



Landscaping to Attract Butterflies, Moths, and Skippers

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Butterflies, Moths, and Skippers

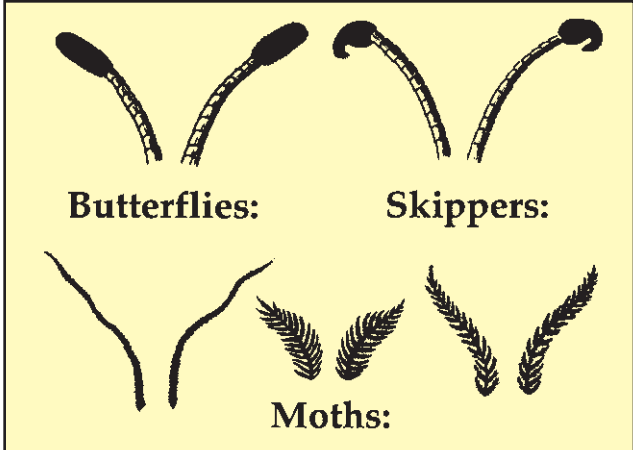
Butterflies, moths, and skippers are some of the most beautiful of all insects. Their striking appearance adds both color and activity to the most pleasing of landscapes. They may also be observed more easily and closely than other species of wildlife. Moths expand the enjoyment time of your garden because they are active primarily during the night, while butterflies and skippers are active during the day.

Butterflies, skippers, and moths belong to the order Lepidoptera. Virtually all members of this order are instrumental in pollinating plants, some specific to a single plant species. Lepidopterans should be conserved and managed because they are an essential component of both the animal food chain and the reproductive process of plants. Locally, many songbirds, reptiles, and amphibians depend upon these insects to survive. The best way to conserve Lepidopterans is to provide suitable habitats. This publication was developed to provide property owners or tenants the information necessary to create these habitats with the greatest ease.

Lepidopteran Physical Characteristics

A key method of determining Lepidopteran identity is by observing antenna shape. A butterfly will have knobby or clubbed looking antennae while a moth's antennae will be feathery, plumed, or threadlike. The antennae of the skipper will appear to be clubbed, yet with a feathery "hook" at the end. The skipper appears to be an intermediate group between the butterfly and moth. Remember, not all moths are active only at night. The Hummingbird Sphinx moth, for example, feeds during the day, and from a distance, looks and sounds like a hummingbird.

Lepidopterans are known for their ability to undergo metamorphosis — a change in form and function. This change occurs through the completion of four stages. First, the butterfly begins as a fertilized egg. It is laid inconspicuously in a group or singly, usually under a leaf, around a stem, or in leaf litter. Depending upon environmental conditions, the egg will hatch in about five to ten days. The next stage is the larval or caterpillar stage. During this time, the caterpillar feeds on plant material to gain enough energy reserves to sustain



Antenna Shapes



Photo by Ron Masters

Tiger Swallowtail (*Papilio glaucus*)

itself through the next stage of development. Next, the pupa or chrysalis stage occurs when the caterpillar finds a suitable plant on which to weave a small silk patch for attachment and complete growth of a pupal skin.

The chrysalis matures in about two weeks. At that time, the adult butterfly emerges with wet, folded wings. After drying, the wings are ready for flight. The adult lifespan, barring predation, is about six days for males and nine days for



Photo by Mike Masters

Luna Moth (*Actias luna*)



Photo by Stephanie Smith

Monarch Butterfly (*Danaus plexippus*)



Photo by Ron Masters

Painted Lady (*Vanessa cardui*), puddling



Photo by Ron Masters

Black Swallowtail (*Papilio troilus*)

females. Silk moths such as the beautiful Luna moth, do not feed as adults. Rather, their sole function as adults is to find partners and mate.

Lepidopterans display their most noticeable attributes by reflecting light. Light is reflected by the thousands of tiny scales that cover their four wings. Each scale grows from a single cell and has several important functions. Scales rub off easily, aiding the butterfly in escape from predators. Scales also enable the butterfly to absorb light, which is essential for maintaining body temperature. Some scales, usually in males, produce scents during courtship. Finally, scales produce the brilliant or sometimes dull colors of butterflies and moths. The colors can be the result of pigmentation or scale structure. Often, scales are shaped like small prisms that diffract light into iridescent colors. Some scales that appear to be white are actually hollow and clear, allowing light to be reflected and scattered. Structurally created colors are enhanced by fluttering of the wings, which continually changes both the angle of light and intensity of reflection.

Lepidopteran wings display some colors of light beyond the human range of visual perception. Ultraviolet rays are crucial for survival because they guide feeding and reproductive behavior. Lepidopterans use ultraviolet rays as visual cues to

locate nectar in flowering plants. Unseen to humans, some blossoms have "directions" to nectar painted in ultraviolet light upon the petals of the flower. Males use ultraviolet light during courtship by reflecting it from their rapidly fluttering wings. This display action produces a kaleidoscope effect intended to catch the attention of a nearby female.

Lepidopterans are adept at detecting plants with suitable nectar in two ways, other than visually. First, they use their antennae, which serve as the primary olfactory receptor, to sample the essence of a plant. Second, on some female butterflies, their two front legs have adapted for the purpose of "tasting" a plant to determine if it is the correct species on which to lay eggs.

Some species of butterflies exhibit cryptic, or camouflaging colors. Moths, for instance, may be dull across all body surfaces while some butterflies have only a dull appearance on the underside of their wings. In this instance, the brilliant colors above function to communicate with other butterflies while the plain sides function to hide them from predators. Some butterflies mimic color patterns of poisonous butterflies, and others may have false antennae on the posterior end of their body, giving them a higher chance of surviving a "frontal" predator attack.

Attracting Lepidopterans (butterflies, moths, and skippers) to your garden

A successful butterfly garden will have:

- A mixture of perennials and annuals, including native plants.
- Nectar plants (such as marigolds, petunias, and asters).
- Plants for larvae (such as tomatoes and herbs).
- A sunny location.
- Shelter from the wind.
- Other features, such as mud puddles or fruit, to attract Lepidopterans.
- Few insecticides and **no bugzappers**.



Behavior

In addition to interesting physical characteristics, Lepidopterans also exhibit several unique behavioral characteristics, one of which is puddling. This occurs when many butterflies or moths gather around a puddle of water or a damp area from which water has evaporated and created a concentration of minerals that they need. Sodium is the primary attractant. For this reason they can be seen gathering on carrion, animal feces, urination sites, and old campfires. Males exhibit this behavior more than females because they require additional sodium for reproduction.

Another behavior exhibited by Lepidopterans is that of courting. Males, while patrolling or perching, are drawn to females by detection of their movement and pheromones. When they have located a potential mate, males begin fluttering their wings conspicuously and displaying their ultraviolet colors.

Butterflies also bask in the bright sun because they cannot fly with a body temperature below 85°F. Flight time affects feeding, mating, and egg laying productivity. Therefore, they must orient their wings, often colored black near the body for heat absorption, toward the sun. Because moths cannot undertake this procedure during night, they have adopted the practice of shivering in order to warm their bodies enough to fly.

Planning the Landscape

Several key elements must be provided for success in the construction of your butterfly garden. Growing nectar plants is the first essential component. These are a primary food source for adults, and without them your garden will not attract nearly as many Lepidopterans. Nectar plants should be planted in large groups according to color. Butterflies recognize the blooms more quickly this way. Also, it is wise to select nectar plants that bloom over several seasons, so that a food source is provided over a longer period of time, increasing feeding activity and your observing opportunity. When planting nectar plants, provide plants of different height. Not only will your flower garden look more organized, it will give both you and the butterflies a wider visual picture of the colorful blossoms.

The second essential component to provide is plants for Lepidopteran larvae. This will also keep the adults in your area. However, most larvae do not feed on the same plants as adults; therefore you must provide appropriate vegetation for females to lay their eggs upon. This is an excellent way to incorporate additional native plants into your landscaping theme, because most larval-food plants are native plants. You should note that many larval-food plants are unsuitable for a showy flower border and would serve better as a large collection in a separate area of your yard.

One possibility is to maintain an herb garden. Herbs such as dill, fennel, parsley, and chives provide excellent food for larvae and produce enough foliage to be harvested for your kitchen. Some vegetable crops such as tomatoes, cabbage, and broccoli are larval food plants. Consider sacrificing some of these from your garden for your Lepidopteran visitors. Clover, which is both a nectar and larval-food plant, may occur in your yard already. When seeded to an area that is not mowed, clover will become a beautiful flowering addition to your garden. Many colorful species are now available at your garden center.

In order to have a successful butterfly garden, you must locate your plantings in a sunny location. This is important for both plants and butterflies. Most blooming plants need exposure to lots of sun to undergo enough photosynthesis to maintain nectar output. Also, butterflies need an open, sheltered area for basking in the sun in order to raise their body temperatures enough to fly. Egg development is also inhibited by cooler temperatures.

Shelter is another essential ingredient for your garden. Taller plants and delicate butterflies need protection from strong gusts of wind. Cooling winds lower the body temperature of butterflies and limit blooming time of flowering plants. Shelter can be wind breaks in the form of deciduous plants, conifers, or even heat absorbing rock fences. Vining plants on fences can serve a dual role as both shelter and a food source when species such as blackberries, Dutchman's pipe, and Japanese honeysuckle are planted. Regardless of the type of shelter used, it should be located on the north and west sides of your garden to block the colder winds.

Components other than plants can be used to attract Lepidopterans to your yard. Try using other attractants such as mud puddles, wet sand, fruit, sap, manure, or even carrion. There are also tried and true moth “brews” that can be made from simple ingredients and painted on tree trunks to allow you to get a closer look at the often unseen night flying moths. This technique is called “sugaring”. Most recipes simply consist of mashed, fermented fruit, yeast, and alcohol. Mashed bananas and a small amount of stale beer alone will work extremely well. When trying to observe or photograph moths at night, keep in mind that they are usually inactive on full moon evenings yet prefer hot, humid nights before a storm. Also, moths seem to have an affinity for white flowers and those emitting their fragrances at night. Intensely bright lights will drive them away whereas a simple flashlight filtered with a red, yellow, or even a paper-towel lens will not disturb them very much. Some moths remain relatively active through November.

When trying to attract insects to your yard, the broadscale use of insecticides is inappropriate. Additionally, bugzappers, even though they are intended to control mosquitoes, will mainly attract and destroy male moths. Therefore, these control measures should not be a part of your landscaping plan. As an alternative control measure, pheromone traps are now available, and will successfully remove the males of many unwanted pests from your yard.

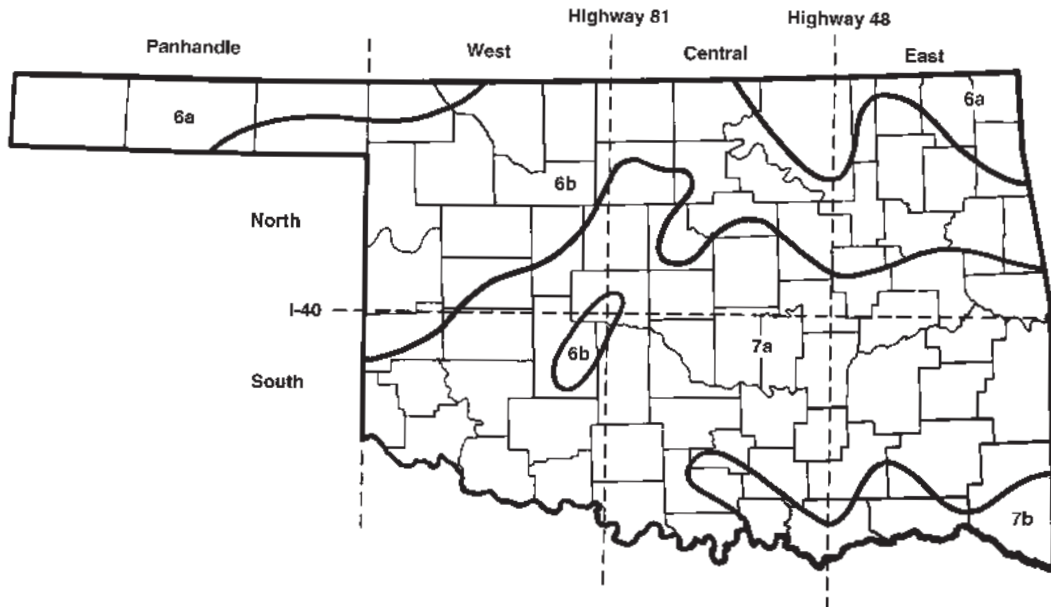
When landscaping to attract Lepidopterans, keep in mind these principles for formulating your garden plan. Be sure to mix perennials and annuals. Annuals bloom for one season only and may have delayed blooming if grown from seed. Perennials, however, already have established roots and tend to bloom within a predictable time frame. Some perennials may be annuals if they cannot survive the winter temperatures in your area. Winter mulching may provide the extra protection that they need from the cold. Use native

plants whenever possible because the Lepidopterans are already familiar with these species and have had success with them in the past. In fact, butterfly declines are a direct result of loss of prime habitat that consists of native plant species. Pollination of many native plant species requires specific adult Lepidopterans for the successful reproduction of that species. Native plants are also beautiful, winter hardy, resistant to disease, low maintenance, and an important part of our regional biodiversity.

SYMBOL KEY

Plant type:	S = Short M = Medium T = Tall	TRE = Tree SHR = Shrub VIN = Vine	AN = Annual BI = Biennial PR = Perennial
Origin:	E = Exotic	N = Native	
Blooming Season:	E = Early M = Middle L = Late	SP = Spring SU = Summer AU = Autumn	WI = Winter
Height/Width:	FT. = Feet		
Hardiness:	1-11 = Hardiness Zones		
Sun:	F = Full S = Shade	P = Partial ALL = All exposures	
Moisture:	D = Dry W = Wet	M = Moist WD = Well drained	
Soil:	ALL = Broad Ranges C = Clayey		L = Loamy S = Sandy
Color:	BLU = Blue LAV = Lavender PIK = Pink ROS = Rose WHT = White	BRW = Brown MAN = Many colors PUR = Purple TAN = Tan YEL = Yellow	GRE = Green ORE = Orange RED = Red VIO = Violet

* = Larval food plant also



Source: USDA U.S. Plant Hardiness Zone Map

U.S. Plant Hardiness Zone Map

LEPIDOPTERAN-NECTAR TREES AND SHRUBS

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Azaleas <i>Rhododendron obtusum</i> 'Hino'	SHR	N	ESP	4 FT.	6 FT.	7-10	PS	MW	SL	RED
Black willow <i>Salix nigra</i>	TRE	N	SP	70 FT.	40 FT.	3-9	FP	WM	ALL	GRE
Blackberry family <i>Rubus trivialis</i>	VIN	N	MSP	6 FT.	20 FT.	6-9	FP	MW	SL	WHT
Boxelder <i>Acer negundo</i>	TRE	N	ESP	75 FT.	45 FT.	2-9	FP	MD	ALL	GRE
Butterfly bush "Summer Lilac" <i>Buddleia davidi</i>	SHR	E	M-LSU	15 FT.	8 FT.	5-9	F	MD	ALL	MAN
Buckeye <i>Aesculus glabra</i>	TRE	N	SP	15 FT.	12 FT.	5-9	PS	WM	ALL	YEL
Buttonbush <i>Cephalanthus occidentalis</i>	SHR	N	LSP-SU	12 FT.	9 FT.	6-10	FP	WM	ALL	TAN
Cherry, wild* <i>Prunus serotina</i>	MTRE	N	LSP-ESU	50 FT.	20 FT.	2-9	F	MW	SL	WHT
Coralberry "Indian currant" <i>Symphoricarpos orbiculatus</i>	MSHR	N	SU	3 FT.	3 FT.	4-9	PS	MD	ALL	GRE
Crape Myrtle <i>Lagerstroemia indica</i>	STRE	E	SU	25 FT.	15 FT.	7-10	F	M	ALL	MAN
Dutchman's pipe <i>Aristolochia durior</i>	VIN	E	MSP	30 FT.	20 FT.	2-9	FP	M	ALL	GRE
Eastern redbud <i>Cercis canadensis</i>	STRE	N	LW-MSP	25 FT.	20 FT.	4-9	FP	MD	L	ROS
English lavender <i>Lavandula angustifolia</i>	SSHR	E	MSU-EAU	3 FT.	3 FT.	5-9	F	MD	L	BLU
Flowering dogwood 'Cherokee Chief' <i>Cornus florida</i>	STRE	N	ESP-ESU	15 FT.	15 FT.	4-9	F	MWD	SL	ROS
Glossy abelia <i>Abelia x grandiflora</i>	MSHR	E	M-LSU	10 FT.	10 FT.	5-10	FP	MD	ALL	WHT
Hard hack <i>Spiraea tomentosa</i>	SSHR	N	ESP	4 FT.	5 FT.	3-5	F	MD	ALL	WHT
Honeysuckle, Japanese <i>Lonicera japonica</i>	VIN	E	SP-SU	8 FT.	8 FT.	6-9	FP	M	ALL	WHT
Jasmine, winter <i>Jasminum nudiflorum</i>	SHR	E	ESP	5 FT.	10 FT.	7-10	F	MD	ALL	YEL
Labrador tea <i>Ledum groenlandicum</i>	SSHR	N	LSP	3 FT.	3 FT.	2-5	F	W	ALL	WHT
Lilac <i>Syringa vulgaris</i> , and cultivars	SHR	E	E-LSP	15 FT.	10 FT.	4-7	FP	MD	SL	LAV
Narrowleaf meadowsweet <i>Spiraea alba</i>	SSHR	N	ESP	4 FT.	3 FT.	3-5	F	WM	L	WHT
New Jersey tea <i>Ceanothus americanus</i>	SSHR	N	SU	3 FT.	3 FT.	5-8	F	D	SL	WHT
Oak family* <i>Quercus</i> spp.	TRE	N	E-LSP	50 FT.	50 FT.	3-9	F	MD	L	GRE
Paw paw* <i>Asimina triloba</i>	TSHR	N	E-LSP	30 FT.	15 FT.	5-8	P	MW	L	BRW

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Plums; Chickasaw, Sand, etc. <i>Prunus angustifolia</i>	SHR	N	ESP-LSU	6 FT.	6 FT.	3-8	F	MD	SL	WHT
Privet, common <i>Ligustrum vulgare</i>	TSHR	E	SU	20 FT.	20 FT.	4-9	FP	MD	ALL	WHT
Red mulberry <i>Morus rubra</i>	MTRE	N	SP	50 FT.	30 FT.	4-9	F	M	ALL	PUR
River Birch <i>Betula nigra</i>	TRE	N	ESP	60 FT.	30 FT.	2-9	FP	M	SL	GRE
Rose, Japanese <i>Rosa rugosa</i>	MSHR	E	SP	6 FT.	6 FT.	2-9	F	MD	SL	ROS
Rosemary <i>Rosmarinus officinalis</i>	SSHR	E	LSP-MSU	3 FT.	3 FT.	6-10	F	MD	L	BLU
Silverberry* "Russian Olive" <i>Eleagnus angustifolia</i>	STRE	E	MA-LA	9 FT.	9 FT.	2-8	F	WMD	SL	WHT
Spicebush* <i>Lindera benzoin</i>	SHR	N	ESP	12 FT.	12 FT.	5-9	FP	M	SL	YEL
Sumac, shining, winged <i>Rhus copallina</i> & <i>R. glabra</i>	TSHR	N	LSP	15 FT.	10 FT.	4-9	FP	MD	SL	RED
Summersweet, Pepperbush <i>Clethra alnifolia</i>	SHR	N	SU	8 FT.	6 FT.	3-9	FP	WM	SL	WHT
Sweet mock orange <i>Philadelphus coronarius</i>	SHR	E	MSP	9 FT.	9 FT.	4-9	FP	M	ALL	WHT
Wayfaring bush <i>Viburnum lantana</i>	SHR	E	SP	8 FT.	12 FT.	3-7	FP	WMD	L	WHT
Weigela, old-fashioned <i>Weigela florida</i>	SHR	E	LSP	9 FT.	6 FT.	5-8	FP	MW	L	PIK
Willow, laurel <i>Salix pentandra</i>	TRE	E	ESP	36 FT.	20 FT.	5-9	FP	WM	ALL	GRE
Willow, prairie <i>Salix humilis</i>	SHR	N	ESP	8 FT.	8 FT.	4-8	F	W	ALL	GRE
Willow, pussy <i>Salix discolor</i>	TSHR	N	ESP	20 FT.	15 FT.	2-8	F	WM	L	TAN
Witchhazel, common <i>Hamamelis virginianus</i>	TSHR	N	E-LAU	20 FT.	20 FT.	4-8	FP	MW	SL	YEL
Witchhazel, vernal <i>Hamamelis vernalis</i>	MSHR	N	MW-ESP	10 FT.	10 FT.	4-8	FP	W	SL	YEL

LEPIDOPTERAN-NECTAR ANNUALS

Anise or Anise-Hyssop <i>Agastache foeniculum</i>	AN	E	LSU	3 FT.	1 FT.	5-9	F	MD	SL	BLU
Asters* <i>Aster</i> spp.	AN	N	SU	3 FT.	3 FT.	5-8	F	MD	SL	MAN
Black-eyed Susan <i>Rudbeckia hirta pulcherrima</i>	AN	N	MSU-MA	3 FT.	2 FT.	4-8	FP	M	ALL	YEL
Begonia 'Othello' <i>Begonia semperflorens</i>	AN	E	ESU-LAU	1.5 FT.	1 FT.	3-9	PF	M	L	RED
Borage <i>Boago officinalis</i>	AN	E	SU	3 FT.	3 FT.	3-8	FP	MD	SL	BLU
Canterbury bells <i>Campanula medium</i>	AN	E	SU	3 FT.	2 FT.	2-8	FP	M	SL	BLU

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Cosmos Cosmos bipinnatus, 'Sulphureus'	AN	E	E-LSU	3 FT.	2 FT.	3-9	F	D	ALL	YEL
Dill* Anethum graveolens	AN	E	LSP	3 FT.	1 FT.	3-9	F	MD	ALL	GRE
Flowering tobacco Nicotiana glauca	AN	E	ESU-EAU	2 FT.	2 FT.	4-9	FP	M	L	WHT
Four O'Clock, Marvel of Peru Mirabilis jalapa	PR	E	MSU-MAU	2.5 FT.	3 FT.	7-9	FP	M	ALL	ROS
Geranium, zonal Pelargonium x hortorum	AN	E	LSP-MSU	2 FT.	2 FT.	3-9	FP	MW	L	RED
Gladiolus Gladiolus spp.	AN	E	SU	3 FT.	1 FT.	3-9	F	MD	SL	MAN
Heliotrope Heliotropium arborescens	AN	E	LSP-SU	2 FT.	2 FT.	3-8	FP	M	SL	LAV
Lantana Lantana camara	AN	E	E-LSU	10 FT.	8 FT.	8-10	PF	M	L	YEL
Marigold, african* Tagetes erecta	AN	E	SU-EAU	3 FT.	2 FT.	3-9	F	MD	L	YEL
Marigold, french* Tagetes patula	AN	E	SU-EAU	1.5 FT.	2 FT.	3-9	F	MD	L	YEL
Marigold, pot* Calendula officinalis	AN	E	MSP	2 FT.	1.5 FT.	7-10	FP	MD	L	ORE
Mexican sunflower Tithonia rotundifolia	AN	E	SU	7 FT.	3 FT.	5-10	F	MD	L	ORE
Nasturtium* Tropaeolum majus	AN	E	SU-LAU	.5 FT.	1 FT.	5-9	FP	MD	SL	MAN
Parsley* Petroselinum crispum	AN	E	SP	1 FT.	1 FT.	3-8	FP	M	L	GRE
Pentas Pentas lanceolata	AN	E	SP-AU	1.5 FT.	1 FT.	5-9	FP	M	L	MAN
Petunia Petunia x hybrida	AN	E	SU-EAU	1.5 FT.	2 FT.	2-8	FP	M	SL	MAN
Phlox Phlox spp.	AN,PR	N	SP-ESU	3 FT.	1 FT.	3-9	F	M	L	MAN
Scarlet star glory "Cypress Vine" Quamoclit coccinea	AN	N	ESU-MAU	8 FT.	2 FT.	5-9	F	MD	L	RED
Scarlet sage, salvia Salvia splendens	AN	E	SU	2.5 FT.	1 FT.	3-9	FP	MD	L	RED
Spider flower Cleome hasslerana	AN	E	SU	5 FT.	4 FT.	3-9	FP	MD	L	ROS
Sunflower, dwarf* Helianthus annuus	AN	N	ESU-EAU	3 FT.	1.5 FT.	4-9	F	MD	ALL	YEL
Sweet pea Lathyrus odoratus	AN	E	LSP-MAU	8 FT.	8 FT.	5-9	FP	MW	L	PIK
Sweet marjoram Origanum marjorana	AN	E	SU	1 FT.	1 FT.	4-9	FP	MD	L	WHT
Sweet William Dianthus barbatus	AN	E	LSP-SU	1.5 FT.	1.5 FT.	4-9	FP	MD	ALL	RED
Touch-me-not, pale Impatiens balsamina	AN	N	ESU-AU	.5 FT.	1 FT.	4-8	SP	WM	SL	PIK
Touch-me-not, spotted Spotted jewelweed Impatiens capensis	AN	N	ESU	2 FT.	1 FT.	3-9	S	WM	L	PIK

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Verbena Verbena hybrida	AN	E	SP-AU	1 FT.	1 FT.	3-9	F	M	SL	MAN
Winter Savory Satureja montana	AN	E	MS-EAU	1 FT.	1 FT.	5-8	FP	MD	SL	WHT
Zinnia Zinnia elegans	AN	E	SU-LAU	3 FT.	1 FT.	4-9	FP	M	L	MAN

LEPIDOPTERAN-NECTAR BIENNIALS/PERENNIALS

Adam's Needle Yucca Yucca filimentosa	PR	N	SU	3 FT.	8 FT.	6-10	FP	MD	ALL	WHT
American columbine Aquilegia canadensis, hybrids	PR	N	MSP	3 FT.	2 FT.	3-9	PF	M	L	MAN
Asters, New England* Aster novae-angliae, A. belgii	PR	N	LSU	4 FT.	2 FT.	4-8	FP	MD	L	MAN
Boneset "Joe-Pye weed" Eupatorium perfoliatum	PR	N	LSU-EAU	3 FT.	1 FT.	4-9	FP	MD	L	BLU
Bouncing bet "Soapwort" Saponaria officinalis	PR	E	MSU-EAU	3 FT.	3 FT.	3-7	F	WD	SL	PIK
Bush clover Lespedeza capitata	PR	N	SLP-SU	4 FT.	2 FT.	6-9	F	D	SL	PIK
Butterfly weed* Asclepias tuberosa	PR	N	SU-MAU	2 FT.	2 FT.	4-9	F	MD	SL	ORE
Centaurea 'Cornflower, bachelor button' Centaurea macrocephala	PR	E	MSP-MSU	4 FT.	1 FT.	3-8	F	WMD	L	BLU
Common evening primrose Oenothera speciosa	PR	N	ESU	2 FT.	2 FT.	3-8	F	WM	ALL	WHT
Coreopsis Coreopsis auriculata	PR	N	ESU-EAU	2 FT.	1 FT.	3-9	F	MD	SL	YEL
Chrysanthemum Dendranthema x grandiflora	PR	E	AU	3 FT.	3 FT.	5-8	FP	M	SL	MAN
Crimson clover* Trifolium incarnatum	BI	E	SU	1.5 FT.	2 FT.	4-8	F	MD	L	RED
Daffodil Narcissus spp.	PR	N	ESP	1.5 FT.	.5 FT	4-9	FP	M	SL	YEL
Dame's violet, Sweet rocket Hesperis matronalis	BI	E	SP	4 FT.	2 FT.	3-8	PS	MD	ALL	PUR
Docks* Rumex spp.	PR	E	LSU	2 FT.	2 FT.	3-9	FP	D	ALL	BRW
Dogbane, intermediate Apocynum medium	PR	N	SU	4 FT.	2 FT.	4-8	FP	MD	L	WHT
Dogbane, Siberian Apocynum sibiricum	PR	E	SU	4 FT.	2 FT.	2-7	FP	MD	L	WHT
Fireweed Epilobium angustifolium	PR	N	MSU-EAU	4 FT.	3 FT.	3-8	PF	MD	SL	RED
Fleabane Erigeron spp.	BI	N	LSP-SU	2 FT.	2 FT.	2-8	F	M	L	BLU
Foxglove, purple Digitalis purpurea	BI	E	LSP-MSU	3 FT.	2 FT.	4-9	FP	M	LS	PUR

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Gaillardia, Blanket flower Gaillardia x grandiflora	PR	N	SU-AU	2 FT.	2 FT.	3-10	F	MD	SL	RED
Garden sage Salvia officinalis	PR	E	ESU-MSU	1 FT.	1 FT.	4-8	FP	MD	ALL	BLU
Gayfeather, dotted Liatris punctata	PR	N	LSU-MAU	2 FT.	1 FT.	5-9	FP	MD	SL	PUR
Gayfeather, Kansas "Prairie Button Snakeroot" Liatris pycnostachya	PR	N	LSU-MAU	2 FT.	1 FT.	4-9	FP	D	L	LAV
Gayfeather; tall, spiked Liatris scariosa, L. spicata	PR	N	LSU-MAU	3 FT.	1 FT.	3-9	F	M	SL	PUR
Globe thistle, dwarf Echinops ritro	PR	E	SU	4 FT.	2 FT.	3-8	FP	MD	SL	BLU
Goldenrods Solidago spp.	PR	N	LSU-MAU	3 FT.	2 FT.	2-8	F	DM	ALL	YEL
Grape hyacinth Muscari neglectum	PR	E	ESP-MSP	.5 FT.	.5 FT.	3-8	F	M	SL	BLU
Hollyhock Alcea rosea	BI	E	SU	3 FT.	1 FT.	5-9	F	MD	ALL	MAN
Hyssop Hyssopus officinalis	PR	E	LSP-MSU	2 FT.	1.5 FT.	4-9	F	D	ALL	BLU
Indian hemp Apocynum cannabinum	PR	N	SU	3 FT.	2 FT.	4-9	F	MD	L	WHT
Iris; German, Dutch Iris germanica, I. xiphium	PR	E	SP-ESU	3 FT.	1 FT.	5-8	FP	MD	L	MAN
Leadplant Amorpha canescens	PR	N	SU	3 FT.	5 FT.	4-8	F	MD	L	PUR
Lemon balm Melissa officinalis	PR	E	SU	2 FT.	2 FT.	4-9	FP	MW	L	WHT
Lovage Levisticum officinale	PR	E	SU	6 FT.	4 FT.	5-7	FP	M	L	YEL
Lupine, wild* Lupinus perennis	PR	N	LSP-MSU	2 FT.	2 FT.	3-9	ALL	MD	L	WHT
Madonna lily Lilium candidum	PR	E	MSU-LSU	6 FT.	1 FT.	4-8	FP	M	SL	MAN
Maltese Cross Lychnis chalcedonica	PR	E	SU	2 FT.	3 FT.	3-9	FP	MD	L	ORE
Maximilian sunflower* Helianthus maximiliani	PR	N	LSU	6 FT.	1 FT.	4-8	F	MD	ALL	YEL
Milkweed, common* Asclepias latifolia	PR	N	LSP-LSU	3 FT.	2 FT.	3-8	FP	MD	ALL	GRE
Milkweed, prairie* Asclepias viridis	PR	N	LSP-SU	5 FT.	2 FT.	4-8	F	M	ALL	WHT
Milkweed, showy* Asclepias speciosa	PR	N	LSP-ESU	3 FT.	3 FT.	4-9	FP	M	ALL	ROS
Milkweed, swamp* Asclepias incarnata	PR	N	SU	4 FT.	2 FT.	3-9	FP	MW	ALL	WHT
Mound Lily Yucca Yucca gloriosa	PR	N	SU	6 FT.	8 FT.	6-10	FP	MD	ALL	WHT
Mountain bluet "Bachelor's Button" Centaurea montana	PR	E	LSP-MSU	2 FT.	1 FT.	3-8	F	MD	L	BLU

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Obedient plant <i>Physostegia virginiana</i>	PR	N	EAU	2.5 FT.	1 FT.	3-9	FP	MD	ALL	LAV
Oriental poppy <i>Papavar orientale</i>	PR	E	LSP-ESU	3 FT.	1 FT.	3-8	F	MW	SL	MAN
Oxeye sunflower* <i>Heliopsis helianthoides</i>	PR	N	MSU-AU	3 FT.	1 FT.	3-9	F	M	ALL	YEL
Ozark Sundrop <i>Oenothera macrocarpa</i>	PR	N	SP	2 FT.	2 FT.	4-8	F	D	L	YEL
Peony, Garden <i>Paeonia latiflora</i>	PR	E	MSP	3 FT.	4 FT.	3-8	FP	MD	L	MAN
Pearly everlasting, cudweed <i>Anaphalis margaritacea</i>	PR	N	LSU-EAU	2 FT.	1 FT.	3-8	F	MD	L	WHT
Peppermints <i>Mentha piperita</i> , etc.	PR	E	SU	2 FT.	2 FT.	5-9	FP	MW	L	WHT
Persian cornflower <i>Centaurea dealbata</i>	PR	E	SU	1.5 FT.	1 FT.	4-7	FP	M	L	PIK
Pincushion flower <i>Scabiosa caucasica</i>	PR	E	SU	2 FT.	1 FT.	3-7	F	MW	SL	BLU
Prairie blazing star <i>Liatris pycnostachya</i>	PR	N	SU-EAU	4 FT.	1 FT.	3-9	FP	M	L	LAV
Prairie thistle* <i>Cirsium undulatum</i>	PR	N	SU-EAU	2 FT.	1 FT.	4-8	F	MD	ALL	LAV
Purple coneflower* <i>Echinacea purpurea</i>	PR	N	SU	4 FT.	2 FT.	3-8	F	MD	ALL	PUR
Queen Anne's lace* "Wild carrot" <i>Daucus carota</i>	BI	E	SU	2 FT.	2 FT.	4-8	FP	MD	ALL	WHT
Red Valerian <i>Centranthus ruber</i>	PR	E	ESP-ESU	3 FT.	2 FT.	4-8	F	MW	SL	RED
Rock cress <i>Arabis caucasica</i>	PR	E	ESP	1 FT.	1.5 FT.	4-7	FP	WD	SL	WHT
Rosemary <i>Rosemarinus officinalis</i>	PR	E	ESP-MSU	2 FT.	3 FT.	6-9	F	M	L	BLU
Selfheal <i>Prunella grandiflora</i>	PR	E	ESU	1 FT.	1 FT.	4-8	FP	W	L	BLU
Shasta Daisies <i>Leucanthemum x superbum</i>	PR	E	ESU	3 FT.	3 FT.	5-8	FP	M	L	WHT
Showy sunflower* <i>Helianthus multiflorus</i>	PR	N	MSU-AU	4 FT.	2 FT.	4-8	F	MD	LS	YEL
Snapdragon* <i>Antirrhinum majus</i>	PR	E	LSP-SU	2.5 FT.	1 FT.	3-9	F	MD	L	MAN
Soloman's seal <i>Polygonatum biflorum</i>	PR	N	LSP	2 FT.	2 FT.	3-9	S	MW	L	WHT
Sedum, showy stonecrop* <i>Hylotelephium spectabile</i>	PR	E	LSU-LAU	2 FT.	2 FT.	3-9	FP	D	SL	ROS
Sweet Violet* <i>Viola odorata</i>	PR	N	SP	.5 FT.	.5 FT.	4-8	S	M	ALL	VIO
Tawny daylily <i>Hemerocallis fulva</i>	PR	E	ESU-EAU	3 FT.	3 FT.	3-9	FP	MD	ALL	ORE
Thyme, common <i>Thymus vulgaris</i>	PR	E	SU	1 FT.	1 FT.	5-8	F	MD	SL	PIK
Tickseed sunflower "Western tickseed" <i>Bidens aristosa</i>	PR	N	ESP-SU	4 FT.	1 FT.	6-9	F	MW	SL	YEL

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
Torch lily <i>Kniphofia uvaria</i>	PR	E	SU	3 FT.	1 FT.	5-9	F	WD	SL	ORE
Turtlehead* <i>Chelone glabra</i>	PR	N	SU	2 FT.	1 FT.	3-8	F	WM	L	PIK
Vetches* <i>Vicia</i> spp.	PR	N	SU	3 FT.	5 FT.	4-8	F	MD	ALL	PUR
Western sunflower* <i>Helianthus occidentalis</i>	PR	N	SU-EAU	3 FT.	2 FT.	4-8	F	MD	SL	YEL
Wild marjoram, Oreganum <i>Origanum vulgare</i>	PR	E	MSU-LSU	2 FT.	2 FT.	4-8	F	MW	SL	PIK
Wild bergamot or Beebalm <i>Monarda didyma</i>	PR	N	SU	3 FT.	6 FT.	4-9	FP	M	L	RED
Yarrow <i>Achillea millefolium</i>	PR	N	E-MSU	2 FT.	1 FT.	4-8	F	MD	L	WHT

LEPIDOPTERAN-LARVAL TREES AND SHRUBS

Blueberry, "Rabbit-eye" <i>Vaccinium ashei</i>	SSHR	N	ESU	10 FT.	10 FT.	7-10	FP	M	L	PIK
Cottonwood <i>Populus deltoides</i>	TRE	N	ESP	80 FT.	40 FT.	3-10	F	D	ALL	WHT
Elm, winged <i>Ulmus alata</i>	TRE	N	ESP-LAU	50 FT.	50 FT.	5-8	F	D	ALL	GRE
Hackberry <i>Celtis</i> spp.	STRE	N	ESP	60 FT.	40 FT.	5-10	F	MW	L	GRE
Leadplant <i>Amorpha canescens</i>	SSHR	N	LSU	3 FT.	3 FT.	2-9	F	D	ALL	PUR
Locust, black <i>Robinia pseudoacacia</i>	STRE	N	ESP	50 FT.	40 FT.	4-10	FP	D	ALL	WHT
Passion vine <i>Passiflora incarnata</i>	VIN	N	SU	20 FT.	10 FT.	7-10	FP	MD	SL	LAV
Tulip tree <i>Liriodendron tulipifera</i>	TRE	N	ESU	60 FT.	40 FT.	4-9	FP	WM	L	RED/GRE

LEPIDOPTERAN-LARVAL ANNUALS

Cabbage, flowering <i>Brassica oleracea capitata</i>	AN	E	SP	1 FT.	1 FT.	2-9	F	M	SL	MAN
Balsam, white <i>Gnaphalium obtusifolium</i>	AN	N	LSU	3 FT.	3 FT.	5-8	F	D	SL	WHT
Beans <i>Phaseolus</i> spp.	AN	E	ESU	7 FT.	2 FT.	3-8	F	M	L	WHT
Broccoli <i>Brassica oleracea italica</i>	AN	E	SP	3 FT.	2 FT.	2-9	F	M	SL	GRE
Everlasting, cudweed <i>Gnaphalium purpureum</i>	AN	N	LS-EAU	1.5 FT.	1.5 FT.	4-8	F	D	SL	PUR
Mallow tree <i>Malva lavantera thuringiaca</i>	AN	E	SU	5 FT.	3 FT.	5-8	F	MD	ALL	ROS
Smartweed <i>Polygonum</i> spp.	AN	N	SU-AU	2 FT.	2 FT.	4-8	F	M	CL	PIK
Sneezeweed <i>Helenium</i> spp.	AN	N	SU-EAU	2 FT.	2 FT.	4-9	F	D	ALL	YEL
Tomato <i>Solanum esculentum</i>	AN	E	SU	5 FT.	3 FT.	3-10	F	M	L	YEL/RED

Name	Plant type	Origin	Blooming Season	Height	Width	Hardiness	Sun	Moisture	Soil	Color
LEPIDOPTERAN-LARVAL BIENNIALS/PERENNIALS										
Alfalfa Medicago sativa	PR	E	SLP-ESU	2.5 FT.	3.5 FT.	4-8	F	M	L	LAV
False nettle Boehmeria cylindrica	PR	E	LS-EAU	1.5 FT.	1.5 FT.	4-8	F	S	SL	PUR
Hops, common Humulus lupulus	PR/VIN	E	SPR	15 FT.	10 FT.	4-8	F	M	SL	GRE
Knotweed Polygonum spp.	PR/AN	N	SU-AU	2 FT.	2 FT.	4-8	F	MW	CL	PIK
Partridge pea, showy Cassia fasciculata	PR	N	SU-EAU	3 FT.	3 FT.	3-10	F	D	ALL	YEL
Sorrel, rosy canaigre Rumex hymenosepalus	PR	N	SP	3 FT.	3 FT.	4-8	F	D	ALL	ROS
Winter cress Barbarea vulgaris	PR	E	LSP	3 FT.	3 FT.	3-9	F	D	ALL	YEL

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