

Monarch Wings Across the Eastern Broadleaf Forest



Seed Collection Manual



Mason State Nursery



Table of Contents

1. Introduction
 - 1a. Program Objective
 - 1b. Project Goals
2. Partners
3. Target Species Explanation and List
4. Training and Communication
 - 4a. Communication
5. Permission to Collect
6. Preliminary Site Visits
7. Controlling the Spread of Noxious Weeds
8. Field Documentations and Data Forms
 - 8a. Seed Collection Reference Number Format
9. Seed Collecting Tools
10. Seed Collection Protocol
11. Seed Collection
 - 11a. Labeling Your Seed Collection
12. Recommendations for Collection and Cleaning for Specific Target Plants
13. Seed Storage
14. Photo Documentation
15. GIS App
16. Shipping

Appendices

- A. Target Plant Species Plant Profiles
- B. Field Data Form (blank and example)
- C. Collection Team Reference Numbers
- D. Sample Right of Entry Permit and Notification Documents
- E. Hold Harmless Document
- F. Seed Collecting Techniques - Quick Reference
- G. GIS App Instructions
- H. Contact Information

Special thanks to:

Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

1. Introduction

Thank you for agreeing to participate in the Monarch Wings Across the Eastern Broadleaf Forest Seed Collection Project (MWAEBF). MWAEBF is a two-year project sponsored by a grant from the National Fish and Wildlife Federation (NFWF) through the non-profit Pollinator Partnership.

This training manual is a comprehensive collection of the information, protocols and forms related to the MWAEBF project and will help standardize the seed collection process to ensure responsible collection and data integrity. Please use this manual as a reference in part, or in total, to meet the needs of your level of responsibility (State Lead, Team Lead, and Collection Volunteer) as indicated by the Pollinator Partnership and its associated satellite partners. See the accompanying training webinar for further assistance.

1a. Program Objective

This short-term seed collection project is designed to give a boost to the habitat needed by monarchs and to increase interest and skill in seed collection. MWAEBF targets five states located within the Eastern Broadleaf Forest – Continental Province (EBF) for seed collection and distribution: Ohio, Indiana, Illinois, Missouri and Arkansas. All seed generated from this project will be used to support the development of geographically appropriate native plant materials for the restoration of 4,688 acres of monarch habitat.

1b. Project Goals

To successfully meet program objectives, the following tasks will be performed:

Facilitate an eco-regional seed collecting program for the EBF to help meet increased immediate needs for regionally specific monarch-supporting plantings.

- Eco-regionally-specific milkweed and nectar plant seed is generally commercially unavailable in large quantities within the EBF. In order to successfully enhance monarch habitat, a temporary coordinated eco-regional milkweed and nectar plant seed collection and distribution network will be established.
- Seed collecting protocols across the ecoregion for this project will be standardized. Seed collectors will be recruited and trained according to the protocol. All collectors will work off a single plant species target list. Seed will be processed out of a single cleaning center, tested for weeds and germination, and then used for seedling propagation or reseeding efforts at project sites for monarch habitat establishment.
- Any seed collections found to be contaminated by weeds, or of low germination, will be removed from the inventory and destroyed.
- A total of 300 seed collections (approximately 60 per state) will be completed and used in combination with other monarch habitat enhancement techniques. The

seed used for seedling propagation will generate 9,375 seedlings for use within the ecoregion. All native plant materials generated from the seed collecting efforts will be redistributed to reach the goal of 4,688 acres within the same ecoregion to maintain genetic variability and resilience across milkweed and nectar plant populations.

Provide technical assistance to public and private land managers of land in the EBF.

- Technical assistance will be provided in a series of 5 on-site and in person workshops for the various land use types (private lands, private working lands, public lands) as well as a webinar reference series that will be posted online.
- The private lands technical assistance will target land managers of roadsides, farms, corporate lands, utility right-of-way, and other land-use types.
- The workshops and webinar will focus on monarch habitat enhancement and maintenance techniques.
- The on-site workshops will highlight successful monarch habitat projects that have been maintained over a period of time and have used any or all of the following habitat enhancement techniques: seeding, plug planting, invasive plant removal, seedbed preparation, controlled burning, and plug planting preparation.
- 5 workshops, 3 webinars and 12 seed collection training classes will be completed over the 2 year span of the project.

Long-term monarch habitat establishment and enhancement.

- Acres for monarch habitat establishment or enhancement activities identified by public and private partners will be secured in the long-term through a letter of commitment signed by the land owner. The letter will detail the actions required to maintain monarch habitat in the long-term.
- The agreements will primarily be made through the U.S. Fish and Wildlife Service through the Partners for Fish and Wildlife Program but can also be established with the Pollinator Partnership.
- The Pollinator Partnership will track all the acres counted towards the 4,688 acre goal.
- The agreements will ensure that monarch habitat activities take place on lands that have a landowner or manager committed to monarch conservation and long-term monarch habitat management and maintenance.
- The combined total of acres secured through letters of commitment for monarch habitat will meet or exceed 4,688 acres across the EBF ecoregion.

2. Partners

All partners and associated activities operate within the EBF, and the outcomes of this project will be applicable in 10 other states that intersect the EBF. Working across an ecoregion complements efforts of the U.S. Forest Service's seed transfer zones and other native plant materials programs, including the National Seed Strategy for Rehabilitation and Restoration. The core group of partners includes:

- Pollinator Partnership
- U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program (IL, IN, and OH)
- Audubon Arkansas
- Illinois Department of Natural Resources - Mason State Nursery
- Indiana Division of Fish and Wildlife
- Ohio Department of Natural Resources
- Ohio Pollinator Habitat Initiative
- Pheasants Forever (IL and OH)
- University of Arkansas – Center for Advanced Spatial Technologies (CAST)

The following organizations throughout the EBF have been confirmed and secured as satellite partners to help support the activities of the proposed project:

- Tyson Foods, Inc.
- Chicago Botanic Garden
- Jo Daviess Conservation Foundation
- Marathon Petroleum Company LP – Illinois Refining Division
- Patoka River NWR
- Big Oaks Muscatatuck NWR Complex
- Saint Louis Zoo
- University of Missouri-College of Agriculture, Food, and Natural Resources
- University of Missouri – Agriculture Experiment Station
- Cleveland Metroparks
- Cleveland Museum of Natural History
- The Holden Arboretum
- Illinois Department of Transportation
- Miami County Park District
- Ohio River Foundation
- Ottawa National Wildlife Refuge
- The Nature Conservancy
- Western Reserve Land Conservancy
- Blue Heron Ministries

3. Target Plant Species List

All species listed below were cross-referenced with the USDA PLANTS Database for county-level occurrence within each target state throughout the EBF were present. This was done for each state and averaged to make sure we are prioritizing the most widely distributed species across all 5 states and to gain insight into any species that may be considered problematic. The target plant list has been reviewed, collaborated on and vetted across the ecoregion.

Many of these species have similar characteristics to other plants and proper plant ID is crucial.

Detailed plant profiles can be found in Appendix A. Laminated copies will be distributed to the State Leads by the Pollinator Partnership and will be available for use in the field.

Botanical Name	Common Name
<i>Asclepias incarnata</i>	Swamp milkweed
<i>Asclepias syriaca</i>	Common milkweed
<i>Asclepias verticillata</i>	Whorled milkweed
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Coreopsis tripteris</i>	Tall coreopsis
<i>Eupatorium perfoliatum</i>	Common boneset
<i>Eupatorium serotinum</i>	Late boneset
<i>Heliopsis helianthoides</i>	Ox eye Sunflower
<i>Monarda fistulosa</i>	Wild bergamot
<i>Penstemon digitalis</i>	Foxglove beardtongue
<i>Pycnanthemum tenuifolium</i>	Narrowleaf mountainmint
<i>Ratibida pinnata</i>	Yellow coneflower
<i>Rudbeckia hirta</i>	Black eyed susan
<i>Symphyotrichum laeve</i>	Smooth blue aster
<i>Symphyotrichum novae-angliae</i>	New England aster
<i>Symphyotrichum pilosum</i>	Frost Aster
<i>Tradescantia ohiensis</i>	Ohio spiderwort
<i>Verbena urticifolia</i>	White vervain
<i>Vernonia gigantea</i>	Giant ironweed
<i>Zizia aurea</i>	Golden Alexander

4. Training and Communication

It is extremely important that groups and individuals collecting seed for MWAEBF project are well trained so that plant species are properly identified, plant populations are not harmed during the collection process, and the protocol is followed to ensure data integrity.

Training courses will be offered in each state and a training webinar has been developed to provide comprehensive training for MWAEBF seed collection teams. Before becoming a Team Lead or making MWAEBF seed collections, it is highly recommended that at least one lead botanist (all team members are welcome) participate in the training course. If you are a Team Lead and need to train a collection team, contact the Pollinator Partnership or your State Lead for more information.

4a. Communication

MWAEBF Team Leads and Volunteer Seed Collectors should direct all questions and concerns to their State Leads. To contact the Pollinator Partnership directly, call 415-362-1137 or email info@pollinator.org. State Lead, Pollinator Partnership, and additional regional support contacts can be found in Appendix I.

5. Permission to Collect

Seed collection may take place on private lands or lands managed by another federal agency (e.g. Fish and Wildlife Service, USDA Forest Service, and Department of Defense) or state, county or municipal agencies, as long as landowner permission is provided. Document landowner permission on the field data form associated with the seed collection. If seed collection will occur on state lands or right of way areas, a right of entry permit must be obtained as well as notification of your presence in regard to date, time and total persons that will be on site. Right of entry permits can be obtained from district or county DOT offices or State Park offices. Plan ahead – you will not get a permit overnight. Sample Right of Entry Permit and Notification Documents can be found in Appendix D.

If you are a Team Leader and have arranged for your State Lead to obtain your collection permit, you will need to have a copy of the permit on hand when you visit the site. Additionally, you will need to sign a Hold Harmless Document that will release your State Lead and their associated institution from any damage that may inadvertently occur while you are utilizing the permit in the name of a third party. A sample Hold Harmless Document can be found in Appendix E.

6. Preliminary Site Visits

Preliminary site visits are often necessary to assess the populations, confirm the identification/location of specimens, and estimate the likely harvesting date and potential seed production. It is important that a knowledgeable botanist leads the collection team and is involved in identifying the plants and the most suitable populations for seed collection. Additionally, where populations are suitable and the quality and quantity of seed is adequate, it may be possible to make collections of multiple target species from the same site. Team Leaders can make preliminary site visits to confirm plant ID when the plants are in flower and mark populations for their volunteer collection teams to return to when the seeds mature.

Begin by assessing the target population and confirm that a sufficient number of individual plants (usually minimum 50) have seeds at natural dispersal stage. This will ensure that adequate genetic diversity can be sampled from the population, and that the seeds are likely to be at maximum viability and longevity.

Carefully examine a small, representative sample of seeds using a cut test and for smaller seeds a hand lens. Seed should be dry, dark, and relatively loose in its shell. Cut the seed open and examine the contents, the material inside should be a lighter colored embryo. If the embryo is dark or dry like the outer shell the seed may be damaged or dead. The presence of insect damage is an indicator of damaged material. Doing cut tests will help you to estimate the frequency of empty or damaged seeds and confirms that the majority of seeds are mature and fully formed. Use this information as a guide for when to hold your collection event.

How to identify a population:

- A population is a group of individuals (of the same species) living within the same collection site, continuous in range, and generally uniform in appearance.
- Consider plants within a 3 mile radius around your main collection site to be the same population.
- To avoid collecting from the same population in two separate collections (of the same species), do not allow the 3 mile radius of two sites to overlap. If collecting different species from the sites, overlap is not an issue.

7. Preventing the Spread of Noxious Weeds and other Hazards

In natural resource work, including seed collections, equipment and organisms are often moved from one location to another. This provides the potential for the spread of non-target species to invade new habitat. Non-target species are the plants, animals, diseases, pathogens and parasites that are not intended to be moved. As responsible environmental stewards, it is essential that we do our best to reduce our impact and prevent the movement of invasive and weedy species whenever possible. Please use the following protocols before, during, and after each collection.

Come Clean and Educated

- Before leaving the home, inspect your gear and remove dirt, plants, and seeds from clothing, boots, gear, and vehicles. When possible, wear low-tread footwear that doesn't hold soils, seeds, plant parts, or invertebrates.
- Learn to identify the problem weeds you might encounter. It's easy to learn to identify the problem weeds in most areas and you can find a host of free ID guides wherever you are or are going.
- There are many websites available to learn about your local problem weeds and invasive species. Check out your state Department of Natural Resources, www.playcleango.org, or www.stopans.org to name a few.

During the Collection

- Avoid parking in weed patches. Most weeds spread along roadways, as vehicles can easily transport many types of weeds and seeds. Avoid parking in weedy spots. If you are driving off the pavement, try to identify a course that will avoid any weeds.

- Avoid walking through weed patches. Many weed seeds will cling to clothes, shoes, and even hair. If you avoid walking through weeds you will reduce the amount of seed that you might be transporting.
- If collecting from numerous sites in one day, clean all gear between each site.

Leave Clean

- It's important to clean in the right location. If possible, clean your gear on-site at the end of your trip.
- Carefully inspect yourself and your equipment at the end of your trip. Weed seeds will cling to most materials so be sure to carefully check everything for weed seeds. Do this before you leave a site and throw the seeds in the trash. Pay special attention to pant cuffs, shoes (including laces), and socks. Use a stiff brush, stick, or small screwdriver to help remove soils, seeds, plant parts, or invertebrates; use boot brushes and other removal devices when possible.
- Do not clean clothing, footwear, or gear in or near waterways – it may promote the spread of invasive species downstream.
- Use a 70% alcohol solution to sanitize boots and equipment.
- Don't let weeds hitchhike away from the site. If you are not able to clean before you leave the site, make sure to clean in a place where there is no possibility of anything getting away, and dispose of removed materials in the trash.
- If you have parked or driven through weeds, wash your vehicle undercarriage as soon as possible after leaving a weedy area. If you know you have been in weeds, go straight to the car wash without any delay. As soon as you drive out of the weeds, you will begin spreading seeds. Make sure to spray the undercarriage of your vehicle with high pressure water to wash off any seeds. Only wash inside the car wash bay and never spray weed seeds outside the car wash bay.

Take Extra Precaution

Incorporate invasive species prevention into planning for the collection event.

- Place cleaning stations at entrance and exit points
- If necessary, plan travel routes to avoid areas of heavy infestation.
- Identify species in the field to educate participants.
- Provide a 70% alcohol solution to sanitize boots and equipment.

Safety Concerns

Make sure to bring plenty of water (minimum 1 liter). Wear bright clothes when working near roads, and do not collect along busy highways. Wear comfortable, well-fitting shoes and socks, and bring gloves. Dress in layers.

Be careful when handling milkweed plants, as the sap can harm your eyes. The initial irritation can be painful, followed by a cloudiness of the cornea, which can take a week to clear up. Take the following steps to avoid transferring milkweed sap to yourself or your fellow volunteers:

- Wear gloves while collecting milkweed pods
- Avoid contacting your face with your hands or gloves
- Wash your hands carefully after handling milkweed pods

- If milkweed sap gets into your eyes, seek medical attention immediately
- Inform your team lead of any allergies, such as to latex

Always check for ticks after leaving the field. Look where you step and always remain aware of your surroundings. Watch for poison ivy, poison oak, and poison sumac. Do not venture anywhere alone or without informing your team lead.

8. Field Documentation and Data Forms

Use a copy of the MWAEBF Field Data Form in Appendix B for each seed collection and fill out all the data fields. Fill out a data form for each species collected even if you collect many species from the same location. Data should be recorded in the field to ensure all pertinent information is retained. Keep the original form for your records as you will need to send a copy of this data form with your related seed collection to Mason State. Notify your State Lead by email after the collection has been made to document the collection of the species.

8a. Seed Collection Reference Number Format

MWAEBF collecting teams use the following format to identify their collections. The Seed Collection Reference Number will include three parts: the Seed Collection Team reference ID (state abbreviation and collection team number), the project site ID (represented by letters a-z) and collection number; for example, OH.CT1.A-3 for Ohio seed Collection Team 1's 3rd collection at site A. Seed collection reference numbers should be unique and sequential from year to year, and should never be repeated. If the last collection of the previous year was 34, the next year's collection numbering should start with 35. The same goes for project site ID, each new site should be unique and sequential. See Appendix C for Collection Team reference IDs and Appendix B for a filled out example of a Field Data Form.

Examples

Ohio collection team 1 collects their first collection of the season, *Asclepias incarnata*, at a local park. The seed collection reference number would be as follows:

OH.CT1.A-1

Ohio collection team 1 goes to the same site and their next collection is a new species (*Rudbeckia hirta*). The seed collection reference number would be as follows:

OH.CT1.A-2

- If revisiting a site to collect a new species, utilize the same project site ID, but assign a unique collection number.

Ohio collection team 1 now goes to a new site and collects from *Asclepias incarnata*. The seed collection reference number would be as follows:

OH.CT1.B-3

- Even though it is the same species that was sampled at project site A, it is a different population (it is found at site B), with unique genetics, so it is recorded as a new collection number.
- If a site is revisited and the same species is collected from that same site, but on a different date, that information can be added to the original data sheet, without creating a new record. This would happen if not enough seed was mature at the first visit, and a second visit is necessary to collect from the same population.

9. Seed Collecting Tools

Before you leave for your seed collection trip, you will want to make sure you have the following items:

- Paper bags (Sandwich lunch bags or grocery paper bags)
- Permanent black marker or pencil
- Pruners, heavy scissors or garden clippers
- Heavy garden gloves
- Large storage container (To hold bags of harvested seed)
- GIS Application to acquire latitude and longitude
- Data forms
- Permits (when applicable)

10. Seed Collection Protocol

Following proper seed collection protocol (cited in the USFWS Policy Regarding Controlled Propagation of Species Listed under the Endangered Species Act (FR65:183, p56916), collect propagules from each of the known populations on the target species list.

In order to ensure genetically representative propagules suitable for plant reintroductions, we will adhere to the following guidelines recommended by Bureau of Land Management Seeds of Success Program (BLM-SOS):

- Collect no more than 20% of the available seed on the day of collection.
- Collect randomly from a diverse selection of plants regardless if characteristics are rare or common (do not select for only the plants with the largest blooms, unique colors, etc).
- If the genetics are unknown, collect as broadly (in an area) as possible to collect the most diverse selection of material.
- When populations are abundant, collecting from every 5th plant is a good way to randomize collection.
- Prioritize sites where populations are of wild origin
- Do not collect in the early morning, before the dew has evaporated. Seed should be dry when collected.

- While collecting, keep track of the number of plants from which you've harvested seeds and report that number to the data collector.

11. Seed Collection

Collect mature, dry seeds into double-bagged brown paper bags. Large collections can be made using plastic buckets and then transferred into bags. Specific information regarding collection and cleaning of target plants is detailed in Section 12. Do not collect in the early morning, before the dew has evaporated. Seed should be dry when collected.

Do not allow collections to overheat, and do not leave them in a vehicle or in full sun. Exposure to sustained high temperatures can badly damage seed collections. Maintain ventilation around the collections at all times, if making more than one collection on a field day, bring the existing collections outside of the car and leave in a shady spot. Never leave seed in a vehicle for any period of time. Damp collections should be spread out on newspaper to dry naturally in a well-ventilated area immediately after collection. For further explanation of the seed collection techniques, please see the quick reference guide in Appendix F.

11a. Labeling Your Seed Collection

Unlike the data forms, the information you record on your collection bag will aid in the tracking of the seed throughout its life in Mason State Nursery until it is planted at its final habitat restoration site. Write the following information below on the outside of your collecting bag. If using a cloth bag, write the information on a jewelers tag and tie it to the bag. It is imperative that this information is accurate so please label your seed collection bags in the field as you collect and record the following information:

- Latin name
- Common name
- Collection date
- Collection location
- County, state
- Collector's name
- Unique collection team Seed Collection Reference Number (See Section 8 for details)

12. Recommendations for Collection and Cleaning for Specific Target Plants

Estimated monthly collection periods for each species are detailed in the Plant Profiles (Appendix A). This will vary based on the region, weather, and growing conditions that

year, but those months can serve as a ball park. Preliminary site visits will provide a more accurate picture of when seeds will ripen and collection should occur.

Asclepias spp., milkweed

Collection Time: Late summer

Collect seed pods as they turn yellow or greyish brown and begin to split. White fluff will likely be visible. Seed should be brown and plump. Do not collect pods with holes as these seeds are likely nonviable due to insect damage. Split open pod and remove fluff.

Chamaecrista fasciculata, partridge pea

Collection Time: Fall

Seeds ripen in pods. Pods turn from green to brown when they are ready for harvest. Spilt open some of the pods in the field to see if the seeds are brown and plump. If the seeds are still green they are not ready. It's easiest to collect several pods and put them in your collection bag. When indoors, peel the pods to release the seeds.

Coreopsis tripteris, tall coreopsis

Collection Time: Late summer through fall

Seed is ready for harvest when the heads turn yellow to brown. Ripe seed is grayish black in color and resembles a sunflower seed. Seeds are inside the calyx tubes that make up the flower head. Place entire dried flower head into the collection bag. Gently mash the flower head into the palm of your hand to remove any remaining seed.

Eupatorium spp., boneset

Collection Time: Late fall

Seeds ripen about a month after flowering and should be collected when the white fluff begins to dry and expand and the calyx and stem begin to brown. It is easiest to cut off the entire flower head and remove the chaff and fluff from the seed in an area where you are sheltered from the wind. (The white fluff acts as a parachute and the seeds will fly away.) Seeds should be dark in color and plump as flat seeds indicate the embryo has not developed and the seeds are not ripe.

Heliopsis helianthoides, ox-eye sunflower

Collection Time: Fall

Seed will ripen about a month after flowering if the weather is mild. Seed is ready for harvest when the heads turn from yellow to brown. Ripe seed is grayish brown in color. Plants can be self-sterile, so crack some open before collecting to check for viability. Place entire dried flower head into the collection bag. Gently mash the flower head into the palm of your hand to remove any remaining seed.

Monarda fistulosa, wild bergamot

Collection Time: Mid through late summer

Seeds are ready for harvest when the flower head turns from green to brown. Ripened seed is tiny and inside the tiny calyx tubes that make up the flower head. Remove the petals (if there are any remaining) and place entire dried flower head into the collect

bag. Tap the flower heads on a piece of white paper and the remaining seeds will fall out.

Penstemon digitalis, foxglove beardtongue

Collection Time: Midsummer to fall

Seed ripen in upright capsules that turn from green to brown when ready to harvest. The dried capsules can be turned upside down and emptied right into an envelope or collection bag.

Pycnanthemum tenuifolium, narrowleaf mountainmint

Collection Time: Late summer

Seed heads turn from green to brown when ripe. Cut off the entire seed head and put in the collection bag to dry. Mash the dried seed head in your hand or onto a piece of white paper to release the seed from the calyx. Seeds are very tiny and dark brown resembling itty-bitty mouse poop.

Ratibida pinnata, yellow coneflower

Collection Time: Late summer

The seeds form on the inside of the brown or black cone in the center of the flower. When the cone becomes hard and turns grayish or dark brown the seeds are ripe. Remove the entire cone from the plant and put them in the collection bag. Gently pull apart the cones to dislodge the remaining seeds.

Rudbeckia hirta, black-eyed Susan

Collection Time: Late summer through early fall

The seeds form on the inside of the brown or black cone in the center of the flower. When the cone becomes hard and turns grayish or dark brown the seeds are ripe. This usually occurs three to four weeks after the blooms fade. Remove the entire cone from the plant and put them in the collection bag. Gently pull apart the cones to dislodge the remaining seeds.

Symphotrichum spp., asters

Collection Time: Late summer through fall

The seed is ready for collection when the white fluff begins to dry and expand and the calyx and stem begin to brown. It is easiest to cut off the entire flower head and remove the chaff and fluff from the seed in an area where you are sheltered from the wind. (The white fluff acts as a parachute and the seeds will fly away.) Seeds should be dark in color and plump as flat seeds indicate the embryo has not developed and the seeds are not ripe.

Tradescantia ohiensis, Ohio spiderwort

Collection Time: Early summer

Seeds ripen in capsules wrapped in the calyx. The capsules open when the seed is ripe and drop the seeds out quickly. It is best to start checking the seeds about six weeks after they bloom to see if they are ready.

Vernonia gigantea, giant ironweed

Collection Time: Fall

Seeds are ready for collection when the pappus (scales, bristles, or featherlike hairs that are attached to the seeds) is dry and the white fluff begins to expand. Like other members of the composite family, it is easiest to cut off the entire flower head and remove the chaff and fluff from the seed in an area where you are sheltered from the wind. Seeds should be dark in color and plump as flat seeds indicate the embryo has not developed and the seeds are not ripe.

Verbena urticifolia, white vervain

Collection Time: Late summer

Seeds ripen sequentially over the season so not all the seed will be ripe at one time. Each flower is replaced by 4 flattened nutlets. Harvest the entire flower panicle when the about 75% of the capsules are brown and dry, and place them in the collection bag. The flower head may need to be left for a week to dry. Gently crush the capsules to release the tiny seeds by rolling them back and forth over a piece of paper.

Zizia aurea, golden Alexander

Collection Time: Summer

Seeds ripen into capsules on the flower umbel. The capsules turn from green to brown when they are ready to harvest. Remove the entire flower umbel and put into collection bag. Rub ripe capsules between finger tips to release seeds.

13. Seed Storage

After your collection, let the seed dry for 3 days in a cool, dark, dry location before shipping to Mason State Nursery. The optimal method for drying seed material is to spread it out in a single layer on laid out newspaper. Placing a fan nearby on the lowest setting can expedite the drying process. If space is a constraining factor, leave the seed in the collection bag, but leave the bag open and stir the seeds at least once a day. Again, a fan on its lowest setting blowing over the bags can help expedite the drying process.

Ship the seed immediately after drying and completing a preliminary cleaning. Leftover bits of plant material (leaves and stems) can promote the growth of mold which will ultimately affect the viability of the seed. Seeds vary greatly in how they need to be cleaned. Refer to individual plant information in Section 12 for method of cleaning, if necessary.

Only ship seed Monday through Wednesday to ensure that it arrives at Mason State Nursery before the weekend. If necessary, keep the seed in a cool, dark and dry location until Monday morning. Do not freeze seed and never store or ship seed in plastic.

14. Photo Documentation

Digital photos of the species being collected should always be taken while in the field. Data collectors can take photos with their smartphones and upload directly through the GIS app. Digital Photos not uploaded to the app should be labeled with the unique collection ID number and submitted to the Pollinator Partnership via email by the end of the collection season. At least three photos should be taken for each collection:

1. Landscape level / population
2. Individual plants
3. Material collected (seed)

When possible, you have the option to photograph the flower or leaf structure, depending on what is visible and most helpful in identifying the plant. You may also wish to take a photo of your field data form or any field notes as a backup.

15. GIS App

You will use the GIS app to acquire specific data about the location of each seed collection including latitude and longitude coordinates. Specific directions on how to use the GIS app are in Appendix G. A training webinar will accompany this manual in order to provide further assistance to seed collection participants.

16. Shipping

Background

It is critical to the success of the seed that it is shipped immediately following drying, together with the completed field data forms. The Collection Team Lead should ship the seed directly to Mason State Nursery, unless otherwise instructed by the State Lead. In some cases, the Collection Team Lead may need to send the seed first to the State Lead, who will then send the seeds in bulk to Mason State Nursery. Do not mail seeds out on Thursday or Friday in order to ensure they are not left in an uncontrolled (i.e., hot or humid) shipping center for a prolonged period. Always check the estimated delivery before mailing to make sure the seed will arrive before the weekend. If no one is available to receive mail over the weekend, the seeds may end up sitting for two days (or longer) in a boiling hot mailbox or on a doorstep in the direct sun.

Packaging

As often as possible, ship each seed collection in one bag. Make sure that the seed bags are clearly labeled with your unique collection number. The field data form must be shipped with the corresponding collection. Tape or staple it to the bag, or put it inside the bag. As an additional precaution, place a second label on top of the seed inside the bag, indicating the Collection ID and species. As an additional precaution, place a second label on top of the seed inside the bag. We recommend shipping in a sturdy

cardboard box, such as a USPS Priority Mail Medium Flat Rate Box. These boxes can be used to ship seed anywhere in the U.S. (with tracking) for the flat rate of \$13.60, regardless of weight – if it fits, it ships! Boxes can be ordered online at the USPS Postal Store (<https://www.usps.com/>) or picked up at any USPS Post Office, free of charge. The labeled paper bags should be securely packaged for shipping (i.e., taped at the seams and padded with newspaper or loose bubble wrap inside the box). Woven PVC or nylon air freight envelopes can be used for smaller quantities of seed. Please do not use any non-breathable bags or containers for seeds as this may contribute to mold growth.

Shipping via USPS

To ship the seed, first log in to the project USPS account at www.usps.com (contact State Lead, Collection Team Lead, or Pollinator Partnership for login credentials). From the homepage, select “Mail & Ship” and then “Click-N-Ship.” From there, you will be able to fill out the shipping label using the following steps:

1. Where are you sending from?

You will need to edit the “Return Address” to reflect your own address or the State Lead’s address, as the default address is the Pollinator Partnership headquarters in San Francisco.

2. Where are you sending to?

Unless instructed otherwise by your State Lead, all seed must be shipped to the following address:

**Dave Horvath
IDNR, Mason State Nursery
17855 N. County Road 2400E
Topeka, Illinois 61567**

Under “Additional Actions,” check the box indicating “I would like to get tracking notification” so that Pollinator Partnership can be updated on the status of the package.

3. Enter a shipping date

Select same day shipping to ensure the seed is delivered ASAP.

4. Enter package details

Select “I am Shipping Flat Rate”

5. Enter package value

Leave this field blank.

6. Select a service type

Select “Priority Mail” under “Choose a Service Type.” Once all other fields are complete, you can click “View available Services and Prices” at the bottom. Then, select the option

for “Priority Mail® Medium Flat Rate Box.” Be sure to check the scheduled delivery date to ensure it falls before the weekend. The price of postage should be \$13.60.

7. Add insurance and extra services

Do not change anything in this category. Leave all fields set to the default options.

8. Label Summary

Review the label summary to ensure the address and delivery date are correct, then click “Add to Cart.”

9. Shipping Cart

Once again, review the order to ensure all the information is correct, then select “Next: Billing Information.”

10. Billing Information

Check the box indicating “I certify that my mailing complies with...” Select “Use PayPal,” and click “Next: Pay and Print.”

11. Printing the label

Now that you have paid for the postage, you can print the label. The label should be securely taped to the top of the box.

12. Mailing

Once the seed has been securely packaged in a USPS box and postage has been added, you can either hand deliver the package to any USPS Post Office, or you can schedule a pickup with your daily mail pickup (your office might have an outgoing mail receptacle which a postal worker takes from during your daily mail delivery). Regardless of how the package is received by the USPS, you want to make sure: 1) it is received by a postal worker on the same day, and 2) it is never left in an uncontrolled or hot or humid environment.

Please contact your State Lead or info@pollinator.org to confirm when seed has been shipped. If you have any questions or concerns regarding the delivery of the package, please contact Dave Horvath, Nursery Supervisor at Mason State Nursery, at 309-535-2185 or dave.horvath@illinois.gov

Appendix A:

Target Plant Species Plant Profiles

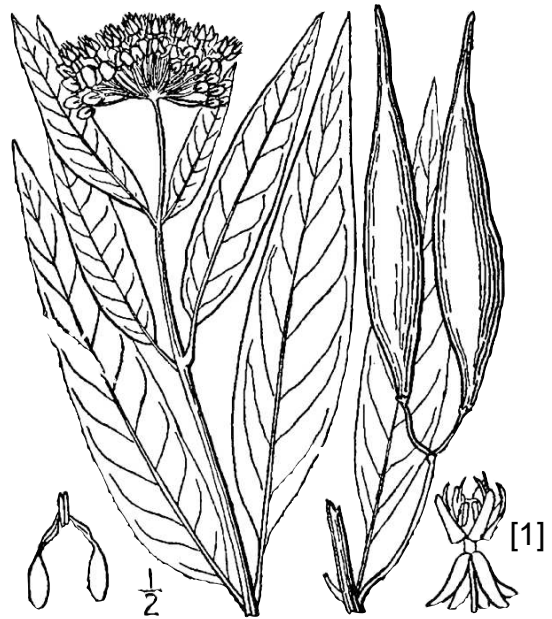
Target Plant Species

Botanical Name	Common Name
<i>Asclepias incarnata</i>	Swamp milkweed
<i>Asclepias syriaca</i>	Common milkweed
<i>Asclepias verticillata</i>	Whorled milkweed
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Coreopsis tripteris</i>	Tall coreopsis
<i>Eupatorium perfoliatum</i>	Common boneset
<i>Eupatorium serotinum</i>	Late boneset
<i>Heliopsis helianthoides</i>	Ox eye Sunflower
<i>Monarda fistulosa</i>	Wild bergamot
<i>Penstemon digitalis</i>	Foxglove beardtongue
<i>Pycnanthemum tenuifolium</i>	Narrowleaf mountainmint
<i>Ratibida pinnata</i>	Yellow coneflower
<i>Rudbeckia hirta</i>	Black eyed susan
<i>Symphotrichum laeve</i>	Smooth blue aster
<i>Symphotrichum novae-angliae</i>	New England aster
<i>Symphotrichum pilosum</i>	Frost Aster
<i>Tradescantia ohiensis</i>	Ohio spiderwort
<i>Verbena urticifolia</i>	White vervain
<i>Vernonia gigantea</i>	Giant ironweed
<i>Zizia aurea</i>	Golden Alexander

Asclepias incarnata

swamp milkweed

Other common names include: rose milkweed



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:

Duration: Perennial

Type: Herb

Size: 2-5' tall

Leaf: Opposite; up to 6" long and 1½" wide, but typically about 3" long and ½" wide; hairless and toothless, tapering to a point at the tip on a short petiole. Upper leaf surfaces are medium to dark green, although they can become yellowish green or pale green in response to bright sunlight and hot dry conditions.

Stem: Mostly hairless but may have lines of fine hairs in the upper plant.

Flower: Upper stems terminate in pink clusters of flowers spanning about 2-3½" across. Each flower is about ¼" across, consisting of 5 upright whitish hoods and 5 surrounding pink petals that droop downward in the manner of most milkweeds.

Seed collection**: Late September [2]

What it can be confused with:

Swamp milkweed is easily distinguished from other milkweeds (*Asclepias* spp.) by its erect umbels of pink flowers, tall branching habit, and relatively narrow leaves. Other milkweeds with pink flowers, such as *Asclepias syriaca* (common milkweed) and *Asclepias sullivantii* (prairie milkweed), are shorter and less branched plants with wider leaves. Sometimes stray plants of swamp milkweed occur in drier areas; these specimens are usually much shorter and little branched, but their leaves remain narrow in shape. [3]

Known Pollinators:

Hummingbirds, honey bees, native bees, flies, wasps, butterflies, and skippers. [3,4]

Larval Host: Monarch and queen butterflies [4]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

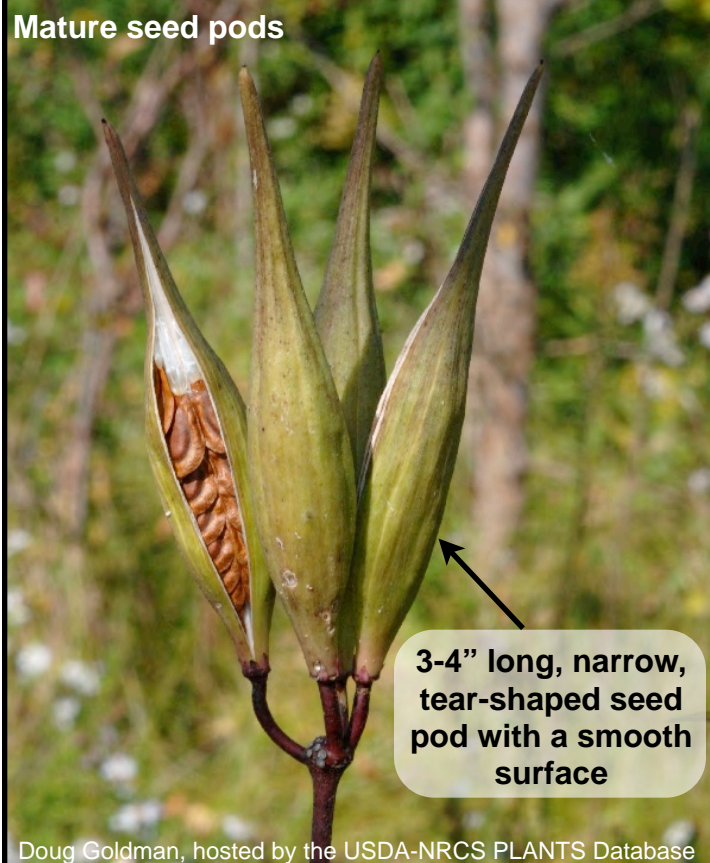
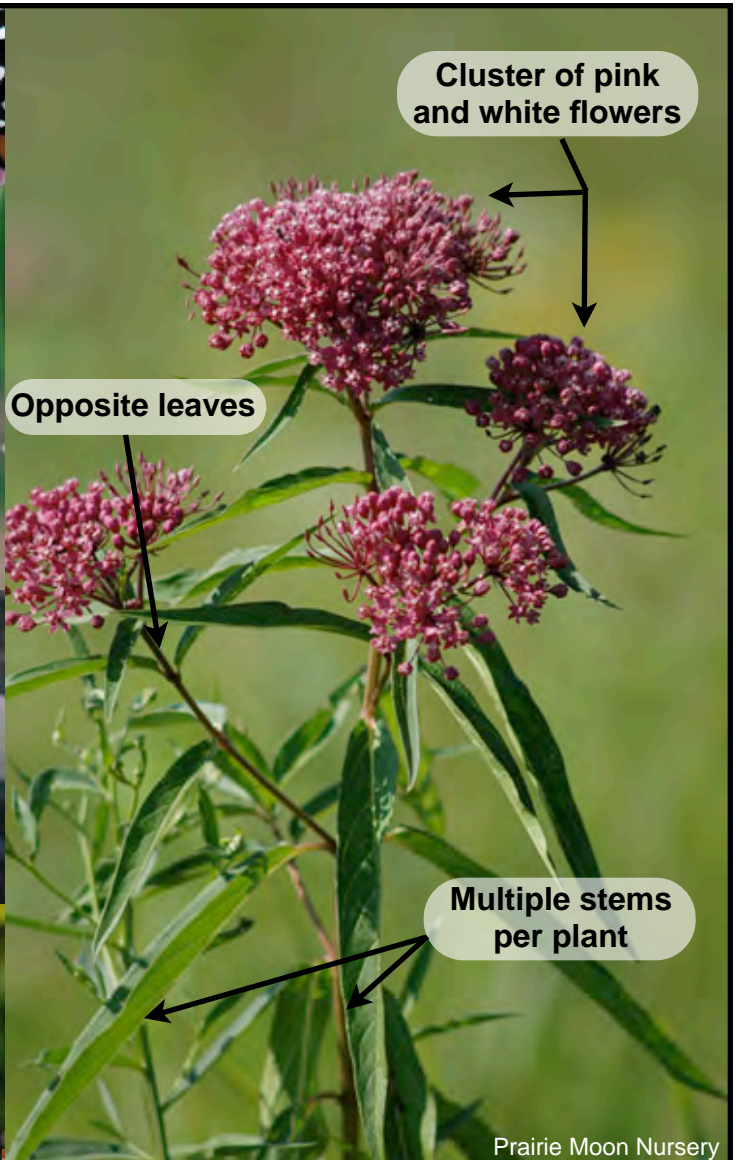
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 26

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html> [3] http://www.illinoiswildflowers.info/wetland/plants/sw_milkweed.htm

[4] http://www.wildflower.org/plants/result.php?id_plant=ASIN

Asclepias incarnata

swamp milkweed

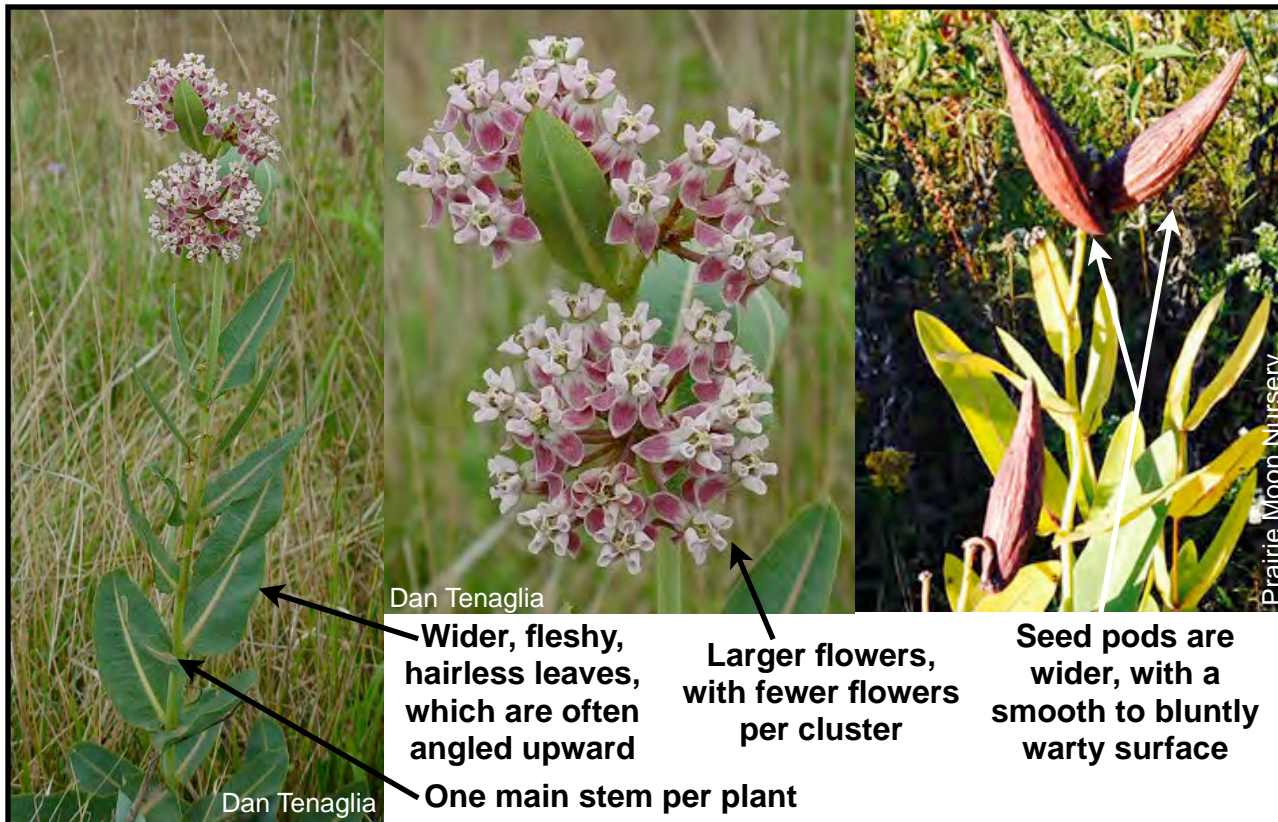


Asclepias incarnata

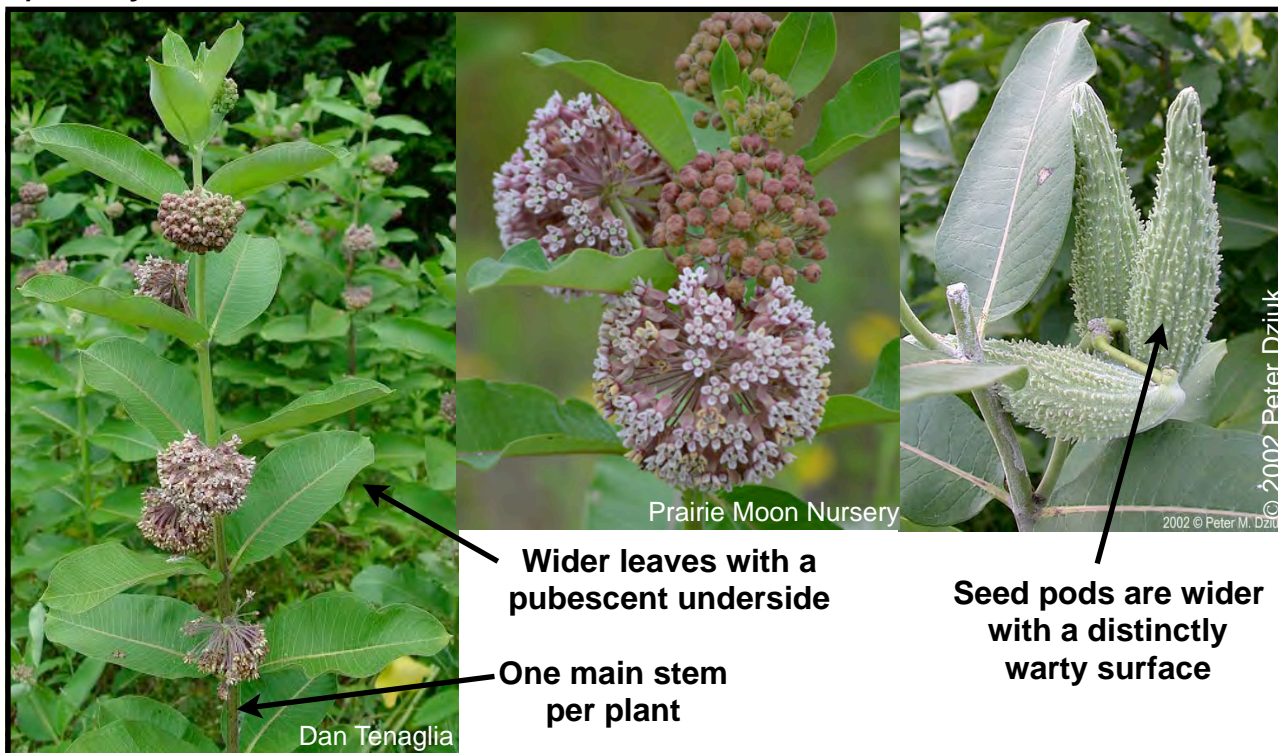
swamp milkweed

SWAMP MILKWEED COULD BE CONFUSED WITH:

Asclepias sulivantii - prairie milkweed



Asclepias syriaca - common milkweed



Asclepias incarnata

swamp milkweed

SWAMP MILKWEED COULD BE CONFUSED WITH:

Apocynum cannabinum - common dogbane



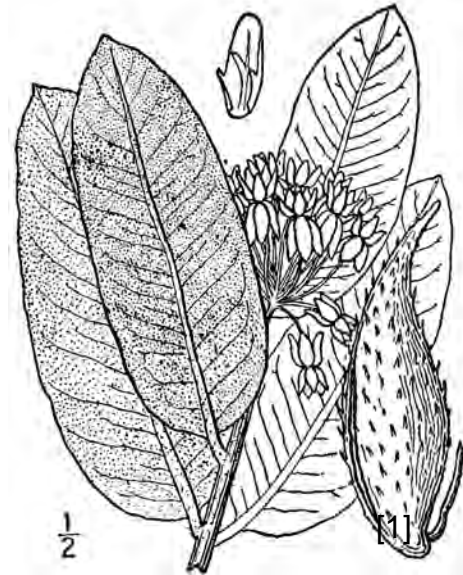
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Asclepias syriaca

common milkweed

Other common names include: silkweed and milkplant



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X				

Plant Characteristics:

Duration: Perennial

Type: Forb

Size: 3-5' tall

Leaf: Opposite; up to 8" long and 3.5" wide; oblong with smooth margins, the upper leaf surface is pale-medium to dark green and hairless above, lower leaf surface is densely covered with woolly hairs that are very short; prominent central vein; if damaged, milky sap is released.

Stem: Central stem is stout, pale green, unbranching (except sometimes at the tip near the flowers) and usually covered in small, short hairs.

Flower: Umbels of flowers, each about 2½-4" across, emerge from the axils of the upper leaves. These flowers are fragrant and range in color from faded light pink to reddish purple. Each flower is about ¼" across, consisting of 5 reflexed petals and 5 raised hoods with curved horns. The hoods are more light-colored than the petals. The pedicels (flower stem) of the flowers are light green to pale red and hairy.

Seed collection**: Late September - October

What it can be confused with:

Common milkweed can be distinguished from other milkweeds by its warty seedpods – other *Asclepias* spp. within the ecoregion have seedpods which are smooth, or nearly so. The leaves of swamp milkweed are more narrowly lanceolate than those of common milkweed. Prairie milkweed is similar in having one main stem and large leaves, but it is hairless, unlike the common milkweed which has small hairs on the stems and undersides of the leaves. [2]

Known Pollinators:

Honey bees, native bees, flies, wasps, butterflies, moths, and skippers. [2,3]

Larval Host: Monarch and milkweed tiger moth. [2,3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 30.

[2] http://www.illinoiswildflowers.info/weeds/plants/cm_milkweed.htm [3] https://www.wildflower.org/plants/result.php?id_plant=ASSY
 © Pollinator Partnership 2017

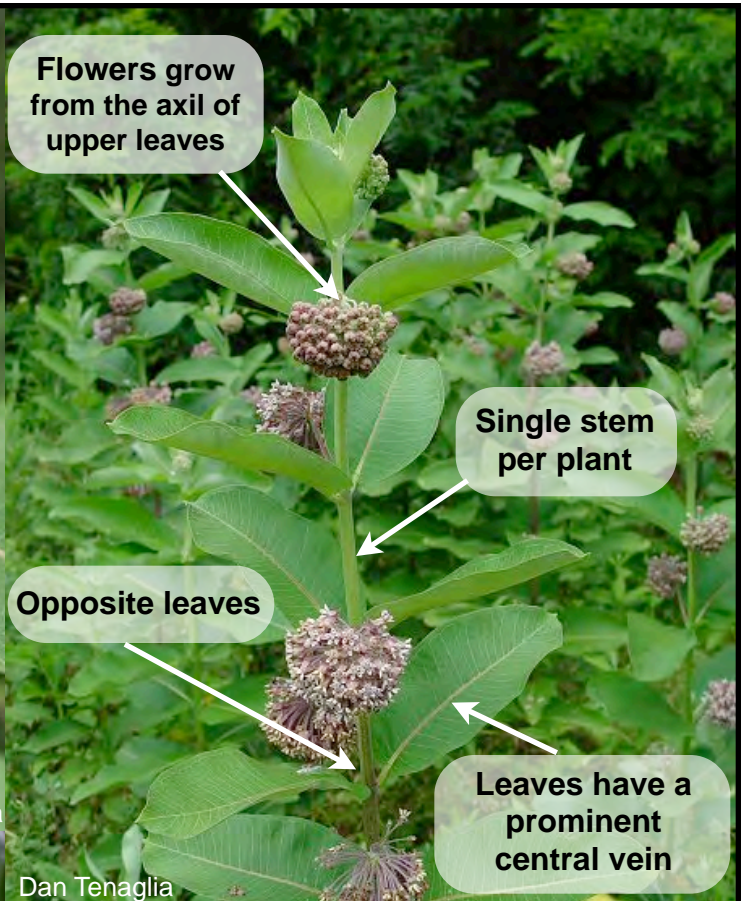
Asclepias syriaca

common milkweed



Small, light and dark pink flowers

© 2008 k. chayka



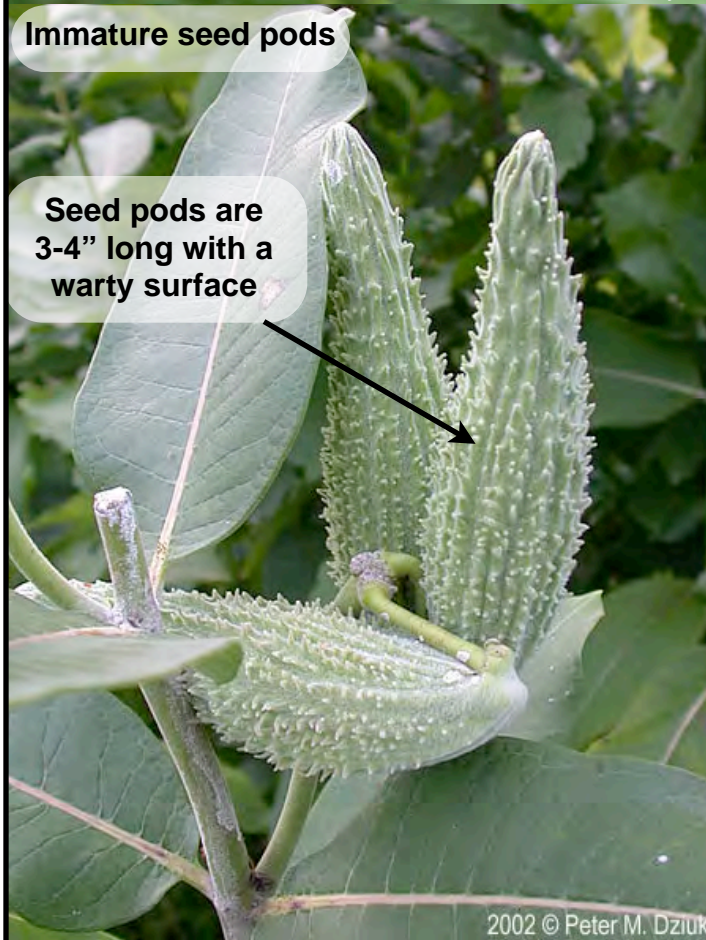
Flowers grow from the axil of upper leaves

Single stem per plant

Opposite leaves

Leaves have a prominent central vein

Dan Tenaglia



Immature seed pods

Seed pods are 3-4" long with a warty surface

2002 © Peter M. Dziuk



Stems and leaf bottoms are covered in small hairs

John Hilty, Illinois Wildflowers



Cleaned Seeds

Prairie Moon Nursery

Asclepias syriaca

common milkweed

COMMON MILKWEED COULD BE CONFUSED WITH:

Asclepias sulivantii - prairie milkweed

Fleshy, hairless leaves, which are often angled upward

Similar in having one main stem per plant

Larger flowers, with fewer flowers per cluster

Seed pods are similar in size, but are clearly distinguishable by the smooth to bluntnly warty surface

Dan Tenaglia

Prairie Moon Nursery

Asclepias incarnata - swamp milkweed

Long, narrow, hairless leaves

Multiple stems per plant

Stems terminate in clusters of small pink and white flowers

Seed pods are more narrow with a smooth surface

Amber Barnes

Prairie Moon Nursery

Doug Goldman, hosted by the USDA-NRCS PLANTS Database



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Asclepias verticillata

whorled milkweed

Other common names include: eastern whorled milkweed

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:Duration: PerennialType: HerbSize: .5-2' tallLeaf: Whorls of 4-6 leaves surround the central stem, long and thin: 2-3" long, 1/16-1/8" across, smooth leaf edges, and some leaves droop downward. The upper leaf surface is yellowish-medium green and nearly hairless with narrow grooves along the middle. The lower leaf surface is whitish green with small hairs.Stem: Yellowish green to medium green, sparsely branched along the upper half of the central stem.Flower: White. 1-4 flower heads grow from the middle to upper leaf axils. Flowerheads span 3/4-1 1/2" across and consist of 7-20 small whitish green flowers.Seed collection**: Mid-Late September - Early October [2]**What it can be confused with:**

This small milkweed blooms later into the year than most milkweed species (*Asclepias* spp.). Whorled milkweed superficially resembles the common field horsetail (*Equisetum arvense*) because of its thin whorled leaves. It can be distinguished from this horsetail by the milky latex of its foliage and the later development of its flowers and seed pods. Field horsetail is a spore-bearing plant that lacks true flowers. Whorled milkweed is readily distinguished from other milkweed species by its more narrow leaves (only 1/16-1/8" across). Narrow-leaved milkweed (*Asclepias stenophylla*) is an exception, because its linear leaves are almost as narrow. However, this latter species has leaves that are alternate to nearly opposite along its stems, rather than whorled. [3]

Known Pollinators:

Honey bees, native bees, flies, wasps, butterflies, moths, and beetles. [3]

Larval Host:

Monarch

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 32.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/prairie/plantx/wh_milkweedx.htm

Asclepias verticillata

whorled milkweed



Cleaned seeds



Steve Hurst, hosted by the USDA-NRCS PLANTS Database

Flowers



Mature seed pod



Asclepias verticillata

whorled milkweed

WHORLED MILKWEED COULD BE CONFUSED WITH:

Equisetum arvense - field horsetail

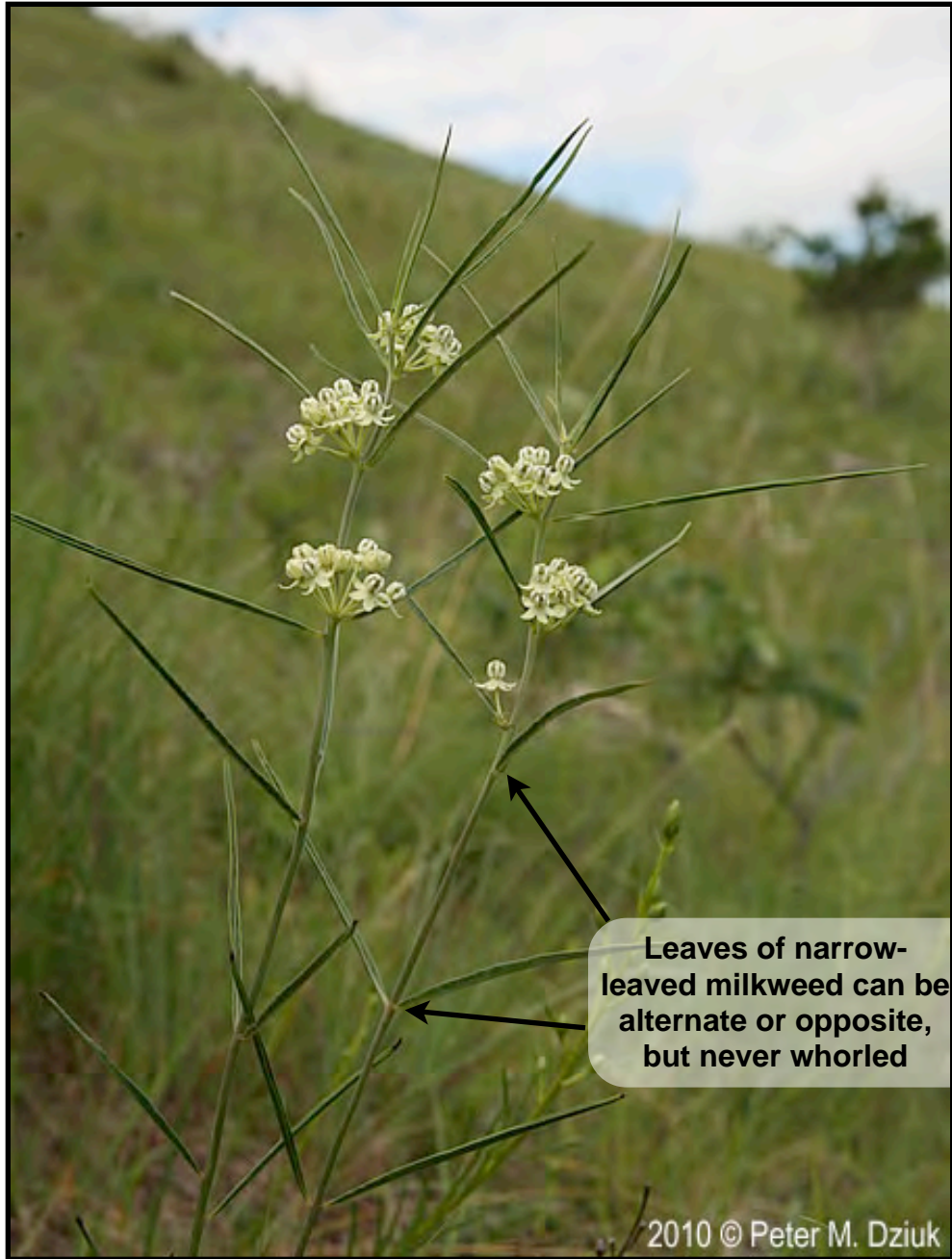


Asclepias verticillata

whorled milkweed

WHORLED MILKWEED COULD BE CONFUSED WITH:

Asclepias stenophylla - narrow-leaved milkweed

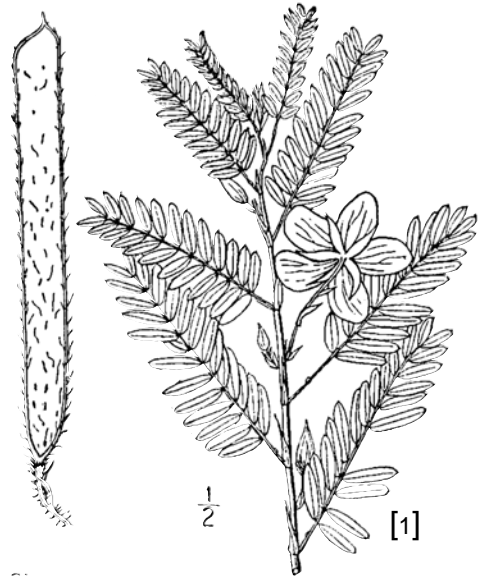


Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Chamaecrista fasciculata

partridge pea

Other common names include: showy partridge pea, sleepingplant, or sensitive plant



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:

Duration: Annual

Type: Herb

Size: 1-3' tall

Leaf: Alternate, pinnately compound. Medium to dark green. Petioles with nectaries. Each compound leaf has up to 20 leaflets, which are hairless, oblong, and roughly 2/3" long and 1/3" wide.

Stem: Shorter plants are erect while larger plants tend to sprawl. Stems are slender and hairless, and are light green at first but become reddish brown.

Flower: Flowers are bright yellow and irregular, appearing on 1/3" flower stalks along major stems near leaf axils. Flowers are 1" wide with 5 rounded petals and approximately 10 ruddy stamens. No scent. [3]

Seed collection**: Early September [2].

What it can be confused with:

Sometimes confused with *Chamaecrista nictitans* (sensitive partridge pea) which can be distinguished by its flowers (which are smaller in size - about 1/3" across, have 5 stamens, and appear on 1/10" flower stalks), as well as its leaves, which are sensitive to the touch and will fold when contacted. [5]

Known Pollinators:

Honey bees, native bees, flies, wasps, ants, butterflies [4, 5]

Larval Hosts:

Several species of sulfur butterflies feed on the foliage. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 2: 337.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

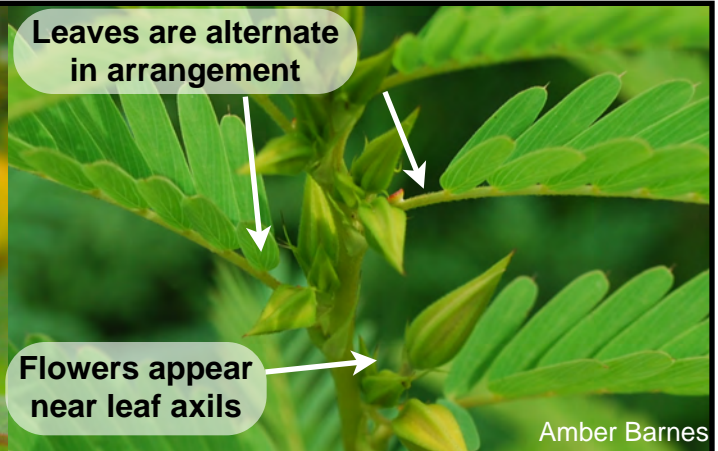
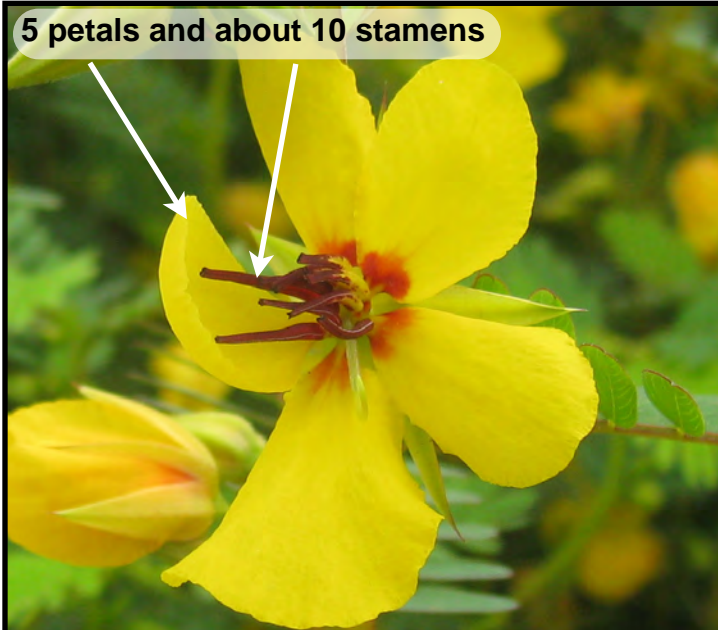
[3] http://www.illinoiswildflowers.info/prairie/plantx/part_peax.htm

[4] http://www.wildflower.org/plants/result.php?id_plant=CHFA2

[5] <https://gobotany.newenglandwild.org/species/chamaecrista/fasciculata/>

Chamaecrista fasciculata

partridge pea

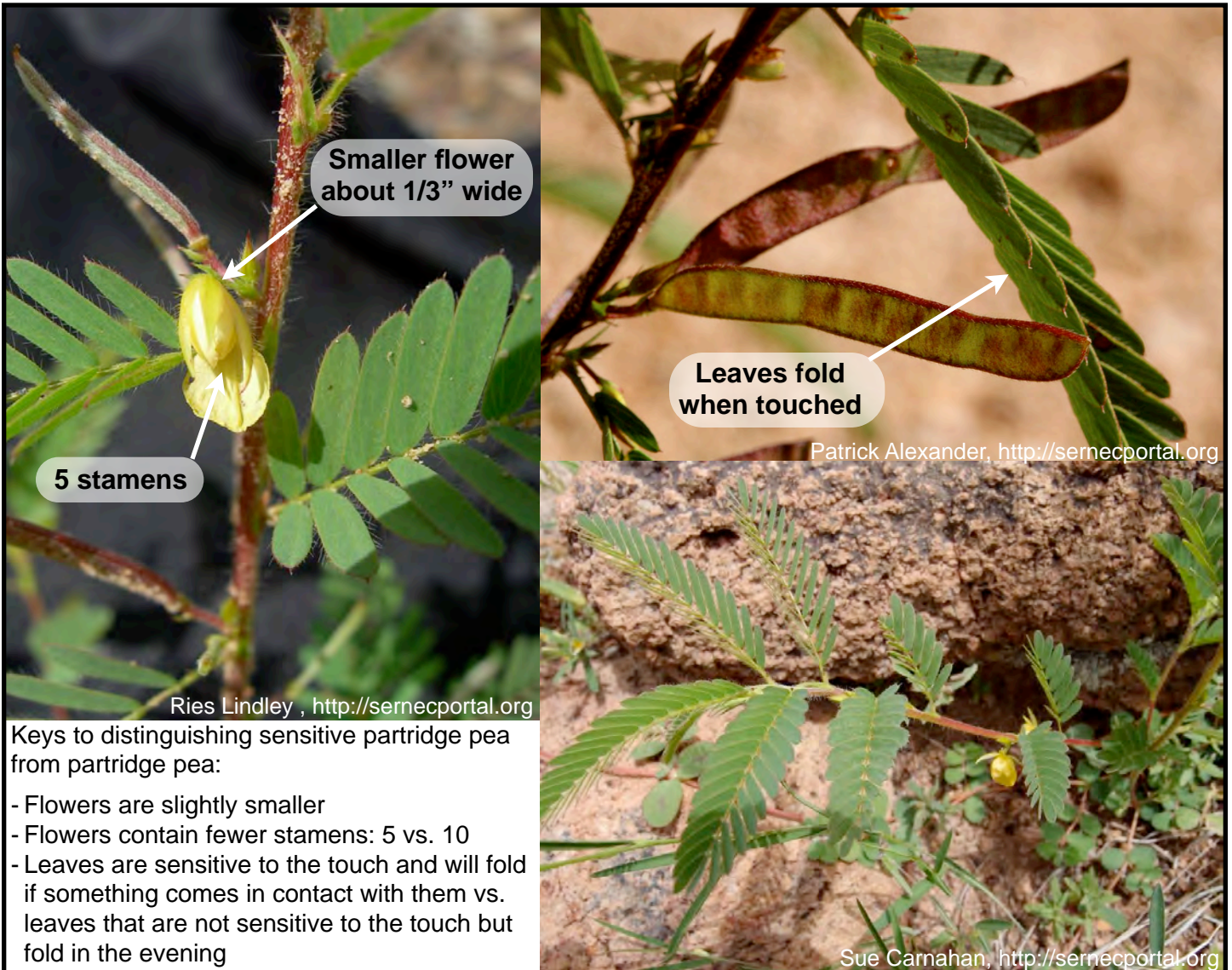


Chamaecrista fasciculata

partridge pea

PARTRIDGE PEA COULD BE CONFUSED WITH:

Chamaecrista nictitans - sensitive partridge pea



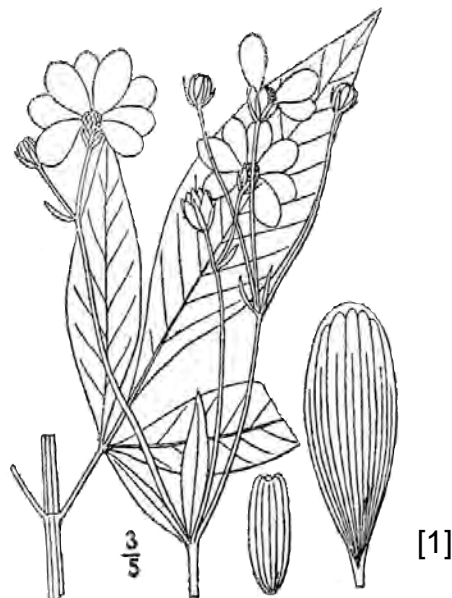
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Coreopsis tripteris

tall coreopsis

Other common names include: tall tickseed and Atlantic coreopsis

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X	X		

Plant Characteristics:Duration: PerennialType: HerbSize: 3 - 8' tall

Leaf: Opposite, may occur alternately along uppermost stems; up to 5" long and $\frac{3}{4}$ " wide; compound leaf with 3 or 5 leaflets, smooth leaf margins with small hairs; lateral leaflets are sessile (no leaf stem), while terminal leaflets have petioles (leaf stem). Upper leaf surfaces are medium green, and hairless; lower leaf surfaces are light green, slightly pubescent. Petioles are up to 1½" long.

Stem: Light green, hairless, and sometimes glaucous (a whitish film that rubs off).

Flower: Upper stems terminate in solitary clusters of flowerheads up to 1½-2" wide. Flowering stalks may develop from axils of upper leaves. Each flower consists of 8 ray florets (outer petals) surrounding a head of disk florets. Ray flowers are yellow; Disk florets are 4-5 lobed (petaled), and dark purple to maroon.

Seed collection**: Late September - Mid October

What it can be confused with:

Tall coreopsis' greater height, later bloom period, and flowerheads with dark purple or maroon centers make it readily distinguishable from other *Coreopsis* spp. Most *Coreopsis* spp. flowerheads have yellow centers. Its height can sometimes cause it to be confused with sunflowers (*Helianthus* spp.). Sunflowers, however, have simple leaves as opposed to the tall coreopsis' odd-pinnate leaves. [2]

Known Pollinators:

Bumblebees, native bees, wasps, flies, butterflies, skippers, and the goldenrod soldier beetle. [2,3]

Larval Host: Dimorphic gray wave moth, wavy-lined emerald moth, and common tan wave moth. [2]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

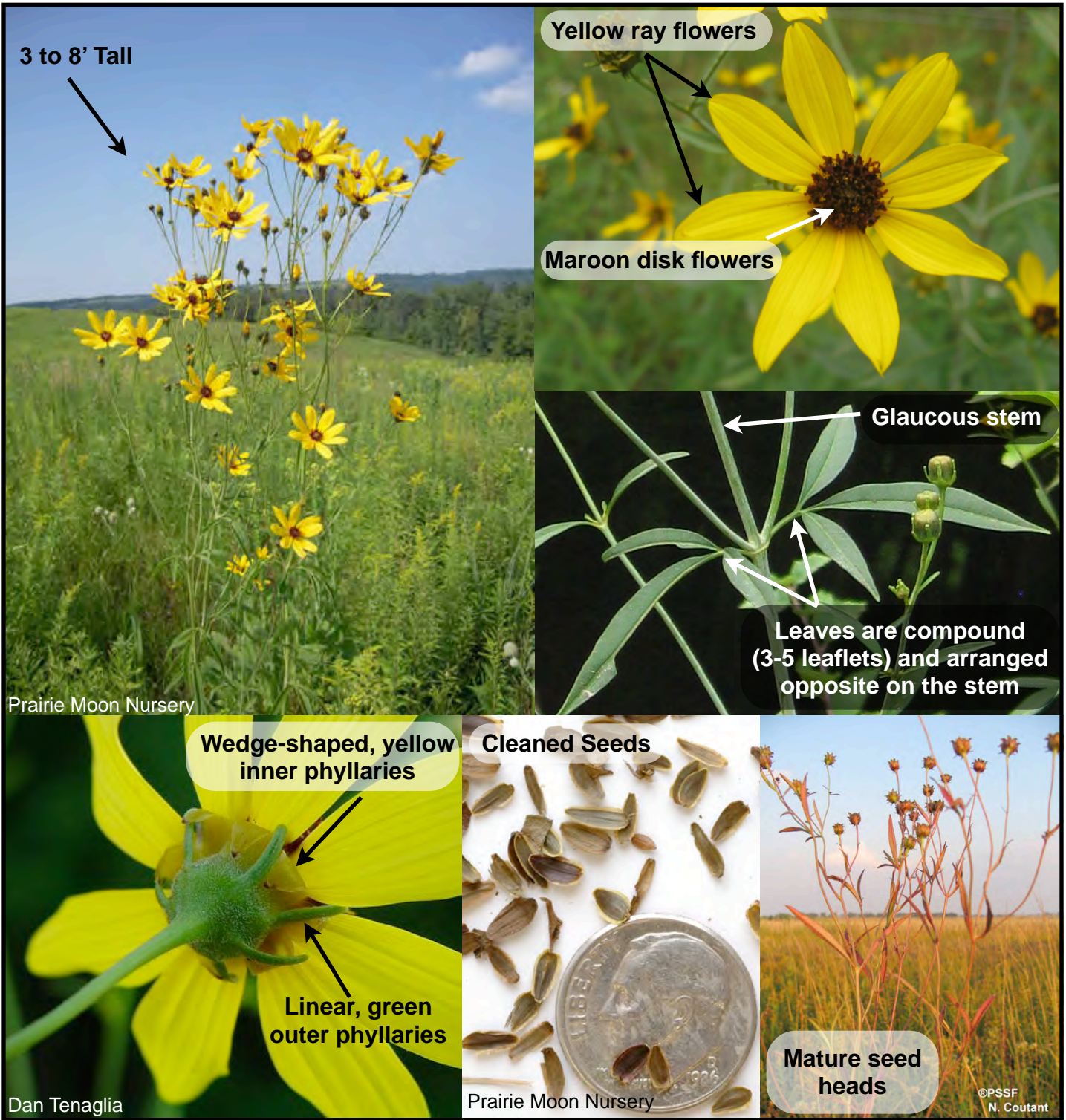
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 491.

[2] http://www.illinoiswildflowers.info/prairie/plantx/tl_coreopsisx.htm

[3] http://www.wildflower.org/plants/result.php?id_plant=COTR4

Coreopsis tripteris

tall coreopsis



Coreopsis tripteris

tall coreopsis

TALL COREOPSIS COULD BE CONFUSED WITH:

Helianthus spp. - sunflowers



The phyllaries can also be helpful, as sunflowers often have many rows of overlapping green phyllaries



The best feature to differentiate between tall coreopsis and sunflower species is their leaves: Sunflowers have simple (non-compound leaves)



Coreopsis palmata - prairie coreopsis



The disk flowers of prairie coreopsis (and many other coreopsis species) are yellow, opposed to the deep purple-maroon disk flowers of the tall coreopsis



Prairie coreopsis is much shorter (1-2.5' tall) and the leaves are lobed rather than compound



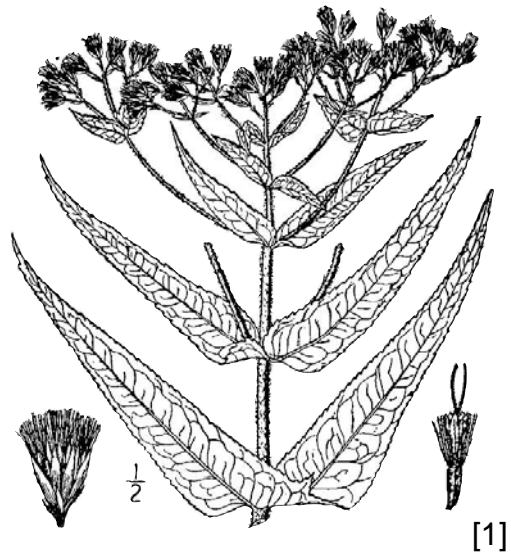
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Eupatorium perfoliatum

common boneset

Other common names include: boneset



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X			

Plant Characteristics:

Duration: Perennial

Type: Herb

Size: 2-4' tall

Leaf: Opposite, serrate, pubescent, light or yellowish green, up to 8" long and 2" across, the leaf bases surround the central stem and merge together.

Stem: Covered in long, white hairs.

Flower: White, upper stems terminate in clusters of white flower heads, spanning about 2-8" across, each flowerhead is about 1/6" across and consists of about 15 disk florets with no ray florets (outer petals).

Seed collection**: Early September - Early October [2]

What it can be confused with:

Common boneset tolerates flooded conditions better than many other boneset species. It can be distinguished from these other species by the perfoliate leaves that surround the central stem. The other species have opposite leaves that are sessile (no leaf stem) or have distinct petioles (leaf stem). All of these species have spreading clusters of white flowers with a similar appearance. [3]

Known Pollinators:

Bees, flies, wasps, butterflies, and beetles. [3,4]

Larval Host: Many species of moth feed on various parts of the plant. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 361.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>
 [4] https://www.wildflower.org/plants/result.php?id_plant=EUPE3

[3] http://www.illinoiswildflowers.info/prairie/plantx/cm_boneset.htm

Eupatorium perfoliatum

common boneset



Dan Tenaglia

Stems are covered in long, white hairs



Dan Tenaglia

Leaves are opposite and perfoliate, making stem appear to grow through one big leaf



Dan Tenaglia

Seeds are wind dispersed



The Native Plant Nursery

Dan Tenaglia



Composite flower heads are made up of many white disk flowers with no ray flowers (outer petals)

Eupatorium perfoliatum

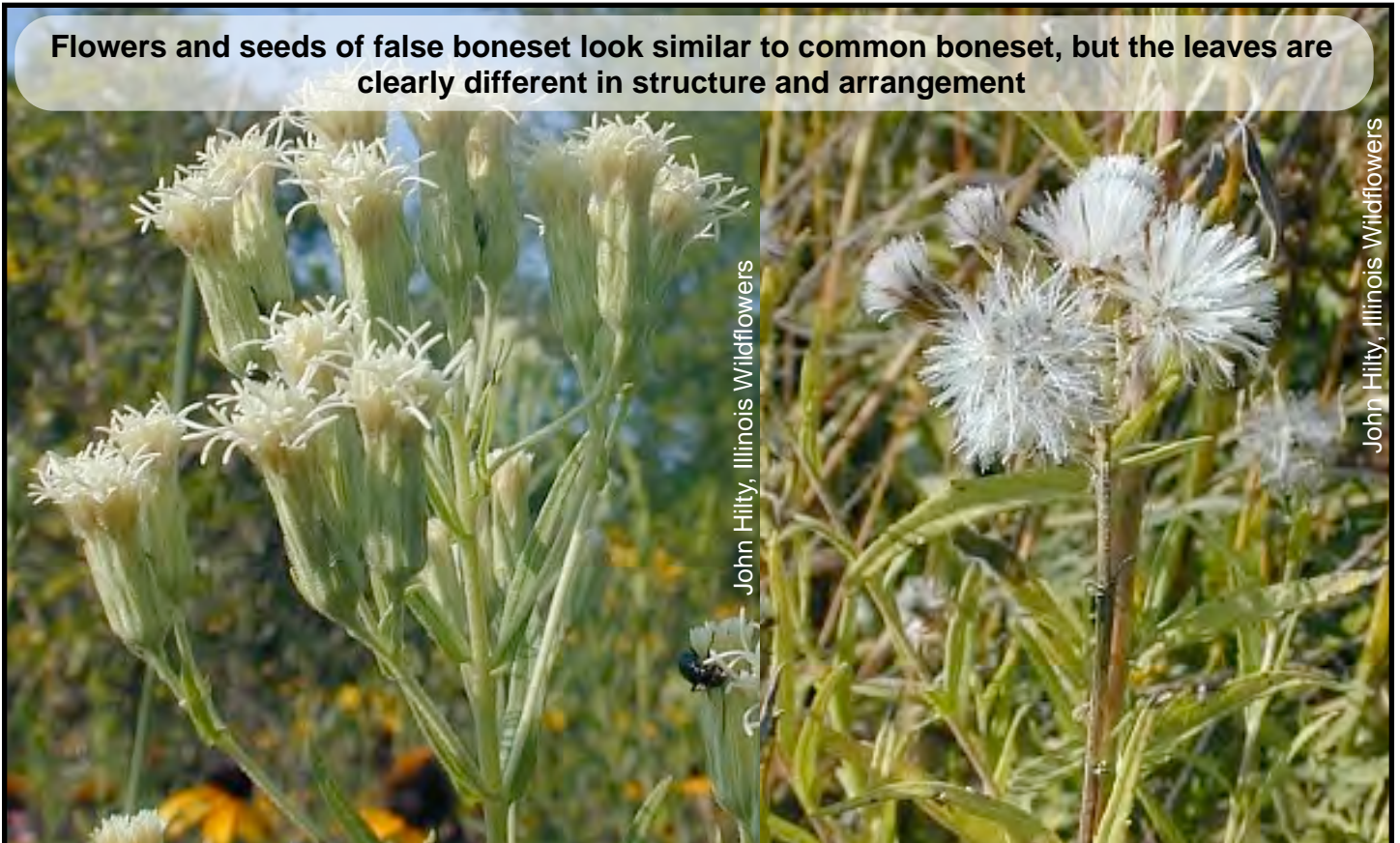
common boneset

COMMON BONESET COULD BE CONFUSED WITH:

Eupatorium serotinum - late boneset (see separate plant profile for key features)

Brickellia eupatorioides - false boneset

Flowers and seeds of false boneset look similar to common boneset, but the leaves are clearly different in structure and arrangement



Leaves are not perfoliate, but sessile (attaching directly to stem with no petiole) and alternate along the stem



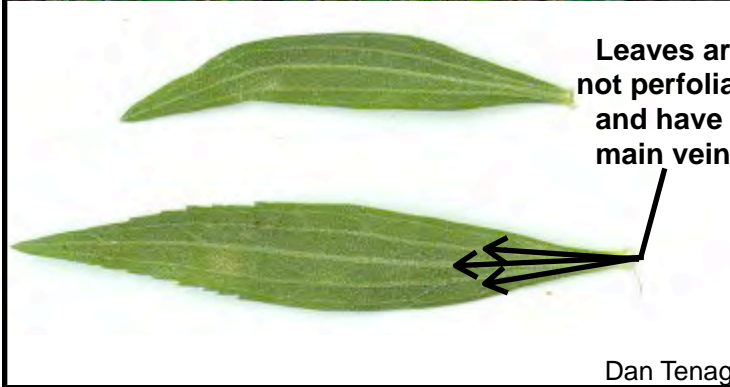
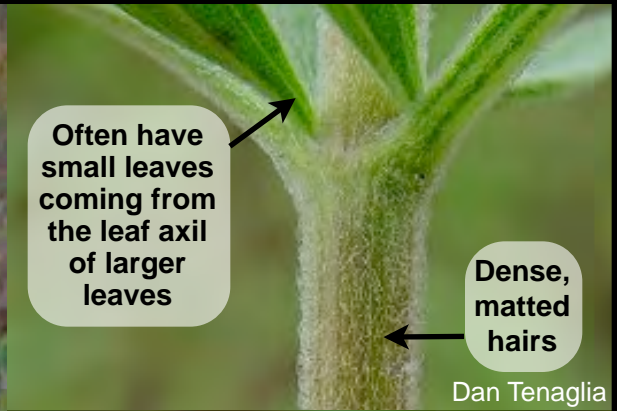
Stem has fine, small hairs

Eupatorium perfoliatum

common boneset

COMMON BONESET COULD BE CONFUSED WITH:

Eupatorium altissimum - tall boneset



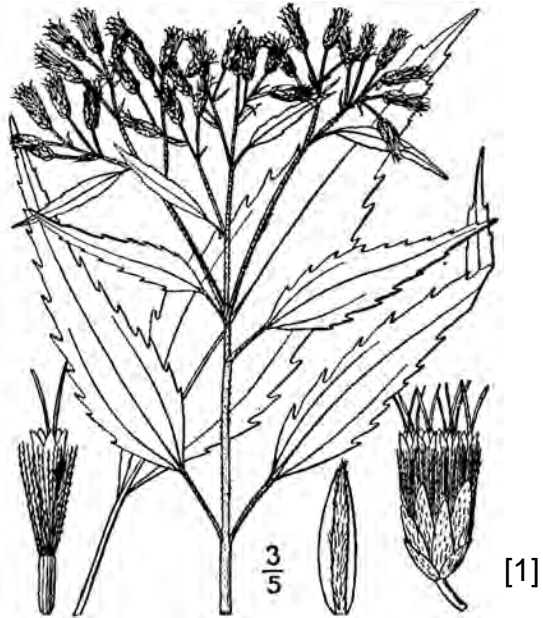
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Eupatorium serotinum

late boneset

Other common names include: late flowering thoroughwort, white boneset, late-flowering boneset



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X	X		

Plant Characteristics:

Duration: Perennial

Type: Herb

Size: 3-6' tall

Leaf: The leaves are primarily opposite, although the upper leaves near the flowerheads sometimes alternate. These leaves are up to 7" long and 2½" across, with petioles up to 1" long. They are lanceolate, largely hairless, with coarse serration along the margins, and there are 5 veins that diverge from the base.

Stem: It is largely unbranched below, but forms occasional side stems toward the apex. The stems have indistinct lines of white hairs, and are generally pubescent.

Flower: White, upper stems terminate in clusters of white flowerheads which consist of about 12 disk florets with no ray florets (outer petals). Each disk floret is narrow and tubular, with 5 small triangular lobes (petals) at the top and a long white style that clearly protrudes from each floret.

Seed collection**: Mid October - Early November [2]

What it can be confused with:

The flowers of late boneset closely resemble those of other bonesets, such as *Eupatorium altissimum* (tall boneset) and *Eupatorium perfoliatum* (common boneset), in both color and structure. These bonesets can be distinguished readily from each other by looking at and comparing their leaves. Tall boneset has leaves that are pubescent, more narrow, and less coarsely serrated than late boneset, while common boneset has leaves that wrap around the stem and are without petioles. [3]

Known Pollinators:

Honey bees, native bees, flies, wasps, butterflies, moths, skippers, and beetles [3,4]

Larval Host: Many species of moth feed on various parts of the plant. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 357.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/prairie/plantx/late_bonesetx.htm

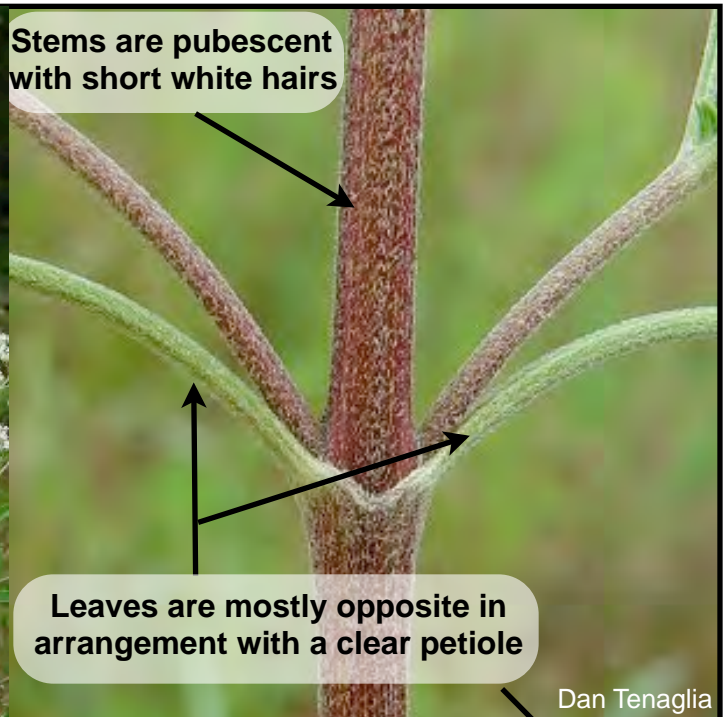
[4] https://www.wildflower.org/plants/result.php?id_plant=EUSE2

Eupatorium serotinum

late boneset



Composite flower heads are made up of many white disk flowers with no ray flowers (outer petals)



Eupatorium serotinum

late boneset

LATE BONESET COULD BE CONFUSED WITH:

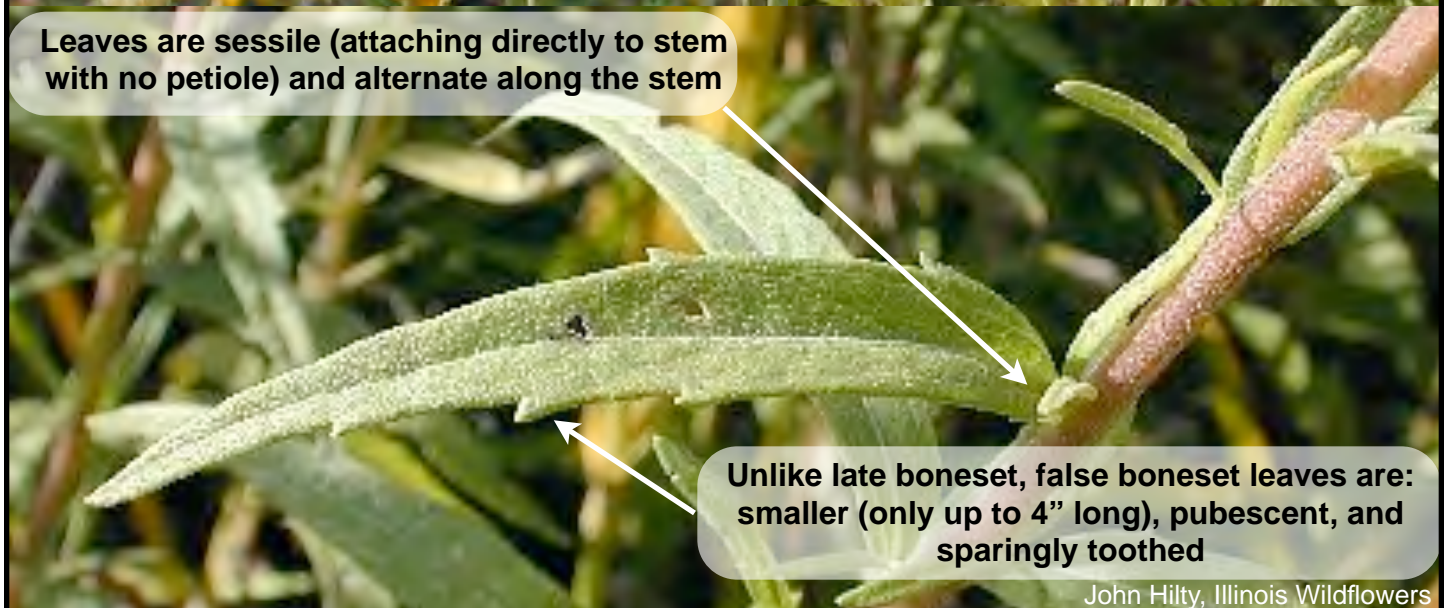
Eupatorium perfoliatum - common boneset (see separate plant profile for key features)

Brickellia eupatorioides - false boneset

Flowers and seeds of false boneset look similar to late boneset, but the leaves are clearly different in structure and arrangement



Leaves are sessile (attaching directly to stem with no petiole) and alternate along the stem



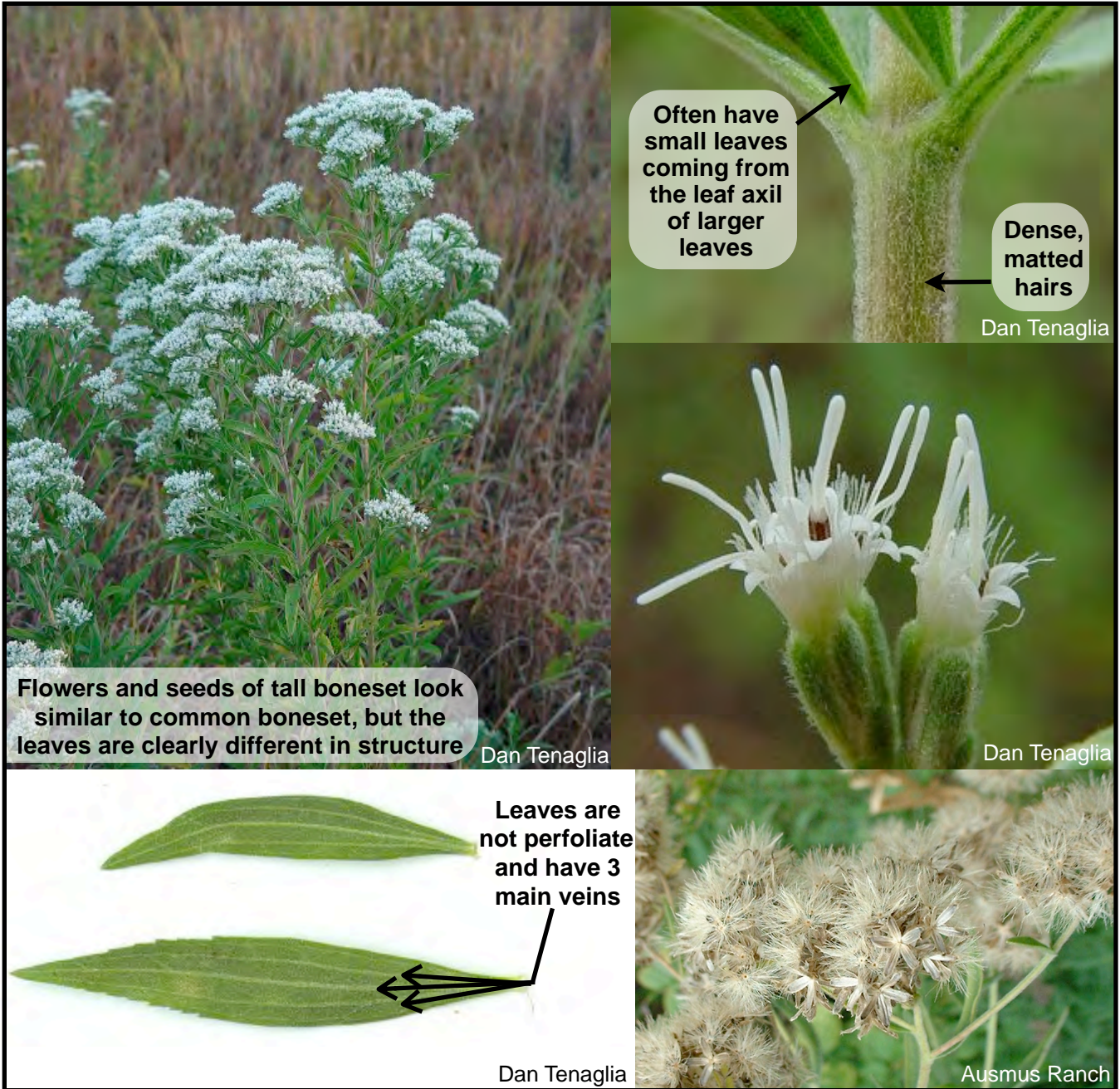
Unlike late boneset, false boneset leaves are: smaller (only up to 4" long), pubescent, and sparingly toothed

Eupatorium serotinum

late boneset

LATE BONESET COULD BE CONFUSED WITH:

Eupatorium altissimum - tall boneset



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Heliopsis helianthoides

oxeye sunflower

Other common names include: smooth oxeye, common oxeye, sunflower heliopsis, & false sunflower

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:Duration: PerennialType: HerbSize: 3-5' tallLeaf: Opposite, toothed, 2½-5" long and 1-3½" across, medium to dark green, pubescent.Stem: Light green to reddish green, variably pubescent or hairy, and terete to slightly angular.Flower: Yellow, 1½-3" across, 8-20 ray florets surround numerous disk florets.Seed collection**: Late September - October**What it can be confused with:**

Heliopsis helianthoides is not considered a true sunflower (*Helianthus* spp.) because both the ray and disk florets of its flowerheads can produce seeds. In contrast, only the disk florets of true sunflowers can produce seeds. Both of these species are relatively large and robust plants that produce showy flowerheads with yellow rays, and they prefer habitats that are at least partly sunny. Oxeye sunflower resembles many sunflower species, particularly those that are found in and around woodlands. In addition to the difference in the fertility of their florets, oxeye sunflower can be distinguished by its more erect flowerheads, by the rather stout and blunt-tipped phyllaries (sepal-like bracts) on its flowerheads, and by the arrangement of its outer phyllaries in a single series. In contrast, most sunflower species have flowerheads that nod sideways, their phyllaries are either more slender (linear-lanceolate in shape) or they are triangular with acute tips, and they have several overlapping series of outer phyllaries. [2]

Known Pollinators:

Hummingbirds, honey bees, native bees, flies, wasps, butterflies, and beetles. [2,3]

Larval Host: Rigid sunflower borer moth and tischeriid moth. [2]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

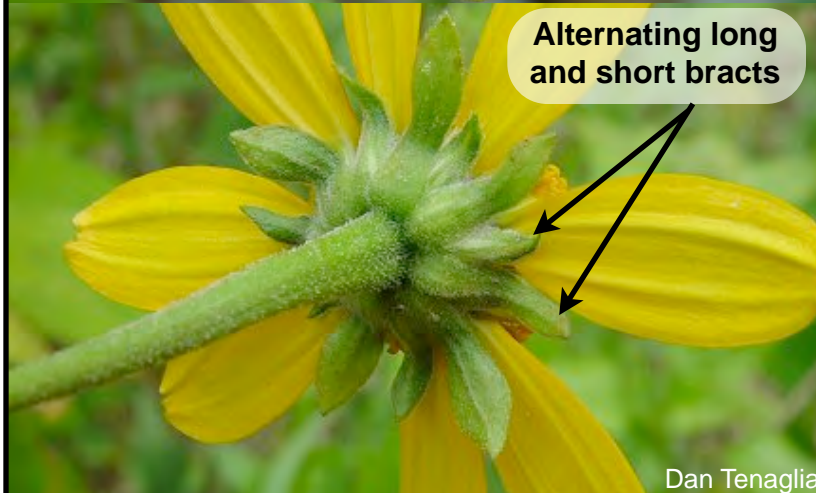
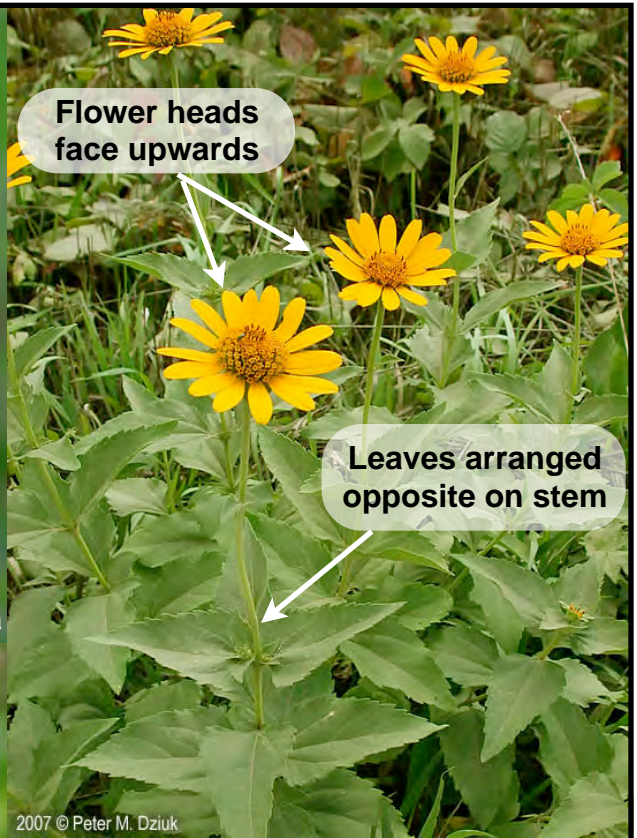
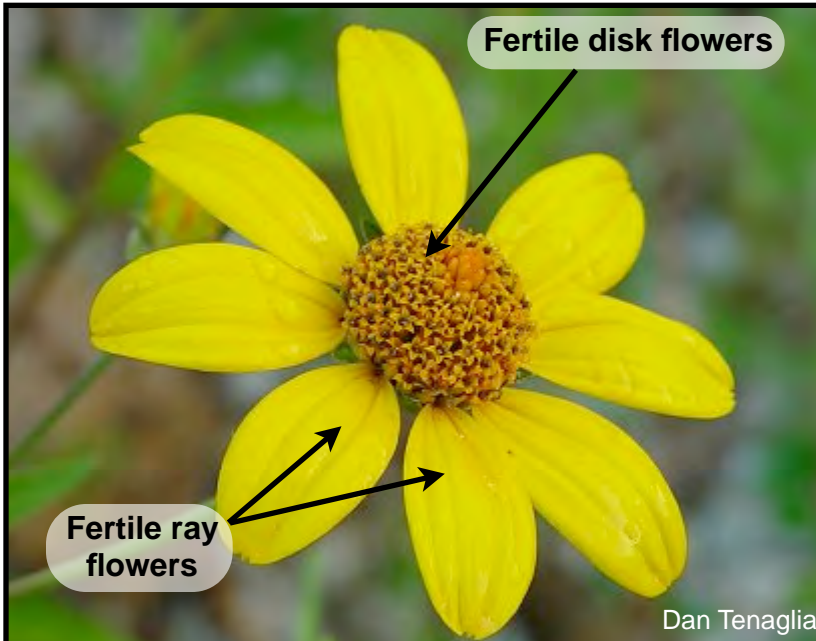
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 467.

[2] http://www.illinoiswildflowers.info/prairie/plantx/fs_sunflowerx.htm

[3] https://www.wildflower.org/plants/result.php?id_plant=HEHE5

Heliopsis helianthoides

oxeye sunflower



Heliopsis helianthoides

oxeye sunflower

OXEYE SUNFLOWER COULD BE CONFUSED WITH:

Helianthus grosseserratus - sawtooth sunflower



Dan Tenaglia

Dan Tenaglia

Dan Tenaglia

- Glaucous stem
- Long, slender, multilayered phyllaries (bracts)
- Longer, thinner, coarsely toothed leaves
- Flower heads tend to nod to the side



Dan Tenaglia

Helianthus hirsutus - hairy sunflower



Dan Tenaglia

Dan Tenaglia

John Hilty, Illinois Wildflowers

- Stem is green to reddish purple with small hairs
- Lanceolate, multilayered phyllaries (bracts)
- Lanceolate, lightly toothed leaves
- Flower heads tend to nod to the side

Heliopsis helianthoides

oxeye sunflower

OXEYE SUNFLOWER COULD BE CONFUSED WITH:

Helianthus tuberosus - Jerusalem artichoke



- The stem is green or reddish and covered with stiff hairs, giving it a rough feel
- Wider, wedge-shaped, multilayered phyllaries (bracts)
- Leaf edges are serrated to nearly toothless
- Attachment is opposite but may be alternate near the top of the plant
- Flower heads tend to nod to the side



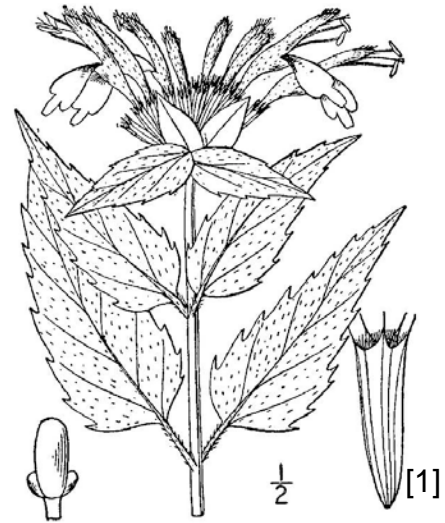
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Monarda fistulosa

wild bergamot

Other common names include: beebalm, horsemint, and mint-leaf bea-balm

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X			

Plant Characteristics:Duration: PerennialType: HerbSize: 2-5' tallLeaf: Opposite, toothed, up to 4" long and 2" across, vary in color from light green to dark green-sometimes with yellow or red tints.Stem: The light green stems are square-shaped and hairless.Flower: Lilac or pink, flower heads are 1-3" across, each flower is about 1" long, with an irregular shape.Seed Collection**: Mid September - October**What it can be confused with:**

Wild bergamot can be distinguished from other *Monarda* spp. by the color of its flowers – the petals of its flowers are solid pink or lavender. Other species have flowers with red, purple, or white petals, or they have dark purple dots on the lower lips of their petals. [2]

Known Pollinators:

Bees, hummingbirds, butterflies, and moths. [3]

Larval Hosts:*Sphinx eremitus* (hermit sphinx moth) and *Agriopodes teratophora* (gray marvel moth) feed on the foliage. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

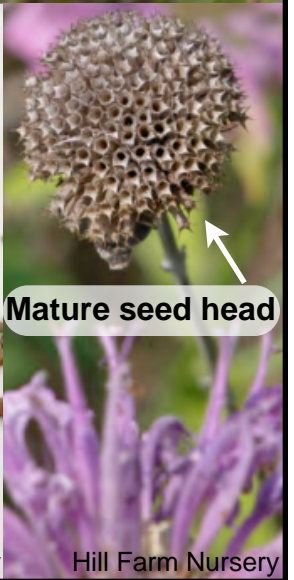
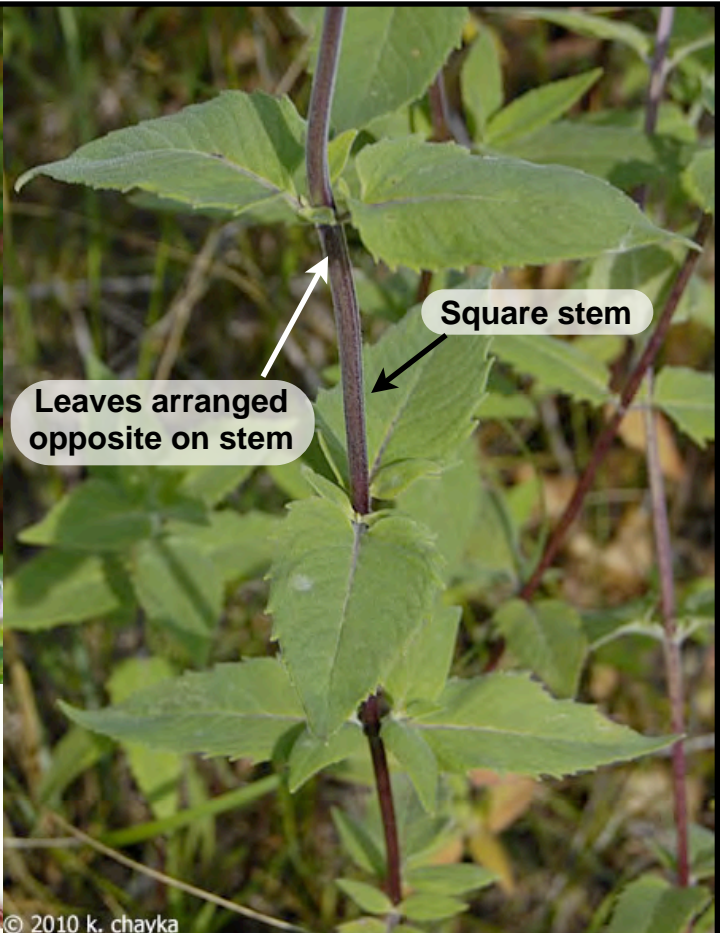
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 132.

[2] http://www.illinoiswildflowers.info/prairie/plantx/wld_bergamotx.htm

[3] https://www.wildflower.org/plants/result.php?id_plant=MOFI

Monarda fistulosa

wild bergamot



Monarda fistulosa

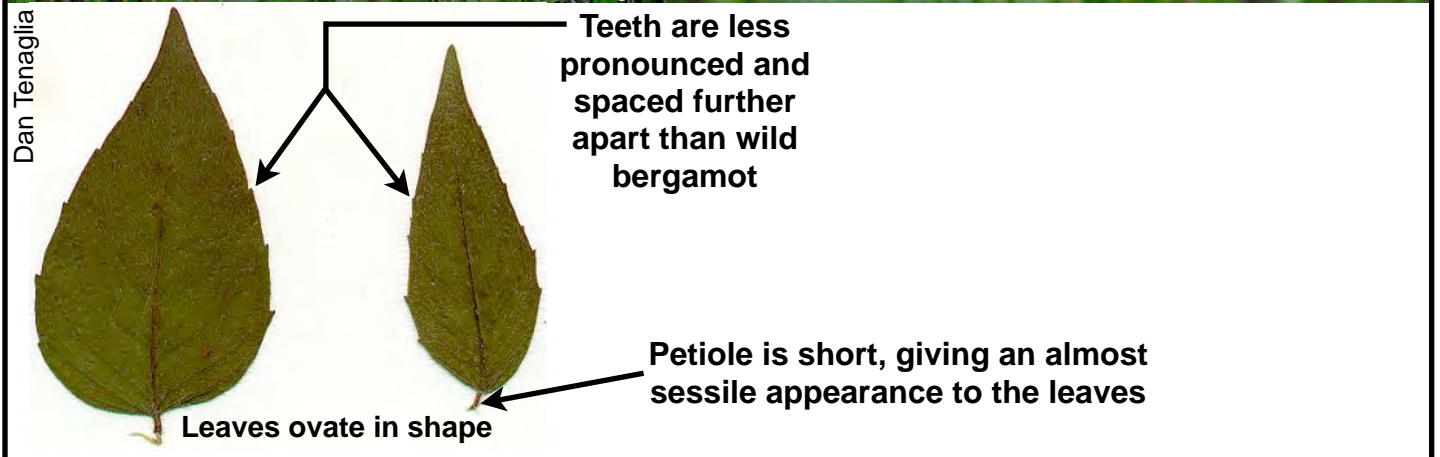
wild bergamot

WILD BERGAMOT COULD BE CONFUSED WITH:

Monarda bradburiana - eastern beebalm



Spots on petals



Dan Tenaglia

Dan Tenaglia

Dan Tenaglia

Teeth are less pronounced and spaced further apart than wild bergamot

Petiole is short, giving an almost sessile appearance to the leaves

Leaves ovate in shape



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

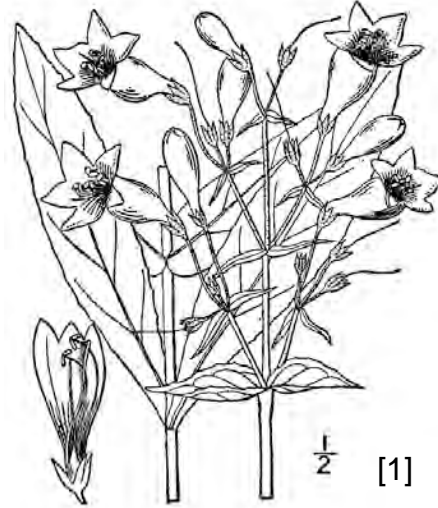
Penstemon digitalis

foxglove beardtongue

Other common names include: foxglove penstemon, Mississippi penstemon/beardtongue, smooth white penstemon/beardtongue, and talus slope penstemon/beardtongue



2014 © Peter Dziuk

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
				X	X	X					

Plant Characteristics:Duration: PerennialType: HerbSize: 3' tallLeaf: Rosettes of basal leaves; 6" long and 2 1/2" wide; smooth margins; medium green with reddish tints. Stalk leaves opposite; up to 6" long and 2 1/2" wide; edges with tiny teeth and surface shiny.Stem: Light green, hairlessFlower: Upper stems terminate in panicles (branching cluster) of white flowers. Each flower is tubular and about 1" long, consisting of a white corolla (petals) with a lower lip of 3 lobes and an upper lip of 2 lobes. Occasionally thin, violet lines within the corolla; outer surface is hairy. The flower, calyx and flower stalks are all densely covered in short, sticky, glandular hairs.Seed collection**: September**What it can be confused with:**

Foxglove beardtongue is distinguishable from other penstemons (*Penstemon* spp.) by its hairless leaves and stems, primarily white corolla, tiny hairs on anthers, and absence of ridges inside the corolla. [3]

Known Pollinators:

Honeybees, bumblebees, native bees, butterflies, Sphinx moths, and hummingbirds. [3]

Larval Host: Chalcedony midget moth and baltimore butterfly. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 184.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/prairie/plantx/fx_penstemonx.htm

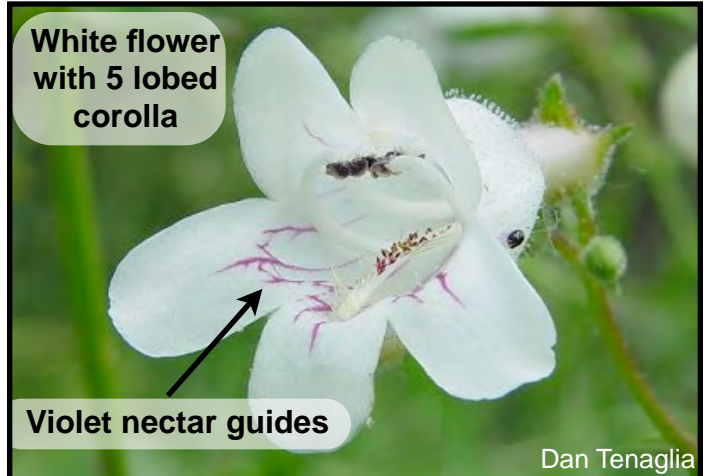
[4] http://www.wildflower.org/plants/result.php?id_plant=PED

Penstemon digitalis

foxglove beardtongue



John Hilty, Illinois Wildflowers



White flower with 5 lobed corolla

Violet nectar guides

Dan Tenaglia



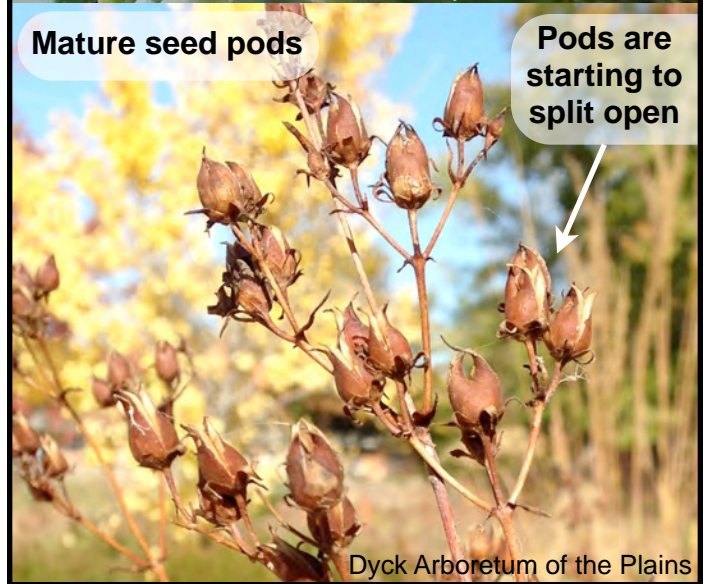
Hairless, opposite, slightly toothed leaves

John Hilty, Illinois Wildflowers



Glandular hairs on flower, flower stem and calyx

Dan Tenaglia



Mature seed pods

Pods are starting to split open

Dyck Arboretum of the Plains



Cleaned Seeds

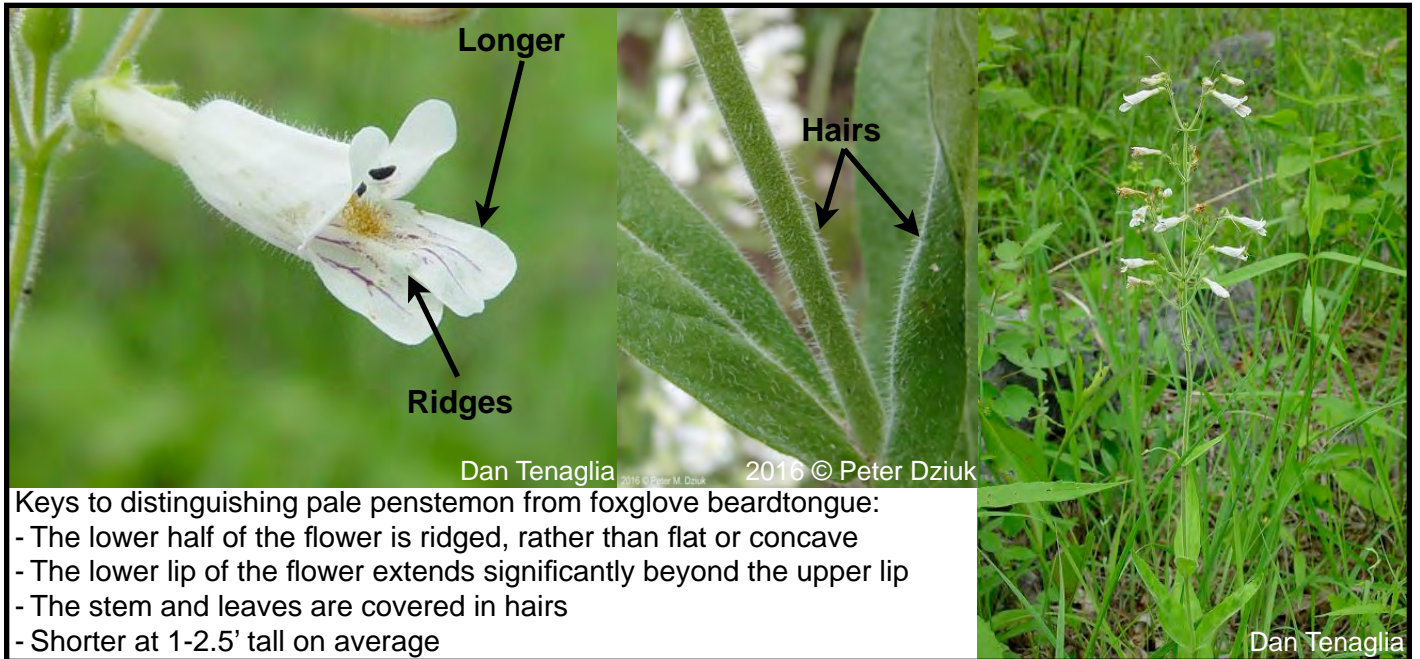
Prairie Moon Nursery

Penstemon digitalis

foxglove beardtongue

FOXGLOVE BEARDTONGUE COULD BE CONFUSED WITH:

Penstemon pallidus - pale penstemon



Keys to distinguishing pale penstemon from foxglove beardtongue:

- The lower half of the flower is ridged, rather than flat or concave
- The lower lip of the flower extends significantly beyond the upper lip
- The stem and leaves are covered in hairs
- Shorter at 1-2.5' tall on average

Penstemon calycosus - long-sepal penstemon



Keys to distinguishing long-sepal penstemon from foxglove beardtongue:

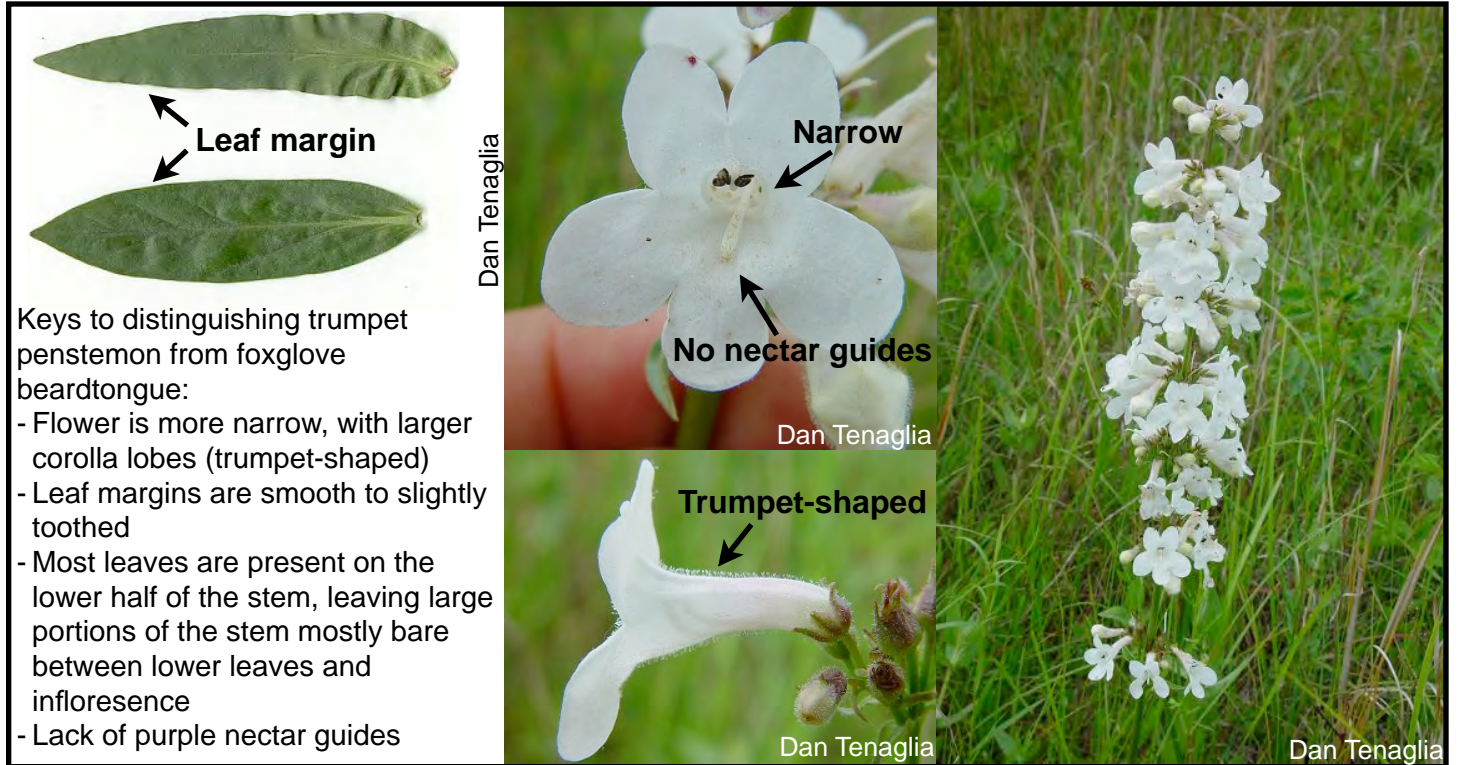
- The sepals are longer
- Has light violet or purple flowers
- The stem sometimes has fine white hairs
- Leaves have more widely spaced teeth

Penstemon digitalis

foxglove beardtongue

FOXGLOVE BEARDTONGUE COULD BE CONFUSED WITH:

Penstemon tubaeiflorus - trumpet penstemon



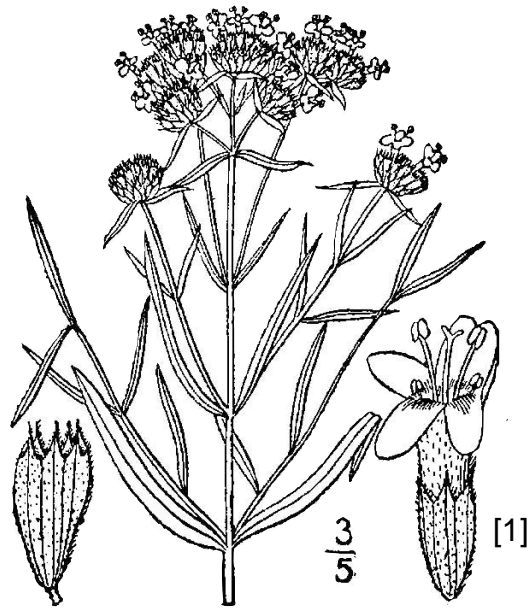
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Pycnanthemum tenuifolium

narrowleaf mountainmint

Other common names include: slender mountain mint and common horsemint

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:Duration: PerennialType: HerbSize: 2-3' tallLeaf: Opposite; up to 3" long and ¼" across. Leaves have no petiole (leaf stem), are linear, and hairless, with a prominent central vein and smooth edges. Leaves smell minty when crushed.Stem: Stiff, smooth, slender, square stem, with no hairs.Flower: The short tubular flowers are white, often with scattered purple dots, and individually about ¼" long.

The flower petals have an upper lip, and three-lobed lower lip.

Seed collection**: Late September - Late October [2]**What it can be confused with:**

This plant has a delicate, somewhat airy appearance. *P. tenuifolium* closely resembles *Pycnanthemum virginianum* (Virginia mountainmint), except that the *P. tenuifolium* has hairless stems and leaves that never exceed ¼" across. *P. virginianum*, on the other hand, has lines of white hairs on its stems, and some of the larger leaves will exceed ¼" across. *P. virginianum* tends to be taller, stouter, and less branched in appearance; it also blooms a little later in the year. [3]

Known Pollinators:

Honey bees, native bees, flies, wasps, butterflies, skippers, and beetles. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

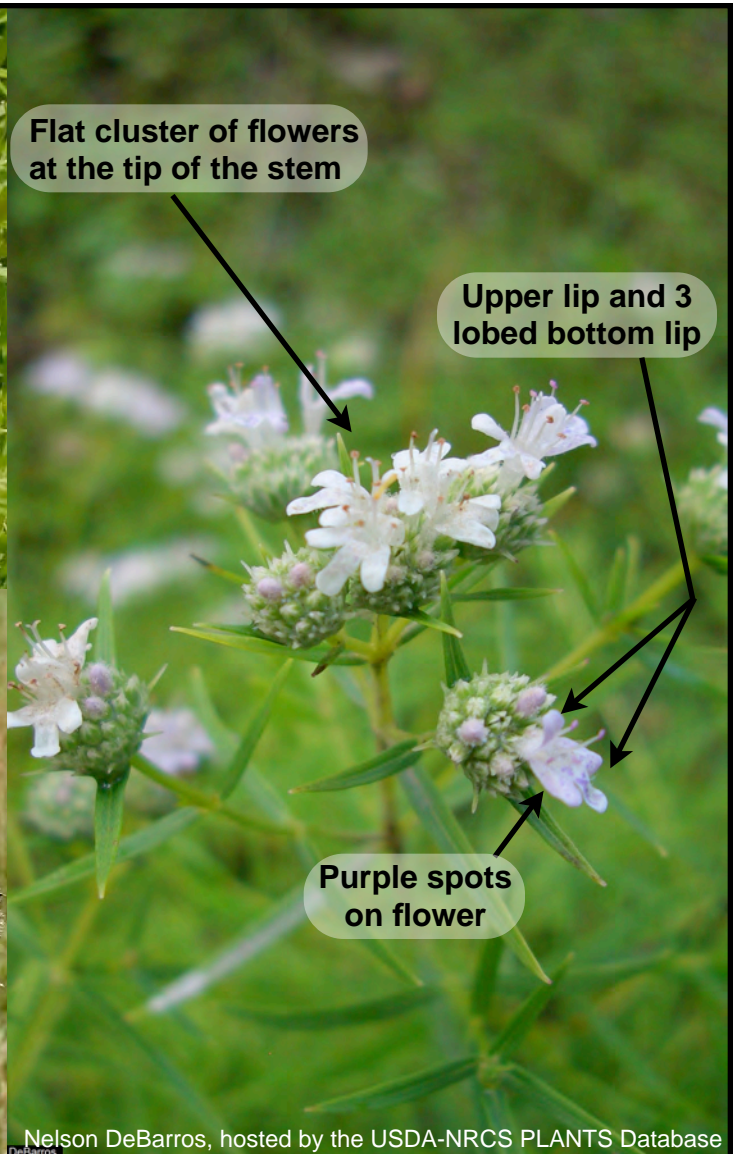
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 142.

[2] http://plants.usda.gov/plantguide/pdf/pg_pyte.pdf

[3] http://www.illinoiswildflowers.info/prairie/plantx/slm_mintx.htm

Pycnanthemum tenuifolium

narrowleaf mountainmint

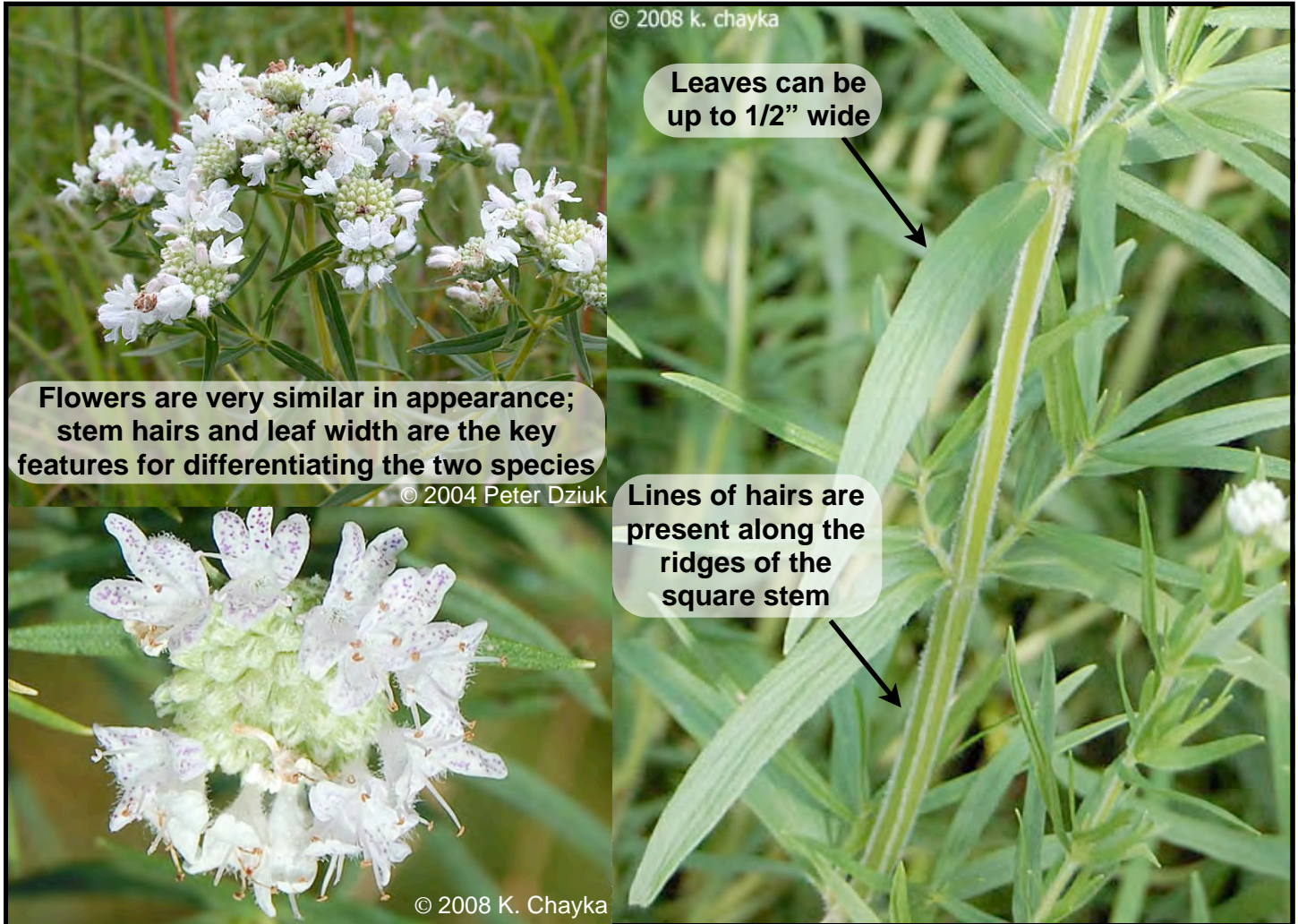


Pycnanthemum tenuifolium

narrowleaf mountainmint

NARROWLEAF MOUNTAINMINT COULD BE CONFUSED WITH:

Pycnanthemum virginianum - Virginia mountainmint



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Ratibida pinnata

yellow coneflower

Other common names include: gray-headed coneflower, grayhead coneflower, gray-headed Mexican hat, grayhead Mexican hat, and pinnate prairie coneflower



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:

Duration: Perennial

Type: Herb

Size: 3-5' tall

Leaf: Alternate; irregularly shaped; up to 8" long and 5" wide; basal leaves are compound with 3-7 lobes, sometimes with 1-2 secondary lobes; small, stiff hairs and bumps, smooth or sparsely toothed.

Stem: Long, slender, hairy, and slightly ridged.

Flower: Composite flower occurs at the tip of the stem; up to 13 yellow ray florets (outer petals) up to 1-2½" wide, disk floret head ½-¾" tall; little to no floral scent.

Seed collection**: September - Early October [2]

What it can be confused with:

Yellow coneflower can be distinguished from other yellow colored coneflowers like *Rudbeckia hirta* (black-eyed Susan) and *Rudbeckia laciniata* (cutleaf coneflower) by the drooping ray florets, grayish central cone, ridged stem, height, and complex structure of the basal leaves. [3]

Known Pollinators:

Native bees, wasps, flies, small butterflies, and beetles. [3]

Larval Host: Silvery checkerspot butterfly, wavy-lined emerald moth, and common eupithecia moth. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 474.

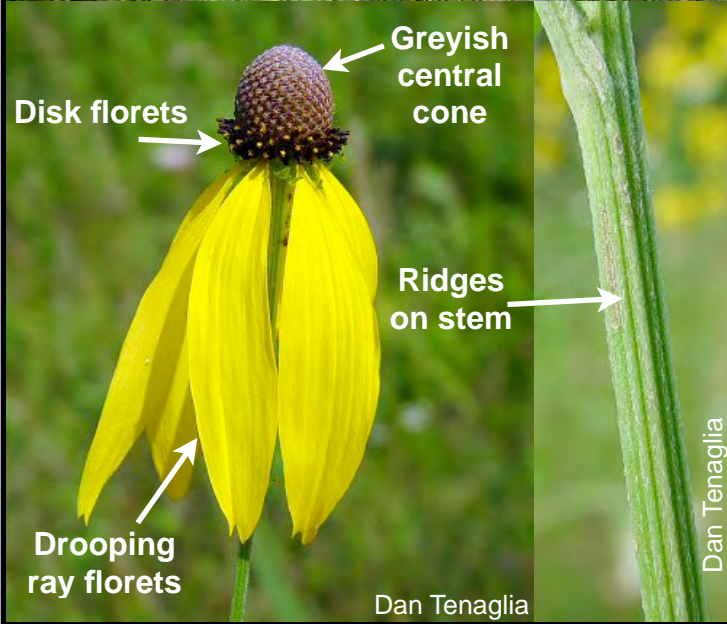
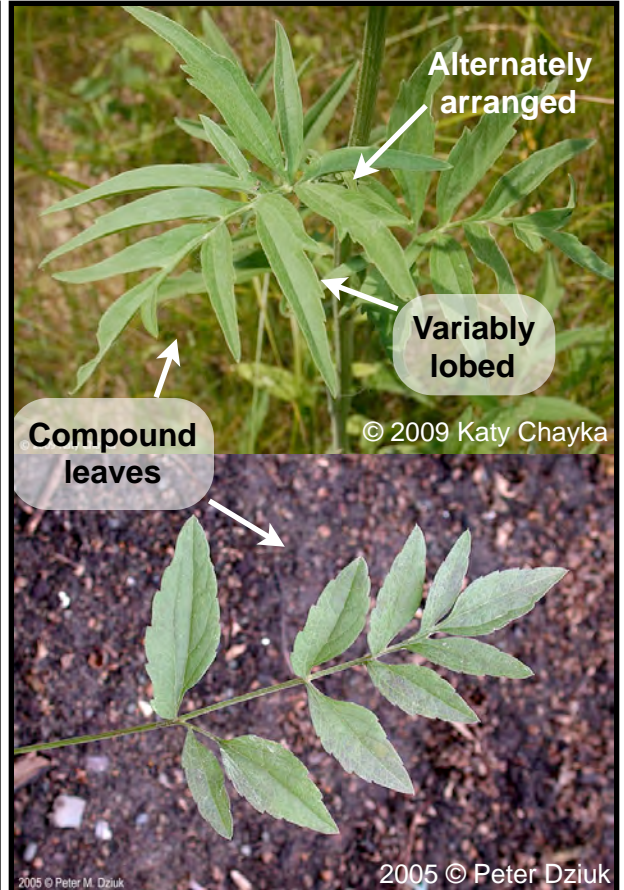
[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/prairie/plantx/yl_coneflowerx.htm

[4] http://www.wildflower.org/plants/result.php?id_plant=RAP1

Ratibida pinnata

yellow coneflower

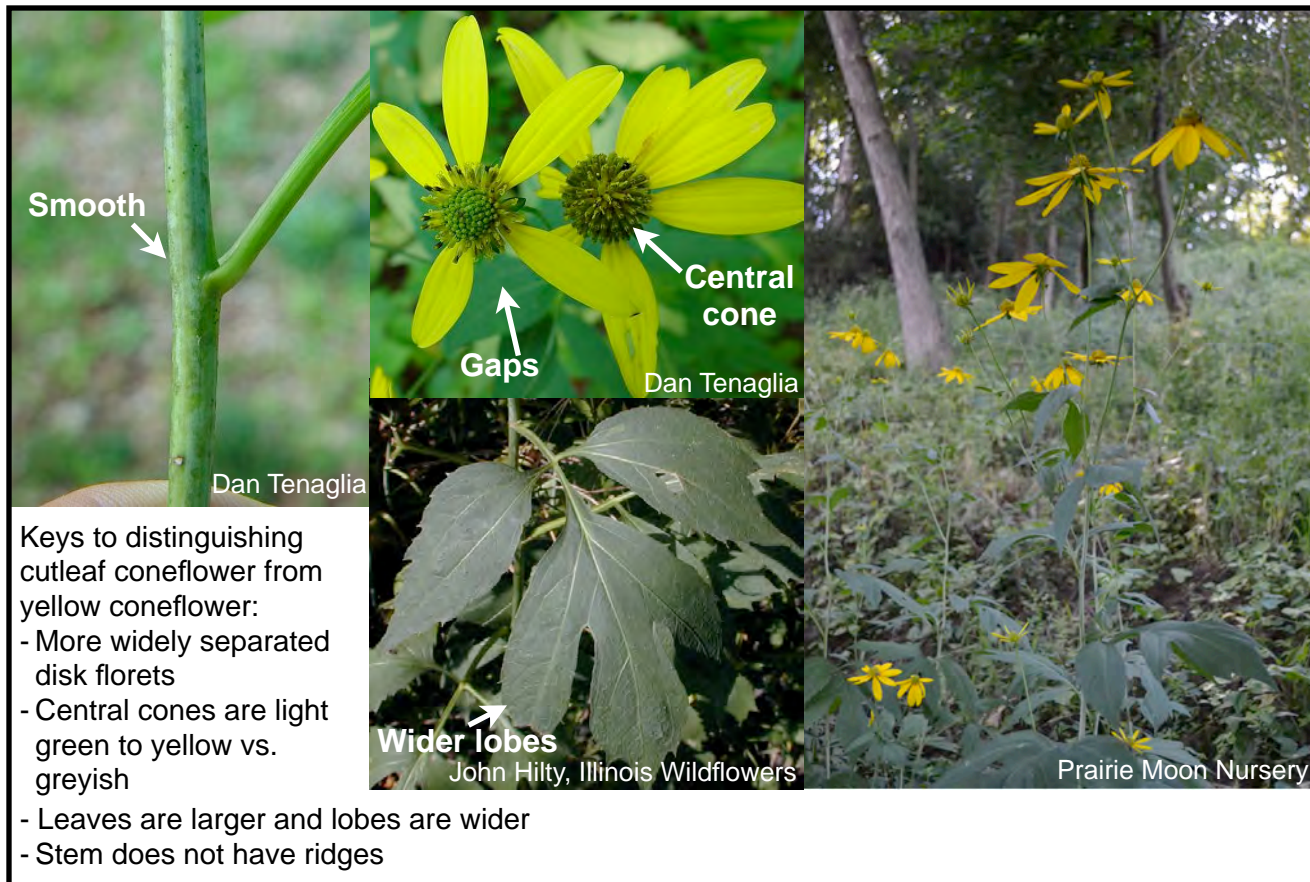


Ratibida pinnata

yellow coneflower

YELLOW CONEFLOWER COULD BE CONFUSED WITH:

Rudbeckia laciniata - cutleaf coneflower



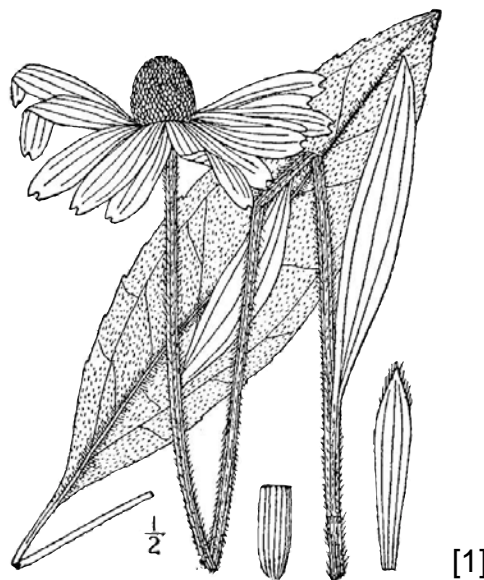
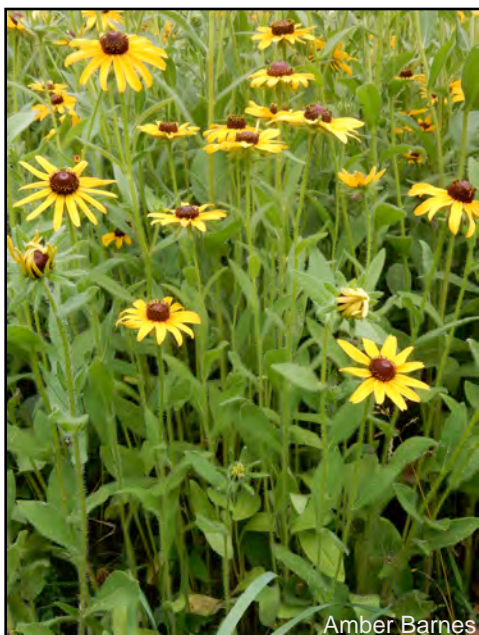
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Rudbeckia hirta

black-eyed Susan

Other common names include: common black-eyed Susan and brown-eyed Susan



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X			

Plant Characteristics:

Duration: Biennial

Type: Forb

Size: 1-2.5' tall

Leaf: Alternate, greyish green, up to 7" long and 2" across, pubescent (covered in small hairs).

Stem: Upper stem is devoid of leaves and has long, white hairs.

Flower: Yellow, 2-3" across, 8-20 yellow ray florets surround a cone-shaped group of brown disk florets.

Seed collection**: Mid September - Mid October [2]

What it can be confused with:

Black-eyed Susan can be distinguished from other *Rudbeckia* spp. by its lanceolate hairy leaves and the long hairs on the stems; most of the leaves occur toward the base of each stem, and never have lobes. The species *Rudbeckia fulgida* (orange coneflower) is quite similar in appearance, but usually blooms later, and has style-tips that are shorter and more rounded. [3]

Known Pollinators:

Bees, flies, wasps, butterflies, and beetles. [3]

Larval Host:

Gorgone checkerspot, bordered patch butterfly. [4]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 470.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/prairie/plantx/be_susanx.htm

[4] https://www.wildflower.org/plants/result.php?id_plant=RUHI2

Rudbeckia hirta

black-eyed Susan

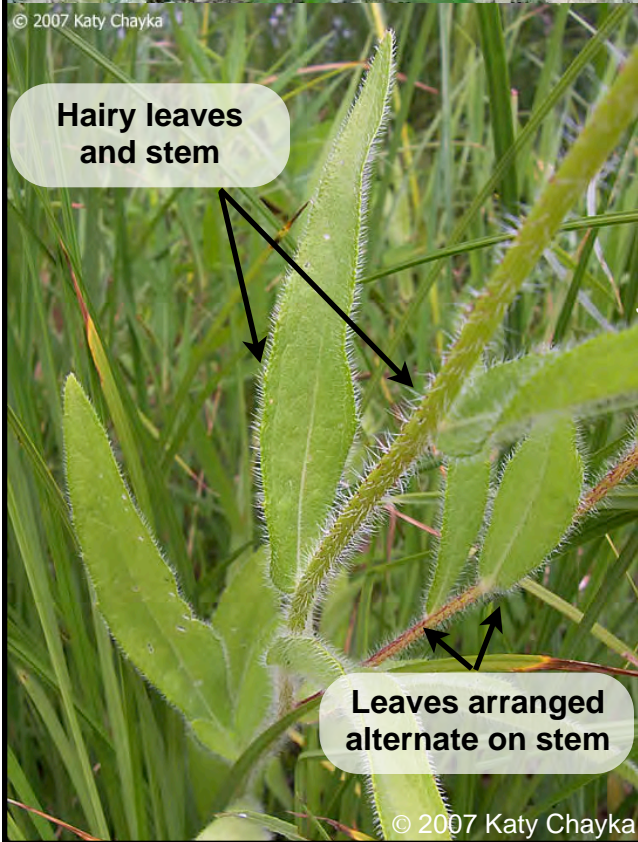


Dan Tenaglia



John Hilty, Illinois Wildflowers

© 2007 Katy Chayka



Hairy leaves and stem

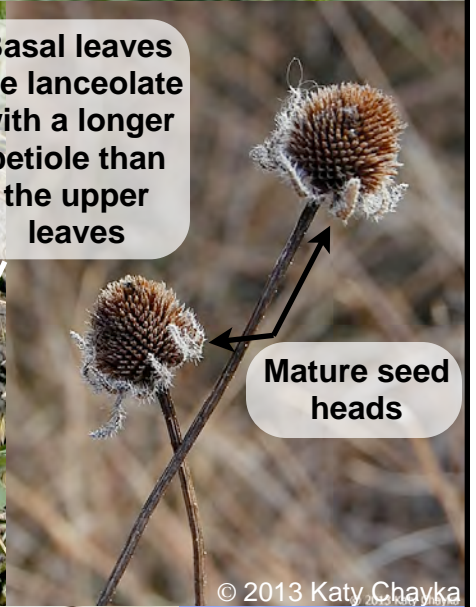
Leaves arranged alternate on stem

© 2007 Katy Chayka



John Hilty, Illinois Wildflowers

Basal leaves are lanceolate with a longer petiole than the upper leaves



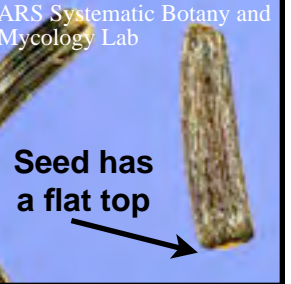
Mature seed heads

© 2013 Katy Chayka
ARS Systematic Botany and Mycology Lab



Cleaned Seeds

Prairie Moon Nursery



Seed has a flat top

Rudbeckia hirta

black-eyed Susan

BLACK-EYED SUSAN COULD BE CONFUSED WITH:

Rudbeckia fulgida - orange coneflower

Dan Tenaglia

The mid and basal leaves have a long thin petiole on an ovate leaf

While both varieties are still hairy, they are noticeably less hairy than the black-eyed Susan

Two varieties of orange coneflower can be found in the region, but each can be differentiated from black-eyed Susan based on their: leaves, seeds, and stems

John Hilty, Illinois Wildflowers

The *sullivantii* variety has a clearly winged petiole

The end of the orange coneflower seed has small teeth, while the black-eyed Susan seed does not

Dan Tenaglia

Dan Tenaglia

John Hilty, Illinois Wildflowers

John Hilty, Illinois Wildflowers



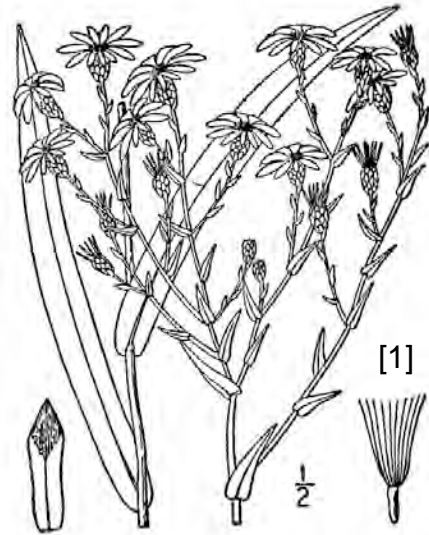
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Symphotrichum laeve

smooth blue aster

Other common names include: smooth aster and smooth american aster

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							X	X	X		

Plant Characteristics:Duration: PerennialType: HerbSize: 1½ - 3' tallLeaf: Alternate; up to 6" long and 1¼" wide; smooth or bluntly toothed margins. Upper leaf surfaces are medium to grayish blue, hairless, and sometimes glaucous (a whitish film that rubs off); lower leaf surfaces are light green or light grayish blue, hairless, and sometimes glaucous.Stem: Light green or light blue and hairlessFlower: Central stem terminates in a panicle (branching cluster) of flower heads and lateral upper stems and upper leaves may terminate in smaller panicles. Each flower is about ½-1" wide, consisting of 15-30 ray florets (outer petals) surrounding a head of disk florets. Ray flowers are light lavender or rarely white; disk florets are 5 lobed (petaled) and turn from whitish yellow to purplish red during blooming.Seed collection**: Early - Mid November.**What it can be confused with:**

Smooth blue aster is easily distinguished from other asters (*Symphotrichum* spp.) due to its bluish tint and smooth leaves and stem. Other asters typically have hair on either the leaves or stem. One species which is similar to smooth blue aster is the sky blue aster, which grows in similar habitat and blooms around the same time. The keys to distinguishing the two are the leaves and flowers. The leaves of smooth blue aster are sessile (no petiole) all along the stem. Sky blue aster, on the other hand, only has sessile leaves on the top half of the plant, the lower and basal leaves have clear petioles. Additionally, sky blue aster has smaller flowers, averaging about ½" across, while smooth blue aster is about ½-1" across. [2,3]

Known Pollinators:

Honeybees, bumblebees, native bees, sphecid wasps, flies, butterflies, and skippers. [2]

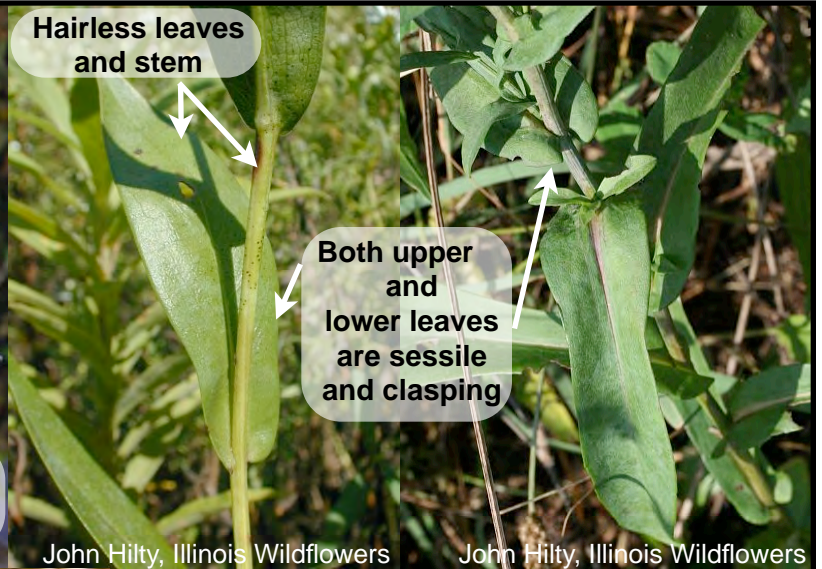
Larval Host: Leaf-mining fly, papery blister gall midge, pearl crescent butterfly. [2]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 420.[2] http://www.illinoiswildflowers.info/prairie/plantx/sm_asterx.htm[3] <https://www.minnesotawildflowers.info/flower/smooth-blue-aster>

Symphotrichum laeve

smooth blue aster

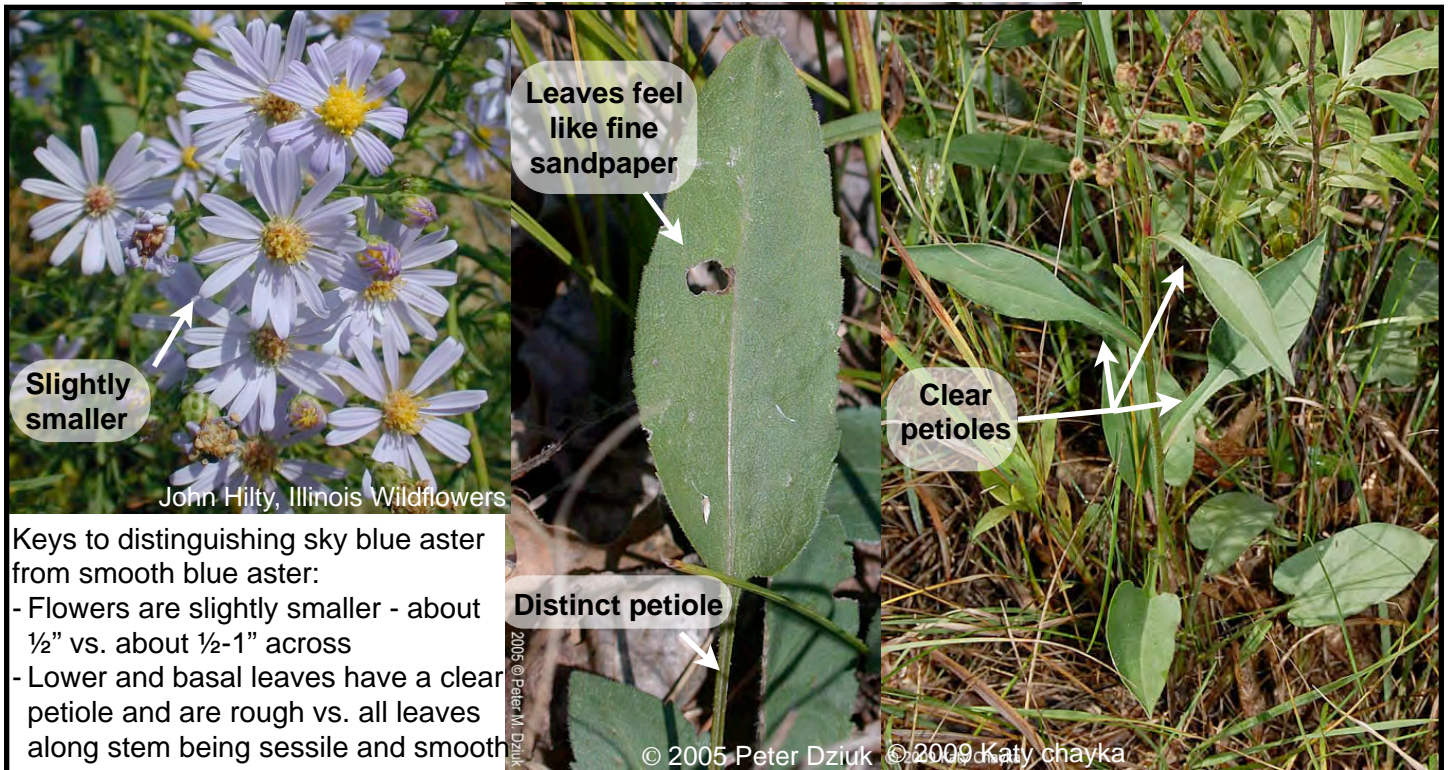


Symphotrichum laeve

smooth blue aster

SMOOTH BLUE ASTER COULD BE CONFUSED WITH:

Symphotrichum oolentangiense - sky blue aster



Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Symphotrichum novae-angliae

New England aster

Other common names include: New England American aster and Michaelmas daisy



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X			

Plant Characteristics:

Duration: Perennial

Type: Herb

Size: 4' tall

Leaf: Alternate; up to 4" long and 1" wide; pubescent with smooth, but ciliate margins (lined with small hairs), clasping, becoming smaller as they ascend the stems.

Stem: Single or multiple from the base, mostly erect, brown to reddish, and covered in short, spreading hairs.

Flower: Upper stems terminate in clusters of composite flowers. Each flower is about 1½" wide, consisting of yellow or gold disk florets, surrounded by 30-100 purple, lavender, or light pink ray florets (outer petals); no floral scent.

Seed collection:** Early - Mid November

What it can be confused with:

New England aster is easily distinguished from other asters (*Symphotrichum* spp.) because of its more numerous ray florets, larger flowers, and hairy spreading phyllaries. Another large-flowered aster it could potentially be mistaken for is the purple-stemmed aster (*Symphotrichum puniceum*). The two species can be distinguished by a few key features observed on the leaves and phyllaries. New England aster can be differentiated from purple-stemmed aster by: the smooth leaf margin vs. widely toothed leaf margin, the variably pubescent leaves vs. glabrous leaves with hairs along the central veins of their underside, and the hairy spreading phyllaries vs. smooth spreading phyllaries. [2,3]

Known Pollinators:

Honeybees, bumblebees, native bees, bee flies, butterflies, and skippers. [2]

Larval Host: Many species of moths. [2]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

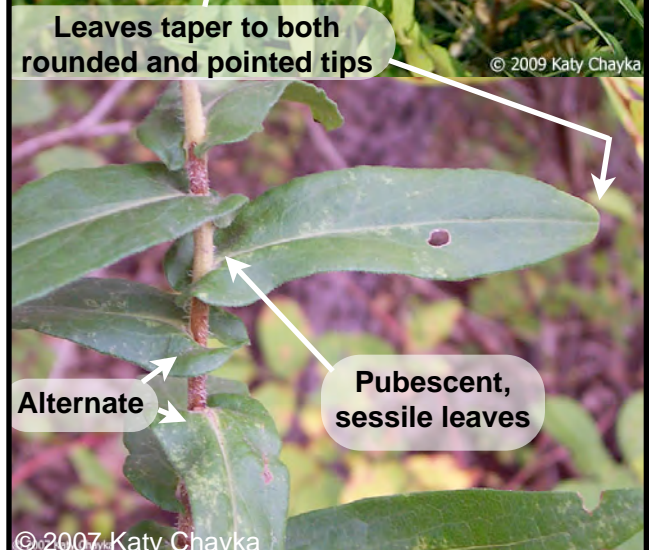
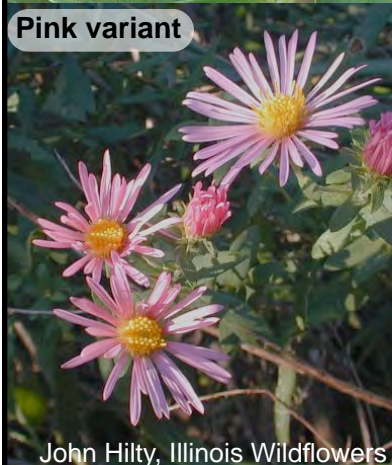
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 417.

[2] http://www.illinoiswildflowers.info/prairie/plantx/ne_asterx.htm

[3] <https://www.minnesotawildflowers.info/flower/new-england-aster>

Symphotrichum novae-angliae

New England aster

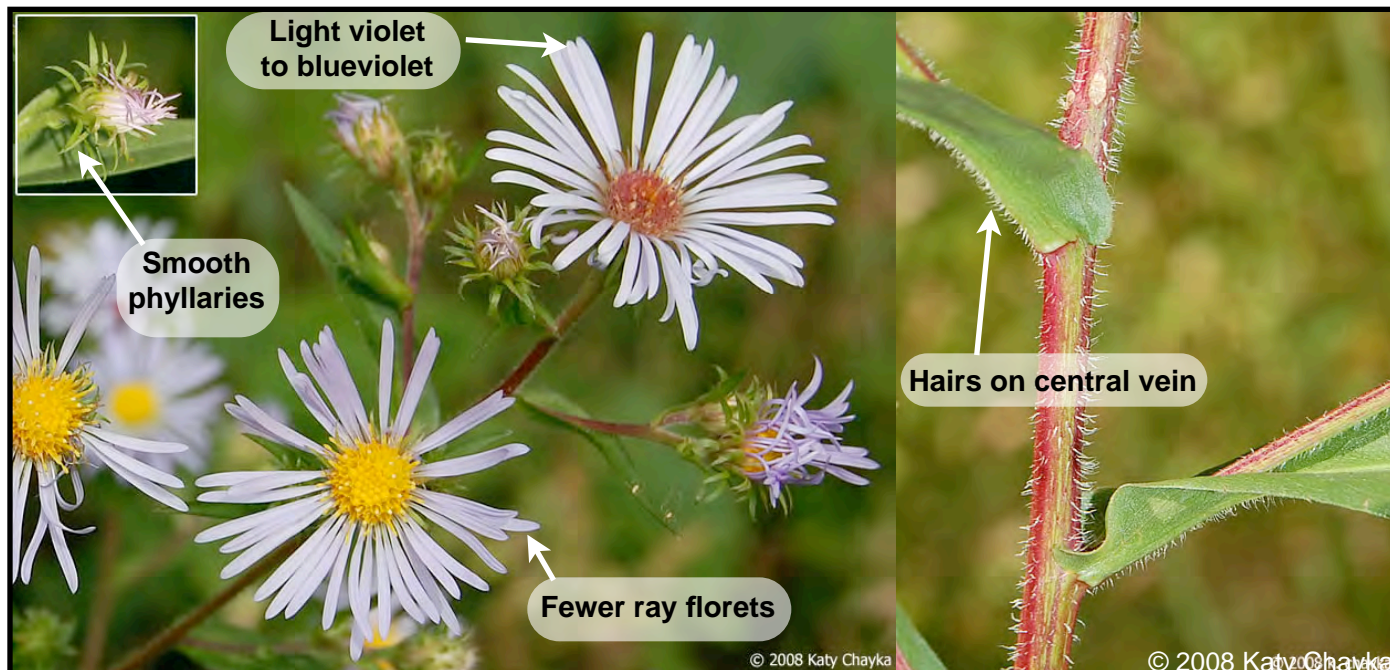


Symphotrichum novae-angliae

New England aster

NEW ENGLAND ASTER COULD BE CONFUSED WITH:

Symphotrichum puniceum - purple-stemmed aster



Keys to distinguishing purple-stemmed aster from New England aster:

- Ray petals are light violet to blue-violet vs. purple, lavender, or light pink
- Less ray petals (30-60) vs (30-100)
- Leaves are fairly hairless except along the central vein of the underside of the leaf vs. a variably pubescent leaf
- Leaf margin is widely toothed vs. smooth and ciliated
- Leaves taper to a sharp point vs. tapering to a pointed or rounded tip
- Phyllaries are hairless vs. covered in small hairs
- Flowers are slightly smaller: $\frac{3}{4}$ – $1\frac{1}{4}$ " across vs. $1\frac{1}{2}$ "



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Symphotrichum pilosum

frost aster

Other common names include: hairy white oldfield aster and awl aster



John Hilty, Illinois Wildflowers

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X	X		

Plant Characteristics:Duration: PerennialType: HerbSize: 1-5' tall

Leaf: Alternate. Leaves are mostly lance shaped, sometimes widest above the middle, 1-4" long, up to 1" wide, toothless or shallowly toothed, pointed at the tip, stalkless or nearly so, typically with clusters of secondary leaves developing from the primary leaf axils. Basal leaves are more spatula-shaped, rounded at the tip, with winged, sheathing stalks; basal and the lowest stem leaves wither away by flowering time. Leaf surfaces are sparsely to densely covered in long, spreading hairs, with shorter hairs all around the leaf edge.

Stem: Stems are single or multiple from the base, ascending to erect, light green, densely covered in long, spreading hairs. Lower stems can turn reddish brown and lose hair with age.

Flower: Ray color is white, rarely pinkish or pale violet. Branching clusters of stalked flowers at the top of the stem and arising from upper leaf axils. Branches are widely spreading, arching or ascending, with flowers usually all on one side of the branch. Flowers are 1/2-3/4" across with 15-35 petals (ray flowers) and a yellow center disk that turns reddish with age. Ray color is white, rarely pinkish or pale violet. [2]

Seed collection**: Mid-Late October [3]

What it can be confused with:

The appearance of frost aster is similar to several other asters with small white flowerheads. It is often larger in size than these other species, although small specimens of frost aster also occur. Compared to the common panicled aster (*Symphotrichum lanceolatum*), the frost aster has more hairy foliage and it prefers drier habitats. Another similar species, the calico aster (*Symphotrichum lateriflorum*), has smaller flowerheads with fewer petaloid rays than those of the frost aster. The calico aster also prefers shadier habitats, such as woodland borders and woodland openings. Yet another species, the heath aster (*Symphotrichum ericoides*), also has smaller flowerheads with fewer petaloid rays, and its leaves are smaller in size. This latter species is typically found in prairies. [4]

Known Pollinators:

Bees, flies, wasps, butterflies, skippers, moths, and beetles. [4]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / USDA NRCS. Wetland flora: Field office illustrated guide to plant species. USDA Natural Resources Conservation Service..

[2] <https://www.minnesotawildflowers.info/flower/awl-aster>, [3] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

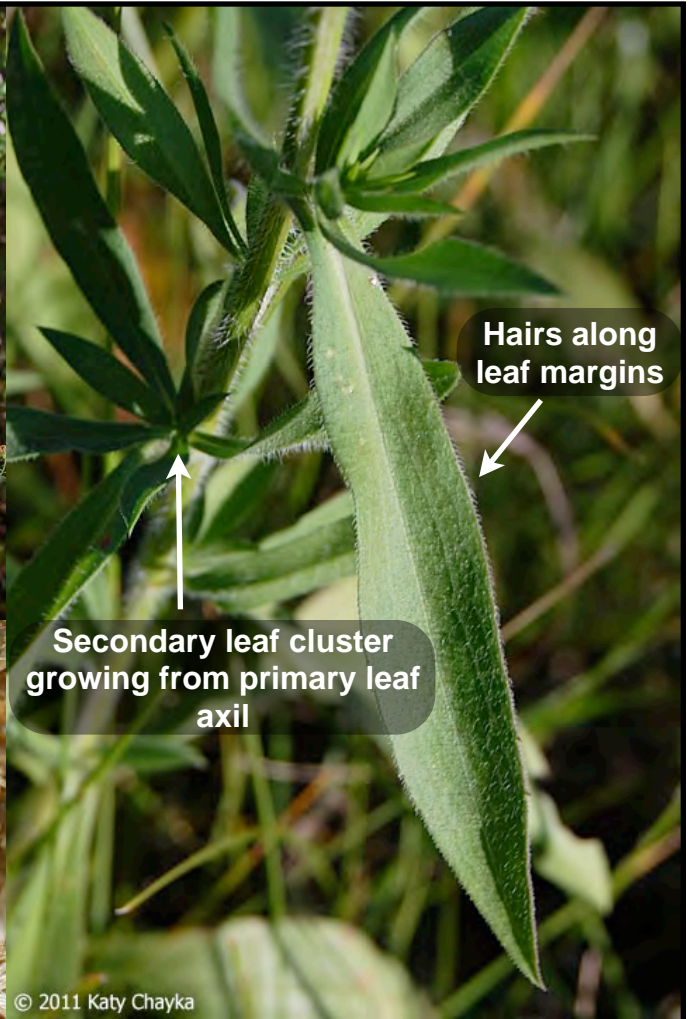
[4] http://www.illinoiswildflowers.info/weeds/plants/fr_aster.htm

Symphiotrichum pilosum frost aster



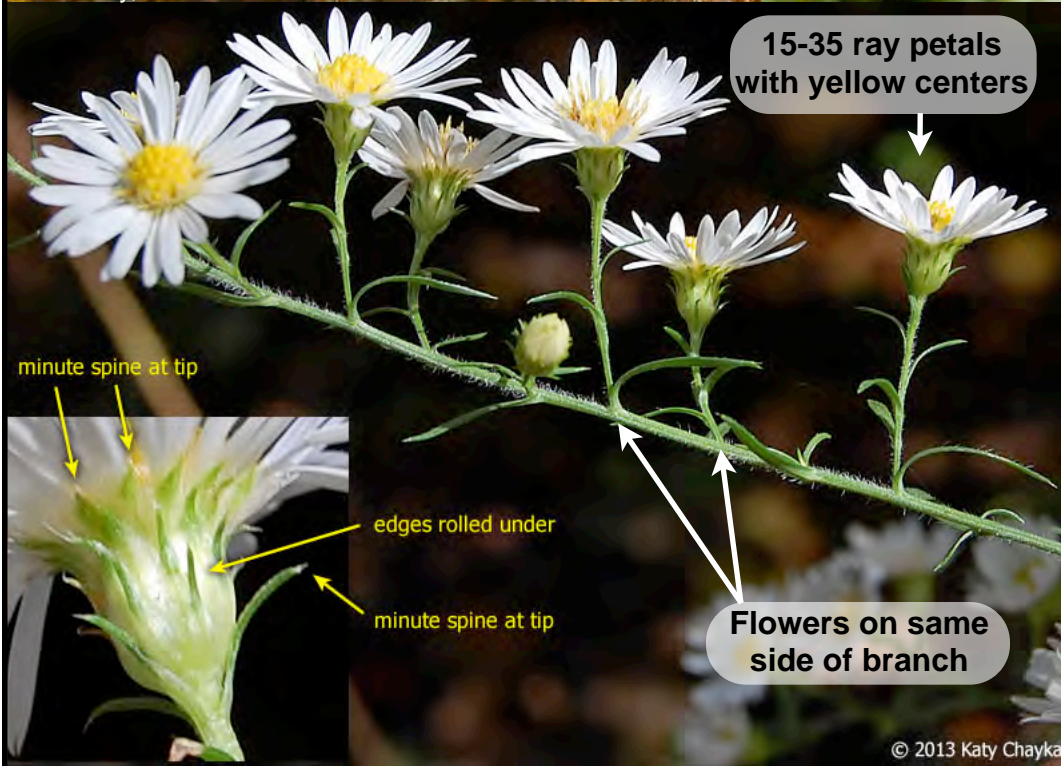
Alternate leaves

Flower heads going to seed



Hairs along leaf margins

Secondary leaf cluster growing from primary leaf axil



15-35 ray petals with yellow centers

Hairy stem

minute spine at tip

edges rolled under

minute spine at tip

Flowers on same side of branch



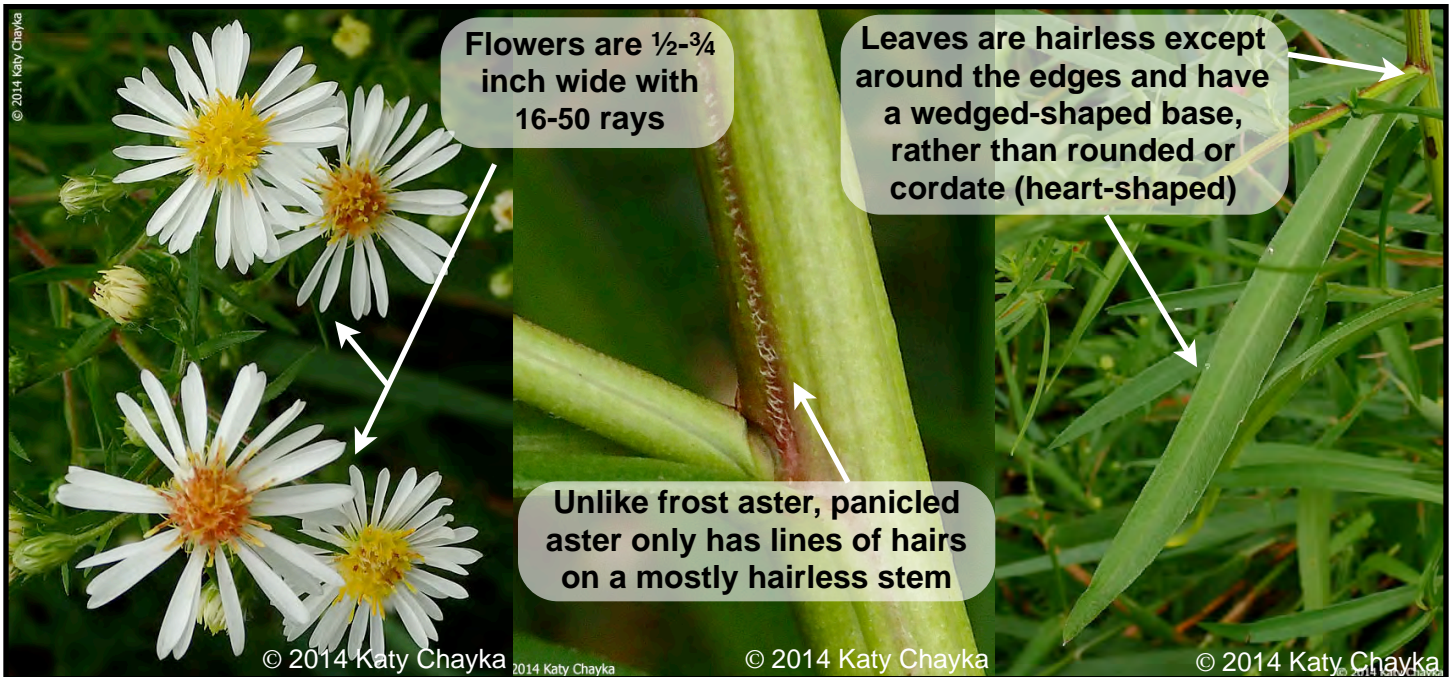
2013 © Peter M. Dziuk

Symphyotrichum pilosum

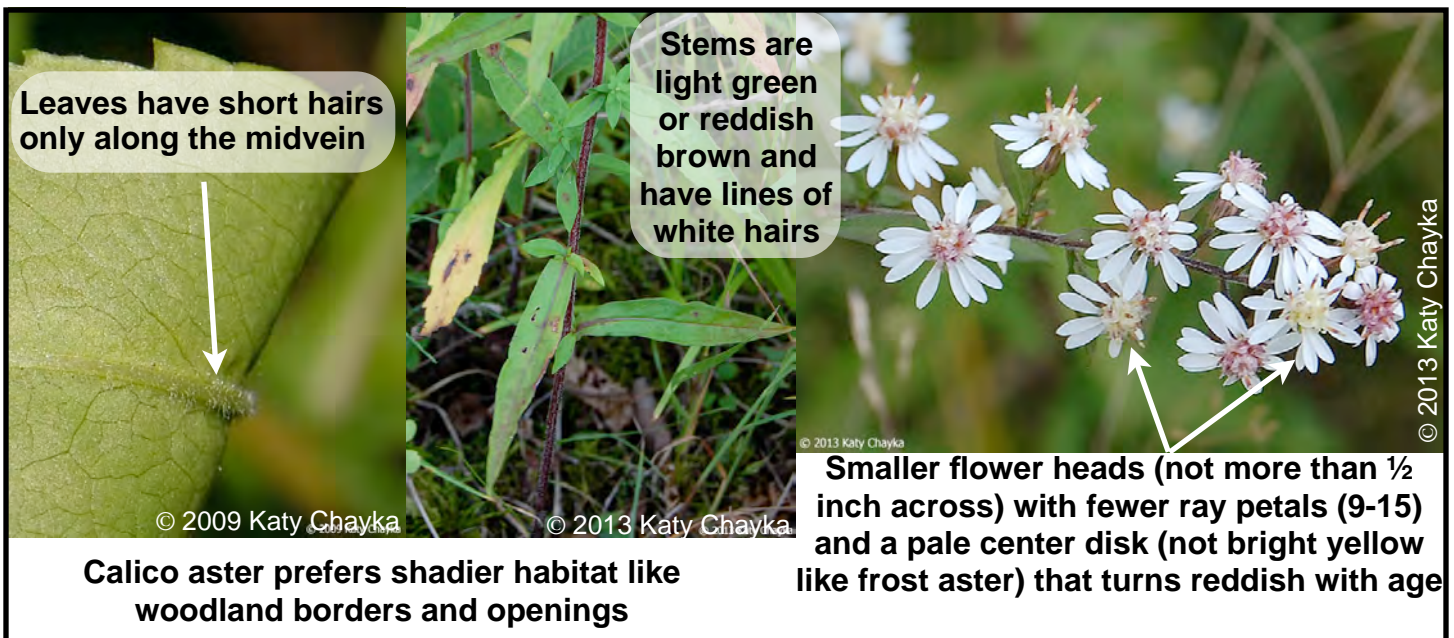
frost aster

FROST ASTER COULD BE CONFUSED WITH:

Symphyotrichum lanceolatum - paniced aster



Symphyotrichum lateriflorum - calico aster

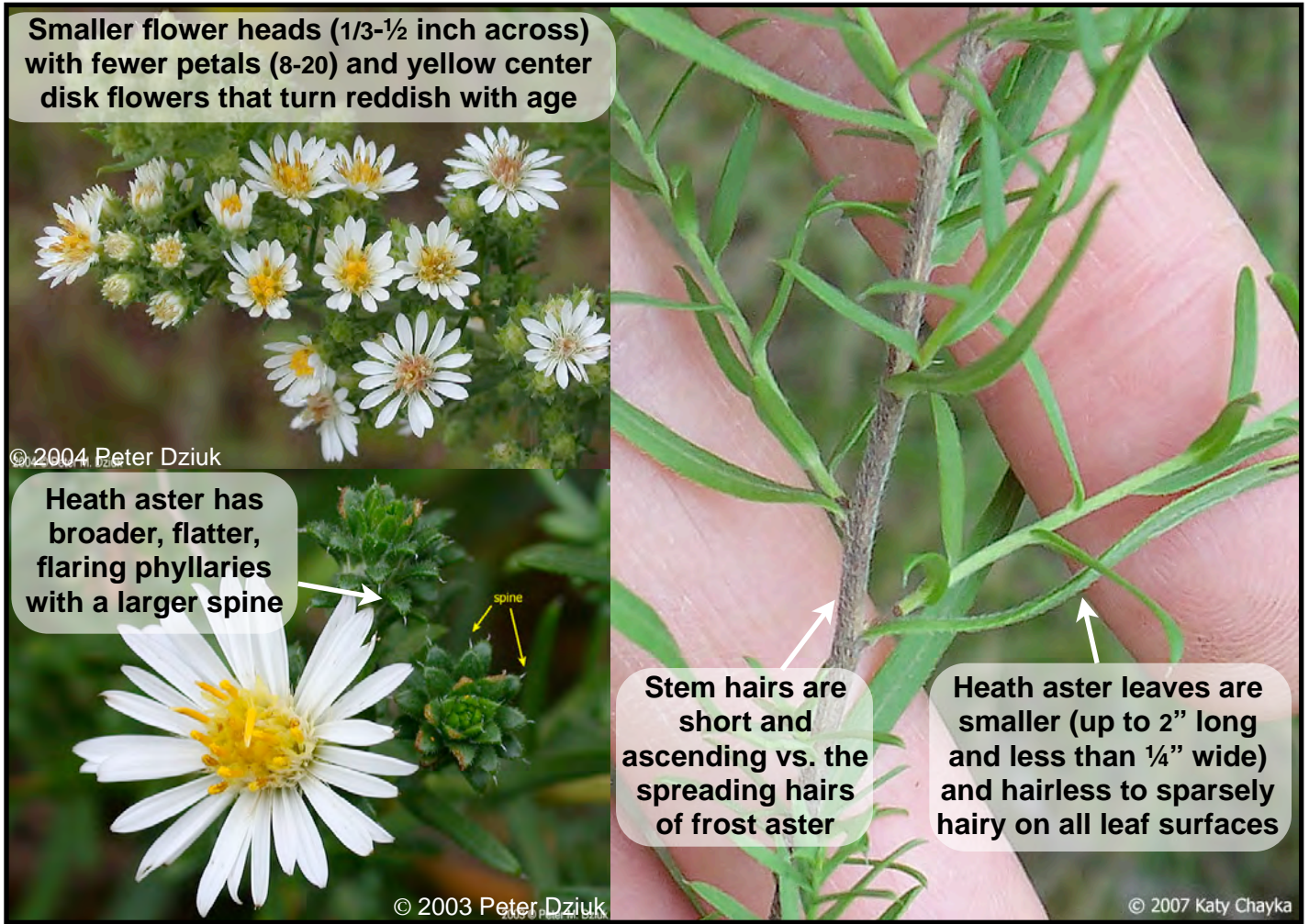


Symphyotrichum pilosum

frost aster

FROST ASTER COULD BE CONFUSED WITH:

Symphyotrichum ericoides - heath aster



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Tradescantia ohiensis

Ohio spiderwort

Other common names include: bluejacket



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			X	X	X	X					

Plant Characteristics:

Duration: Perennial

Type: Forb

Size: 2-4' tall

Leaf: The grass-like leaves are grey- or blue-green, alternate, up to 15" long and 1" across. They are linear, although wider at the base (where the leaves wrap around the stem in sheaths), than at the tip. They are also hairless, with parallel venation, and smooth margins.

Stem: Central stem is round, hairless, and occasionally glaucous (a whitish film that can be rubbed off).

Flower: The light violet to blue-violet flowers occur in small clusters on hairless flowering stems at the top of the plant. Underneath each inflorescence are 2 small bracts, each up to 3" long and less than 1/2" across. Each flower is about 1" across, with 3 rounded petals, 6 bright yellow anthers, and fine spiderly violet hairs near the base. The flowers open up during the morning and close by the afternoon in sunny weather, but remain open longer on cloudy days.

Seed collection**: Early - Mid July.

What it can be confused with:

Ohio spiderwort can be readily distinguished from Virginia spiderwort and prairie spiderwort by the absence of conspicuous hairs on the flowering stems near the inflorescence, and the greyish or bluish appearance of the thin leaves. It also tends to be taller and more spindly in appearance than other species of spiderwort, and has smaller bracts below the inflorescence. Another species, zigzag spiderwort, prefers shaded woody areas, has a stem that slightly zig-zags between its broader leaves (up to 2" across), which are typically dark green, and the flower stems are covered in hairs. [2]

Known Pollinators:

Native bees and flies. [2,3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

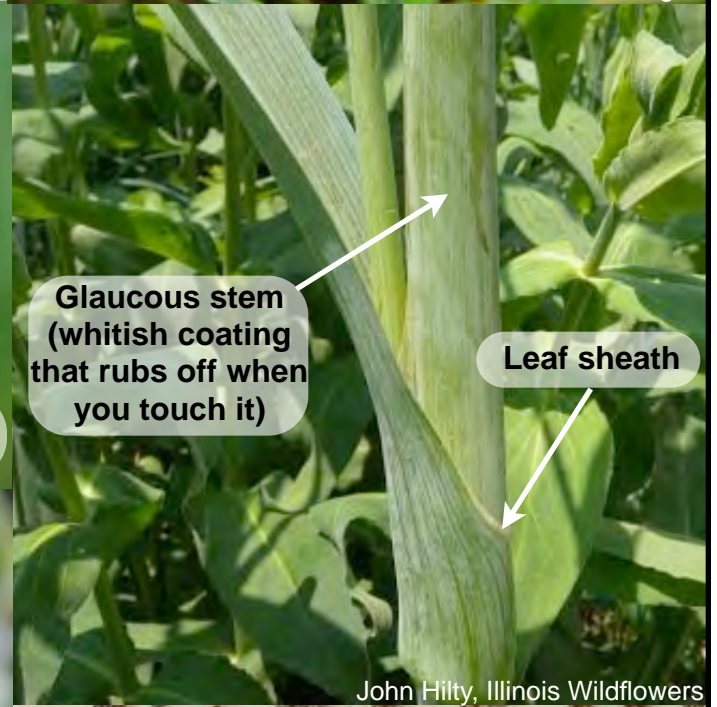
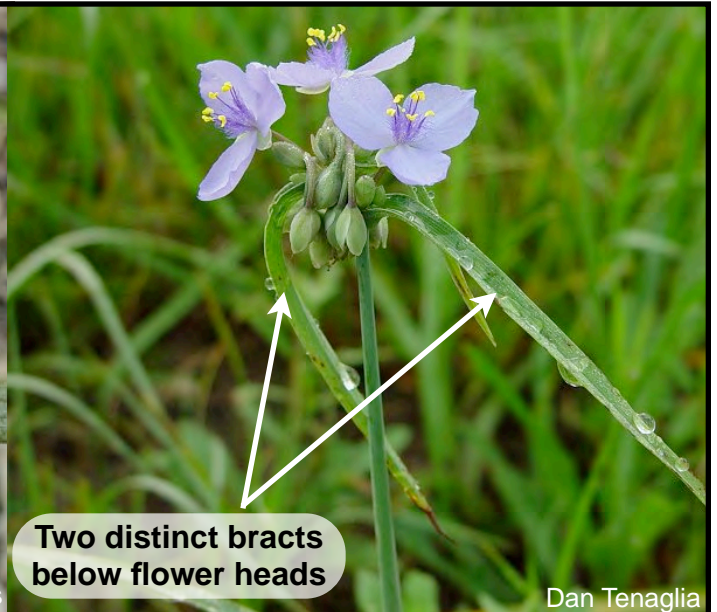
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 1: 461.

[2] http://www.illinoiswildflowers.info/prairie/plantx/oh_spiderwortx.htm

[3] https://www.wildflower.org/plants/result.php?id_plant=TROH

Tradescantia ohiensis

Ohio spiderwort



Tradescantia ohiensis

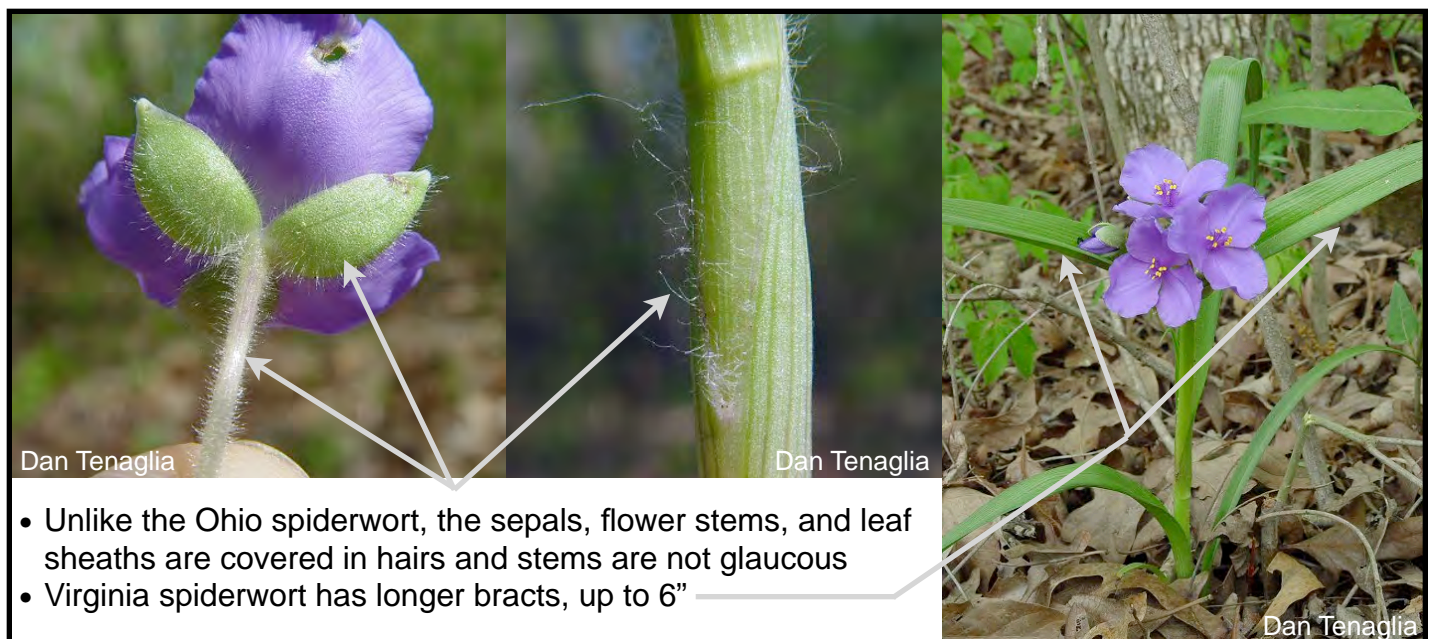
Ohio spiderwort

OHIO SPIDERWORT COULD BE CONFUSED WITH:

Tradescantia bracteata - prairie spiderwort



Tradescantia virginiana - Virginia spiderwort



Tradescantia ohiensis

Ohio spiderwort

OHIO SPIDERWORT COULD BE CONFUSED WITH:

Tradescantia subaspera - zigzag spiderwort



- Unlike Ohio spiderwort, the sepals and flower stems are covered in hairs
- The stem has a tendency to zigzag slightly between the alternate leaves and is not glaucous
- The leaves are up to twice as wide (2") as that of Ohio spiderwort



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Verbena urticifolia

white vervain

Other common names include: nettle-leaf vervain and white verbena

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					X	X	X	X	X		

Plant Characteristics:Duration: PerennialType: HerbSize: 3-6' tallLeaf: Opposite; up to 6" long and 2½" wide; hairless to slightly hairy and coarsely toothed. Upper leaf surfaces are medium-dark green, shiny, and wrinkled along the veins; lower leaf surfaces are light green with more hair.Stem: Light green, 4-angled, densely covered in long hairsFlower: Upper stems terminate in a panicle (branching cluster) of floral spikes up to 2' long and 1' wide. Each flower is about 1/8" across, consisting of a white corolla (petals) with 5 rounded lobes and a tubular green calyx (sepals) with 5 teeth.Seed collection**: Late August - Late September [2]**What it can be confused with:**

The scientific name of this plant refers to the resemblance of its leaves to those of *Urtica* spp. (nettles). White vervain resembles *Verbena hastata* (blue vervain), but blue vervain has more narrow leaves and its flowers are conspicuously blue, rather than bright white. It is found in sunny wetland habitats more often than white vervain.

Known Pollinators:

Honeybees, bumblebees, native bees, flies, small butterflies, and wasps. [3]

Larval Host: Verbena moth and vervain leaf midge. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

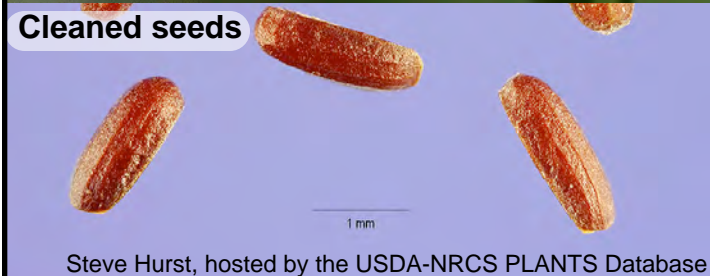
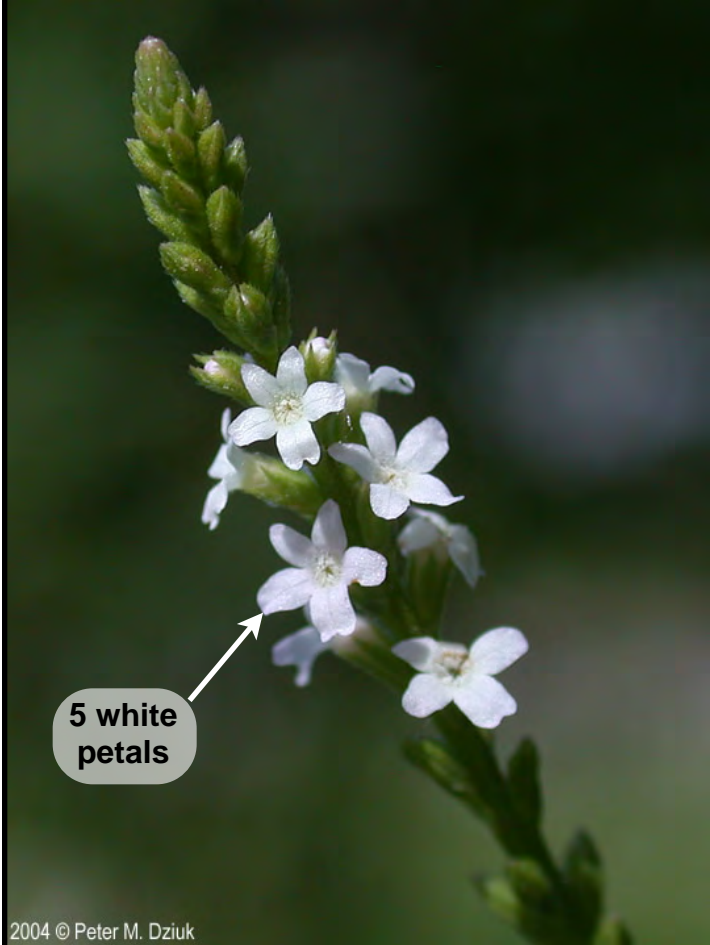
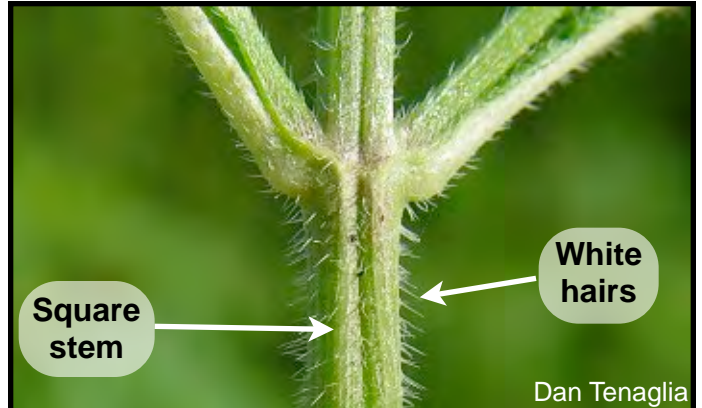
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 95.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/savanna/plants/wh_vervain.htm

Verbena urticifolia

white vervain

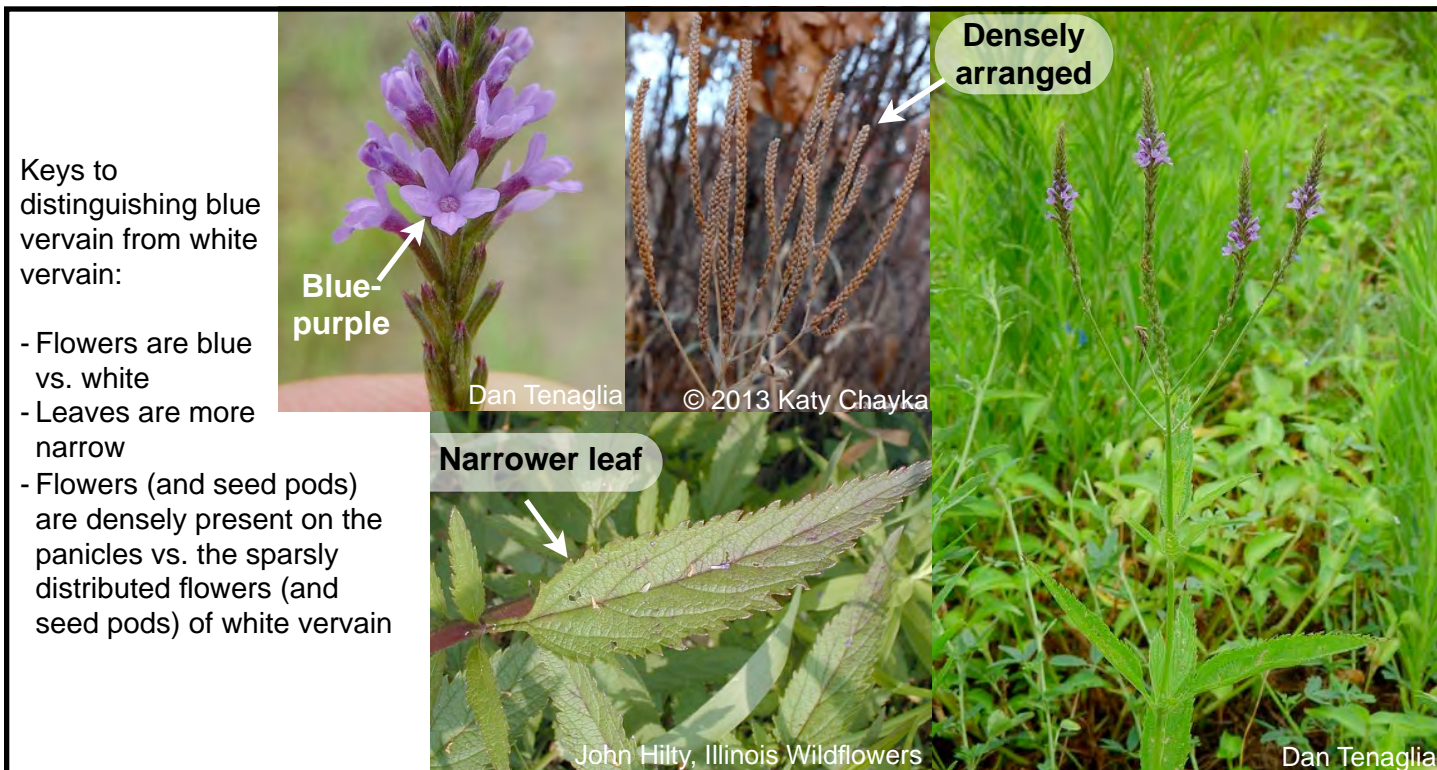


Verbena urticifolia

white vervain

WHITE VERVAIN COULD BE CONFUSED WITH:

Verbena hastata - blue vervain



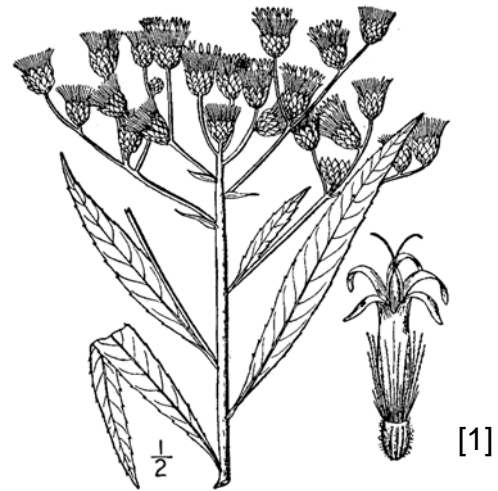
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Vernonia gigantea

giant ironweed

Other common names include: tall ironweed

**Bloom Period:**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
						X	X	X	X		

Plant Characteristics:Duration: PerennialType: HerbSize: 3-7' tallLeaf: Alternate; up to 9" long and 2½" wide; toothed margins. Upper leaf surfaces are dark green and hairless; lower leaf surfaces are light green and sparsely pubescent. Each leaf has a short petiole (leaf stem) or is sessile (no leaf stem).Stem: Usually unbranched, light green or purplish green, and pubescent.Flower: Central stem terminates in a panicle (branched cluster) of flowerheads from 6-16" across. Each flowerhead consists of 10-30 disk florets and no ray florets (outer petals); tubular, magenta corolla (petals) with 5 recurved, narrow lobes; exerted style is bifurcated (2 branching) and strongly recurved. No floral scent.Seed collection**: October**What it can be confused with:**

Tall ironweed hybridizes with other *Vernonia* spp. (ironweeds), especially *Vernonia missurica* (Missouri ironweed). The latter hybrid is referred to as *Vernonia × illinoensis* (Illinois ironweed). Giant ironweed can be distinguished from its hybrid, because Illinois ironweed is more hairy and has flowerheads with 30-35 disk florets. Another species, Missouri ironweed, has flowerheads with 35-50 disk florets and it is more hairy than tall ironweed; both stems and leaf undersides of Missouri ironweed are often white-woolly from the abundance of these hairs. Smooth ironweed (*Vernonia fasciculata*) differs from giant ironweed in that it is smaller in size, has hairless stems and leaves, and sometimes has dark dots on the undersides of its leaves. [3]

Known Pollinators:

Native bees, bee flies, butterflies, and skippers. [3]

Larval Host: Eupatorium borer moth, ironweed borer moth, red groundling moth, pyralid moth, ironweed bud midge, and ironweed blossom midge [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

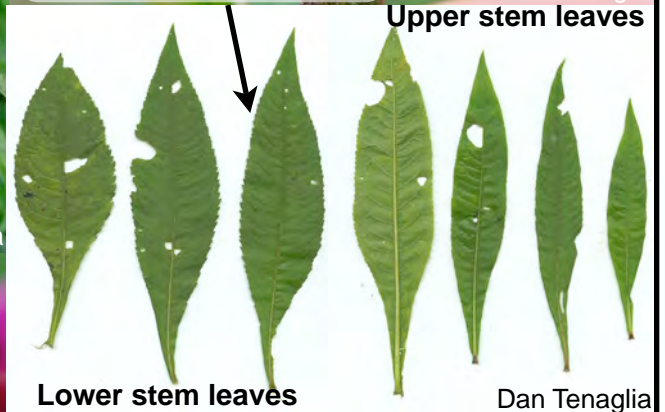
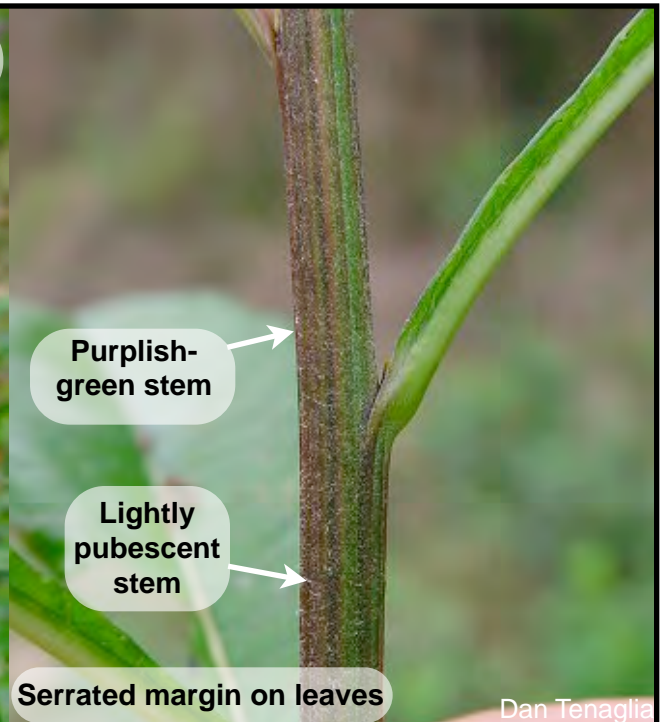
[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 352.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/savanna/plants/tl_ironweed.htm

Vernonia gigantea

giant ironweed



Vernonia gigantea

giant ironweed

GIANT IRONWEED COULD BE CONFUSED WITH:

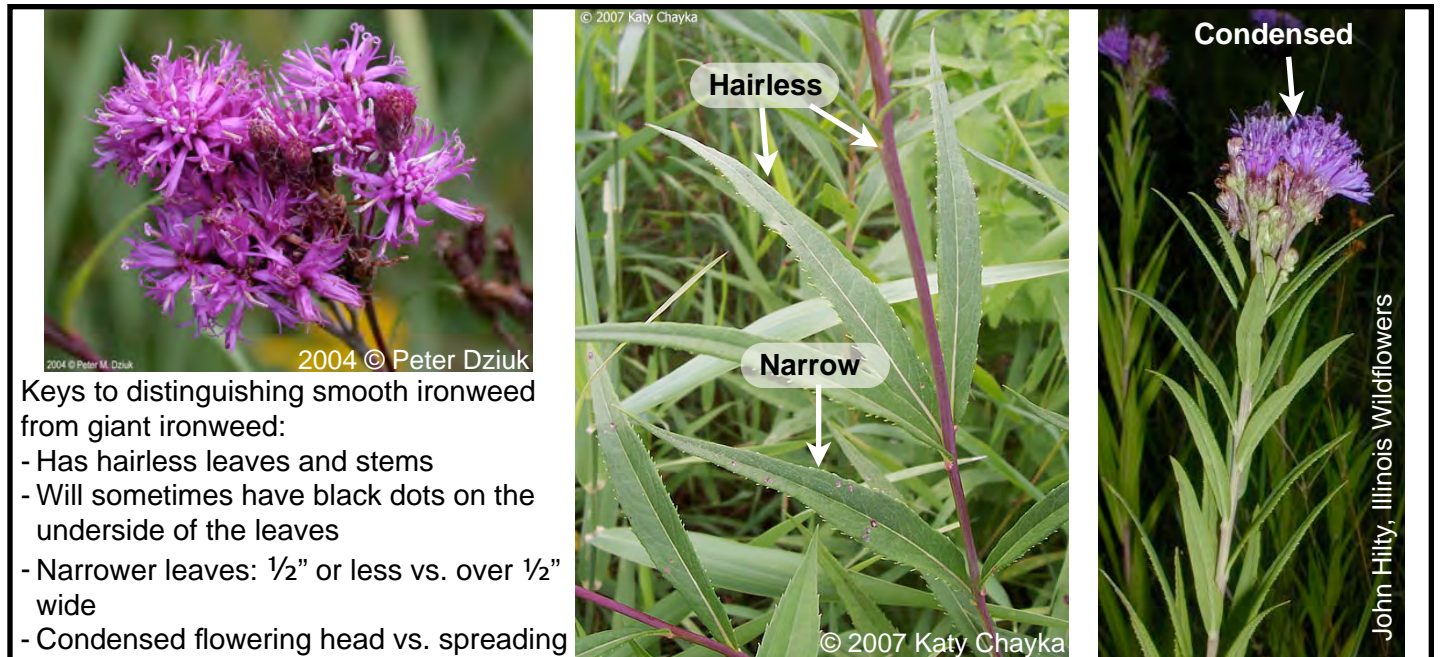
Vernonia missurica - Missouri ironweed



Keys to distinguishing Missouri ironweed from giant ironweed:

- Has densely pubescent stems and underside of leaves vs. sparsely pubescent
- Each composite flower has from 35-50 disk florets vs. 10-30

Vernonia fasciculata - smooth ironweed



Keys to distinguishing smooth ironweed from giant ironweed:

- Has hairless leaves and stems
- Will sometimes have black dots on the underside of the leaves
- Narrower leaves: 1/2" or less vs. over 1/2" wide
- Condensed flowering head vs. spreading



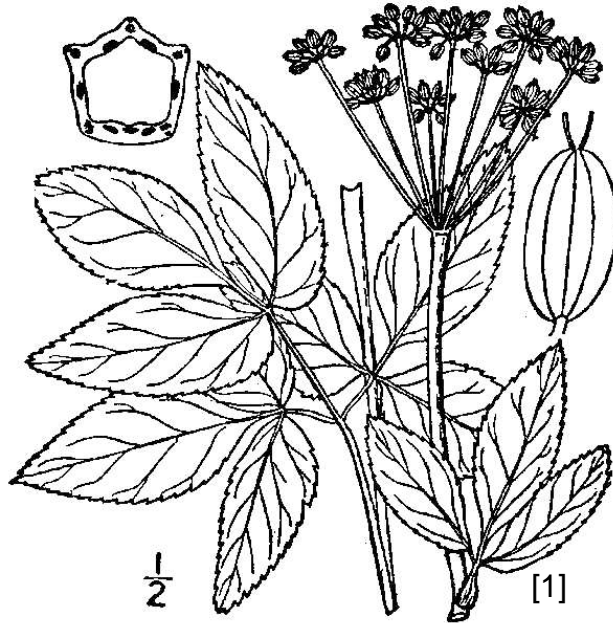
Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Zizia aurea

golden Alexander

Other common names include: golden zizia



Bloom Period:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			X	X	X						

Plant Characteristics:

Duration: Perennial

Type: Herb

Size: 2 1/2' tall

Leaf: Alternate, compound leaves with 3 or 5 leaflets; hairless, shiny, and medium green; 3" long and 2" wide; toothed margins. Lower leaves with long petioles (leaf stem); larger leaflets with 1-2 cleft lobes.

Stem: Forming occasional, lateral stems; light green, hairless, and shiny

Flower: Upper stems terminate in compound umbels of yellow flowers, measuring 2-3" across and consisting of 12 umbellets of 21 flowers each. Each flower is about 1/8" wide, consisting of 5 incurved yellow petals, 5 stamens, and a pistil. No floral scent.

Seed collection**: Early August - Mid September [2]

What it can be confused with:

Golden Alexander is sometimes confused with wild parsnip (*Pastinaca sativa*) and yellow meadow parsnip (*Thaspium trifoliatum aureum*). Wild parsnip blooms later, is taller, and has more leaflets in each leaf than golden Alexander. It can be distinguished from yellow meadow parsnip due to the parsnip's short pedicel on the central flowers of each umbellet, the winged seeds, and simple rather than trifoliate basal leaves. [3]

Known Pollinators:

Native bees, wasps, bumblebees, butterflies, and true bugs. [3]

Larval Host: Black swallowtail butterfly, Ozark swallowtail butterfly, and rigid sunflower borer moth. [3]

** Seed collection times will vary due to location and weather conditions during the growing season. This is a general time seed may be ready, locations will need to be scouted to get a more accurate timetable for each location.

[1] USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. 3 vols. Charles Scribner's Sons, New York. Vol. 3: 641.

[2] <http://pleasantvalleyconservancy.org/seedcollectingtimes.html>

[3] http://www.illinoiswildflowers.info/prairie/plantx/gld_alexanderx.htm

Zizia aurea

Golden Alexander



Dan Tenaglia



Odd-pinnate compound leaves

3-5 leaflets

John Hilty, Illinois Wildflowers



Smooth, hairless stem

John Hilty, Illinois Wildflowers



Compound yellow umbels

2-3" wide

Dan Tenaglia



Mature seeds

Amber Barnes



Immature seeds

2008 © K. Chayka



Cleaned seeds

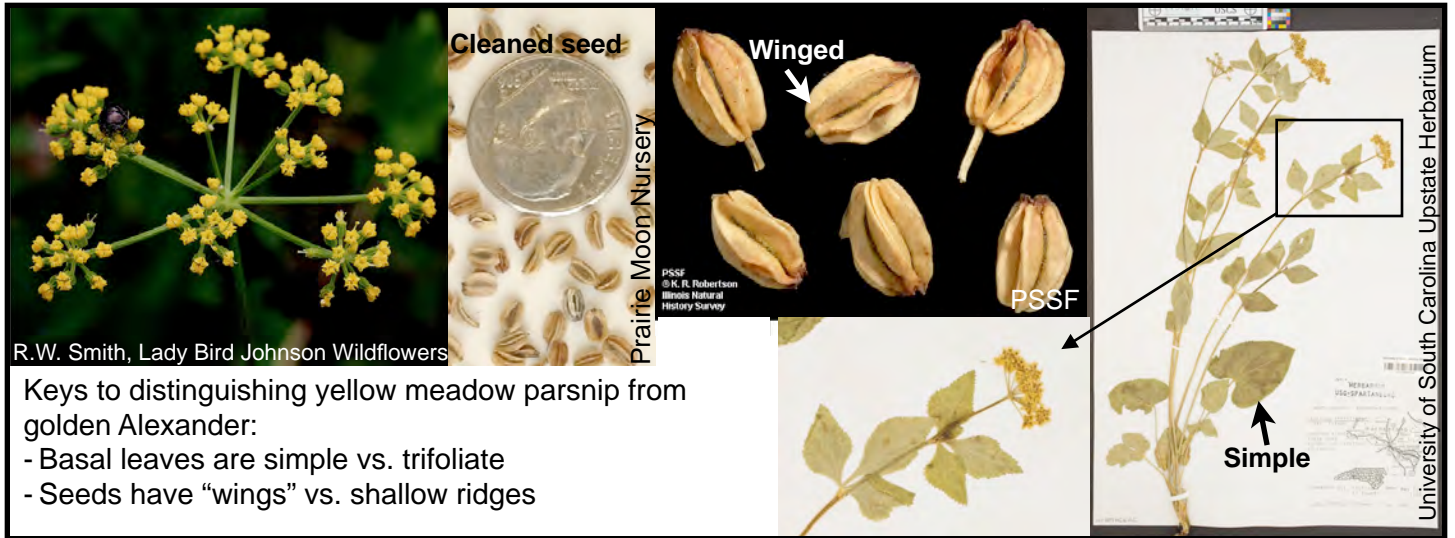
Prairie Moon Nursery

Zizia aurea

golden Alexander

GOLDEN ALEXANDER COULD BE CONFUSED WITH:

Thaspium trifoliatum aureum - yellow meadow parsnip



Pastinaca sativa - wild parsnip



Keys to distinguishing wild parsnip from golden Alexander:

- Furrowed stem
- Plant is larger at 2-5' tall vs. about 2.5'
- More leaflets: 9+ vs. 3-5
- Larger flower head 3-8" across vs. 2-3"



Mason State Nursery

Special thanks to: Holden Arboretum, Blue Heron Ministries, Illinois Department of Transportation, University of Arkansas CAST, and Chicago Botanic Garden

Appendix B:

**Field Data Form
(Blank and Example)**

MWAEBF Field Data Form

COLLECTION TEAM INFORMATION					
Seed Collection Team Reference ID:		Project Site ID:		Collection Number:	
Date(s) Collected:		Collection Time:		Number of Volunteers:	
Collector Names (<i>Circle data collector</i>):					
SEED COLLECTION DATA:					
Scientific Name:		Common Name:			
Number of Plants Sampled:		Photograph Taken:		Y or N	
LOCATION DATA:					
State:		County:		Land Owner:	
Permission Filed:	Y or N	GPS Data Recorded:	Y or N	Managed Area Name:	
Latitude:		Longitude:			
Directions: Provide detailed directions to the collection site. Refer to nearby landmarks, roads, and towns. Include parking information and directions from parking area to collection site.					
HABITAT DATA					
Current Temperature:		Current Humidity:		Land Use Type:	
Non-Target Associated Species:					
SCOUTING INFORMATION: Target plant species in bloom but not ready for collection					
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Notes:					

MWAEBF Field Data Form

COLLECTION TEAM INFORMATION					
Seed Collection Team Reference ID:	OH.CT1	Project Site ID:	A	Collection Number:	1
Date(s) Collected:	4-24-17	Collection Time:	12:30 pm	Number of Volunteers:	4
Collector Names (Circle data collector):	Jane Doe, Ravi Patel, Tyrone Jones, Cindy Lee				
SEED COLLECTION DATA:					
Scientific Name:	<i>Asclepias incarnata</i>		Common Name:	Swamp milkweed	
Number of Plants Sampled:	57		Photograph Taken:	Y or N	
LOCATION DATA:					
State:	Ohio	County:	Cuyahoga	Land Owner:	Cleveland Metroparks
Permission Filed:	Y or N	GPS Data Recorded:	Y or N	Managed Area Name:	Acacia
Latitude:	41.504442		Longitude:	-81.491285	
Directions: Provide detailed directions to the collection site. Refer to nearby landmarks, roads, and towns. Include parking information and directions from parking area to collection site.					
Headed north on I-271 toward Lyndhurst, took Brainard Rd exit. Turned right onto Cedar Rd. Turned right, into the Acacia Reservation parking lot. Found the marked trail and walked about 50 meters to the collection field, located on the left side of the trail.					
HABITAT DATA					
Current Temperature:	65°	Current Humidity:	20%	Land Use Type:	Urban, Rural, Park, ROW
Non-Target Associated Species:	Unknown grasses, red clover, queen ann's lace, goldenrod, and multiflora rose.				
SCOUTING INFORMATION: Target plant species in bloom but not ready for collection					
Scientific Name:	<i>Monarda fistulosa</i>	Common Name:	wild bergamot	Approx. Number of Plants Present:	35
Scientific Name:	<i>Coreopsis tripteris</i>	Common Name:	tall coreopsis	Approx. Number of Plants Present:	58
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Scientific Name:		Common Name:		Approx. Number of Plants Present:	
Notes:					

Appendix C:

**Collection Team
Reference Numbers**

Appendix C: Collection Team Reference Numbers

This page is variable...If we have more or less collection teams in each state, this document will need to reflect that.

This Collection Team Reference ID will be assigned to each team by the State Lead.

Collection Team reference ID by State					
Team #	Ohio	Indiana	Illinois	Missouri	Arkansas
1	OH.CT1	IN.CT1	IL.CT1	MO.CT1	AR.CT1
2	OH.CT2	IN.CT2	IL.CT2	MO.CT2	AR.CT2
3	OH.CT3	IN.CT3	IL.CT3	MO.CT3	AR.CT3
4	OH.CT4	IN.CT4	IL.CT4	MO.CT4	AR.CT4
5	OH.CT5	IN.CT5	IL.CT5	MO.CT5	AR.CT5
6	OH.CT6	IN.CT6	IL.CT6	MO.CT6	AR.CT6
7	OH.CT7	IN.CT7	IL.CT7	MO.CT7	AR.CT7
8	OH.CT8	IN.CT8	IL.CT8	MO.CT8	AR.CT8
9	OH.CT9	IN.CT9	IL.CT9	MO.CT9	AR.CT9
10	OH.CT10	IN.CT10	IL.CT10	MO.CT10	AR.CT10
11	OH.CT11	IN.CT11	IL.CT11	MO.CT11	AR.CT11
12	OH.CT12	IN.CT12	IL.CT12	MO.CT12	AR.CT12

Appendix D:

Sample Right of Entry Permit and Notification Documents

POLLINATOR PARTNERSHIP

Documentation of Oral Permission to Access Private Lands

The (Name of State Lead) obtained oral permission to access private lands as follows:

Description of the work and/or project title, to include date and time of entry and departure or anticipated duration of the work if recurring visits will be made:

Address of Property:

Printed name and address of landowner contacted:

_____ The landowner was provided with the following information:

1. (proposed date and time of entry and departure, or period of time during which recurring visits will be necessary).
2. (kind and number of vehicles to be used).
3. (number of persons in the party).
4. (name, office address, and contact information of chief of party).
5. (purpose of the work).
6. (locations on the property where work is to be done).

Date permission was granted:

Name and signature of State Lead who obtained permission:

Other persons in the party who witnessed the oral permission (as applicable):

The documentation of an oral agreement should be retained in the project file by the initiating office until the project is completed.

POLLINATOR PARTNERSHIP

(Insert Name of Private Landowner)

(Insert Date)

(Insert Address of Private Landowner)

Dear (Insert Name of Private Landowner):

The Pollinator Partnership and its affiliates require employees and volunteers to obtain written permission from landowners in certain cases before entering onto private property to conduct plant surveys, seed collections, and seed/plug planting. Consequently, we are hereby requesting your signature below to confirm your approval for Pollinator Partnership employees or volunteers to enter your land for the purpose described below (the "Purpose"). The data and/or seed collected will be used for enhancing monarch butterfly habitat via the Monarch Wings Across the Eastern Broadleaf Forest project, and details about the work conducted will be provided to you upon request.

Specific information regarding this request is as follows:

1. (proposed date and time of entry and departure, or period of time during which recurring visits will be necessary).
2. (kind and number of vehicles to be used).
3. (number of persons in the party).
4. (name, office address, and contact information of State Lead or Team Lead).
5. (purpose of the work).
6. (locations on the property where work is to be done).

Pollinator Partnership agrees to hold the Landowner identified above harmless from any and all actual damages, liabilities, claims, losses, costs and damages arising from the entry of Pollinator Partnership's employees or volunteers upon Landowner's property for the Purpose, other than those arising from Landowner's willful misconduct or gross negligence.

If you have any questions about the Monarch Wings Across the Eastern Broadleaf Forest project, you may contact (insert name of state lead) at the following telephone number: (insert number).

**POLLINATOR
PARTNERSHIP**

Please indicate your consent to this request by signing below and (list method of return, e.g., envelope provided, leave at a designated location, etc.). Thank you for your cooperation.

Sincerely,

_____ Date: _____
Requestor Signature

_____ Date: _____
Requestor Name

I approve of the entry of Pollinator Partnership employees and volunteers upon the Property identified above, for the Purpose described herein.

_____ Date: _____
Landowner Signature

Landowner Name

Appendix E:

Hold Harmless Document

Pollinator Partnership Volunteer Waiver

Name of Volunteer (please print): _____
Effective Date ____/____/____

Address: _____
Phone Number: (____)____-____

Name of Volunteer Activity: _____

Check here if Volunteer is under age 18:

I, the above listed Volunteer, desire to work as a volunteer for Pollinator Partnership "The Organization" and engage in the activities related to being a volunteer for the Monarch Wings Across the Eastern Broadleaf Forest work project.

I hereby voluntarily execute this Volunteer Waiver under the following terms:

I, the Volunteer, release and hold harmless the Organization and its successors and assigns (the "Organization Releases") from any and all liability, claims, and demands of whatever kind or nature, either in law or in equity, which arise or may hereafter arise from my volunteer work with the Organization.

I understand that this Waiver discharges the Organization Releases from any liability or claim that I, the Volunteer, may have against the Organization with respect to bodily injury, personal injury, illness, death, or property damage that may result from my participation in connection with the Volunteer Activity defined above. I also fully understand that the Organization does not assume any responsibility for or obligation to provide financial assistance or other assistance, including but not limited to medical, health or disability insurance, in the event of injury, illness, death or property damage.

I, the Volunteer, understand that I expressly waive any such claim for compensation or liability on the part of the Organization beyond what may be offered freely by the representative of the Organization in the event of such injury or medical expense.

I hereby release the Organization Releases from any claim whatsoever which arises or may arise in the future on account of any first aid treatment or other medical services that are conducted in connection with an emergency during the Volunteer Activity.

I understand that my participation in the Volunteer Activity may include various activities that may be hazardous to me and I hereby expressly and specifically assume the risk of injury or harm in these activities and release the Organization Releases from all liability for injury, illness, death, or property damage resulting from the my participation in the Volunteer Activity .

I grant unto the Organization all right, title, and interest in and the unlimited right to use any and all photographic images and video or audio recordings including my name or image (collectively, "My Likeness") that are made by the Organization during my work in

Volunteer Waiver

connection with the Volunteer Activity, including, but not limited to, any royalties, proceeds, or other benefits that are derived from such photographs or recordings. I expressly agree that this Waiver is intended to be as broad and inclusive as permitted by the laws of the State of _____ in the United States of America, and that this Waiver shall be governed by and interpreted in accordance with the laws of the State of _____. I agree that in the event that any clause or provision of this Waiver shall be held to be invalid by any court of competent jurisdiction, the invalidity of such clause or provision shall not otherwise affect the remaining provisions of this Release which shall continue to enforceable.

Volunteer's Signature

Print Volunteer's Name

If under 18:

Signature of Parent/Guardian

____/____/____
Date

Printed Name of Parent/Guardian

Emergency Contact:

Name: _____

Relationship to Participant: _____

Phone Number: _____

VOLUNTEERS MUST COMPLETE THE WAIVER AND RELEASE FORM

PARENT/LEGAL GUARDIAN SIGNATURE IS REQUIRED IF VOLUNTEER IS UNDER
AGE 18

Appendix F:

Seed Collecting Techniques – Quick Reference

Seed Collection Techniques Quick Reference
Adapted from Bureau of Land Management Seeds of Success Program

	What to do...	Why?
1.	Assess the target population and confirm that a sufficient number of individual plants (usually 50) have seeds at natural dispersal stage.	To ensure that adequate genetic diversity can be sampled from the population, and that the seeds are likely to be at maximum possible viability and longevity.
2.	Carefully examine a small, representative sample of seeds using a cut test and for smaller seeds a hand lens.	Estimate the frequency of empty or damaged seeds and confirm that the majority of seeds are mature and fully formed.
3.	Collect mature, dry seeds into double-bagged brown paper bags. Large collections can be made using plastic buckets and then transferred into bags.	Ensures the highest possible viability at collection and maximizes the potential storage life at the Mason State.
4.	If seeds can be liberated from their fruits quickly and easily, by shaking the open fruits over a container, carry this out and note it on the field data form.	Maximizes the use of available field time and allows for seeds to be cleaned and prepared in controlled laboratory conditions.
5.	Sample equally and randomly across the extent of the population, maintaining a record of the number of individuals sampled.	Capture the widest possible genetic diversity from the plant population sampled.
6.	Collect no more than 20% of the viable seed available on the day of collection.	Ensure that the sampled population is not over collected and is maintainable.
7.	For each collection, estimate the viable seed production per fruit, per individual and per population, and note these on the field data form.	Document species seed biology and better assess the influence of collecting on the population.
8.	Clearly label all bags with your name, date and latin name. If there are multiple bags, label 1 of 3, 2 of 3, etc.	To ensure that this unique identifier is attached to each sample of a collection. All other data will be recorded on the field data form.

Appendix G:
GIS App Instructions

Appendix G. Seed Collection Report GIS App Instructions

Introduction:

In order to facilitate accurate and consistent data collection during the volunteer seed collection efforts, Pollinator Partnership teamed up with the University of Arkansas Center for Advanced Spatial Technologies (CAST) to develop an innovative reporting tool. The Seed Collection Report survey allows users to input spatial data directly to a shared database while in the field. Anyone with a smartphone can download the app and survey for free. Finished surveys can be submitted directly to the database, maintained by the University of Arkansas, from the field, or maintained within the app until an internet connection can be established. The submitted data can be actively referenced and monitored, improving communication and organization within the project. The data collected through this app can support other monarch research and modeling efforts, and the survey platform can be repurposed for future field studies.

Getting Started:

This app will run within a web browser OR within a free mobile app called "Survey123 for ArcGIS" which can be found within the app stores for Apple, Windows Mobile or Android devices.

Field Data Reporter Requirements

State Leads for the MWAEBF project should identify at least one person within each Seed Collection Team to serve as their designated reporter for each MWAEBF seed collection site visit. The Field Data Reporter should be an experienced field worker with a smart-phone or mobile device that includes a built-in Camera and onboard GPS.

- **Camera:** Since a minimum of three photographs are required for each seed collection report, it will streamline the field workflow if the user's device contains a camera.
- **GPS:** The location of the seed collection site can be manually navigated to using the embedded interactive map within the Seed Collector Report form; however, a mobile device with "Location Services Enabled" will significantly expedite the seed collection report process.

Paper Field Data Forms

The paper field data forms included within MWAEBF training materials should also be completed during each field collection effort since those notes will help the designated Seed Collection Reporter upload the correct attributes (and the three required site photos) using their mobile device or desktop computer. These paper forms can also be photographed and included within an individual Seed Collection Report – an excellent way to digitize your field notes and store them along with the digital Seed Collection report submitted into the MWAEBF geodatabase.

Appendix H. Seed Collector GIS App Instructions

For Use in Web Browser

The following desktop web browsers are supported (for best performance, be sure to update to the latest version):

- Chrome
- Firefox
- Safari
- Edge
- Internet Explorer 11

To view the Seed Collector Survey directly within your desktop web browser, go here and log in using your credentials: <http://tinyurl.com/P2seeds2017>

For Use on Smartphone

Each State Coordinator and **designated** Field Data Reporter(s) will need to request a MWAEBF user-account in order to download the MWAEBF Seed Collection Report survey. To request this username / password, please send an email to Alex Pourfard (ap@pollinator.org) and Brian Culpepper (brian@cast.uark.edu) with the following subject line: **MWAEBF User Account Request**. Please provide this important information within the body of the email:

- Your first/last name
- Organization you represent
- Full mailing address
- Name of your State Lead for the MWAEBF project
- Date you anticipate field collection to begin within your area
- Phone number (cell preferred) that we can use to reach you

Please specify the type of cell phone (iphone/windows/android) or tablet that you plan to use for submitting your Seed Collection Reports during the MWAEBF project. If you plan to upload these reports from your laptop or desktop computer, it would be helpful to know this too.

After your email request has been received, we will create your account and follow-up with your user-credentials and instructions detailing how to download the app and corresponding Seed Collector Report survey. This download must be accomplished and tested by the volunteers prior to participation in a seed collection event.

Step 1: Download the App

1. To download the Survey123 app on your smart phone, first navigate to the App Store. Depending upon the type of mobile phone you're using, here's where to download the app online:
 - iTunes download (Apple):
<https://itunes.apple.com/us/app/survey123-for-arcgis/id993015031?mt=8>
 - Google Play download (Android):
<https://play.google.com/store/apps/details?id=com.esri.survey123&hl=en>

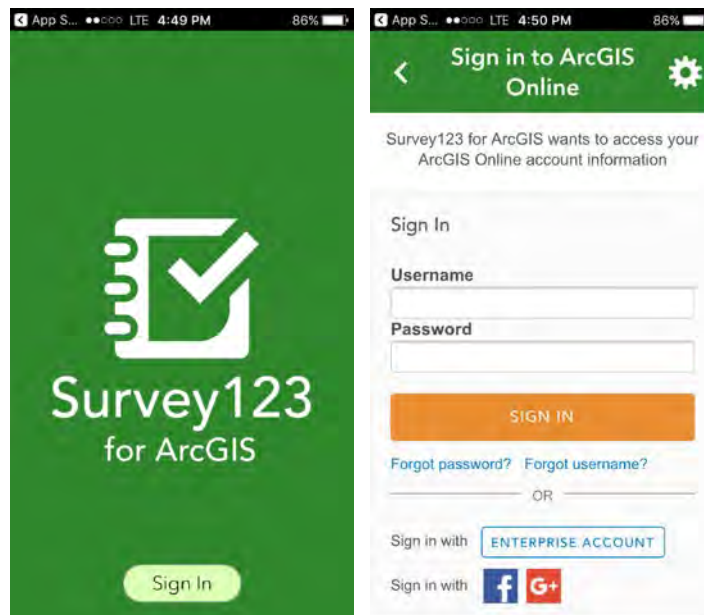
Appendix G. Seed Collection Report GIS App Instructions

2. Search for “Survey123” so you can locate and install this (free) mobile application created by ESRI, Inc. called Survey123 for ArcGIS.
3. Click to install the app. You may need to log in using your Apple ID or other credentials to enable the download.



Step 2: Sign In

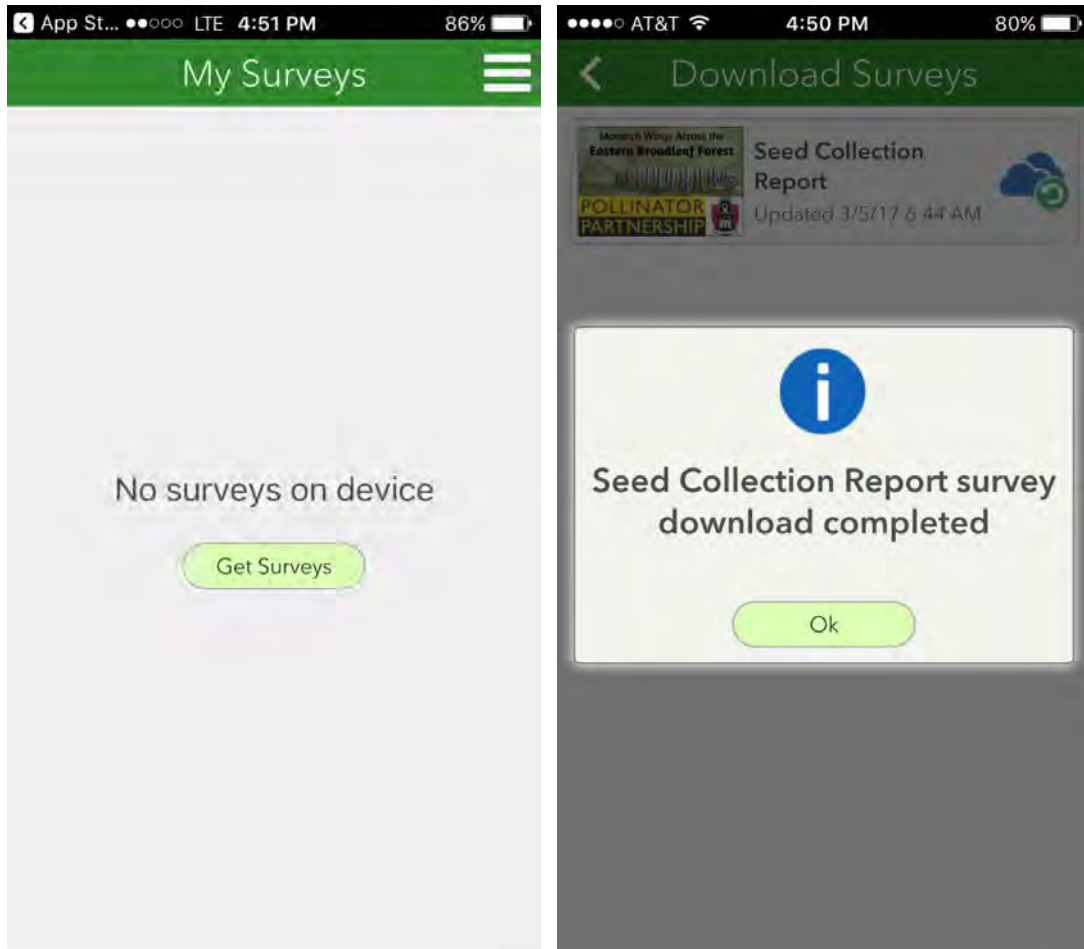
1. After the Survey123 for ArcGIS application is installed, use your credentials to sign-in to the Survey123 app. Contact your State Lead or Brian Culpepper (brian@cast.uark.edu) for help logging in.



Appendix H. Seed Collector GIS App Instructions

Step 3: Download the Survey

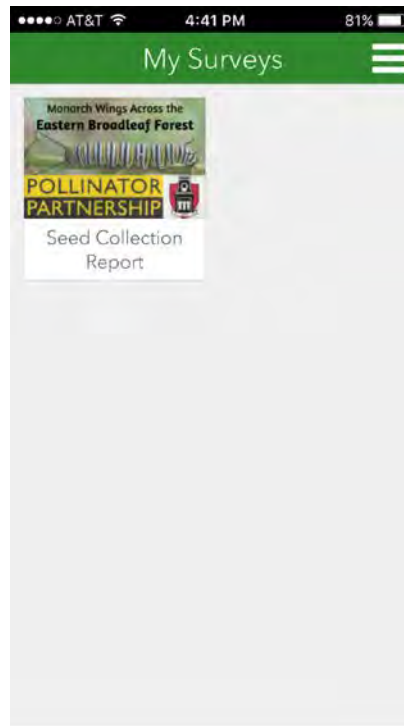
1. Next, you will need to download the Seed Collector Report survey. Click “Get Surveys” and then select “Seed Collection Report” to download the survey. It should now display in the “My Surveys” home screen.



Step 4: Completing a Survey

1. Now that you've installed the app and downloaded the survey, you are all set to begin collecting data! This survey app can be used when 'off-line' and should work whether you have wi-fi / cell service or not. However, once you return to cell service or wi-fi, you must remember to submit those 'draft' survey responses so that they are pushed back into the cloud for all other project members to see.
2. Select Seed Collection Report on the “My Surveys” home page to be directed to the survey’s home page.

Appendix G. Seed Collection Report GIS App Instructions

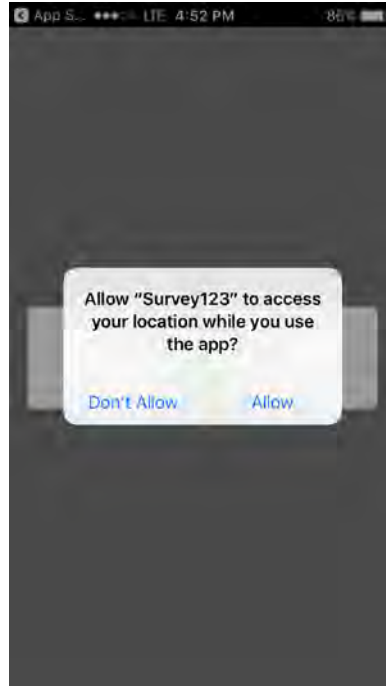


3. To begin collecting data, select the "Collect" button at the bottom of the Seed Collection Report home page.



4. You may receive a pop-up box asking if you would like to allow the survey to access your location while using the app. Select "Allow" so that the app can auto-locate your point based on your phone's GPS coordinates.

Appendix H. Seed Collector GIS App Instructions



5. Fill out the form starting with "Data Recorder Name." Note that fields marked with asterisks are required in order to submit the survey. The only fields that are not required are "Leaf Photo," "Data Sheet Photo," "Site Description," "Permission to access the site," "Air Temperature," and "Relative Humidity".
6. Refer to Section 8a of the training manual for the appropriate Project Site ID and Collection Number formats.

A screenshot of the "Seed Collector v1.5" app interface. The title bar shows "Seed Collector v1.5" and a hamburger menu icon. The main content is a "Seed Collection Report" form with the following fields:

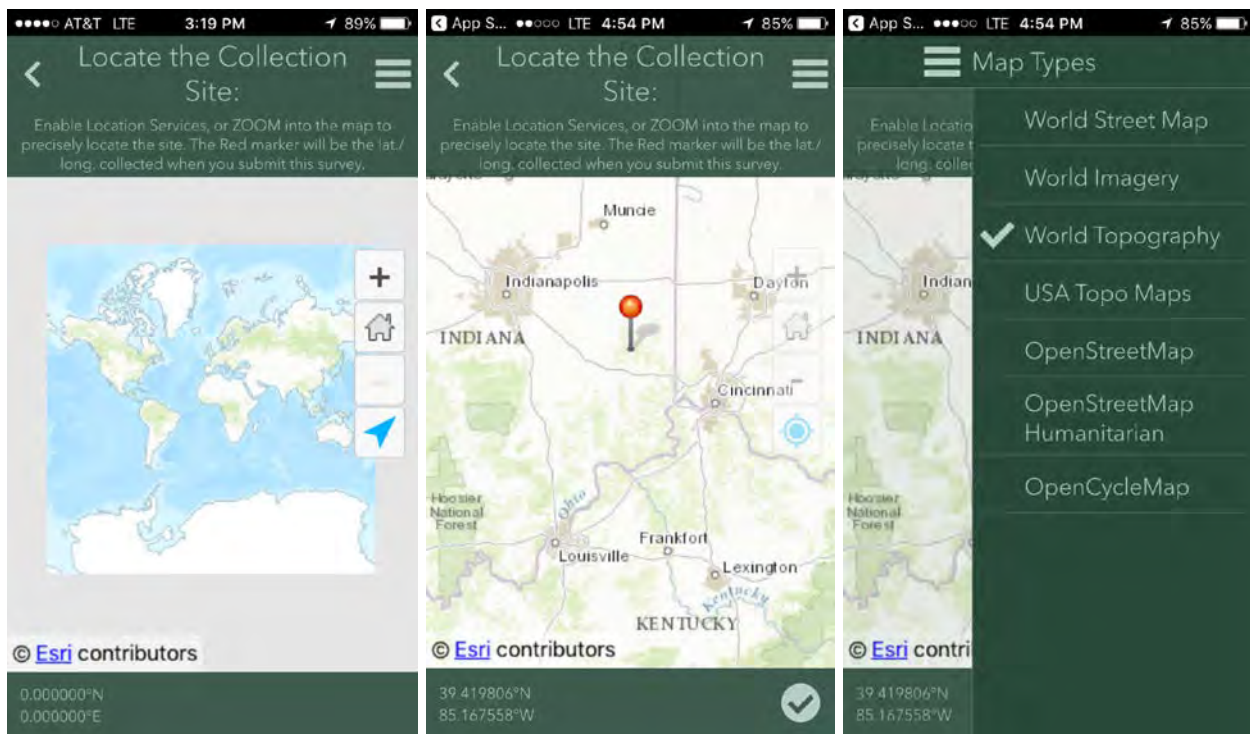
- Data Recorder Name: *** Last name only. Input field.
- Project Site ID: *** Follow the Project Site ID naming methodology from the training materials. Input field.
- Collection Number: *** Please enter this Seed Collection Number following the training material guidelines. Input field.
- Seed Collection Date: *** When did the Seed Collection occur? A date picker showing "March 7, 2017".
- State Name: *** Input field.

A green checkmark icon is visible in the bottom right corner of the form area.

Appendix G. Seed Collection Report GIS App Instructions

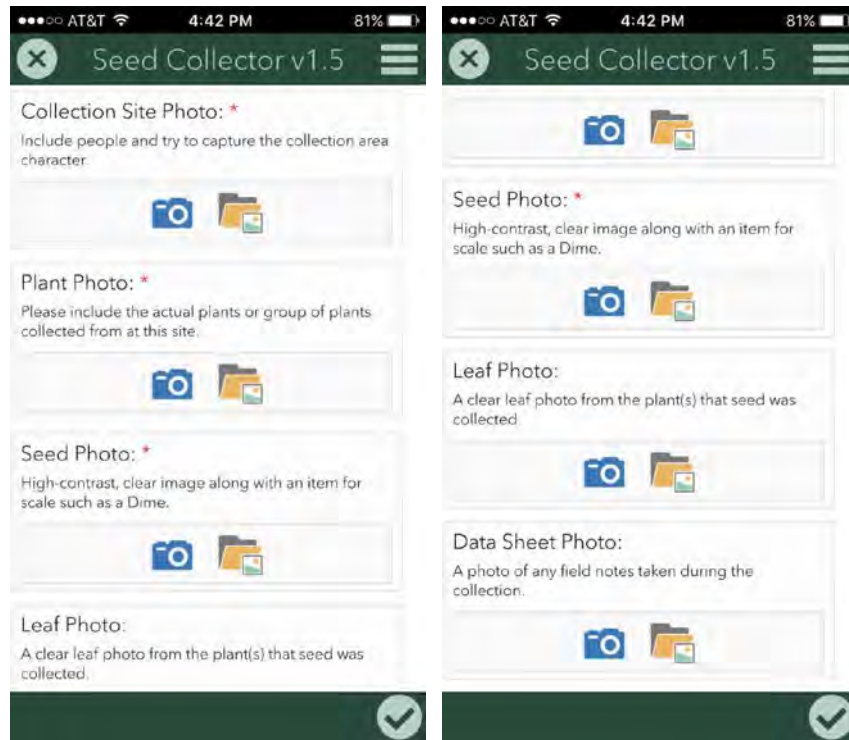
- 7. Locating the collection site.** To auto-locate based on your phone's location, select the bullseye at the top right corner of the map. You will need to allow the app to access your location settings when first prompted by the app, and you will need adequate satellite reception. When inside the map, you can toggle between the blue arrow and bullseye buttons below the “-” button to switch between auto-locate and manual-locate. Given the relatively low accuracy of cellphone GPS receivers, especially in areas where trees, buildings, or other natural features cause significant interference, you may want to first try auto-locating your position, and then manually adjust your pin to better reflect your exact position. Switching the base layer map to “World Imagery” may help you determine your exact location based on nearby features.

To manually locate the collection site, select the map and drag the pin to the appropriate location. You can zoom in or zoom out by pinching inwards or outwards with two fingers on the map, or by simply pressing the “+” or “-” buttons. When satisfied with the position of your point, select the green check mark at the bottom-right of the screen to confirm your location.

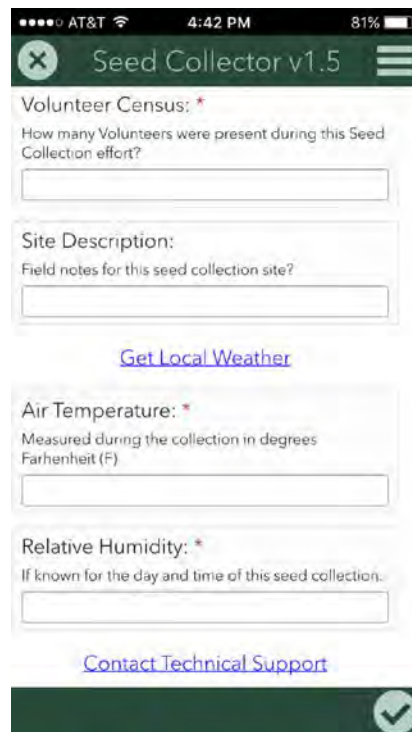


- 8. Photos** can be submitted in two ways. Click the camera icon to take a photo directly through the app, or click the folder icon to select a photo from your saved pictures. Note that the first three photo fields – Collection Site, Plant, and Seed – are each required, but the last two – Lead and Data Sheet – are optional.

Appendix H. Seed Collector GIS App Instructions



9. Click the “Get Local Weather” link to be directed out of the app to your web browser in order to look up the weather data (Air Temperature and Relative Humidity). Once you find this information through the “Get Local Weather” link or another weather app on your phone, you will need to return to the app to enter in the information in the final two fields of the survey form.

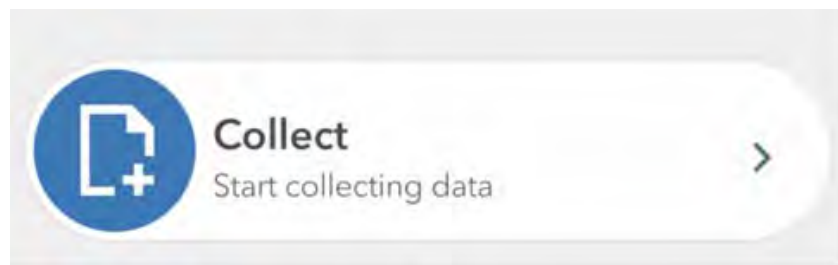


Appendix G. Seed Collection Report GIS App Instructions

Step 5: Submitting the Survey

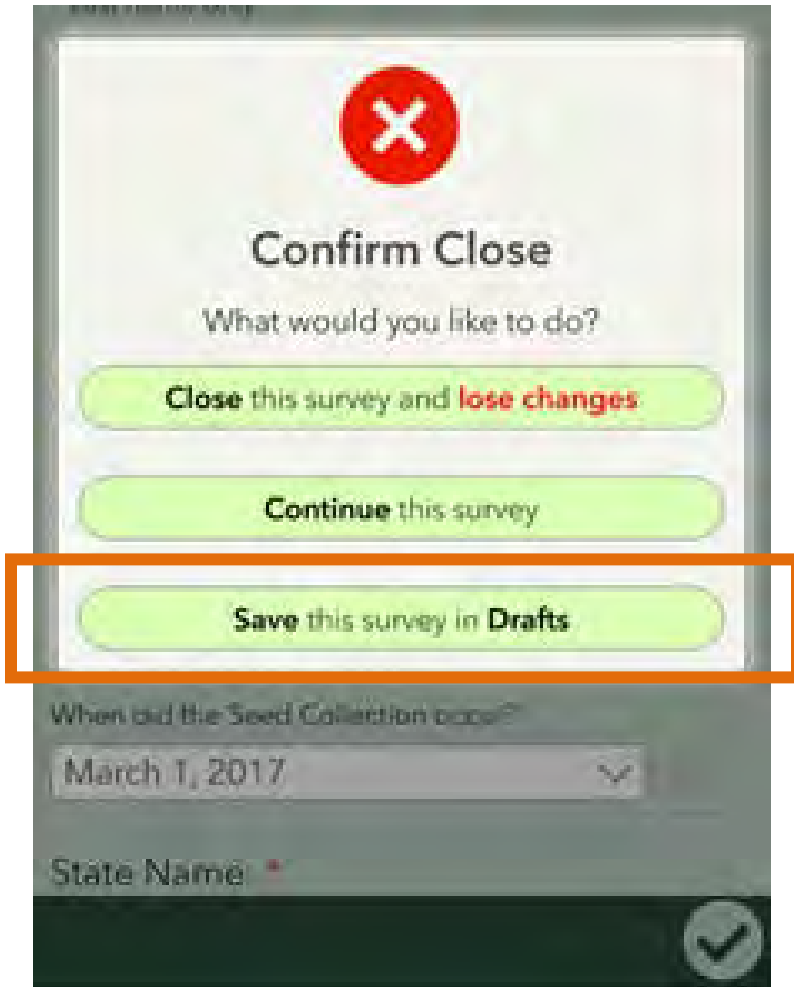
After the Survey123 App has been installed on your device and you've logged in and downloaded the Seed Collector Report survey (from within the Survey123 for ArcGIS application) you should turn-ON your location services prior to preparing to record a Seed Collection Report.

- Make certain that each submitted report has a properly formatted SiteID and Collection number so that each Seed bag can be uniquely identified and processed without error.
- The SiteID, Collection Number and Seed Species should also be recorded/written on the outside of each bag or envelope at the time the seed is collected.
- This information should also be recorded on a paper form and/or uploaded into the MWAEBF geodatabase using the Seed Collection Report application.

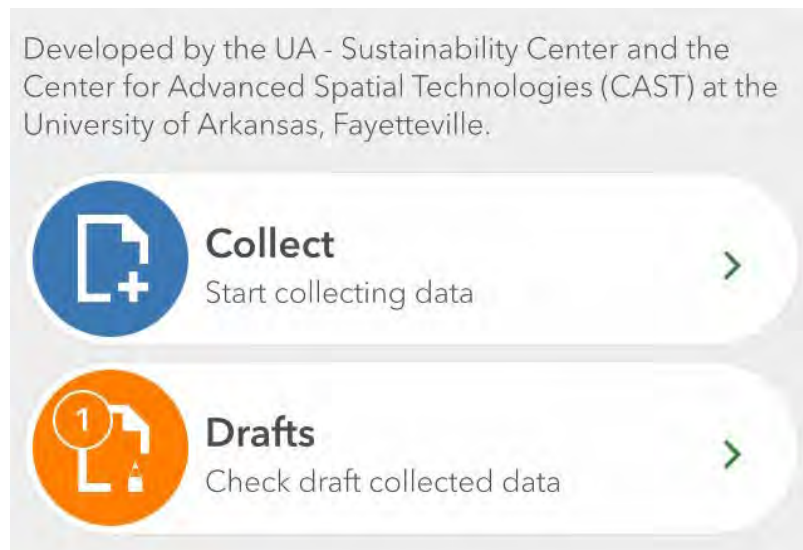


Since photos must also be collected as part of the Seed Collection Report, it may be easier to leverage the “DRAFT” option available within the Seed Collector Report mobile application. You can ‘pause’ the attribute collection at any time within the Seed Collector Report survey by pressing the Check BOX (lower right corner) of the form, and THEN selecting the “**Save** this survey in **Drafts**” option.

Appendix H. Seed Collector GIS App Instructions

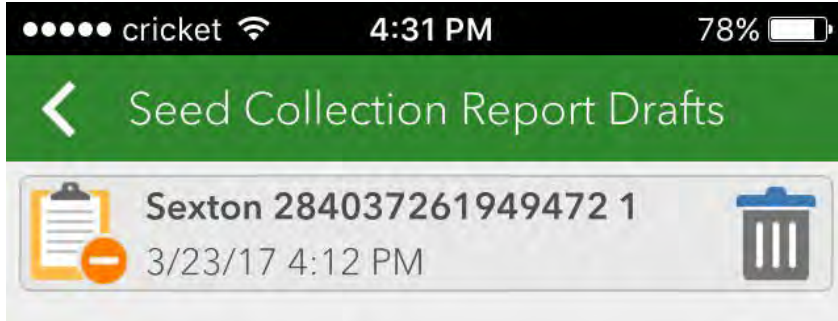


DRAFT SURVEYS within the Seed Collector Report DRAFT folder.
This screen indicates the number of unsent Seed Collector Report surveys that have not been submitted.



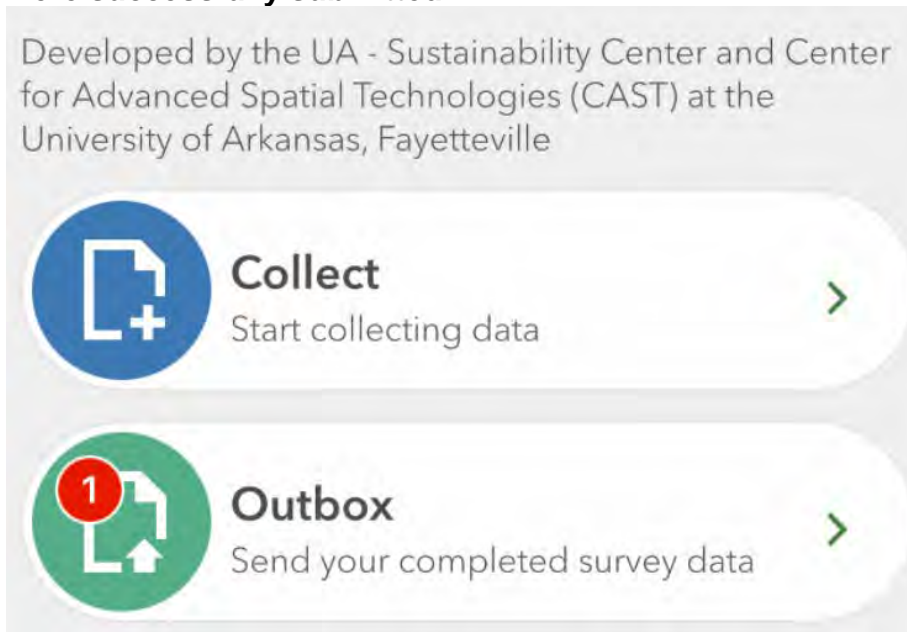
Appendix G. Seed Collection Report GIS App Instructions

EACH Draft survey within the Seed Collection Report drafts folder can be re-opened and completed at a later day or time. Once the Seed Collection Report is completed, users can submit the completed report to the MWAEBF geodatabase.



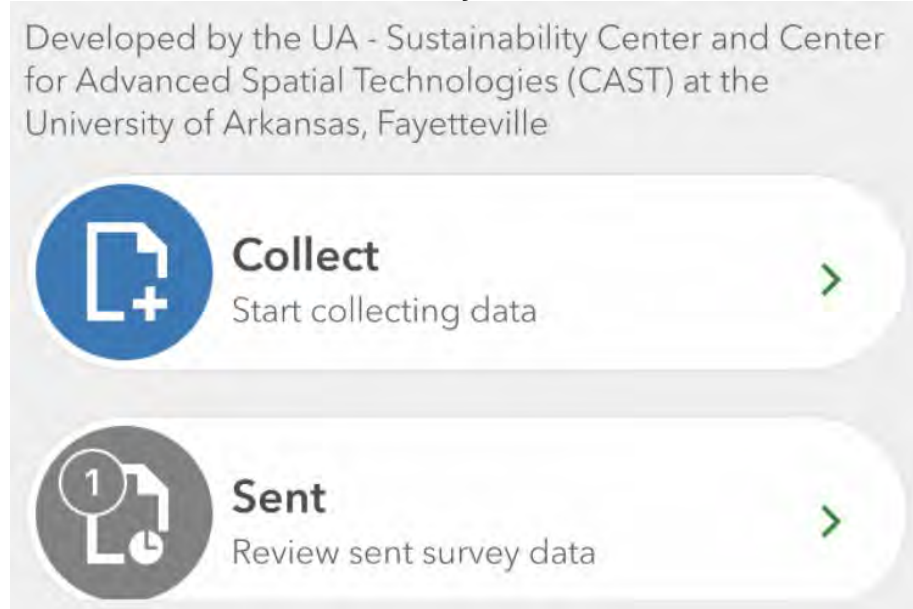
COMPLETED UNSENT SURVEY within the Seed Collector Report will be found within the **OUTBOX** folder. IF the number of surveys within the Outbox folder is inside a **RED** circle, then those surveys have not been successfully submitted.

This screen indicates the number of unsent Seed Collector Report surveys that have not been sent, successfully from your mobile device. Cellular coverage or wifi interruptions can interrupt a submission and cause this message to appear. Retry until you receive satisfactory feedback within the app that your reports were successfully submitted.

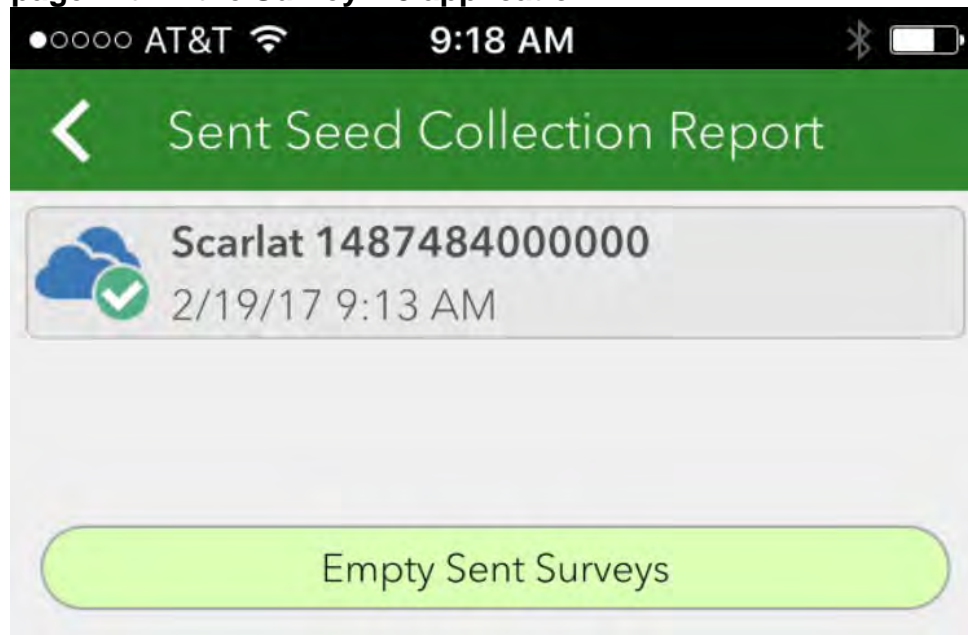


Appendix H. Seed Collector GIS App Instructions

SUCCESSFULLY SENT Survey is in the SENT folder and it is Gray

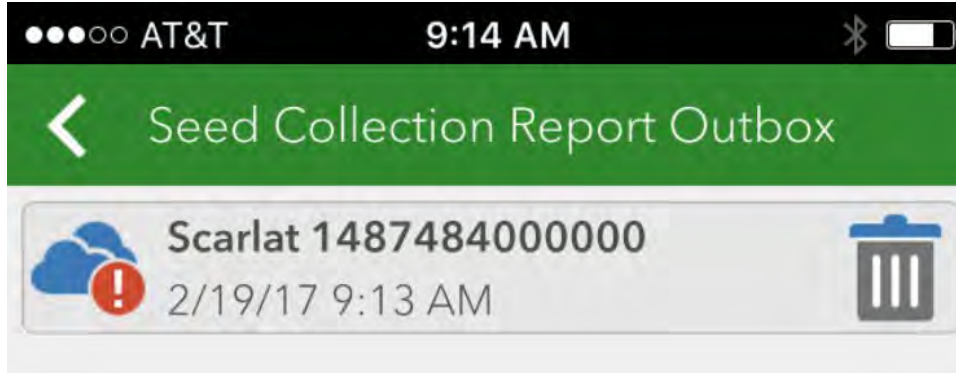


The Seed Collector Report Survey's that were **SUCCESSFULLY SUBMITTED** have the **GREEN CHECKMARK**. You can decide to keep these locally on your device or **CLEAR** them from your **SENT** folder by clicking the button at the bottom of the page within the Survey123 application.



Appendix G. Seed Collection Report GIS App Instructions

SURVEY SEND FAILURE - Red Exclamation beside the unique survey id in the OUTBOX folder.



Using the Seed Collection Report within a Web Browser (desktop/Tablet browser):

You can also submit your Seed Collection Reports from a web browser, if desired. Although it's best to use the Survey123 mobile application to collect/report your Seed Collection report from the field, it's not always possible. We still have a way for volunteers to upload their field collection reports so that everyone involved within the MWAEBF project are updated on your seed collection activities! YOU must have P2 seed collector Report credentials to log-in and submit any Seed Collection Reports, so review the instructions above for obtaining your MWAEBF credentials. Not all volunteers will require credentials; only volunteers that are using the Seed Collector Report applications on their mobile device or desktop web browser.

<http://tinyurl.com/P2seeds2017>

**** if you have any troubles opening this link; please contact Alex Pourfard (ap@pollinator.org) at the Pollinator Partnership and Brian Culpepper (brian@cast.uark.edu) at the University of Arkansas, Fayetteville.**

For Use within a Web Browser

The following desktop web browsers are supported (for best performance, be sure to update to the latest version):

- Chrome
- Firefox
- Safari
- Edge
- Internet Explorer 11

Appendix H. Seed Collector GIS App Instructions

Seed Collector Report – Web Form (after logging in).

Print

p2demo17

Sign Out

Seed Collector v1.5

Seed Collection Report

*** Data Recorder Name:**

Last name only.

*** Project Site ID:**

Follow the Project Site ID naming methodology from the training materials.


*** Collection Number:**

Please enter this Seed Collection Number following the training material guidelines.

Appendix G. Seed Collection Report GIS App Instructions

* **Seed Collection Date:**

When did the Seed Collection occur?

* **State Name:**

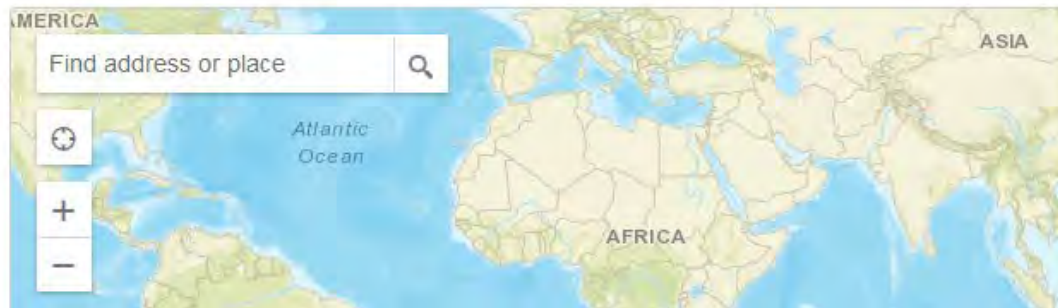
Which State is this seed collection located?

* **County Name:**

Please select a county or begin typing to shorten the pick list.

Locate the Collection Site:

Enable Location Services, or ZOOM into the map to precisely locate the site. The Red marker will be the lat./long. collected when you submit this survey.



Appendix H. Seed Collector GIS App Instructions

decimal

latitude (x.y °)

39.21732875

longitude (x.y °)

-84.49431862

accuracy (m) Not Available



*** Seed Type Collected:**

none selected

Species In Bloom:

Were any other target plant species in bloom?

Swamp milkweed

Common milkweed

Whorled milkweed

Partridge pea

Tall coreopsis

Common boneset

Late boneset

Ox eye Sunflower

Wild bergamot

Foxglove beardtongue

Narrowleaf
mountainmint

Yellow coneflower

Black eyed susan

Smooth blue aster

New England aster

Frost Aster

Ohio Spiderwort

White vervain

Giant ironweed

Golden Alexander

Other

Appendix G. Seed Collection Report GIS App Instructions

*** Collection Site Photo:**

Include people and try to capture the collection area character.

*** Plant Photo:**

Please include the actual plants or group of plants collected from at this site.

*** Seed Photo:**

High-contrast, clear image including an item for image scale such as a coin.

Leaf Photo:

A clear leaf photo from the plant(s) that seed was collected.

Data Sheet Photo:

A photo of any field notes taken during the collection.

Appendix H. Seed Collector GIS App Instructions

*** Land Cover Type:**

Which Land Cover category best describes this seed collection site?

Was permission required to access the site?

*** Volunteer Census:**

How many Volunteers were present during this Seed Collection effort?

Site Description:

Field notes for this seed collection site?

[Get Local Weather](#)

THIS FIELD IS A BUG IN THE WEB FORM. PLEASE IGNORE

Air Temperature:

Measured during the collection in degrees Fahrenheit (F)

Relative Humidity:

If known for the day and time of this seed collection.

[Contact Technical Support](#)

THIS FIELD IS A BUG IN THE WEB FORM. PLEASE IGNORE

Submit

Appendix H:
Contact Information

Appendix H. Contact Information

State Leads:

Arkansas:

TBD

Illinois:

Dr. Kayri Havens

Medard and Elizabeth Welch Director, Plant Science and Conservation
Nancy Poole Rich Herbarium,
Research Department
Chicago Botanic Garden
1000 Lake Cook Rd.
Glencoe, IL 60022
Tel: 847-835-8378
Email: khavens@chicagobotanic.org

Indiana:

Julia Kemnitz

Partners for Fish and Wildlife
Indiana Private Lands Office
Indiana Private Lands Office
U.S. Fish and Wildlife Service
620 S. Walker Street
Bloomington, IN 47403
Tel: 812-334-4261 ext.1217
Email: Julia_Kemnitz@fws.gov

Benjamin Miller

Landscape Conservation Initiative Liaison
Indiana Division of Fish and Wildlife
402 W. Washington St., Rm W273
Indianapolis, IN 46204-2781
Tel: 317-234-8101
Email: BMiller2@dnr.in.gov

Jeff Kiefer

State Coordinator, Partners for Fish and
Wildlife
Indiana Private Lands Office
U.S. Fish and Wildlife Service
620 S. Walker St.
Bloomington, IN 47403
Tel: 812-334-4261, Ext. 1212
Email: Jeffrey_Kiefer@fws.gov

Appendix H. Program Contacts: State Leads and Coordinating Partners

Ohio:

Ann Rzepka
Horticulturist III
The Holden Arboretum
9500 Sperry Road
Kirtland, Ohio 44094
Tel: 440-946-4400 x250
Email: arzepka@holdenarb.org

Missouri:

TBD

Appendix H. Contact Information

Coordinating Partners

Pollinator Partnership:

Val Dolcini

President and CEO
Pollinator Partnership
423 Washington St. 5th Floor
San Francisco, CA 94111
Tel: 415-362-1137
Email: vdolcini@pollinator.org

Alex Pourfard

Program Associate
Pollinator Partnership
423 Washington Street, 5th Floor
San Francisco, CA 94111
Tel: 415-362-1137
Email: ap@pollinator.org
Website: www.pollinator.org

Amber Barnes

Wildlife Biologist and Program
Coordinator,
Pollinator Partnership - Great Lakes
Region
Email: ab@pollinator.org

U. S. Fish and Wildlife Service:

Mike Budd

Illinois State Coordinator
Partners for Fish & Wildlife Program
1 Natural Resources Way
Springfield, IL 62702
Tel: 217-557-4474
michael_budd@fws.gov

Marci A Lininger

US Fish and Wildlife Biologist
Transportation Liaison
Coordinator, OH Pollinator Habitat
Initiative
Ohio Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230
Tel: 614-416-8993 Ex:27
Email: marci_lininger@fws.gov

Andrew DiAllesandro

Private Lands Biologist
U.S. Fish and Wildlife Service
Rock Island Field Office
1511 47th Avenue
Moline, IL 61265
Tel: (309) 757-5800 x210
Email: andrew_diallesandro@fws.gov

Lori Stevenson

Ohio Private Lands State Coordinator
U.S. Fish & Wildlife Service
Partners for Fish and Wildlife Program
Ohio Private Lands Office
771 East Main Street, Suite #102
Newark, OH 43055
Tel: 740-670-5312
Email: lori_stevenson@fws.gov

Jeff Kiefer

State Coordinator, Partners for Fish and
Wildlife
Indiana Private Lands Office
620 S. Walker St.
Bloomington, IN 47403
Tel: 812-334-4261, Ext. 1212
Email: Jeffrey_Kiefer@fws.gov

Appendix H. Program Contacts: State Leads and Coordinating Partners

Mason State Nursery:

Dave Horvath

IDNR Nursery Program Manager
Mason State Nursery
17855 N. County Road 2400E
Topeka, Illinois 61567
Tel: 309-535-2185
Email: dave.horvath@illinois.gov

Illinois Department of Transportation

James Alwill

Illinois Department of Transportation
james.alwill@illinois.gov

University of Arkansas – CAST

Brian Culpepper

GIS Research / Outreach Spec.
CAST, University of Arkansas
Tel: 479 575-8745
Email: brian@cast.uark.edu

Hanna Ford

Public Information Specialist
CAST, University of Arkansas
Tel: 479-575-8614
Email: hlford@uark.edu