Coastal Prairie Plant Growers' Handbook

A multimedia guide to selecting and growing wildflowers and grasses native to the critically imperiled Coastal Prairie ecosystem of Texas & Louisiana

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www.coastalprairiepartnership.org

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Videos

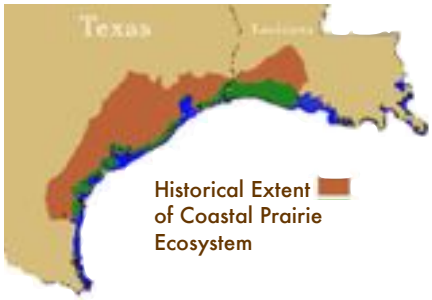
This handbook has been digitally enhanced. In addition to the words and pictures found inside, there are also links to video clips that will help to illustrate concepts. Each time you see the video icon to the left simply double-click on the link to start the video segment for that section.

Introduction

Why Grow Coastal Prairie Natives?

The Coastal Prairie ecosystem of Texas and Louisiana is one of the most imperiled ecosystems in the United States.

This unique mosaic of grassy uplands, depressional wetlands, oak mottes, and forested rivers was once a sprawling wilderness that blanketed 9 million acres across two states - an area the size of Delaware, Connecticut, and New Jersey combined. Since European settlement, agricultural conversion, urbanization, the introduction of exotic species, and other changes have reduced the coastal prairie to 1% of its original coverage.



Restoration and maintenance of our remaining prairies requires robust native plant propagation and planting programs. Volunteer plant growers can play a role in this restorative process by growing plants at home and donating them to a local prairie conservation institution or schoolyard habitat initiative.

Growing native plants can also be a great way of connecting with your local environment and cultural history. Coastal Prairie plants have been in our area for many thousands of years and have been used by birds, insects, mammals, native people, and early settlers for food, medicine, and shelter. By nurturing natives, you'll start to learn the stories that each of these amazing plants has to tell, enjoy the mini-dramas of insects and other wildlife at home in this habitat, and appreciate the seasonal splashes of color that they will provide to your patch of our good Earth.

Carolyn Fannon

Good luck and happy growing,

Jaime González
Coastal Prairie Partnership
December 2009

Connections

Carolyn Fannon

fig 1. Green Treefrog (*Hyla cinerea*)

Green Treefrogs are reminders that wetlands are a vital part of our Coastal Prairies. Restorations should include small depressions if possible to allow for the establishment of wetland plants and the animals they attract.

Video 1
Introduction

Jaime González

fig 2. Pickerelweed (*Pontederia cordata*)

We often think of prairies as dry places but in some areas 30-40% of prairies are wetlands. Pickerelweed is just one indicator plant found in prairie wetlands

Aren't These Plants Just Weeds?

Gardeners new to growing native plants, particularly grasses or non-showy wildflowers, may ask "why should I grow weeds". In fact, a weed is just a plant growing where it is not wanted. When gardeners discover their many attributes, native plants cease to be weeds and may lead to a lifetime of discovery and satisfaction.

Although many Coastal Prairie plants may not be aesthetically beautiful in the traditional sense, they are essential to wildlife. Whether planted in your garden, backyard habitat, or a prairie restoration, these plants provide food (nectar, leaves, seeds, insects, etc.) and shelter to diverse mix of birds, mammals, frogs, lizards, and butterflies. Prairie insects and birds pollinate our plants, eat pest insects and enrich our surroundings by connecting us with the natural world.

Native plants provide us with a sense of place and connect us historically and culturally to Native Americans and the early settlers that preceded us. Before our food, medicine, textiles, and tools were readily available at the corner store, we depended on native plants. Native grasslands provide valuable services to society by building soil, controlling erosion, and absorbing rainwater. They also have commercial value as cultivated plants and as a potential source of biofuels.

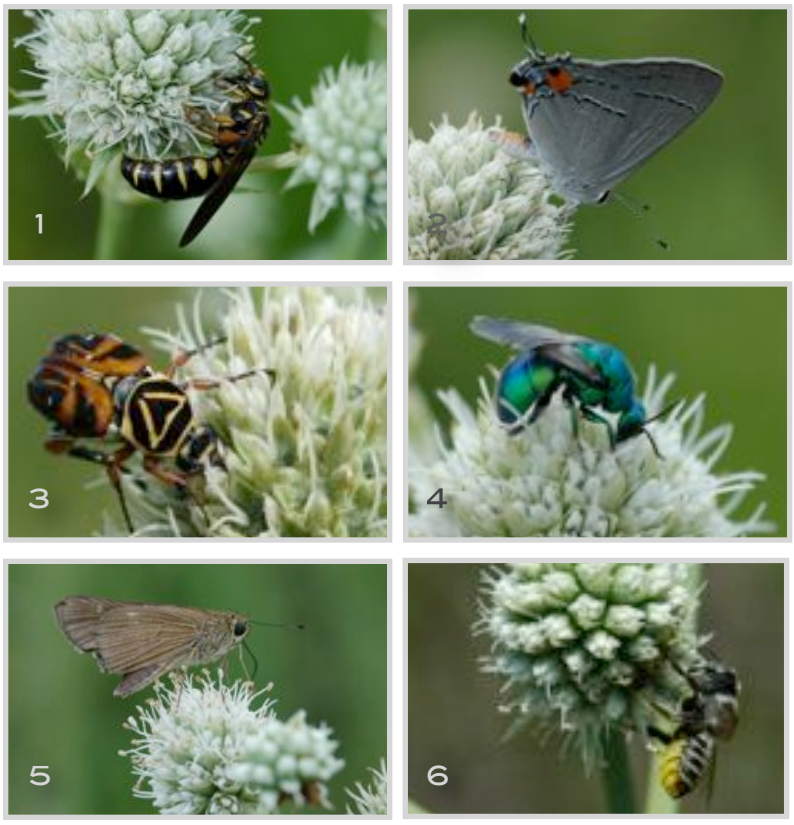
So are Coastal Prairie plants weeds? Certainly not!

Lisa Spangler

Rattlesnake Master (*Eryngium yuccifolium*)

This odd-looking member of the parsley family might be considered a weed by some, but it is supermarket for pollinators. Scientists with the USGS have identified over 200 species of invertebrates using this special plant!

Larry Allain, USGS - National Wetlands Research Center



Rattlesnake Master - Pollinators' Delight

Rattlesnake Master is a rich source of nectar for pollinators, and its seeds are prized by birds. A few of the insects that feed on this plant are pictured above. (1) Tiphiid wasp (*Myzinum sp.*) (2) Gray Hairstreak Butterfly (*Strymon melinus*) (3) Delta Scarab Beetle (*Trigonopeltastes delta*) (4) Cuckoo wasp (*Family: Chrysididae*) (5) Ocola skipper (*Panoquina ocola*) (6) Leafcutter bee (*Megachile sp.*)

1 It Begins with Seeds

Where to Find Seeds

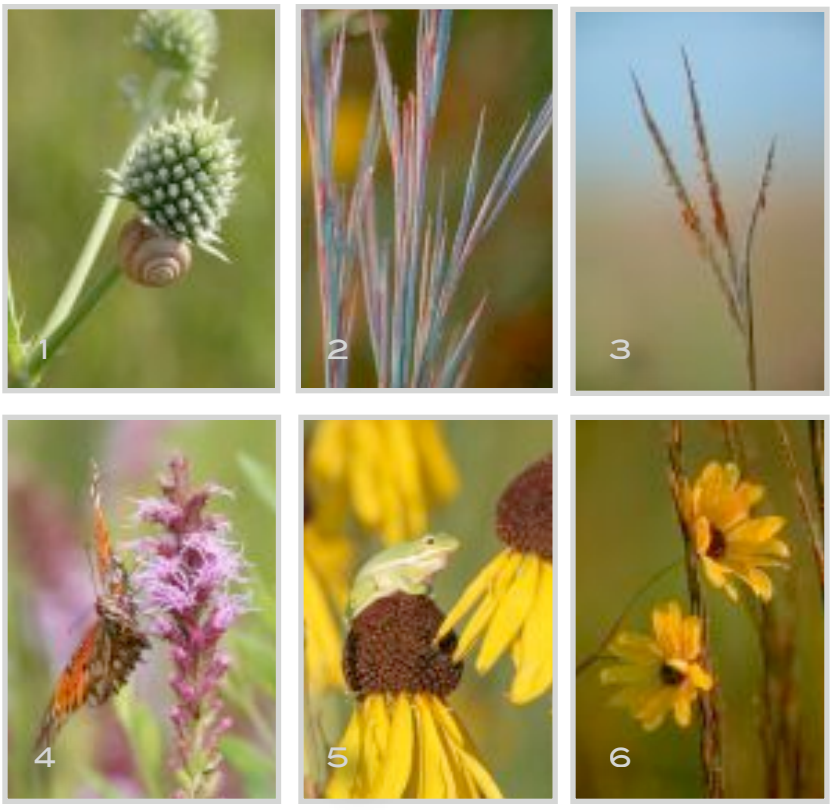
Growing natives begins with the right seeds. Collecting and using seeds that are native to your area ensures that your plants will be adapted to your local climate and soils. Seeds collected from as many parent plants and locations as possible preserves the genetic diversity of prairie species. Genetic diversity provides the raw material for ecological resilience and long term sustainability of Coastal Prairie.

Where can you find sources for wild seed collection? Suitable sites for seed collection are not difficult to find. Prairie remnants may be found in hay meadows, railroad rights-of-way, edges of cemeteries, even in vacant lots of developed neighborhoods. Seeds can sometimes be collected at local nature centers, parks, or restoration sites.

Remember that collecting seeds without permission is illegal and may ruin opportunities for future seed collection. So, be a good neighbor and ask permission before visiting a site to collect seeds. You may even have an opportunity to educate the land owner about the value of their land.

If you cannot collect seeds in the wild, consider purchasing seeds from a reputable seed supplier.

Carolyn Fannon



Prairie Indicator Plants

Learn to recognize plants which indicate high-quality prairie remnants (1) Rattlesnake Master (2) Little Bluestem (3) Big Bluestem (4) Prairie Blazingstar or Gayfeather (5) Rough Coneflower (6) Swamp Sunflower

Jaime González

Seed Collection Sites

Railroad and utility rights-of-way, like this spot in Houston's Memorial Park, can be excellent seed sources.

Join a Seed Collecting Trip

Participating in seed collecting trips is a hands-on way of learning about prairie natives and making connections with others prairie enthusiasts. A variety of clubs and organizations lead seed collecting trips, particularly in the fall. Here are just a few of the organizations that regularly lead trips to Coastal Prairie remnants:

In Texas

Armand Bayou Nature Center | website

Houston Audubon | website

Katy Prairie Conservancy | website

Native Prairies Association of Texas | website

Native Plant Society of Texas

- Houston Chapter | website

Texas Master Naturalists

- Galveston Bay Chapter | website
- Gulf Coast Chapter | website
- Coastal Prairie Chapter | website

In Louisiana

Acadiana Resource Conservation an Development Council | website

Cajun Prairie Habitat Preservation Society | website

When to Collect Seeds

Collecting native seeds requires patience, access to local prairie sites, and a bit of good luck.

There are two principal seed collecting windows during the year in coastal Texas and Louisiana: (1) March – June (for spring wildflowers and grasses) and (2) October – December (for warm season wildflowers and grasses). Seeds of some species are available in other months and it may be worth visiting collection sites at those times as well.

In general, seeds that come off easily from the parent plant are ready to be harvested but you should consult local experts to collect seed at peak ripeness.

See the informational table on the next page for seed collection windows for selected species.

Connections

Jaime González

fig 3. Slender Glass Lizard (*Ophisaurus attenuatus*)

These legless lizards can reach lengths of 42" and prefer dry prairies. There they feed on insects, spiders, small reptiles, and occasionally on young rodents.

Video 2
Collecting Seeds

Jaime González

fig 4. Pink Crab Spider (*Misumena vatia*)

Crab Spiders often are cryptically colored to blend in with prairie flowers. This helps them ambush prey while steering clear of predators like the Slender Glass Lizard.

A Seed Collector's Calendar

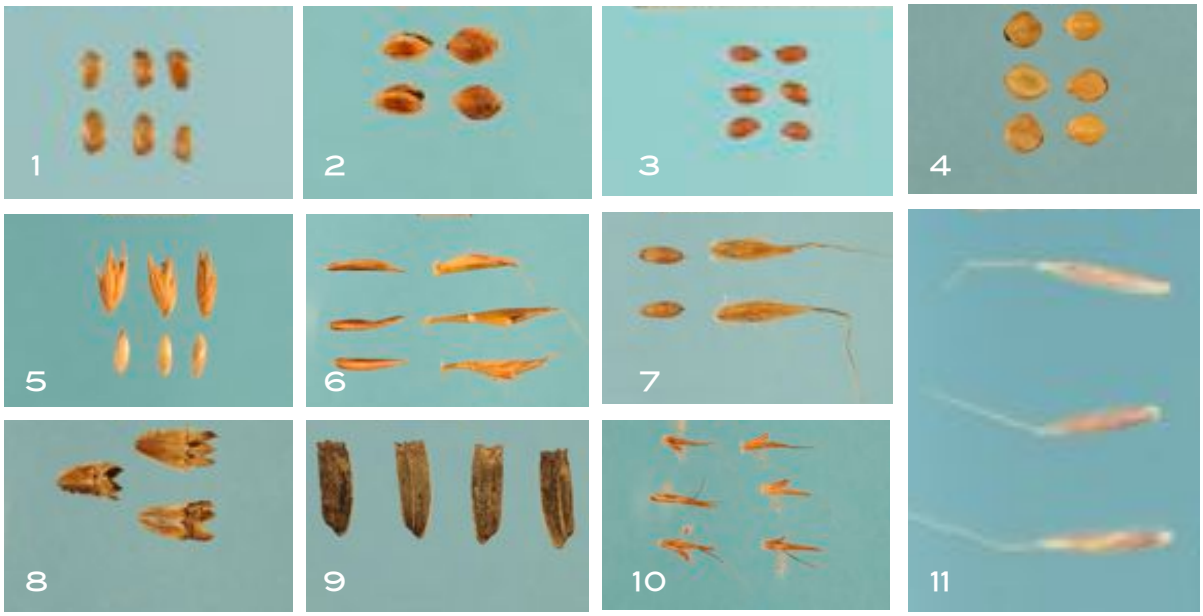
Collecting seeds at their peak ripeness may require several trips to your seed collection site(s). Rainfall amounts, natural variation within species, and mowing regimes can all influence seed availability. The list below is a generalized guide to seed collection.

When to collect seeds in Coastal Texas and Louisiana: Listing by Species and Collection Time			
Species	Collecting Time	Species	Collecting Time
Grasses			
Big Bluestem *Andropogon gerardii*	Nov.- Dec.	Little Bluestem *Schizachyrium scoparium*	Oct.- Dec.
Brownseed Paspalum *Paspalum plicatulum*	Mar.- Nov.	Long-spiked Tridens *Tridens strictus*	Nov.- Dec.
Canada Wild Rye *Elymus canadensis*	Apr.- Dec.	Purpletop Tridens *Tridens flavus*	Nov.- Dec.
Eastern Gamagrass *Tripsacum dactyloides*	Apr.- Nov.	Silver Bluestem *Bothriochloa saccharoides*	Apr.- Dec.
Feathered Threeawn *Aristida purpurascens*	Nov.	Split-beard Bluestem *Andropogon ternarius*	Oct.- Nov.
Florida Paspalum *Paspalum floridanum*	Jul.- Dec.	Switchgrass *Panicum virgatum*	Sep.- Oct.
Gulf Coast Muhly *Muhlenbergia capillaris*	Oct.- Nov.	Yellow Indiangrass *Sorghastrum nutans*	Sep.- Oct.
Wildflowers			
American Aloe *Manfreda virginica*	Nov.	Late-flowering Boneset *Eupatorium serotinum*	Oct.- Nov.
American Basketflower *Centaurea americana*	May-Jun.	Liatris or Blazing Star *Liatris sp.*	Oct.- Nov.
Black-eyed Susan *Rudbeckia hirta*	Aug.- Sep.	Maximillian Sunflower *Helianthus maximiliani*	Oct.- Nov.
Clustered Bushmint *Hyptis alata*	Nov.	Meadow Beauty *Rhexia virginica*	Aug.
Coreopsis *Coreopsis lanceolata*	Jul.- Aug.	Mexican Hat *Ratibida columnifera*	Aug.- Sep.
Erect Baptisa or False Indigo *Baptisia sphaerocarpa*	Mar.- May	Nodding Baptisia or Plains Wild Indigo *Baptisia bracteata*	May - Jun.
Green Milkweed *Asclepias viridis*	Jun.- Jul.	Partridge Pea *Chamaecrista fasciculata*	Nov.
Guara or Beeblossom *Gaura lindheimeri*	Jul.- Aug.	Rattlesnake Master *Eryngium yuccifolium*	Aug.- Sep.
Herbertia *Herbertia lahue*	Apr.- Jun.	Seaside Goldenrod *Solidago sempervirens*	Oct.- Nov.
Horsemint *Monarda citriodora*	Apr.- May	Swamp Sunflower *Helianthus angustifolia*	Oct.- Nov.
Indian Blanket *Gaillardia pulchella*	Mar.- Dec.	Texas Coneflower *Rudbeckia texana*	Jul.- Aug.

Seed Gallery

This gallery is just a sampling of a few of the hundreds of Coastal Prairie seeds that you can collect in our area. Please note that seeds depicted below are not shown at their relative sizes.

Larry Allain, USGS - National Wetlands Research Center



Visit our online native seed gallery

Seeds

(1) Coastal Lovegrass (2) Brownseed Paspalum (3) Purple Lovegrass (4) Florida Paspalum (5) Switchgrass (6) Big Bluestem (7) Yellow Indiangrass (8) Rattlesnake Master (9) Texas Coneflower (10) Little Bluestem (11) Gulf Muhly

Seed Storage - Larry Allain's Advice

In order to maintain seed quality in storage, the sum of relative humidity of the air (in % relative humidity, or RH) and the temperature of the seeds (in degrees Fahrenheit) should total, as a general rule, less than 100. This means that the relative humidity around seeds stored at room temperature (about 72°F) should be less than 28%, while it should be less than 63% for seeds stored in a household refrigerator (~37°F). Storage life of most seeds is doubled for every 10°F drop in temperature, or every 1 percent drop in seed moisture content.

Video 3
Seed Storage - Another Viewpoint

Seeds are hygroscopic, meaning they will absorb or lose water from the atmosphere until they come into equilibrium (which for most seeds takes less than 30 minutes). I put all my seeds in paper packets or bags and store them in Tupperware containers. When relative humidity is high, as it always is in coastal Texas and Louisiana (except maybe in October), seeds should be dried in an air conditioned room. To dry seeds outdoors place the seeds in a shaded location during the day as temperatures are rising and relative humidity is dropping. In the evening when temperatures begin to fall place the seeds in an air tight container and remove again in the morning as temperatures rise. Once seeds have been dried they can be stored in an air tight container with a desiccant to keep them dry. I use empty film containers or medicine bottles with holes drilled, punched, or burned in the sides and top to hold the desiccant. Silica gel, charcoal, powdered milk, or rice can be used as desiccant although I prefer charcoal because it can be dried in the sun where, because of its black color, it dries quickly and completely.

2 Propagating Plants

Cone-tainers

Cheese cloth protecting seedlings

Seed liners

Flat of 4"X4" pots

What do I need to grow prairie natives?

CONTAINERS - You can start your seeds in flats, 4"X4" pots, or "cone-tainers". You'll need 1-gallon pots for "bumping up" seedlings before planting.
LIGHT - Seeds should be started in a semi-shaded area (20%-40% shade). Once sprouted and established, seedlings in 1-gallon containers will thrive in full sun.
SOIL - We suggest starting you seeds in a good potting mix. This soil dries quickly and will necessitate daily watering. When you place your seedlings into 1-gallon containers you should use a sandy-loam topsoil. *Do not* use potting soil in 1-gallon containers.
WATER - If you want to be a successful prairie plant grower, you need to water methodically and frequently. For young seedlings, we suggest watering twice a day for 1 to 2 minute intervals. Once your seedlings are robust 1-gallon-sized plants, you should water them thoroughly twice a week until water runs out of the bottom of the container.
PROTECTION - Consider using cheesecloth to protect seedlings grown in open areas from seedeaters and from damaging rain.

Sowing Seeds

Sowing prairie seeds can be an enjoyable experience to share with friends and family. If seeds are plentiful, don't worry too much about getting an exact quantity of seeds into each container unless the seeds are tiny (such as bushmint or horsemint seeds). Spread seeds liberally over each cell. You can always divide seedlings into separate containers later. As a general rule of thumb, you should sow wildflower seeds soon after collection. If this is not possible, you should store your seeds as indicated earlier in this manual.

Some plant propagation authorities suggest pre-treating seeds prior to sowing. Please remember that many of these techniques were developed to grow plants found on northern prairies. Do a little experimentation of your own to discover what works best for your location.

Seedling Gallery

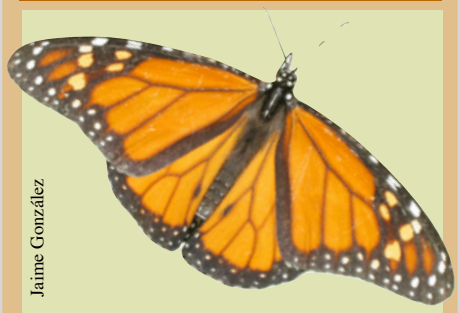
Inexperienced growers may have trouble recognizing prairie plants in the seedling stage. Studying seedlings by pressing them in the pages of a book, photographing them, or drawing them, will help you determine which seedlings are prairie plants and which are weeds that should be pulled. The pictures below are of seedlings of several common prairie plants.

Larry Allain, USGS - National Wetlands Research Center

Seedlings [Visit our online native seedling gallery]

(1) Indian Plantain (2) Mexican Hat (3) White Plains Indigo (4) Brownseed Paspalum (5) White Prairie Clover (6) Rattlesnake Master (7) Texas Coneflower (8) False Indigo (9)Yellow Indiangrass (10) Black-eyed Susan

Connections



Jaime González

fig 5. Monarch Butterfly (*Danaus plexippus*)

Monarch butterflies rely on prairies to find both nectar for adults and milkweed species for their caterpillars.

VIDEO 4
SOWING SEEDS

Jaime González

fig 6. Green Milkweed (*Asclepias viridis*)

Monarch caterpillars feed on the leaves of milkweed that contain powerful toxic chemicals called alkaloids. This, in turn, makes the caterpillars and mature butterflies toxic to birds, providing the insects protection from predators.

Germination Rates

Germination rates can be influenced by species characteristics, seed source, rainfall, temperature, watering schedule, and many other factors. In the table below Larry Allain (A), Flo Hannah (H), and Tom Solomon (S) provide germination rates based on their personal experiences. Because germination is so variable your efforts may be more or less successful than the table below indicates. An (n) indicates that no data was available from that grower.

Typical Germination Rates | 1= High (>75%) 2=Good (51-75%) 3=Fair (25-50%) 4=Low (<25%)

Species	Germination Rate A | H | S	Species	Germination Rate A | H | S
Grasses			
Big Bluestem *Andropogon gerardii*	n | 4 |4	Little Bluestem *Schizachyrium scoparium*	| 2 | 3
Brownseed Paspalum *Paspalum plicatulum*	4 | 1 | 3	Long-spiked Tridens *Tridens strictus*	4 | 1 | n
Canada Wild Rye *Elymus canadensis*	n | n | 1	Purpletop Tridens *Tridens flavus*	n | 1 | n
Eastern Gamagrass *Andropogon Geradi*	n | 1 | 3	Silver Bluestem *Bothriochloa saccharoides*	n | n | 1
Feathered Three-Awn *Andropogon Geradi*	n | 1 | n	Split-beard Bluestem *Andropogon ternarius*	n | n | 1
Florida Paspalum *Andropogon Geradi*	n | 3 | 4	Switchgrass *Panicum virgatum*	n | 1 | 2
Gulf Coast Muhly *Muhlenbergia capillaris*	n | 1 | n	Yellow Indiangrass *Sorgastrum nutans*	2 | 3 | 1
Wildflowers			
Ashy Sunflower *Helianthus mollis*	1 | n | n	Horsemint *Monarda citriodora*	n | n | 1
American Aloe *Manfreda virginica*	n | n | 2	Indian Blanket *Gaillardia pulchella*	n | 1 | 1
American Basketflower *Centaurea americana*	n | 1 | 1	Lanceleaf Loosetrife *Lythrum alatum*	2 | n | n
Black-eyed Susan *Rudbeckia hirta*	n | 1 | 1	Liatris or Blazingstar *Liatris sp.*	3 | n | 1
Calico Aster *Symphyotrichum lateriflorum*	1 | n | n	Mexican Hat *Ratibida columnaris*	n | n | 1
Clustered Bushmint *Hyptis alata*	1 | n | 1	Nodding Baptia or Plains Wild Indigo *Baptisia bracteata*	n | n | 3
Compass Plant *Silphium lacinatum*	3 | n | n	Slender Mountain Mint *Pycnanthemum tenuifolium*	1 | n | n
Coreopsis *Coreopsis lanceolata*	n |1 | 1	Rattlesnake Master *Eryngium yuccifolium*	n | n | 2
Erect Baptisia or False Indigo *Baptisia sphaerocarpa*	n | n | 3	Seaside Goldenrod *Solidago sempervirens*	2 | n | n
Green Milkweed *Asclepias viridis*	n | n | 2	Swamp Sunflower *Helianthus angustifolia*	n | n | 3
Herbertia *Herbertia lahue*	n | n | 1	Texas Coneflower *Rudbeckia texana*	2 | 1 | 2

Division

If you sow many seeds in one container, you will need to divide the seedlings before transplanting them into a large container. This will avoid crowding and will allow them to survive. Because your young seedlings are tender, be careful to keep them moist and be careful to cover all of their roots when transplanting them.

These seedlings need to be divided

Bumping Up

Once you observe your seedlings' roots starting to pop out of the bottom of your starter seed flat or 4" X 4" container, it's time to transplant your seedling(s) to a one-gallon (6") container.

Why not just plant the seedling directly into the ground at this size? At this stage your seedling's roots may only be 4" inches deep. Our Coastal Prairies often experience prolonged periods of little to no rain. The prairie's upper 6-10" of soil can easily dry out, forming a seedling killing layer that Dick Benoit, an experienced prairie restorationist and Texas Master Naturalist, refers to as the "bake layer". Seedlings whose roots cannot reach below this dry layer will not survive.

A container plant is ready to transplant when it has a root system sufficient to hold soil in an intact root ball when removed from its pot but is not so developed that roots have wrapped around the soil ball numerous times. Root wrapped soil balls should be sliced open with a sharp knife before transplanting to allow roots to grow into the surrounding soil. This is a critical stage for your prairie plants and proper transplanting is essential for survival.

Connections

Jaime González

fig 7. American Bison (*Bison bison*)

These grazers were once seasonal residents of local prairies where they fed on grasses and flowering plants. Small herds can still be seen at places such as Attwater's Prairie Chicken National Wildlife Refuge.

Video 5
Division and Bumping Up of Seedlings

Jaime González

fig 8. Black-eyed Susan (*Rudbeckia hirta*)

This beautiful biennial is relished by many herbivores including rabbits and white-tailed deer. Its nectar is a favorite of bees and hummingbird moths.

What to Expect - From Seed to Plant

The table below provides a general idea of the time required for each step in the production process. and is based on the work of Tom Solomon, an experienced plant grower.

Results will vary but success will increase with experience. Continue to provide your seeds and seedlings with the adequate water and proper light conditions and they will respond positively. This manual is a work in progress and we hope to add additional information as it becomes available. You can help by contacting the authors with your own records and observations!

Germination in 4" X 4" Pot (days) | Bump Up to Gallon pot (days) | Ready to Plant (days)				
Species	Sown in January	Sown in April	Sown in July	Sown in October
Big Bluestem	60 | 120 | 120	30 | 60 | 180	30 | 60 | 180	30 | 90 | 240
Canada Wild Rye	30 | 90 | 120	Not Available	Not Available	Not Available
Clustered Bushmint	30 | 90| 180	20 | 60 | 120	20 | 60 | 120	20 | 60 | 150
Coreopsis (Tickseed)	30 | 90 | 120	Not Available	Not Available	Not Available
Erect Baptisia	30 | 90 | 120	Not Available	Not Available	Not Available
Liatris	30 | 180 | 210	Not Available	Not Available	Not Available
Rattlesnake Master	30 | 90 | 120	Not Available	Not Available	Not Available
Swamp Sunflower	30 | 90 | 120	Not Available	Not Available	Not Available
Switchgrass	30 | 90 | 180	15 | 60 | 180	15 | 60 | 180	15 | 60 | 240
Yellow Indiangrass	30 | 90 | 210	10 | 61 | 80	10 | 60 | 180	10 | 90 | 270

Area needed to grow prairie natives		
Number of Plants	4" X 4" pots	1-gallon pots
18	10" X 20"	32" X 32"
36	20" X 20"	3'3" X 3'3"
100		5'5" X 5'5"
225		8'2" X8'2"
500		10'10" X 13'9"
1000		54'2" X 54'2"

Cost of supplies for growing natives		
Item	Price (2009)	Fills
4" X 4" (flat of 18)	$3.42	N/A
1 Gallon pot	$0.49	N/A
Potting Soil (40 lbs)	$6.50	72, 4" X 4" Containers
Topsoil (40 lbs)	$1.50	15, 1-gallon Pots
Water	Dependent on many factors including number of plants grown and season	

Conservative Species

When choosing species for a prairie restoration an effort should be made to include as many **conservative prairie species** as possible. A conservative species is one found in good quality prairie remnants.

Botanists in Louisiana have assigned a value known as a **coefficient of conservatism** (on a scale of 1-10) to coastal prairie species based on their sensitivity to disturbance. Those species found only in undisturbed habitat are assigned a high coefficient (7-10) while weedy, colonizing species, found only in highly disturbed sites, are assigned a low coefficient (0-4). When conducting a restoration, only species with coefficients above 5 should be planted. Species with high coefficients are generally slower, and more difficult, to establish in a restoration. The seeds of weedy species tend be numerous, long lived, and have high viability while the seeds of conservative species are fewer, short lived, and generally have low viability. There are exceptions to these rules among prairie plants.

American Aloe
Manfreda virginica

Diamondflower
Hedyotis nigricans

Pitcher Sage
Salvia azurea

Oklahoma Grass Pink Orchid
Calopogon oklahomensis

Ashy Sunflower
Helianthus mollis

Larry Allain, USGS - National Wetlands Research Center - Diamondflower, Pitcher Sage, Ashy Sunflower, Pink Orchid
Jaime Gonzalez, American Aloe

Conservative Species of Louisiana's Cajun Prairie

Botanists in Louisiana have assigned coefficients of conservatism for many of the species that occur on remaining Coastal Prairie (locally known as the Cajun Prairie) remnants in the Pelican State. The five species pictured above have high coefficients of conservatism (10) for prairie sites in Louisiana.

3 Planting Seedlings

A Planting Protocol

Now that you've grown your prairie natives with dedication and care, it's time to put the plants into the ground. Sufficient watering, suitable transplant size, and proper placement are three critical factors for successful plantings.

We recommend thoroughly soaking your plants before and after planting to reduce stress and to ensure adequate moisture for tender roots. We also highly recommend that plants are grown to full gallon size or larger before planting to allow roots to get past the "bake zone" - around 8". If attempting larger scale restorations, we recommend pre-drilling holes with an auger bit to reduce your workload. Otherwise, make sure to dig holes deep enough with a shovel so that you can transplant your flower or grass with its base roughly even with the surrounding soil.

Tom Solomon's Planting Protocol:

- Dig a hole at 2-3 times the diameter of the container
- Note depth of dirt in pot.
- Adjust depth of planting hole by removing or adding dirt as necessary. Keep a sharpshooter shovel available for significant adjustments.
- Add one gallon of water if pot is dry or if you are planting in hot months of the year.
- Position your hand in the mouth of the pot, invert, and tap bottom. Plant should slide out. If unsuccessful, lay the container on the ground and compress with you hand and try again.
- Firmly insert the plant into the hole, roots first.
- Gather ALL residual dirt around the plant.
- Stand up and tamp the dirt firmly all around the plant with your feet. Do NOT worry about compacting the soil too much, it is critical that no air pockets remain in the soil.
- Add one gallon of water as needed. This step is very important if the ground is dry and during warm months of the year. When in doubt, WATER. ***Dry roots will be fatal to the plant.***
- Repeat with additional plants as needed.

Connections

Greg Lavaty

fig 9. Savannah Sparrow (*Passerculus sandwichensis*)

This abundant year-round resident relies on grass and wildflower seeds. Many common grassland

Video 6
Planting Seedlings

Jaime González

fig 10. Brown-seed Paspalum (*Paspalum plicatulum*)

Warm-season grasses, like this grass, provide energy-rich seeds for prairie birds. They are also an important food source for rabbits, harvester ants, and cows.

4 Using Seed balls

What are Seed Balls?

3 Parts Compost
Provides nutrients to growing seedlings

+

5 Parts Red (not White) Potter's Clay
Protects seedlings from birds, mice, and dry conditions

+

1 Part Seeds
Grows into native flowers and grasses

=

Many Seed Balls
Used to establish small pocket prairies or wildflower gardens

Seed balls are made of a mixture of compost, red potter's clay (do not use white potter's clay - it may burn your skin), native prairie seeds, and water that have been rolled into marble-sized balls and allowed to dry for several days. Each component of a seed ball plays an important role as depicted above. Seed balls are a cost-effective and efficient method of protecting tender seeds from drying wind and sun and from the hungry mouths of mice, birds, and insects. They are very useful in establishing a pocket prairie or wildflower garden.

When & Where to Use Seed Balls

We recommend using seed balls for establishing small (less than 1/8 of an acre) pocket prairies. Making seed balls is also a highly engaging educational activity that allows preschoolers and other young restorationists to take an active role in distributing seeds.

Here are some important considerations:

- Before applying seed balls, make sure to mow vegetation low on application site.
- Apply 10 seed balls per square yard.
- Do not bury or plant seed balls - just let them lie on the surface of the ground.
- Be patient - it will take some time for rains to break the seed balls' outer coating down.
- Experiment with different mixture amounts to see what works best for you - Read the Lady Bird Johnson Wildflower Center's written description of the seed ball making process.

Connections

Video 7
Seed Balls

Photo Credits

Larry Allain | Seedlings, Seeds, Pollinators, Conservative Species
Carolyn Fannon | Big Bluestem, Kansas Blazingstar, Little Bluestem, Rattlesnake Master, Rough Coneflower, Swamp Sunflower, Coastal Prairie in July
Jaime González | Seedling (Front cover), Rattlesnake Master, Railroad meadow, Slender Glass Lizard, Crab Spider, Monarch Butterfly, Green Milkweed, Bison, Brownseed Paspalum, Black-eyed Susan, Seed Ball Components
Greg Lavaty | Savannah Sparrow
Lisa Spangler | Rattlesnake Master
Steve Upperman | Plant Propagation and Planting

Resources

Print and Online resources

Printed Resources

These books provide further guidance on native plant propagation:

- *The Tallgrass Restoration Handbook: For Prairies, Savannas, and Woodlands*, by Stephen Packard and Cornelia F. Mutel, editors. 1997. Society for Ecological Restoration by Island Press
- Native Plant Propagation (2nd ed.), by Jan A.W. Midgley. 2008. Self-published

Online Resources

- Cajun Prairie Habitat Preservation Society | website
- Coastal Prairie Partnership | books & publications
- Native Prairies Association of Texas | resources

Native Seed and Restoration Supplies

- See our website for suppliers | website

Contacts

To get answers about growing out Coastal Prairie natives

- **Tom Solomon**, Texas Master Naturalist | e-mail
- **Flo Hannah**, Houston Audubon | | e-mail
- **Larry Allain**, USGS - National Wetlands Research Center | e-mail

To get answers about Coastal Prairie education

- **Jaime González**, Katy Prairie Conservancy | 281.660.6683 | e-mail

The Coastal Prairie Partnership

Mission

The mission of the Coastal Prairie Partnership (CPP) is to promote and support the conservation of Coastal Prairie ecosystems.

How we work

CPP is a grass-roots, all-volunteer organization made up of partners from NGOs, federal, state, and local governmental agencies, and private individuals across the Coastal Prairie bioregion.

Our group is guided by a steering committee which helps direct the organization and organize annual Coastal Prairie conferences. CPP seeks committed volunteers to help with prairie rescues, seed collecting, plantings, and other critical conservation activities, as well as public outreach and education initiatives.

Membership

CPP membership is free and available through our website at www.coastalprairiepartnership.org.