for long periods of time, posing a threat to pollinators. When purchasing plants at nurseries, ask if they have been treated with systemic insecticides.

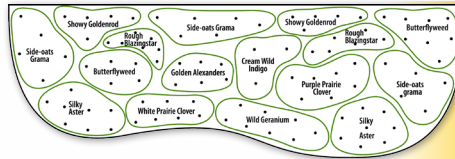
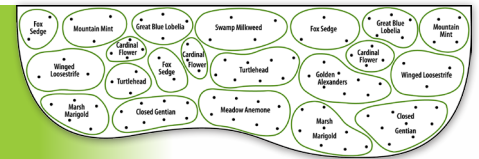
Shop for plants using their Latin name to ensure proper plant selection. Plants often have multiple common names.

Pollinator Garden Designs (See detailed plans inside.)



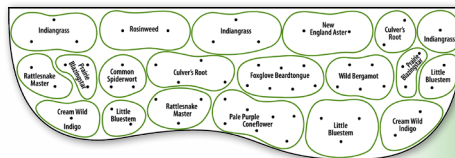
Dry Pollinator Garden plants thrive in dry, drought-prone, well drained soils. Dry sites are usually found on hills and/or sandy soils.

Wet Pollinator Garden plants thrive in low-lying, poorly drained areas that pond water after it rains and retain wetness for long periods.



Typical Moisture Pollinator Garden plants thrive in moist, moderately drained soil that are not too wet or too dry soils.

Savanna Pollinator Garden plants thrive in moist soils that are partially shaded by scattered trees and receive 3-6 hours of sun per day.




Tall Border Pollinator Garden plants provide a floral backdrop along property lines or fence rows. These plants are suited to soils that are not too wet or too dry.

Tips for Success

Maximize the success of your efforts and minimize long-term maintenance by spending time preparing the site. The importance of "proper" site preparation cannot be stressed enough. What does proper mean? Eliminate existing vegetation and suppress competition from seed lying dormant in the soil waiting for enough sun and moisture to germinate. Sod removal, smothering,

tilling, and herbicide application are techniques commonly used alone or in combination to properly prepare a garden bed for planting.

Once competing vegetation has been removed and the soil has been prepared, installation of a garden edging can keep lawn grass and other weeds from creeping into the garden for years to come.



Digging Into the Details... Site Prep

Sod Removal

The fastest site preparation method is to remove the sod and till the soil.

- If needed, mow grass or existing vegetation.
- Remove sod using a sod cutter. A sod cutter removes 2"-3" of soil. The bed will be lower than the adjacent soil.
- Till soil using a roto-tiller or other implement (*optional*).
- Mulch after planting to conserve moisture and discourage weeds (*recommended*).

Vegetation can be planted immediately. However, roots and seed capable of sprouting a new crop of weeds can persist in the soil. If weeds regrow, pull weeds or lightly till using a hoe or similar tool.

Smothering

Lawns can usually be killed in 2-3 months. For sites with a lot of perennial weed pressure, leave smothering material on the garden for a full growing season.

Smothering is a simple technique that does not require chemicals or special equipment. Plants need sunlight to survive, smothering deprives plants of that sunlight.

- Mow vegetation at the lowest setting.
- During the growing season, cover garden area with materials such as old plywood, a thick layer of newspaper covered with grass clippings, black plastic, or other available material until vegetation is completely dead.
- Remove smothering material and plant.
- Mulch after planting (*recommended*).

Tilling

Existing garden beds or areas with little vegetation, such as areas that have been in row crops, may simply require hand pulling of vegetation or tilling to be ready for planting. Follow these steps:

- Mow existing vegetation.
- Till soil.
- Rake out remaining vegetation and roots to prevent them from re-growing.
- Mulch after planting (*recommended*).

If considerable weed pressure is anticipated, additional tilling may be required to eliminate weeds that may germinate from the existing seed-bank or grow from roots remaining in the soil. Lightly till the soil 2-3 times, approximately 1 week apart before planting, if needed.

Herbicide Application

Non-selective, non-persistent herbicides may be used to kill existing vegetation when it is actively growing.

- Apply a non-selective, non-persistent herbicide in early fall or mid-spring when vegetation is actively growing. If vegetation is tall, mow the site prior to application and apply herbicide once new growth reaches 4"-6" in height.
- Early Fall Application - After a complete kill, if dead vegetation is thin or has decomposed over winter, new plants can be planted directly into the bed. Dead thatch helps prevent weeds and holds moisture in the soil.

- Early Spring Application - After a complete kill, if dead vegetation is thick, tilling once more or removing the sod using a sod cutter may make planting easier. Remember, tilling may bring more weed seed to the surface. Plan to keep weeds in check with regular weeding or light tilling using a hoe or similar tool.
- Mulch after planting (*recommended*).

Note: Always read and follow the manufacturer's herbicide label. Plant plugs, potted plants, and bare root stock after waiting the time indicated.

Avoid use of pesticides toxic to pollinators. Contact your local Extension office for more information.

Where to Find Native Plants?

Local nurseries frequently provide a selection of popular native plants in pots during the spring and early summer. Nurseries that specialize in native plants provide a wide array of species, which can be purchased as bareroot, corm, potted, or plug material. When selecting plants, overlook the flowers and focus on plants with robust vegetation, a well-developed root system, and no signs of insect or disease damage. When ordering by mail, nurseries commonly ship native plants in the spring and fall when conditions are safe for plant transport. Spring plant shipments generally occur from early April through mid-June and fall plant shipments generally occur from mid to late September until the first freeze.

Dry Pollinator Garden

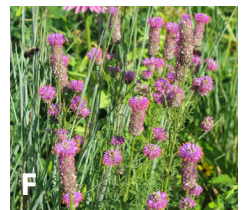
Site conditions: Full sun - 6 or more hours per day
 These sites have soils that tend to be overly dry



Dry Pollinator Garden

	Common Name	Latin Name	No. of Plants	Height	Spacing	Flower Color
Early Bloomers						
A	Common Spiderwort *	<i>Tradescantia ohiensis</i>	6	2'-4'	1'	Blue
B	Cream Wild Indigo	<i>Baptisia bracteata</i>	4	1'-3'	1'-3'	Cream
C	Prairie Smoke	<i>Geum triflorum</i>	9	6"	6"-1'	Pink
D	Pale Penstemon *	<i>Penstemon pallidus</i>	7	1'	6"-1'	White
Mid Season Bloomers						
E	Butterflyweed	<i>Asclepias tuberosa</i>	14	2'-3'	1'-18"	Orange
F	Purple Prairie Clover	<i>Dalea purpurea</i>	6	1'-2'	1'	Purple
G	White Prairie Clover	<i>Dalea candida</i>	6	1'-2'	1'	White
Late Season Bloomers						
H	Rough or Meadow Blazingstar	<i>Liatris aspera</i> or <i>Liatris ligulistylis</i>	7	2'-5'	6"-1'	Purple
I	Showy Goldenrod*	<i>Solidago speciosa</i>	7	1'-3'	1'-18"	Yellow
J	Stiff Aster*	<i>Aster linariifolius</i>	6	1'-2'	1'	Purple
Grasses						
K	Junegrass	<i>Koeleria macrantha</i>	9	2'-3'	1'-3'	—
L	Prairie Dropseed	<i>Sporobolus heterolepis</i>	6	2'-3'	2'-3'	—

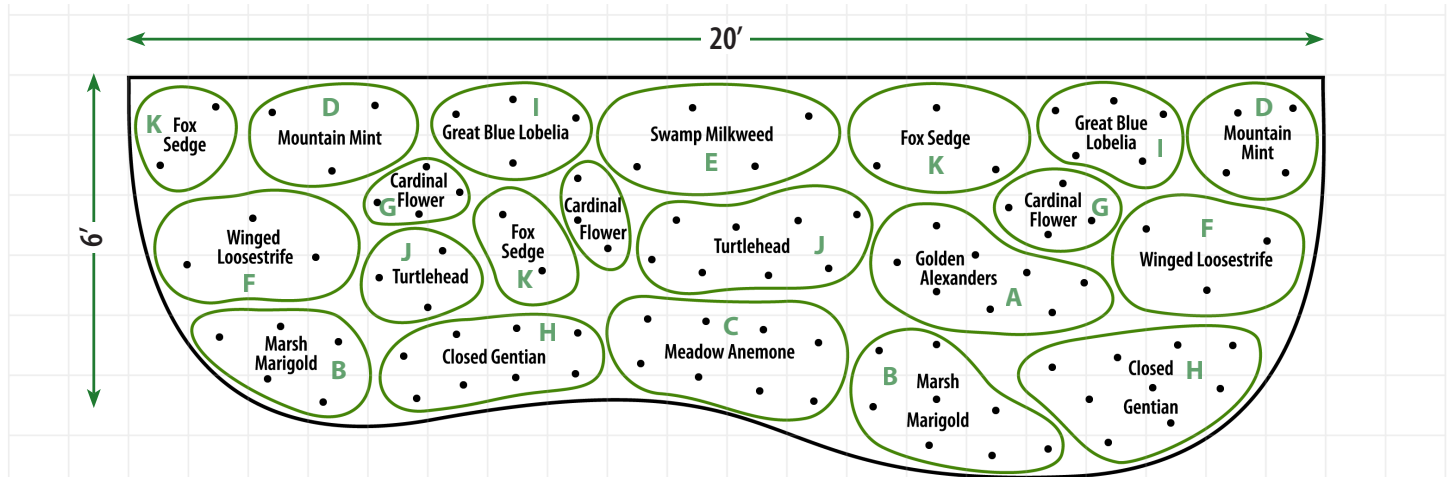
* Reseeds readily. Remove spent flowers before the plant goes to seed.



Wet Pollinator Garden

Site conditions: Full sun - 6 or more hours per day

These wet sites have soils that remain wet for prolonged periods of time



Wet Pollinator Garden

	Common Name	Latin Name	No. of Plants	Height	Spacing	Flower Color
Early Bloomers						
A	Golden Alexanders *	<i>Zizia aurea</i>	8	1'-2'	1'	Yellow
B	Marsh Marigold	<i>Caltha palustris</i>	13	1'-2'	1'-2'	Yellow
C	Meadow Anemone *	<i>Anemone canadensis</i>	8	1'-2'	1'	White
Mid Season Bloomers						
D	Mountain Mint	<i>Pycnanthemum virginianum</i>	7	3'	1'-18"	White
E	Swamp Milkweed *	<i>Asclepias incarnata</i>	4	3'-5'	1'-18"	Pink
F	Winged Loosestrife	<i>Lythrum alatum</i>	6	3'	2'-3'	Purple
Late Season Bloomers						
G	Cardinal Flower	<i>Lobelia cardinalis</i>	11	2'-5'	6"-1'	Red
H	Closed Gentian	<i>Gentiana andrewsii</i>	17	1'-2'	1'	Blue
I	Great Blue Lobelia *	<i>Lobelia siphilitica</i>	9	1'-4'	1'	Blue
J	Turtlehead	<i>Chelone glabra</i>	11	2'-4'	1'	White
Grasses						
K	Fox Sedge	<i>Carex vulpinoidea</i>	7	1'-3'	18"	—

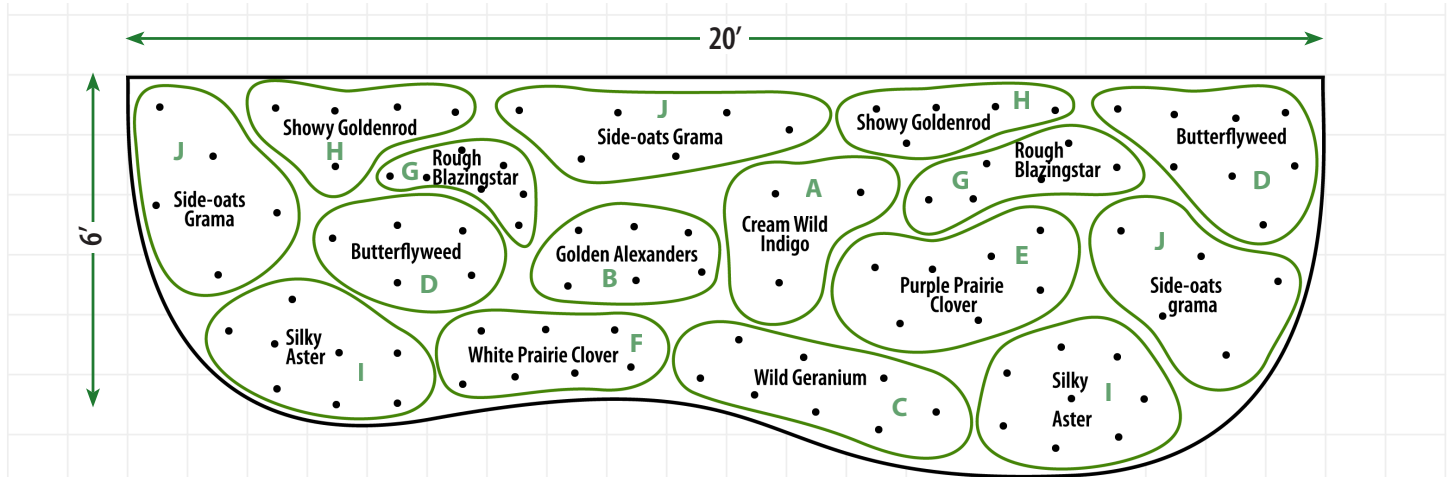
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Typical Moisture Pollinator Garden

Site conditions: Full sun - 6 or more hours per day

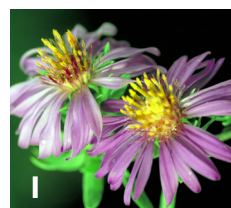
These typical sites have soils that are moist, but are not wet, soggy, or overly dry



Typical Moisture Pollinator Garden

	Common Name	Latin Name	No. of Plants	Height	Spacing	Flower Color
Early Bloomers						
A	Cream Wild Indigo	<i>Baptisia bracteata</i>	3	1'-3'	1-3'	Cream
B	Golden Alexanders *	<i>Zizia aurea</i>	6	1'-2'	1'	Yellow
C	Wild Geranium	<i>Geranium maculatum</i>	8	1'	6"-1'	Purple
Mid Season Bloomers						
D	Butterflyweed	<i>Asclepias tuberosa</i>	13	2'-3'	1'-18"	Orange
E	Purple Prairie Clover	<i>Dalea purpurea</i>	7	1'-2'	1'	Purple
F	White Prairie Clover	<i>Dalea candida</i>	7	1'-2'	1'	White
Late Season Bloomers						
G	Rough Blazingstar	<i>Liatris aspera</i>	13	2'-5'	6"-1'	Purple
H	Showy Goldenrod	<i>Solidago speciosa</i>	10	1'-3'	1'-18"	Yellow
I	Silky Aster	<i>Symphotrichum sericeum</i>	16	1'-2'	1'	Purple
Grasses						
J	Side-oats Grama	<i>Bouteloua curtipendula</i>	16	2'-3'	2'-3'	—

* Reseeds readily. Remove spent flowers before the plant goes to seed.



Savanna Pollinator Garden

Site conditions: Part shade - 4 to 6 hours per day

These savanna sites have soils that are moist, but are not wet or soggy



Savanna Pollinator Garden

	Common Name	Latin Name	No. of Plants	Height	Spacing	Flower Color
Early Bloomers						
A	Cream Wild Indigo	<i>Baptisia bracteata</i>	6	1'-3'	1-3'	Cream
B	Virginia Spiderwort *	<i>Tradescantia virginiana</i>	6	18"-3'	1'-18"	Blue
C	Wild Larkspur	<i>Delphinium tricornis</i>	12	6"-1'	6"-1'	Blue
Mid Season Bloomers						
D	Culver's Root *	<i>Veronicastrum virginicum</i>	7	3'-6'	18"	White
E	Purple Milkweed	<i>Asclepias purpurescens</i>	6	3'	1-3'	Purple
F	Savanna Blazingstar	<i>Liatris scariosa</i>	10	2'-4'	1-2'	Purple
Late Season Bloomers						
G	Purple Coneflower *	<i>Echinacea purpurea</i>	12	2'-5'	1'	Purple
H	Showy Goldenrod *	<i>Solidago speciosa</i>	6	3'-5'	1'-18"	Yellow
I	Sky Blue Aster *	<i>Symphyotrichum oolentangense</i>	3	2'-3'	1'	Purple
Grasses						
J	Little Bluestem *	<i>Schizachyrium scoparium</i>	10	2'-3'	2-3'	—

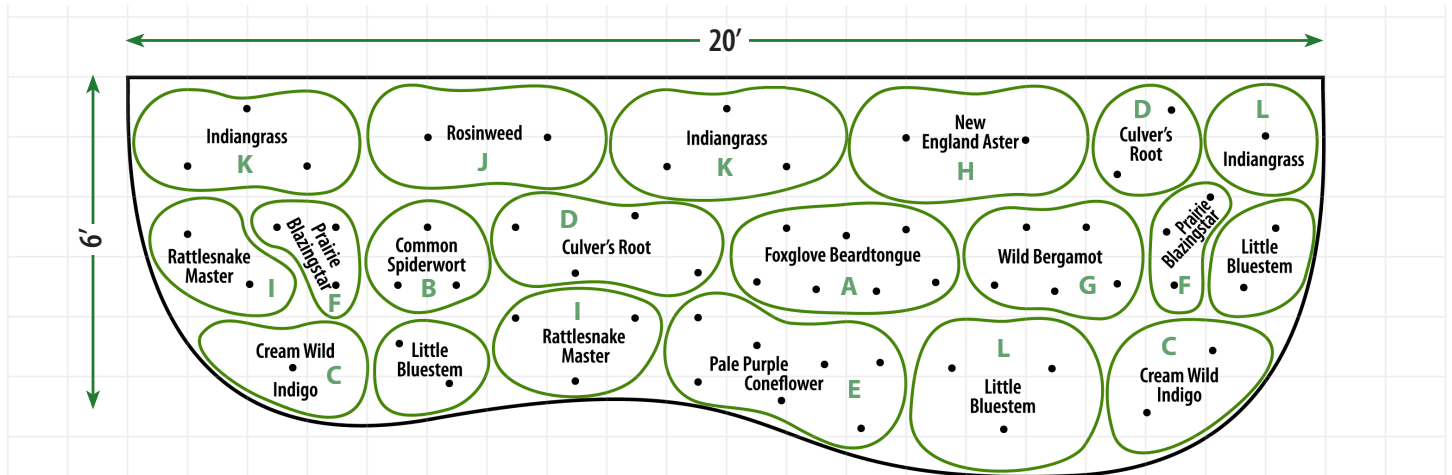
* Reseeds readily. Remove spent flowers before the plant goes to seed.



Tall Border Pollinator Garden

Site conditions: Full sun - 6 or more hours per day

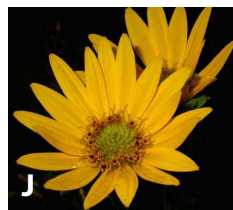
These sites have soils that are moist, but are not saturated wet or soggy



Tall Border Pollinator Garden

	Common Name	Latin Name	No. of Plants	Height	Spacing	Flower Color
Early Bloomers						
A	Foxglove Beardtongue*	<i>Penstemon digitalis</i>	7	2'-3'	1'	White
B	Common Spiderwort *	<i>Tradescantia ohiensis</i>	3	2'-4'	1'	Blue
C	Cream Wild Indigo	<i>Baptisia bracteata</i>	3	1'-3'	1'-3'	Cream
Mid Season Bloomers						
D	Culver's Root *	<i>Veronicastrum virginicum</i>	6	3'-6'	18"	White
E	Pale Purple Coneflower	<i>Echinacea pallida</i>	7	3'-5'	1'	Purple
F	Prairie Blazingstar *	<i>Liatris pycnostachya</i>	6	3'-5'	6"-1'	Purple
G	Wild Bergamot *	<i>Monarda fistulosa</i>	5	2'-3'	1'	Pink
Late Season Bloomers						
H	New England Aster *	<i>Symphyotrichum novae-angliae</i>	2	3'-6'	1'-18"	Purple
I	Rattlesnake Master *	<i>Eryngium yuccifolium</i>	5	3'-5'	1'	White
J	Rosinweed *	<i>Silphium integrifolium</i>	2	2'-6'	2'	Yellow
Grasses						
K	Indiangrass *	<i>Sorghastrum nutans</i>	7	5'-7'	2'	—
L	Little Bluestem *	<i>Schizachyrium scoparium</i>	7	2'-3'	2-3'	—

* Reseeds readily. Remove spent flowers before the plant goes to seed.



When to Plant?

Spring planting will allow plants to grow, develop, and possibly bloom long before the winter freeze, but may require more diligent weeding and watering than a fall planting. The benefits of planting in the fall include cooler temperatures, reduced weed pressure, and consistent moisture. When planting, follow the nursery's specifications and plant at the correct depth. To reduce plant shock and promote root growth, plant on an overcast day, separate roots if root bound, and cut back half of the aboveground vegetation if the plant is robust and leafy. It is common for native plants to spend the first, and possibly the second, growing season developing an extensive and deep root system rather than aboveground vegetation and flowers. This is a marvelous adaptation for survival in a prairie landscape, which was essential to the development of the Midwest's fertile soil.



Leaving duff, stems, and seed pods over winter will provide pollinators a safe place to hibernate and will provide habitat and food for other wildlife, including backyard birds.

Size and Availability of Native Plant Materials

These gardens were designed for the use of bare root stock, plugs or potted plants. Using seed to establish this garden will require more vigilance in eliminating vegetation prior to planting, particularly roots and weed seed persisting in the soil.

Maintenance

Don't forget to maintain vegetation after planting. Water and weed the garden until plants are established. Full establishment may take up to two years.

The native plants included in these gardens evolved to thrive under Midwest conditions, generally requiring less maintenance when established. However, maintenance during establishment is key to a successful planting. Remember:

- Weed as needed.
- Water throughout the growing season when the soil begins to dry out or if plants begin to wilt. Watering is typically required during the first year. In cases of drought, additional watering may be necessary.
- Mulch beds with shredded bark mulch or other material. Newspaper can be placed under mulch for extra cover.

- Fertilizer use can encourage weed growth and is not recommended. Native plants have evolved to handle the Midwest soil and climate.

Bees and Mulch

Some bare soil is desirable for ground nesting bees. However, using mulch during the first year helps plants become established by conserving water and suppressing weeds.

When the soil is disturbed during preparation and planting, seeds that were previously lying dormant are brought to the surface. With enough light, moisture and heat, those seeds may germinate. Weeds can also grow from roots that remain in the soil after tilling. Mulching helps to conserve moisture and prevent weeds from getting enough sunlight to germinate and grow.

Note: Use hardwood mulch without dyes. Keep mulch away from the base of the plant to avoid smothering them.

Native Bees and Mulch

The Midwest is home to roughly four hundred different kinds of native bees. Native bees out-pollinate the more familiar European honey bee. Approximately seventy percent of native

bees nest underground. Once plants fill in and shade the soil, allow mulch to decompose, leaving bare soil areas for native, ground nesting bees.

Neighborhood Garden

Not enough space for a garden this size? Consider a neighborhood pollinator garden. Find nearby friends and neighbors and have each person plant a portion of the garden or encourage a local school to develop a pollinator garden for use as an outdoor classroom.

For more information on gardening with pollinators:

USDA Natural Resources Conservation Service national website for pollinators:
<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/>

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