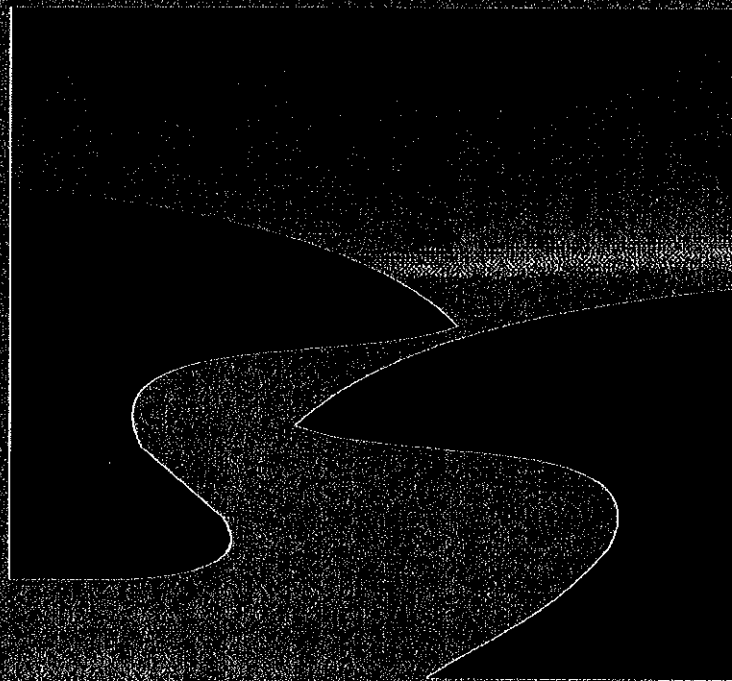


MASTER DESIGN GUIDELINES
FOR
SENDERO RANCH

Appendix A, Appendix B, Illustration 1



Appendix A

Master Design Guidelines

1. Founding of the Master Design Guidelines

The Master Design Guidelines, and the Master Design Committee were created through Article VII, MASTER DESIGN COMMITTEE of the Declaration of Covenants, Conditions, Easements and Restrictions, as filed with the City of San Antonio, Volume 6241, Pages 0897- 0918, for Sendero Ranch Planned Unit Development. **Other provisions within the Declaration that are applicable to design and landscape control are incorporated herein by reference, and control over the provisions herein.** Capitalized terms used within the Master Design Guidelines, but not defined herein, shall bear the same meaning as in the Declaration.

2. The Master Design Committee

The Master Design Committee may, from time to time and in its sole discretion, adopt, amend, and repeal by unanimous vote, rules and regulations to be incorporated into the Master Design Guidelines or the design guidelines of any additional unit or annexation which, among other things interpret, supplement, implement or entirely revise the provisions of those Guidelines. All such rules, regulations, or amendments, as may from time to time be adopted, amended, or repealed, should be appended to and made a part of the Master Design Guidelines or the design guidelines of the units affected, and shall have the same force and effect as if they were set forth in, and were part of, the applicable Guidelines.

Each Owner is responsible for obtaining from the Master Design Committee a copy of the most recently revised Master Design Guidelines, and should inquire if any substantive amendments to the Master Design Guidelines have been adopted since the most recent printing of the Master Design Guidelines.

3. Correspondance with the Master Design Committee

All notices and correspondance required herein shall be made to:

Sendero Ranch Master Design Committee
% Steven H. Brown
1600 N. E. Loop 410, Suite 202
San Antonio, Texas 78209
Telephone: (210) 829-7202

4. Non-Liability of Master Design Committee and Developer

Neither the Master Design Committee, any member thereof, nor the Developer, or their respective successors or assigns, shall be liable in damages to anyone submitting drawings or specifications to them for approval, or to any Owner or other person by reason of mistake in judgment, negligence, or nonfeasance arising out of or in connection with the approval or disapproval or failure to approve any drawings or specifications or by the approval or disapproval of the primary contractor by the Master Design Committee. **By submission of such for approval, an Owner agrees that he will not bring any action or suit against the Master Design Committee, any member thereof, or Sendero Ranch Development Ltd., the Developer.** Approval of a submittal or of a contractor shall not be deemed to be a representation or warranty that the Owners' drawings or specifications for the actual construction of a residence or other improvement complies with applicable governmental ordinances or regulations, or of any ability fiscal or otherwise of the contractor. Furthermore any approvals by the Committee does not warrant habitability or soundness of structure in any way. It shall be the sole responsibility of the Owner or any agent of the Owner on his behalf submitting drawings or specifications to the Master Design Committee, as well as any person performing any construction, to comply therewith.

5. Enforcement

These Master Design Guidelines may be enforced by the Master Design Committee or the Sendero Ranch Owners' Association as provided herein, or in the Declaration, or in the Bylaws of the Association.

6. Right of Waiver

The Master Design Committee reserves the right to waive procedures or standards set forth at its sole discretion for good cause.

7. Estoppel Certificate

Within 30 days after written demand is delivered to the Master Design

Committee by any Owner, and upon payment therewith to the Master Design Committee of a reasonable fee from time to time to be fixed by it, the Master Design Committee shall record an estoppel certificate executed by any two of its members certifying with respect to any Lot of said Owner, that as of the date thereof either all improvements and other work made or done upon said Lot: (a) **comply** with the Master Design Guidelines and the Master Declaration, or (b) **do not so comply**. In the event the improvements do not comply, the certificate shall also (1) identify the noncomplying improvements and/or work and (2) set forth particularly the cause or causes for such noncompliance. Any purchaser from the Owner or mortgagee or other encumbrancer shall be entitled to rely on said certificate with respect to the matters therein set forth, such matters being conclusive as between the Sendero Ranch Owners' Association, the Master Design Committee, Developer, all Owners and other interested Persons, and such purchaser, mortgagee, or other encumbrancer.

8. Commencement of Construction

Upon receipt of approval from the Master Design Committee, the Owner shall satisfy all conditions thereof and commence the construction, reconstruction, refinishing, alterations, or other work pursuant to the approved drawings within one year from the date of such approval. If the Owner shall fail to comply with this paragraph, any approval given shall be deemed revoked unless, upon the written request of the Owner made to the Master Design Committee prior to the expirations of said one-year period, and upon finding by the Master Design Committee that there has been no change in circumstances, the time for such commencement may be extended in writing by the Master Design Committee. The Owner shall, in any event, complete the construction, reconstruction, refinishing, or alteration of the foundation and all exterior surfaces (including the roof, exterior walls, windows, and doors) of any improvement of his Lot within one year after commencing construction thereof, except when and for so long as, such completion is rendered impossible or would result in great hardship to the Owner due to strikes, fires, national emergencies, or natural calamities. If Owner fails to comply with this paragraph, the Master Design Committee may notify the Board of Directors of the Sendero Ranch Owners' Association of such failure, and the Board at its option, shall either complete the exterior in accordance with the approved drawings, or remove the improvement and return the Lot to its natural state prior to construction. The Owner shall reimburse the Sendero Ranch Owners' Association for all expenses incurred in connection therewith.

Appendix B

Approved Plant List

1. Planting Zones Within Your Lot

The Master Design Committee supports a landscape ethic which recognizes the reality of the semi-arid zone in which Sendero Ranch is located, and thus does not support extensive areas of high water demand planting areas. For the purpose of guiding home owners and landscape designers, we have identified three basic "hydrozones" - or planting zones - each of which is based upon a different set of plants and water requirements:

2. The Microclimate

This zone allows for the most intensive landscape and the widest variety of plants with high water requirements. It is appropriate within courtyards, patios or fenced/walled gardens associated with the residence. Due to the protection from wind provided by building and courtyard walls, these areas present microclimates allowing for both functional uses and visual delights of a broader range of introduced ("foreign") plants. Shade trees within this zone should not be of a larger scale than mature Live Oaks and should be limited in size to up to 25 feet in height. Fruit trees and shrubs which might otherwise be difficult to grow in this area find their rightful place in this zone.

3. Perimeter Transition Zone

Areas immediately outside the building walls which involve high use - such as entry areas, portals, patios not enclosed by walls, etc.- may be planted with a combination of plants which will require permanent watering but which provide a visual transition to the xeriscape zone beyond. Native and drought tolerant perennials such as coreopsis, verbena, blue and red sage, iris, day lilies and many others can provide color from spring till frost in this area.

4. Xeriscape Zone

Plantings which make up the remainder of the property within the area disturbed by construction within the Developable Area of the Lot, and supplemental planting to the Native Area should be drought and wind tolerant native plants and plants which have proven to be adaptable to local conditions with a minimum of additional water

and care. Most of the approved plants will require additional watering for the first two years, and then will survive with natural rainfall alone. A few of the plants will require a minimum of additional watering during their lifetime in order to thrive and present the best appearance. Grasses in this zone should be a mixture of native grasses such as blue grama, side oats grama, buffalo grass, etc., which will also require additional watering for the first few years to establish a solid cover. After establishment, only sufficient additional watering as is desired to maintain the best appearance, (approximately half that required for typical lawn grasses) will be required. As in the Transitional Zone, it is possible to create a colorful landscape within this zone with a wide variety of native or drought tolerant wildflowers (both annuals and perennials) which will require minimal care and water.

5. Approved Plant List

The Master Design Committee has found the plant lists developed by the National Wildflower Research Center "Recommended Species for Central Texas" and "Recommended Species for South Texas" to be inherently compatible with Sendero Ranch landscape ethic and approves the use of these plants within Sendero Ranch as provided within these guidelines. Any species not contained therein may not be planted or installed within Sendero Ranch without written approval from the Master Design Committee. Any species of trees or shrubs not listed which have been found to be indigenous to the Sendero Ranch may also be acceptable, but upon specific review and approval of the Master Design Committee.

In order to help you and your landscape designer, the additional National Wildflower Research Center publications "Native Plant Bibliography for Texas", "Texas Sources for Native Plants and Seeds", "Gardening and Landscaping with Native Plants", and "Wildflower Meadow Gardening" are also included herewith. In addition, the National Wildflower Research Center has consultants available at a nominal fee to help you either by prepaid telephone conversations or by personal appointments.



CLEARING HOUSE

Recommended Species for South Texas

Botanical name	Common name	Site preference
WILDFLOWERS		
Annuals		
<u>Amblyolopis setigera</u>	Huisache daisy	Sandy loam or caliche, open areas; sun
<u>Castilleja indivisa</u>	Indian paintbrush	Sandy prairies, openings; sun
<u>Cassia fasciculata</u>	Partridge pea	Open, sandy fields; sun
<u>Centaurea americana</u>	Basketflower	Sandy or clayey loam, open areas; sun
<u>Coreopsis tinctoria</u>	Coreopsis	Moist, sandy soil, low areas; sun
<u>Gaillardia pulchella</u>	Indian blanket	Dry, well-drained soil; sun
<u>Lindheimeria texana</u>	Texas star	Sandy or limestone soil, open areas
<u>Lupinus texensis</u>	Texas bluebonnet	Well-drained clay or limestone soil; sun
<u>L. subcamosus</u>	Bluebonnet	Sandy soil; sun
<u>Monarda citriodora</u>	Horsemint	Well-drained, sandy loam to rocky soil; sun
<u>M. punctata</u>	Horsemint	Sandy soil, open areas, waste places; sun
<u>Phlox drummondii</u>	Drummond's phlox	Prefers sandy loam; sun
<u>Rudbeckia hirta</u>	Black-eyed Susan	Variety of soils; sun to part sun
Perennials		
<u>Achillea millefolium</u>	Yarrow	Wide variety of soils; sun-shade
<u>Callirhoe involucrata</u>	Winecup	Sandy soil in prairies; sun
<u>Cooperia drummondii</u>	Rain lily	Variety of soils, open areas; sun-part sun
<u>C. pedunculata</u>	Rain lily	Well-drained sandy or clayey loams
<u>Delphinium carolinianum</u>	Blue larkspur	Sandy oak woods on Aransas Refuge
<u>Desmanthus illinoensis</u>	Bundleflower	Shell deposits east of Aransas Pass
<u>Eryngium yuccifolium</u>	Rattlesnake master	Damp sands in depressions near coast
<u>Helianthus maximiliani</u>	Maximilian sunflower	Moist, clay-like soil; sun
<u>Kosteletzkya virginica</u>	Salt marsh-mallow	Moist soils, ditches, marshes, along shores
<u>Monarda fistulosa</u>	Beebalm	Dry, open areas; sun
<u>Oenothera speciosa</u>	Showy pink primrose	Open areas in a variety of soils; sun
<u>Penstemon cobaea</u>	Wild foxglove	Loamy to clay soils; sun
<u>Ratibida columnaris</u>	Mexican hat	Variety of soils; sun-part sun
<u>Salvia coccinea</u>	Scarlet sage	Loamy or alkaline soil; sun-part sun
<u>S. farinacea</u>	Mealy blue sage	Alkaline soils around Goliad
<u>Verbena bipinnatifida</u>	Verbena	Variety of soils, open areas, waste places
<u>Vernonia baldwinii</u>	Ironweed	Dry, well-drained soil; sun
GRUBS		
<u>Abutilon hypoleucum</u>	Rio Grande abutilon	Sandy loam, moist, well-drained soil; shade
<u>Agave americana</u>	Century plant	Well-drained soil; sun

Atriplex canescens
Berberis trifoliolata
Capsicum annuum
Colubrina texensis
Callicarpa americana
Condalia hookeri
Erythina herbacea
Eupatorium coelestinum
E. odoratum
Euphorbia antisiphilitica
Eysenhardtia texana
Hesperaloe parviflora
Hibiscus cardiophyllus
Lantana horrida
Larrea tridentata
Lencophyllum frutescens
Malpighia glabra
Malvaviscus arboreum
Mimosa wherryana
Nolina texana
Opuntia sp.
Pavonia lasiopetala
Salvia greggii
Sabal minor
Schaefferia cuneifolia
Yucca constricta
Y. treculeana
Zexmenia hispida

Four-wing saltbush
Agarita
Chile pequin
Snakewood
Beautyberry
Condalia
Coralbean
Mistflower
Blue mistflower
Candelilla
Bee brush
Red yucca
Rose mallow
Lantana
Creosote bush
Cenizo
Barbados cherry
Turk's cap
Wherry mimosa
Basket grass
Prickly pear
Pavonia
Autumn sage
Palmetto
Desert yaupon
Yucca
Spanish dagger
Zexmenia

Well-drained soil, saline okay; sun
Brushy pastures, variety of soils; sun
Well-drained soil; part shade-shade
Well-drained soil; sun
Coastal woods, bottomlands; shade
Variety of soils, brushy pastures, woods; sun
Coastal sands, also oak mottes; sun-part sun
Damp sandy wooded areas
Well-drained soil, mottes, low woods
Well-drained soil; sun
Variety of soils, brushy pastures
Prairies, rocky slopes, mesquite groves
Well-drained loam or caliche
Sandy or clayey soil, pastures, woods
Well-drained soil; sun
Caliche ridges, bluffs, slopes
Moist but well-drained soil; sun-part shade
Moist but well-drained soil; part sun-shade
Well-drained soil; sun-part shade
Well-drained soil; sun-part sun
Well-drained soil; sun
Well-drained soil, rocky woods; sun-shade
Well-drained soil; sun
Moist soil; part sun-shade
Well-drained soil; sun
Well-drained sand or caliche
Well-drained soil, fields, coastal dunes
Well-drained soil; sun

SMALL TREES

Acacia greggii
A. rigidula
A. wrightii
Caesalpinia mexicana
Condalia hookeri
Cordia boissieri
Cornus drummondii
Eysenhardtia texana
Guaiacum angustifolium
Ilex decidua
I. vomitoria
Karwinskia humboldtiana
Pistacia texana
Pithecellobium pallens
Sophora secundiflora
S. tomentosa
Ungnadia speciosa

Catclaw
Blackbush acacia
Wright acacia
Mexican poinciana
Condalia
Mexican olive
Roughleaf dogwood
Kidneywood
Guayacan
Possum haw
Yaupon
Coyotillo
Texas pistachio
Tenaza
Mountain laurel
Yellow sophora
Texas buckeye

Dry loams or caliche
Well-drained soil; sun
Well-drained soil; sun
Well-drained soil; sun
Well-drained soil; sun-part shade
Well-drained soil; sun-part shade
Bottomlands near rivers
Well-drained soil; sun-part shade
Well-drained soil; sun
Bottom woods; sun-part shade
Sandy oak woods; sun-shade
Well-drained soil; sun
Well-drained soil; sun
Well-drained loam; sun
Caliche ridges, bluffs, ravines
Warm coastal areas; sun-part sun
Creek bluffs, rocky slopes; sun-part sun

LARGE TREES

Acacia farnesiana
Carva illinoensis
Cercidium macrum
Ehretia anacua
Fraxinus berlandieriana

Huisache
Pecan
Paloverde
Anacua
Mexican ash

Poorly drained or low ground in pastures
Along San Antonio & Mission rivers
Brushy pastures on well-drained soils
Well-drained soil; sun-part shade
Stream banks

Parkinsonia aculeata
Pithecellobium flexicaule
Platanus occidentalis
Prosopis glandulosa
Quercus hemisphaerica
Q. macrocarpa
Q. marilandica
Q. virginiana
Sabal mexicana
Sapindus saponaria
Ulmus crassifolia
Ziziphus jujuba

Retama
Texas ebony
Sycamore
Honey mesquite
Laurel oak
Bur oak
Blackjack oak
Live oak
Texas palm
Soapberry
Cedar elm
Jujube

Stream bottoms, low places
Well-drained soil; sun-part shade
Stream banks near San Antonio River
Variety of soils, open areas
Coastal sands
Scattered along San Antonio River
Coastal sands, also sandy woods
Variety of soils where moisture exists
Variety of soil, poor drainage okay; sun
Sandy mottes, woods, stream banks
Well-watered areas
Well-drained soils

GRASSES

Andropogon gerardii
A. glomeratus
Bouteloua curtipendula
Eragrostis spectabilis
Panicum virgatum
Schizachyrium scoparium
Sorghastrum nutans

Big bluestem
Bushy bluestem
Sideoats grama
Purple lovegrass
Switchgrass
Little bluestem
Indiangrass

Prairies, open woods, sandy or loamy soil
Low, moist sites
Loose, limey soils
Sandy or disturbed soil
Moist lowlands
Open woods, prairies, roadsides
Open woods and prairies

VINES

Bignonia capreolata
Campsis radicans
Clematis pitcheri
Ipomoea stolonifera
Lonicera sempervirens
Parthenocissus quinquefolia
Wisteria macrostachya

Crossvine
Trumpet creeper
Leatherflower
Morning glory
Coral honeysuckle
Virginia creeper
Wisteria

Variety of soil, moist sites; sun-shade
Woods along streams; sun-part shade
Fence rows; sun-part sun
Barrier islands, bay beaches; sun
Sun-part sun
Sun-shade
Sun-part shade

NOTE: Gardeners and conservationists should seek out nurseries that propagate their own plants or that purchase nursery-propagated plant materials. As consumers, we need to avoid purchasing wild-collected plants. Some native plants are diminishing in number, and it is ecologically detrimental to dig up wild plants unless an area is to be developed. It is best to either collect seeds from wild plants or to purchase seeds (or plants grown from wild seeds) from commercial nurseries.



CLEARING HOUSE

Recommended Species for Central Texas

Botanical name	Common name	Site Preference
WILDFLOWERS		
Annuals		
<u>Amblyolepis setigera</u>	Huisache daisy	Dry, well-drained soil; sun
<u>Cassia fasciculata</u>	Partridge pea	Open, sandy fields; sun
<u>Castilleja indivisa</u>	Indian paintbrush	Sandy loam; sun
<u>Centaurea americana</u>	Basket flower	Dry, well-drained soil; sun
<u>Coreopsis tinctoria</u>	Coreopsis	Moist, sandy soil; sun
<u>Dracopis amplexicaulis</u>	Clasping-leaf coneflower	Moist areas, ditches; sun
<u>Eryngium leavenworthii</u>	Eryngo	Plains, prairies; sun
<u>Eustoma grandiflorum</u>	Texas bluebell	Moist areas in prairies; sun
<u>Gaillardia pulchella</u>	Indian blanket	Variety of soils, disturbed areas; sun
<u>Linum lewisii</u>	Blue flax	Sandy or rocky soils; sun
<u>Lupinus texensis</u>	Bluebonnet	Well-drained, alkaline soil; sun
<u>Machaeranthera tanacetifolia</u>	Tahoka daisy	Rocky or sandy soils; sun
<u>Monarda citriodora</u>	Horsemint	Well-drained, sandy loam to rocky soil; sun
<u>Palafoxia callosa</u>	Palafoxia	Limestone soil; sun
<u>Phacelia congesta</u>	Blue curls	Moist, well-drained soils; sun-shade
<u>Phlox drummondii</u>	Drummond's phlox	Prefers sandy soil; sun-part sun
<u>Rudbeckia hirta</u>	Black-eyed Susan	Varies widely; sun-part sun
<u>Thelesperma filifolium</u>	Greenthread	Calcareous soils; sun
Perennials		
<u>Achillea millefolium</u>	Yarrow	Wide variety of soils; sun-shade
<u>Aquilegia canadensis</u>	Columbine	Rocky, well-drained sites; part shade-shade
<u>Asclepias tuberosa</u>	Butterfly weed	Moist areas in prairies, roadsides; sun
<u>Callirhoe digitata</u>	Winecup	Open woods, plains; sun
<u>C. involucrata</u>	Winecup	Open woods, rocky hills; sun
<u>Calylophus drummondianus</u>	Square-bud primrose	Sandy or rocky soils; sun
<u>Cassia lindheimeriana</u>	Lindheimer senna	Limestone or black clay soils; sun
<u>C. roemeriana</u>	Two-leaved senna	Limestone or black clay soils; sun
<u>Cooperia drummondii</u>	Rain lily	Open fields, prairies, lawns; sun
<u>C. pedunculata</u>	Rain lily	Open fields, prairies, lawns; sun
<u>Coreopsis lanceolata</u>	Lanceleaf coreopsis	Variety of soils; sun
<u>Delphinium carolinianum</u>	Prairie larkspur	Dry, open woods and fields; sun
<u>Echinacea angustifolia</u>	Purple coneflower	Dry, rocky prairies and hillsides; sun
<u>E. purpurea</u>	Purple coneflower	Rocky, open woods; sun-part sun
<u>Engelmannia pinnatifida</u>	Engelmann daisy	Open, calcareous sites; sun
<u>Eryngium leavenworthii</u>	Eryngo	Plains and prairies; sun
<u>Eupatorium coelestinum</u>	Mistflower	Moist, sandy wooded area; sun-part sun

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<u>Helianthus maximiliani</u>	Maximilian sunflower	Moist, clay-like soil; sun
<u>Hymenoxys scaposa</u>	Four-nerve daisy	Dry, well-drained sites; sun
<u>Ipomopsis rubra</u> (biennial)	Standing cypress	Dry sandy or rocky soil; sun
<u>Liatris mucronata</u>	Gayfeather	Well-drained soils; sun
<u>L. pycnostachya</u>	Gayfeather	Well-drained, calcareous soil; sun
<u>Lobelia cardinalis</u>	Cardinal flower	Wet to moist soil; sun-part shade
<u>Melampodium leucanthum</u>	Blackfoot daisy	Calcareous soil; sun
<u>Monarda fistulosa</u>	Beebalm	Dry, open woods, wet meadow; sun-part sun
<u>Oenothera macrocarpa</u>	Missouri primrose	Limestone hills and prairies; sun
<u>O. speciosa</u>	Showy primrose	Open areas in a variety of soils; sun
<u>Penstemon baccharifolius</u>	Rock penstemon	Limestone crevices; sun-part shade
<u>P. cobaea</u>	Wild foxglove	Loamy soil, prairies; sun
<u>P. triflorus</u>	Hill Country penstemon	Limestone soil; sun-part shade
<u>Physostegia pulchella</u>	Obedient plant	Wet soils of bottomlands; sun-part sun
<u>Ratibida columnaris</u>	Mexican hat	Variety of soil; sun-part sun
<u>Salvia coccinea</u>	Scarlet sage	Thickets and open woods; part shade
<u>S. engelmannii</u>	Engelmann sage	Limestone soils; sun
<u>S. farinacea</u>	Mealy blue sage	Wide variety of soils; sun-part sun
<u>S. roemeriana</u>	Cedar sage	Woody, rocky areas; part shade
<u>Solidago</u> spp.	Goldenrod	Sandy to clay soil; sun
<u>Tradescantia</u> spp.	Spiderwort	Prairies and plains, moist areas; part sun
<u>Verbena bipinnatifida</u>	Dakota vervain	Fields; sun
<u>V. elegans</u> var. <u>aperata</u>	Mountain vervain	Limestone and sandstone outcrops; sun
<u>Vernonia baldwinii</u>	Ironweed	Dry, well-drained sites; sun
<u>V. lindheimeri</u>	Woolly ironweed	Limestone soil; sun
<u>Wedelia texana</u>	Wedelia	Dry, well-drained sites; sun

SHRUBS

BLACKLAND PRAIRIE - east of the Balcones fault line

<u>Amorpha fruticosa</u> var. <u>angustifolia</u>	False indigo	Moist woods, stream banks; calcareous soil
<u>Anisacanthus wrightii</u>	Flame acanthus	Dry, well-drained soil
<u>Berberis swaseyi</u> (evergreen)	Texas barberry	Dry, well-drained soil
<u>B. trifoliolata</u> (evergreen)	Agarito	Dry, well-drained soil
<u>Callicarpa americana</u>	American beauty bush	Rich woods, thickets
<u>Dalea frutescens</u>	Black dalea	Dry soil in full sun
<u>Erythrina herbacea</u>	Coral bean	Sandy or loamy soils; sun-part shade
<u>Eupatorium havanense</u>	Mistflower	Well-drained soil, rocky ravines, ledges
<u>E. odoratum</u>	Blue mistflower	Well-drained soil; full sun
<u>Eysenhardtia texana</u>	Kidneywood	Dry hills and canyons
<u>Hesperaloe parviflora</u> (evergreen)	Red yucca	Dry, well-drained soil; full sun
<u>Lantana horrida</u>	Trailing lantana	Dry, well-drained soil; sun-part-sun
<u>Leucophyllum frutescens</u> (evergreen)	Cenizo, Texas sage	Dry, well-drained soil; sun
<u>Malvaviscus drummondii</u>	Turk's cap	Moist, shaded areas
<u>Mimosa borealis</u>	Fragrant mimosa	Well-drained soil; sun
<u>Nolina texana</u> (evergreen)	Bear grass	Well-drained sites; full sun
<u>Pavonia lasiodetala</u>	Pavonia	Dry, rocky woods or stream banks
<u>Rhus aromatica</u>	Fragrant sumac	Wooded areas, rocky soil
<u>R. virens</u> (evergreen)	Evergreen sumac	Rocky hillsides
<u>Ruellia brittoniana</u>	Narrow-leaf petunia	Well-drained sites; full sun
<u>Salvia greggii</u> (evergreen)	Autumn sage	Dry, well-drained soils; prefers full sun
<u>Viburnum rufidulum</u>	Rusty blackhaw	Wood borders, stream edges and thickets

EDWARDS PLATEAU - west of the Balcones fault line

<u>Amorpha fruticosa</u>	False indigo	Moist woods, streambanks; calcareous soil
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<u>Anisacanthus wrightii</u>	Flame acanthus	Dry, well-drained soil
<u>Bauhinia congesta</u>	Orchid tree	Dry, well-drained soil; south side of building
<u>Berberis swaseyi</u> (evergreen)	Texas barberry	Dry, well-drained soil
<u>B. trifoliolata</u> (evergreen)	Agarito	Dry, well-drained soil
<u>Callicarpa americana</u>	American beauty bush	Rich woods and thickets
<u>Capsicum frutescens</u>	Chile pequin	Well-drained sites
<u>Chrysactinia mexicana</u> (evergreen)	Damianita	Dry, rocky well-drained sites; full sun
<u>Colubrina texensis</u>	Texas snakewood	Dry, well-drained sites
<u>Dalea frutescens</u>	Black dalea	Dry soil in full sun
<u>Dasyliirion texanum</u> (evergreen)	Texas sotoi	Dry, well-drained sites; full sun
<u>Erythrina herbacea</u>	Coral bean	Sandy or loamy soils; sun-part shade
<u>Eupatorium havanense</u>	Mistflower	Well-drained soil, rocky ravines, ledges
<u>E. odoratum</u>	Blue mistflower	Well-drained soil; full sun
<u>Hesperaloe parviflora</u> (evergreen)	Red yucca	Dry, well-drained soil; full sun
<u>Hibiscus cardiophyllus</u>	Heart leaf hibiscus	Well-drained soil; sun-part sun
<u>Lantana horrida</u>	Trailing lantana	Dry, well-drained soil
<u>Leucophyllum frutescens</u> (evergreen)	Cenizo, Texas sage	Dry, well-drained soil
<u>Lonicera albiflora</u>	White honeysuckle	Rocky or sandy soils, cedar brakes
<u>Malvaviscus drummondii</u>	Turk's cap	Moist, shaded areas
<u>Mimosa borealis</u>	Fragrant mimosa	Well-drained soil; sun
<u>Nolina texana</u> (evergreen)	Beargrass	Well-drained sites, full sun
<u>Pavonia lasiopetala</u>	Pavonia	Dry, rocky woods or stream banks
<u>Pistacia texana</u>	Pistache	Rocky, limestone stream banks and cliffs
<u>Rhus aromatica</u>	Fragrant sumac	Wooded areas, rocky soil
<u>R. lanceolata</u>	Flame-leaf sumac	Rocky hillsides; sun or shade
<u>R. virens</u>	Evergreen sumac	Rocky hillsides; sun or shade
<u>Ruellia brittoniana</u>	Narrow-leaf petunia	Well-drained sites; full sun
<u>Salvia greggii</u> (evergreen)	Autumn sage	Dry, well-drained soil; prefers full sun
<u>S. regia</u>	Royal sage	Rocky, wooded slopes
<u>Viburnum rufidulum</u>	Rusty blackhaw	Wood borders, stream edges and thickets
<u>Yucca rupicola</u> (evergreen)	Twist-leaf yucca	Dry, rocky soil; full sun

TREES

BLACKLAND PRAIRIE - east of the Balcones fault line

Conifers

<u>Juniperus virginiana</u> (evergreen)	Eastern red cedar	Fields, grasslands
<u>Taxodium distichum</u>	Bald cypress	Along stream banks

Shade Trees

<u>Carya illinoensis</u>	Pecan	Rich, river-bottom soil
<u>Catalpa speciosa</u>	Catalpa	Deep, rich, moist soil
<u>Fraxinus texensis</u>	Texas ash	Prefers limestone hills
<u>Juglans nigra</u>	Eastern black walnut	Well-drained, loamy soil
<u>Plantanus occidentalis</u>	Sycamore	Rich bottomland soils along streams
<u>Quercus glaucooides</u>	Lacy oak	Limestone soils
<u>Q. macrocarpa</u>	Bur oak	Moist forests along streams
<u>Q. muhlenbergii</u>	Chinkapin oak	Calcareous uplands
<u>Q. pungens</u> var. <u>vasevana</u> (evergreen)	Vasey oak	Dry, rocky slopes
<u>Q. shumardii</u>	Shumard red oak	Moist hillsides or bottomlands, clay soils
<u>Q. texana</u>	Texas red oak	Dry uplands
<u>Q. fusiformis</u> (evergreen)	Escarpment live oak	Sandy loam soils, also clay soils
<u>Sapindus drummondii</u>	Western soapberry	Moist soils along streams
<u>Ulmus crassifolia</u>	Cedar elm	Prefers limestone soils

Small Trees

<u>Cercis canadensis</u> var. <u>mexicana</u>	Mexican redbud	Rich, moist sandy loam
<u>C. canadensis</u> var. <u>texensis</u>	Redbud	Rich, moist sandy loam
<u>Chilopsis linearis</u>	Desert willow	Dry, well-drained areas
<u>Cotinus obovatus</u>	Smoketree	Rocky banks and hillsides
<u>Diospyros texana</u>	Texas persimmon	Dry, well-drained sites
<u>Ilex decidua</u>	Possum-haw holly	Rich, moist soils
<u>I. vomitoria</u> (evergreen)	Yaupon	Low, moist woods
<u>Parkinsonia aculeata</u>	Retama	Moist sandy soils
<u>Pistacia texana</u>	Texas pistachio	Rocky limestone soil
<u>Prosopis glandulosa</u>	Mesquite	Variety of soils, well-drained site
<u>Prunus mexicana</u>	Mexican plum	Well-drained, but moist sites
<u>Rhamnus caroliniana</u>	Carolina buckthorn	Low areas, moist site
<u>Rhus glabra</u>	Scarlet sumac	Moist, rich soil
<u>Sophora affinis</u>	Eve's necklace	Limestone soils on hills and banks
<u>S. secundiflora</u> (evergreen)	Mountain laurel	Limestone soils
<u>Ungnadia speciosa</u>	Mexican buckeye	Limestone soils and moist areas

TREES

EDWARDS PLATEAU - west of the Balcones fault line

Conifers

<u>Juniperus ashei</u>	Ashe juniper	Limestone soils of Hill Country
<u>Taxodium distichum</u>	Bald cypress	Along stream banks

Shade Trees

<u>Arbutus xalapensis</u>	Texas madrone	Limestone or igneous hills
<u>Carya illinoensis</u>	Pecan	Rich, river-bottom soil
<u>Fraxinus texensis</u>	Texas ash	Prefers limestone hills
<u>Juglans microcarpa</u>	Texas black walnut	Valleys and rocky stream beds
<u>J. nigra</u>	Eastern black walnut	Well-drained, loamy soil
<u>Plantanus occidentalis</u> var. <u>glabrata</u>	Texas plane tree	Limestone soil
<u>Quercus glaucoides</u>	Lacy oak	Limestone soil
<u>Q. macrocarpa</u>	Bur oak	Moist forest along streams
<u>Q. muhlenbergii</u>	Chinkapin oak	Calcareous uplands
<u>Q. pungens</u> var. <u>vaseyana</u> (evergreen)	Vasey oak	Dry, rocky slopes
<u>Q. shumardii</u>	Shumard red oak	Moist hillsides or bottomlands, clay soils
<u>Q. texana</u>	Texas red oak	Dry uplands
<u>Q. fusiformis</u> (evergreen)	Escarpment live oak	Sandy loam soils, also clay soils
<u>Sapindus drummondii</u>	Western soapberry	Moist soils along streams
<u>Ulmus crassifolia</u>	Cedar elm	Prefers limestone soils

Small Trees

<u>Acacia wrightii</u>	Wright acacia	Dry, rocky soils
<u>Acer grandidentata</u>	Bigtooth maple	Valleys and canyons (protected areas)
<u>Aesculus arguta</u>	White buckeye	Limestone and granite soils
<u>A. pavia</u>	Red buckeye	Limestone canyons and rocky hills
<u>Cercis canadensis</u> var. <u>mexicana</u>	Mexican redbud	Rich, moist sandy loam
<u>C. canadensis</u> var. <u>texensis</u>	Redbud	Rich, moist sandy loam
<u>Chilopsis linearis</u>	Desert willow	Desert washes, rocky soils
<u>Cotinus obovatus</u>	Smoketree	Rocky banks and hillsides
<u>Diospyros texana</u>	Texas persimmon	Rocky hills and canyons

Eysenhardtia texana
Ilex decidua
L. vomitoria
Parkinsonia aculeata
Pistacia texana
Prosopis glandulosa
Prunus mexicana
Rhamnus caroliniana
Rhus glabra
Sophora affinis
S. secundiflora
Ungnadia speciosa
Yucca thompsoniana (evergreen)

Kidneywood
 Possum-haw holly
 Yaupon
 Retama
 Texas pistachio
 Mesquite
 Mexican plum
 Carolina buckthorn
 Scarlet sumac
 Eve's necklace
 Mountain laurel
 Mexican buckeye
 Thompson yucca

Dry hills and canyons
 Rich, moist soils
 Low, moist woods
 Moist, sandy soils
 Rocky, limestone soil
 Variety of soils, well-drained site
 Well-drained, but moist sites
 Low areas, moist sites
 Moist, rich soil
 Limestone soils on hills and banks
 Limestone soils
 Limestone soils and moist areas
 Dry, rocky sites

VINES

Campsis radicans
Clematis pitcheri
C. texensis
Lonicera sempervirens
Parthenocissus quinquefolia
Passiflora incarnata

Trumpet vine
 Purple leatherflower
 Scarlet leatherflower
 Coral honeysuckle
 Virginia creeper
 Passion flower

Sun to part sun
 Sun to part sun
 Limestone cliffs, rocky areas; sun to part sun
 Sun to part sun
 Sun to shade
 Sun to part sun

GRASSES

Andropogon gerardi
A. glomeratus
Bouteloua curtipendula
B. hirsuta
B. pectinata
Buchloe dactyloides
Hilaria belangeri
Melica nitens
Muhlenbergia lindheimeri
M. reverchonii
Panicum virgatum
Schizachyrium scoparium
Sorghastrum nutans
Sporobolus asper
Tripsacum dactyloides

Big bluestem
 Bushy bluestem
 Sideoats grama
 Hairy grama
 Tall grama
 Buffalograss
 Curly mesquite
 Threeflower melic
 Lindheimer muhly
 Seep muhly
 Switchgrass
 Little bluestem
 Indiangrass
 Tall dropseed
 Eastern gamagrass

Prairies and open woods, sandy or loamy soil
 Low, moist sites
 Loose, alkaline soils
 Variety of soils
 Limestone outcrops and hilltops
 Full sun; prefers clay soils
 Rocky slopes, dry hillsides and grassy plains
 Open woods and rocky grasslands
 Rocky, limestone soil near streams
 Calcareous, moist sites
 Moist lowlands
 Open woods and rocky slopes
 Open woods and prairies
 Borders of woods and prairies
 Low, moist grasslands

NOTE: Gardeners and conservationists should seek out nurseries that propagate their own plants or that purchase nursery-propagated plant materials. As consumers, we need to avoid purchasing wild-collected plants. Some native plants are diminishing in number, and it is ecologically detrimental to dig up wild plants unless an area is to be developed. It is best to either collect seeds from wild plants or to purchase seeds (or plants grown from wild seeds) from commercial nurseries.



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1101 CAMPO ROSA ROAD
P O BOX 308
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(409)234-7353 FAX (409)234-7407
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Wildflowers

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CLEARING HOUSE

Gardening and Landscaping with Native Plants

During the past few decades, North American native plants have disappeared at an alarming rate. Preserving natural stands of native plants in forests, prairies, and wetlands is important, but everyone can help reestablish native plant communities in our cities. Landscaping with native plants — no matter the scale of the project — can conserve water and other natural resources and restore regional character.

Benefits of Native Plants

Native plants are adapted to the average rainfall in their region. Once they're established, they don't need supplemental watering.

Xeriscape, a term coined by the Denver Water Department, is a program that promotes water conservation through creative landscaping. One of *Xeriscape's* tenets is the use of drought-tolerant plants, but it doesn't emphasize using native plants exclusively.

A native landscape provides much more than *Xeriscape's* water-conserving features. Native landscapes in urban and rural areas provide habitats for wildlife and link larger natural areas. By planting native species, you encourage the presence of native insects and microorganisms that benefit plants and keep them healthy — without using chemical fertilizers and pesticides.

Your landscape will be an interacting, changing entity — rather than a fixed object — offering a glimpse of the complexities of the natural world in your own backyard.

Experimenting with Native Plants

You can incorporate native plants into a landscape as elaborately or as simply as you want. Add them to an already existing landscape or start completely from scratch.

You'll probably want to start slowly, incorporating native plants into existing, traditionally designed flower beds. Many native perennials make ideal border plants, and their appearance can improve dramatically when they don't have to compete for light, moisture, and nutrients.

If you feel more ambitious, you can assess your property's environmental conditions (Is it shady or sunny? Does it have adequate or poor drainage?), and embellish those areas with groupings of appropriate native plants. The results are well worth the time you spend analyzing and matching species to site conditions.

Design a naturalistic landscape by imitating associations found in specific plant communities in your region (a prairie area, wetland, or woodland edge). To varying degrees, all three landscape options will reflect your region's natural landscape.

Site Assessment, Planning, and Design

Before you create a native plant landscape, you'll need to analyze your site and develop a plan. The plan doesn't have to be elaborate; it can be installed in phases as money and time permit. What do you want or need from your landscape? How do you use your yard? Do you want a formal, informal, or naturalistic look? What native plants are already on the site? Try to coordinate your landscape needs with your site conditions.

Observe native plants in their natural environments to learn more about their cultural requirements and growth habits. Note the plant's maximum size and bloom sequence and where it occurs, such as at the edge of a forest or in an open meadow. Look at wildflowers during all their growth stages before choosing what you'll plant — you don't to plant something you'll hate to look at during some period. Visit local natural areas so you can determine which species might grow well on your property. You don't need to know all your area's plant species, but you should at least learn about the dominant ones. If you duplicate at home what you see in nature, you'll properly place native plants in your yard.

Soil Preparation

If you select plants appropriate to the microhabitats on your site, they should grow well, without soil improvements, once they're established. Disturbing the soil, in fact, can create more problems than it solves. If

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your site has been disturbed or the original topsoil removed, some soil amendments can help.

Properly prepared soil helps conserve water because it absorbs and holds water more efficiently and drains better. Healthy soils support healthy plants that can better resist pests and pathogens. If the soil is clay or sand, you may need to improve its content by adding organic matter such as compost. Prepare your beds two to three months before planting so the soil can settle. Apply a four- to six-inch deep mulch to control weeds.

Some plants will benefit from additional soil preparation. Many wildflowers require well-drained soil, so you may need to supplement the prepared soil with sand, gravel, or other material that loosens it and permits good drainage. Some wildflower species require moist soil; add large amounts of rotted leaves and peat moss to accommodate those needs. Other wildflowers develop weak, spindly stems if they're planted in rich soil, so they'll fare better in a poor soil with high mineral content.

Identify the plants already on your site and decide whether you want them. If you have a lot of weeds, you may need a year or more to kill them all, although killing them may not be feasible if the site is extremely disturbed. Eliminating weeds as much as possible before planting is easier and less expensive than trying to control them in a newly seeded site.

If the site isn't too weedy and you're going to interseed wildflowers into the existing vegetation, the process is relatively easy. Mow the vegetation as short as possible and rake up the thatch. Try to open up some bare areas to allow the seeds to make soil contact.

If you want to plant wildflowers on a clean site, you can repeat an initial light tilling and watering cycle (till no deeper than one inch), or apply an herbicide treatment as many times as needed to clear the site. How many times you need to repeat the process depends on the plot size, existing weed competition problems, and the degree of weed control you desire. The seeds, roots, and rhizomes of weeds frequently lie dormant beneath the soil surface and germinate quickly after they are exposed to moisture and light. The less disturbance there is, the easier it will be to control weeds.

If you prefer not to till or hand-weed, two applications of a non-residual, post-emergent herbicide such as Roundup may remove existing vegetation. Before you apply the herbicide, water the site for a week or two to promote germination of weed seeds. Let the seedlings grow for one or two weeks, and apply the herbicide. Repeat this process once more to ensure a fairly clean seed bed. Because it is non-residual, Roundup does not continue its herbicidal activity. You can plant your wildflower and native grass seeds as soon as you are sure competing vegetation is under control. Roundup

will not affect seed germination, only the growing plants that you have treated.

Plant Selection

If your design calls for a traditional landscape, choose species based on the size, shape, texture, and color you desire. For a more natural landscape, you'll need species that grow together naturally, worrying less about aesthetic characteristics.

The commercial availability of native plant species in your area ultimately will determine which plants you use in your landscape. As demand for native plants increases, the nursery industry will respond and begin offering native species in larger quantities. Keep asking your local nurseries to stock native plants!

Maintaining Your Landscape

All landscapes need several years to become well-established. The critical period is two to three weeks after planting, when the containerized, well-cared-for plants are making the transition to living in an outdoor landscape. Your landscape will need minimal maintenance once it's established, depending on how much control you want to assert. Many maintenance practices used for traditional cultivated plants also work for native plants.

Depending on the look you're trying to achieve, you may need to prune fast-growing species or weed out undesirable plants. Clipping seedheads encourages fullness and longer bloom periods for many perennials. Some perennial wildflowers and native shrubs respond well to severe pruning in the fall or late winter.

Native plants usually do not require fertilizer. Many thrive in poor soil, and applying fertilizer could chemically burn them or stimulate lush foliage growth with few flowers.



CLEARING HOUSE

Wildflower Meadow Gardening

So you want to create the eye-catching color and diversity of a wildflower meadow. Unfortunately, just throwing out a few seeds won't produce the desired results. Natural meadows evolve over many years, adapting to environmental conditions and developing intricate associations between plants, animals, and microorganisms. A planted wildflower meadow can rival nature and deliver low-maintenance advantages in time, but only if it's established correctly and modeled after surrounding natural plant communities. These recommendations are for establishing a wildflower meadow in an *open, sunny, well-drained area*.

Natural meadows occur in areas such as alpine slopes or prairies, where environmental factors limit the growth of woody species and halt the natural progress of plant succession. Most meadows are only a transitional stage that will be replaced by shrubs and trees, so long-term management is important in maintaining a meadow over time.

Many meadow gardeners strive for a field of wildflowers with only occasional clumps of grass. Yet grasses are an essential component of a self-sustaining, low-maintenance wildflower meadow. Learn to recognize and encourage desirable native grasses, so you can discourage the growth of aggressive non-native grasses.

Selecting the Appropriate Meadow Species

A wildflower area is a complex, interactive plant community, not just a collection of individuals. Choose a mixture of native species that, over a period of time, will naturally sort themselves out; the species best adapted to the site will be the ones that thrive after the first few years. Inventory the site and its microhabitats, such as wet, low-lying areas, shady areas, or open fields, and determine the species best suited to each condition.

When choosing wildflower species for your meadow planting, be sure to consider plant height; bloom period; whether the plant is a perennial, self-seeding annual, or a biennial; seed availability; and noxious weed potential.

You'll want to plant perennials, annuals, and biennials in your meadow, and to plant a variety of

native species that will provide color throughout the growing season. Check to make sure the plants you're choosing aren't on your state's noxious weed list.

The Wildflower Center does not recommend planting wildflower seed mixes. Determining a mix's composition, both for the individual species and their relative contributions, is difficult. Mixes often contain a high percentage of species that will be planted outside their natural ranges. You're better off buying individual native wildflower seeds or making your own mix.

Grasses

Most meadow and prairie managers recommend that native grasses make up 50 to 80 percent of the meadow species. Grasses have several functions:

- to provide support and protection for tall flowers;
- to fill in spaces around wildflowers otherwise occupied by weeds;
- to add color and texture to the landscape;
- to prevent soil erosion; and,
- to provide food and cover for wildlife.

Grass growth forms are either mat-forming or bunch-forming. Mat- or sod-forming grasses spread by runners or stems that grow horizontally along the ground and put roots down. Bunch grasses grow in distinct clumps.

Many native sod grasses, such as buffalograss (*Buchloe dactyloides*) grow in a loose matrix that easily allows room for wildflowers. Open spaces between native bunch grasses such as bluestems (*Andropogon* spp.), grama grasses (*Bouteloua* spp.), and muhly grasses (*Muhlenbergia* spp.), offer gaps for herbaceous plant establishment.

Most non-native turf grasses, such as St. Augustine and annual rye, are too competitive to allow other plants to become established. Plus, many of those turf grasses are cool-season grasses that begin their growth in early spring, with maximum development occurring from late March to early June. They mature and produce seeds in late spring or early summer, becoming semi-dormant during the summer. Growth usually resumes during the cool months of fall.

Warm-season grasses resume their growth in late spring and continue to grow until early fall, producing

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most of their foliage in midsummer. Competition with warm-season grasses shouldn't be a problem for northern wildflowers.

Soil Preparation

If you select plants appropriate to the microhabitats on your site, they should grow well, without soil improvements, once they're established. Disturbing the soil, in fact, can create more problems than it solves. If your site has been disturbed or the original topsoil removed, some soil amendments can help.

Properly prepared soil helps conserve water because it absorbs and holds water more efficiently and drains better. Healthy soils support healthy plants that can better resist pests and pathogens. If the soil is clay or sand, you may need to improve its content by adding organic matter such as compost. Prepare your beds two to three months before planting so the soil can settle. Apply a four- to six-inch deep mulch to control weeds.

Some plants will benefit from additional soil preparation. Many wildflowers require well-drained soil, so you may need to supplement the prepared soil with sand, gravel, or other material that loosens it and permits good drainage. Some wildflower species require moist soil; add large amounts of rotted leaves and peat moss to accommodate those needs. Other wildflowers develop weak, spindly stems if they're planted in rich soil, so they'll fare better in a poor soil with high mineral content.

Identify the plants already on your site and decide whether you want them. If you have a lot of weeds, you may need a year or more to kill them all, although killing them may not be feasible if the site is extremely disturbed. Eliminating weeds as much as possible before planting is easier and less expensive than trying to control them in a newly seeded site.

If the site isn't too weedy and you're going to interseed wildflowers into the existing vegetation, the process is relatively easy. Mow the vegetation as short as possible and rake up the thatch. Try to open up some bare areas to allow the seeds to make soil contact.

If you want to plant wildflowers on a clean site, you can repeat an initial light tilling and watering cycle (till no deeper than one inch), or apply an herbicide treatment as many times as needed to clear the site. How many times you need to repeat the process depends on the plot size, existing weed competition problems, and the degree of weed control you desire. The seeds, roots, and rhizomes of weeds frequently lie dormant beneath the soil surface and germinate quickly after they are exposed to moisture and light. The less disturbance there is, the easier it will be to control weeds.

If you prefer not to till or hand-weed, two applications of a non-residual, post-emergent herbicide such as Roundup may remove existing vegetation. Before you

apply the herbicide, water the site for a week or two to promote germination of weed seeds. Let the seedlings grow for one or two weeks, and apply the herbicide. Repeat this process once more to ensure a fairly clean seed bed. Because it is non-residual, Roundup does not continue its herbicidal activity. You can plant your wildflower and native grass seeds as soon as you are sure competing vegetation is under control. Roundup will not affect seed germination, only the growing plants that you have treated.

When to Plant

When you should plant depends on where you live and what you're planting. Fall is the best time to plant many native species. Some seeds need a chilling period (cold stratification) to break their dormancy, while others have hard seed coats that need to be worn down or scarified before they can germinate. Sowing seeds in the fall often provides the conditions necessary to break seed dormancy. Warm, wet spring weather then induces the seeds to germinate.

In the Midwest, most native wildflowers and grasses are perennials. Although native seeds can be planted in the spring or fall, spring planting is most common. When to plant is hard to predict because of the variability of snow melt and spring showers. You can plant warm-season prairie species any time from mid-spring through June.

Seed in the fall late in the season after frost as a dormant planting. Broadcast or drill the seeds, but remember they won't germinate until spring. During the winter, the seeds will undergo stratification, breaking dormancy.

Ideally, native seeds would be planted following nature's seeding schedule. Since this is logistically impossible for plantings of any size or diversity, select an optimal season. Knowing more about when wildflowers bloom naturally in your area and when the rainy season occurs will help you figure out the time periods and conditions necessary for seed formation and germination.

Seeding Methods

One rule applies to *all* plantings: the seeds must be in good contact with the soil. Soil contact helps the seeds retain moisture, which is necessary for germination, and provides a substrate for seedling growth.

An adjustable, hand-carried mechanical seeder is effective for many plant species. Mixing seeds with fine, damp sand and then distributing the seed-sand mixture should eliminate clumping. Seed into the prepared area, then rake or tamp seeds into the soil to ensure good seed-soil contact.

Spreading a wildflower mix evenly is difficult

because of the different sizes and weights of seeds. Purchasing the seeds for each species separately and seeding one species at a time can eliminate this problem.

Hand-broadcasting is the simplest method and it works if you do it correctly. For better seed distribution, mix the seeds with fine, damp sand, in a proportion of four parts sand to one part seeds. Seed into the prepared area, then rake or tamp the seeds into the soil to ensure good seed-to-soil contact.

For more immediate results, you may want to use a combination of seeding and planting container-grown wildflowers. Adding container-grown plants is especially convenient when planting slower-growing perennials and can be fairly economical if you're only planting a small area.

Remember: All plants require water to germinate. If rain doesn't fall within a couple of days after planting, try to water the area thoroughly at least once, if possible.

Managing Your Site After Planting

How you manage your wildflower area depends on the look you want to achieve. Individual species have different management needs and may require a combination of techniques; the amount or degree of maintenance will vary from year to year.

The First Year

Annual species germinate quickly and visually dominate a site during the first year. Although many perennials germinate the first year, their root growth comprises two to three times the amount of the above-ground vegetation, and they normally don't flower until the second or third year. Native bunch grasses usually don't flower or set seeds the first year, and depending on the species, they reach heights of only two or three inches by the end of the growing season. Under favorable environmental conditions, little bluestem (*Schizachyrium scoparium*) develops a two- to three-inch primary root system before any above-ground shoots appear.

If tall annual weeds are shading the wildflower seedlings, mow at a height set higher than the seedlings. A scythe, hand clipper, or weed cutter will do the job if you don't have a mower, or if the blades can't be set high enough to miss the seedlings. Because most of the weeds will be annuals, mowing them before they set seeds helps destroy the next season's seed crop. The exact time and height for mowing varies with each site and the species planted. In many cases, you can't avoid hand-weeding or spot applications of an herbicide, especially if aggressive species or perennial weeds dominate the site.

Annual and biennial wildflowers must be allowed to re-seed to produce a strong stand the next year. Once

your meadow wildflowers have bloomed, delay mowing the area until at least half of the late-blooming species have dropped seeds. If your meadow has tall, warm-season native grasses, wait until late summer or early fall to mow, allowing them to elongate, flower, and set seeds. Never mow mid- to tall grasses below six inches. Although you can mow the grasses in late fall when they are dormant, you may want to leave them intact until late winter or early spring to provide food and cover for wildlife, and add texture to an otherwise barren winter landscape.

When you mow your meadow, leave the clippings—which may have viable seeds—in place. To increase the diversity in a moist meadow, however, you must remove the clippings. Remove the clippings of any weedy or undesirable species that may have set seed.

The Second Year

With well-spaced and abundant rainfall, most native bunch grasses will flower and produce seeds by the second year. Some biennial and perennial wildflowers will begin to bloom. If optimum conditions didn't occur the first year, residual seeds from the previous year may germinate.

As your wildflower meadow fills out, you may choose to re-seed or spot-transplant species to fill in bare spots or increase species diversity, especially the second or third year after seeding.

If annual weeds continue to be a problem, you'll need to remove them before they set seed. The need to weed should taper off as wildflowers and native grasses become more established.

The Third Year and Beyond

By the third or fourth year, your wildflower area may benefit from a controlled burn if enough fuel has accumulated. Fire is a natural process in many ecosystems and can reduce woody plants and other invasive species. Burning also stimulates the growth of many native grasses and prairie perennials, and breaks the dormancy of some seeds.

Remember that burning is a technique that requires special expertise and should not be attempted without first consulting experienced experts! Fire is a tool that can enhance or inhibit a species, depending on your goal. The target species isn't the only one that will be affected. When and how you burn depends on what you want to achieve.

Many areas require permits for burning. In addition, urban areas often have regulations prohibiting prescribed burns. If you can't burn your meadow, you can continue to control weed invasions and remove excess thatch by mowing or spot-treating with an herbicide.

SEPARATE THE RESIDENCE
 INTO A SERIES OF MASSSES
 TO CREATE A PROPORTIONATE
 HILL COUNTRY SCALE

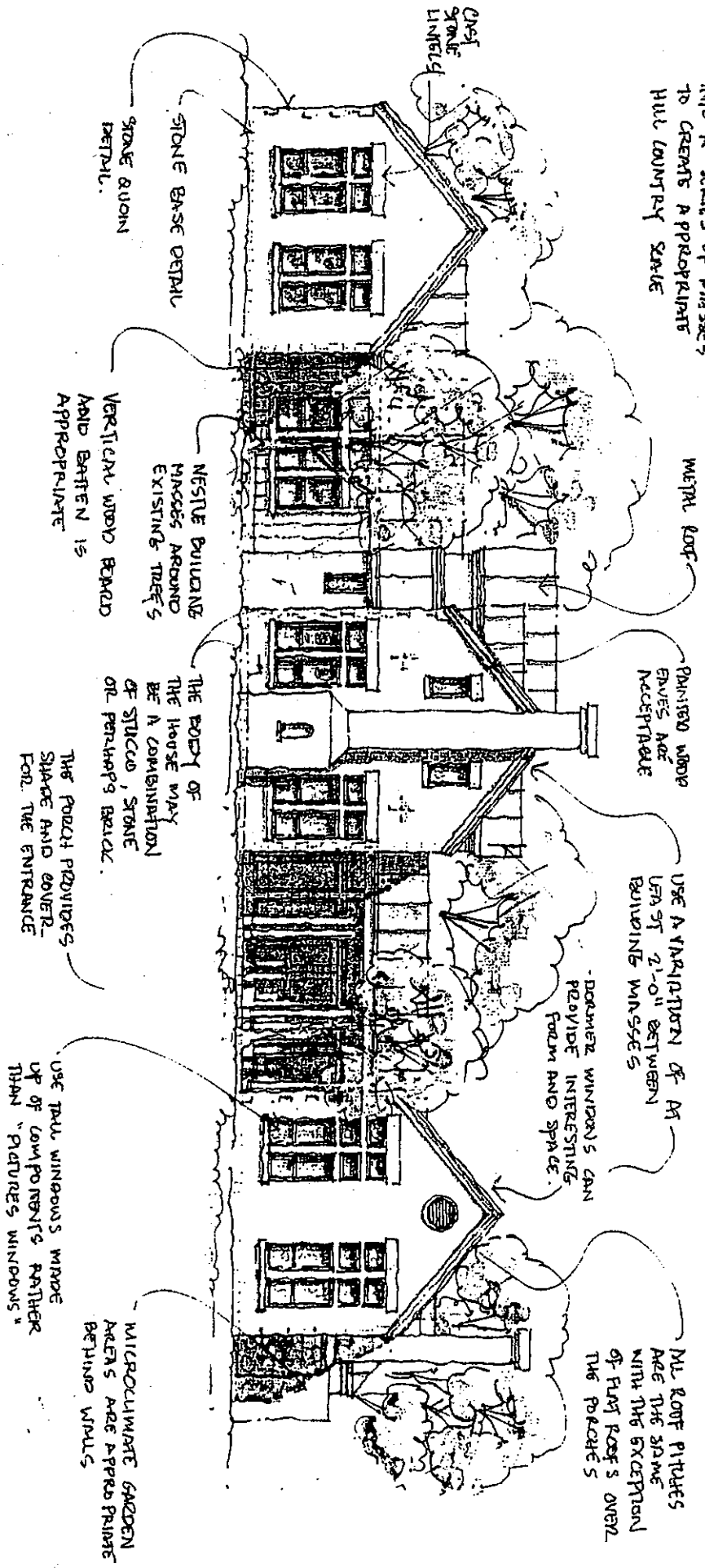


ILLUSTRATION 1

