

Chapter 17.29
PARKS, OPEN SPACE AND TRAILS

Sections:

- 17.29.010 Purpose**
- 17.29.020 General Provisions**
- 17.29.030 Public Parks, Open Spaces, and Trails Criteria**
- 17.29.040 Maintenance of Public Parks, Open Spaces, and Trails**

17.29.010 PURPOSE. The purpose of this Chapter is to guide the planning and design of public parks, trails, open spaces, and other public sites, where such facilities are required to be provided pursuant to this Title. Where a provision of this Chapter is preceded by the word “shall” or “must,” the provision is mandatory; absent the word “shall” or “must,” the provision is a guideline. However, the city decision-making body may invoke guidelines as requirements where the applicant has requested approval of a Density Bonus under Chapter 17.08, Planned Unit Development approval under Chapter 17.17, or where the applicant has requested one or more adjustments pursuant to Chapter 17.11 and/or other provisions of this Title. The intent of this Chapter is to implement the city’s Master Plan by providing for a comprehensive, integrated network of public parks, trails, recreation facilities and open spaces to be developed and preserved as the community grows.

17.29.020 GENERAL PROVISIONS.

- A. The city will typically require the payment of a fee in lieu of land dedication for the parks, open space, and trail impact fee/dedication requirement as outlined in Section 17.19.090 of this Title. As part of the dedication requirement set forth in Section 17.19.090, residential developments with 1,000 residents or more (based on the schedule in Section 17.19.090) shall provide at least six acres of land for a public neighborhood park and/or community park and at least one (1) mile of trail land. For residential developments with less than 1,000 residents, public parks, open space, and/or trails may be provided or a fee in lieu of this dedication requirement may be paid as determined by the city decision making body through the land development review process and based on the approval criteria of Section 17.29.030.
- B. Land to be dedicated for parks, open space, and/or trails must be contained in an out lot dedicated to either the City of Fruita or a Property Owners’ Association and the out lot must include an easement for public access/use on the same basis as the land in question is available to the residents of the development in which it is located. Private open space, parks, trails, or other private recreation areas in any development shall not be a substitute for the required public parks, open space, and trails impact fee/dedication.

- C. In all cases, land and improvements and/or a fee in lieu of land and improvements will be required to meet the requirements set forth in Section 17.19.090.
- D. Ownership and maintenance of public parks, open space, and trails shall be determined by the City Council on a case-by-case basis through the development review process. The city reserves the right to reject any land which it deems unsuitable for park, open space, and/ or trail purposes.
- E. Landscape improvements to public parks, open space and trails must follow landscaping requirements of Appendix A of the Fruita Land Use Code.

17.29.030 PUBLIC PARKS, OPEN SPACE, AND TRAILS CRITERIA.

- A. In determining which land areas are appropriate and/or necessary for public parks and eligible for credit against the otherwise required park, open space, and trails impact fee /dedication, the following criteria must be considered:
 1. Land area to be dedicated should be at least two acres in size.
 2. The land area to be dedicated should be in an area underserved by existing public parks as identified by the Fruita Parks, Open Space, and Trails Master Plan.
 3. The land should be located adjacent to other open space or schools.
 4. The land area's proposed improvements must be designed, signed and stamped by a licensed landscape architect and must include at a minimum the following: water rights, irrigation system, appropriate groundcover, at least one large tree per every 5,000 square feet of landscaped area, and at least one of the following:
 - Paved, multi-purpose area for court games (e.g. basketball, tennis);
 - A multi-purpose play field with backstop;
 - Playground equipment and a bench;
 - Shade structure for picnics and sitting within a landscaped setting.
 5. The land area to be dedicated should have at least twenty percent (20%) of the perimeter of the parkland area adjacent to a public right-of-way so that the park is visible to the public and to increase safety by allowing activities in the park to be easily seen from other public areas.
 6. The land to be dedicated should be relatively flat and lend itself to organized recreational activities without the need for substantial improvements to accommodate facilities for recreational activities.

7. The size and shape of the land to be dedicated must lend itself to recreational activities.
 8. The soil conditions and drainage must allow for development of park facilities.
 9. The parkland should be used to organize and focus lot, block, and circulation patterns in a development and enhance surrounding development. Street, block, lot and building patterns shall respond to the views, landscape and recreational opportunities provided by such parks, open space, and trail areas.
 10. Surrounding the site with the rear property lines of residential lots is strongly discouraged.
 11. Parks to be used for on-going organized recreational activities should include adequate access and parking areas (both motorized vehicles and bicycles) for the type and intensity of uses intended for the park.
 12. Uses designated within public parks shall be appropriate to the context and character of the site and the intensity of the proposed development.
 13. Notwithstanding the preceding criteria, a five-foot wide landscaped outlot abutting and parallel to public right-of-way for collector and arterial roads will be eligible for credit against the otherwise required parks, open space and trails impact fee/dedication. Both the land area and the improvement to the land are eligible for credit. The minimum required width is five feet and the minimum required landscaping must consist of one large tree for every forty linear feet along the public right-of-way and appropriate groundcover and irrigation. This outlot must be owned and maintained by a Homeowners Association and contain a public access easement in order to receive credit.
- B. The following public trails will be required to be provided in all developments to provide an adequate bicycle and pedestrian transportation system. The land area required for the public trail is not eligible for credit against the otherwise required public parks, open space, and trails impact fee/dedication. Construction of the public trail(s) may be required and the cost of trail construction of a primary trail or an off-site trail is eligible for credits against the public parks, open space, and trails impact fee/dedication. Internal links necessary to provide an adequate bicycle and transportation network internal to the development are not eligible for credits.
1. Land for primary trails as identified in the Parks, Open Space, and Trails Master Plan must be provided. Trail heads should be required for primary trails at all major access points and should include parking areas, restrooms, shaded seating and picnic

areas, regulatory, informational and entry signs, and drinking fountains where feasible.

2. Local trails must be provided to link to existing or planned future trails.
 3. Trails that provide a valuable link to destinations such as schools, parks, open space, other neighborhoods, and commercial areas must be provided.
 4. Trails are required to provide a connection to avoid out-of-direction travel by pedestrians and bicyclists. As an example, a trail is required at the end of all cul-de-sacs to connect to an existing road, other trail or future development connection if the property has development potential (regardless of future land use).
 5. Trails proposed adjacent to a roadway should be a last resort when no other options exist. Attached sidewalks are not considered trails. If a trail is proposed adjacent to a roadway, the trail must be detached from the roadway and trail user safety shall be a primary consideration.
 6. The width of land required for primary trails shall be at least 30 feet, but 50 feet or more is preferred. The width of the trail surface for a primary trail should be at least 10 feet and may be required to be wider in certain circumstances such as in areas of limited site distance. The width of land required for local trails must be at least 16 feet for short connections (such as between cul-de-sacs) and wider for longer connections (such as a trail behind rear property lines along a block). The width of the trail surface for local trails should be at least 8 feet and may be required to be wider in certain circumstances.
 7. Trails will be required to be paved in most circumstances and trails must be paved in order to receive credit.
 8. Vertical clearance on all trails must be at least eight (8) feet. Horizontal clearance must be at least 3 feet on both sides.
 9. Adequate lighting should be required at all trailheads, primary trail access points, underpasses and at intersections with other trails. Adjacent roadway lighting may be used where possible.
 10. Maximum grade should be no more than 5%.
- C. Open space that is not a park as defined in this Title is not eligible for credits against the otherwise required park, open space, and trails impact fee/dedication (with the exception of five foot wide landscape strips as described in Section 17.29.030.A.13). In open space areas,

the emphasis is on resource protection or preservation and public use should be balanced with the need for resource protection. Types of public use should be limited to trails, benches, picnic sites, environmental interpretation and educational areas. Easements for a public trail, protection of natural or historical features, watersheds, wildlife, and similar resources may be required and improvements to open space areas may be eligible for credits against the otherwise required public parks, open space, and trails impact fee/dedication and will be determined on a case-by-case basis by the city decision making body through the land development review process.

- D. Appropriate buffering and setbacks shall be used between environmental resources and proposed development to ensure that the proposed development does not degrade the existing habitat or interfere with other uses. At a minimum, the following buffer standards apply to the following environmental resources:

Canals and drains – fifty (50) feet on both sides of the canal or drain as measured from the centerline of the canal or drain.

Washes and creeks and wetlands – one hundred (100) feet on both sides of the wash, or creek as measured from the centerline of the wash or 100 feet from the edge of the wetland area.

Colorado River – three hundred (300) feet on both sides of the river as measured from the centerline of the river.

17.29.040 MAINTENANCE OF PUBLIC PARKS, OPEN SPACE, AND TRAILS.

- A. Any homeowners' association of other organization established to own and maintain public parks, open space, or trails shall maintain such lands and improvements in a reasonable order and condition in accordance with the approved land development.
- B. In the event a homeowners' association or other organization established to own and maintain public parks, open space, or trails fails at any time after approval of the development by the city to maintain the public parks, open space, or trails in a reasonable order and condition, the Community Development Department may serve written notice upon such organization or upon the residents of the development setting forth the manner in which the organization has failed to maintain the public parks, open space, or trails, as applicable, in a reasonable order and condition, and said notice shall include a demand that such deficiencies of maintenance be cured within thirty (30) days thereof and shall state the date and place of a hearing thereon before the City Council which shall be held within twenty-one (21) days of the notice. At such hearing, the City Council may modify the terms of the original notice as to deficiencies and may give an extension of time within which they shall be cured.

If the deficiencies set forth in the original notice or in the modification thereof are not cured within said thirty (30) days, or any extension thereof, the City Council, in order to preserve the taxable values of the properties within the development, and to prevent the public park, open space, or trails from becoming a public nuisance, may enter upon said public park, open space, or trails and maintain the same for a period of one (1) year. Said entry and maintenance shall not vest in the public any right to use the park, open space, or trails, except when the same is voluntarily dedicated to the public by the developer. Before the expiration of said year, the City Council, upon its own initiative or upon the written request of the organization previously responsible for the maintenance of the public park, open space, or trails, shall call a public hearing upon notice to such organization or to the residents of the development, at which hearing such organization or the residents of the development shall show cause why such maintenance by the city should not, at the election of the city, continue for a succeeding year.

If the City Council determines that such organization is ready and able to maintain the public park, open space, or trails in a reasonable condition, the city shall cease to maintain such area at the end of the one (1) year period. If the City Council determines that such organization is not ready and able to maintain said public park, open space, or trails in a reasonable condition, the city may, at its discretion, continue to maintain the public park, open space, or trails during the next succeeding year and, subject to a similar hearing and determination, in each year thereafter.

- C. The cost of the maintenance of a public park, open space, or trails by the City of Fruita, including and administration fee equal to ten (10) percent of such cost, shall be paid by the organization established to own and maintain the park, open space, or trail, and any unpaid assessments shall become a tax lien on the properties within the development. The city shall file a notice of such lien in the office of the Mesa County Clerk and Recorder upon the properties affected by such lien within the development and shall certify such unpaid assessments to the Mesa County Board of County Commissioners and the Mesa County Treasurer for collection, enforcement and remittance in the manner provided by law for the collection, enforcement, and remittance of general property taxes.

APPENDIX
LANDSCAPING STANDARDS

UPDATED MARCH 16, 2010

CITY OF FRUITA LANDSCAPING SPECIFICATIONS

DEVELOPED AND COMPILED BY THE CITY OF FRUITA COMMUNITY
DEVELOPMENT DEPARTMENT USING THE TRI RIVER AREA
COLORADO STATE UNIVERSITY EXTENSION OFFICE PUBLICATIONS
ON RECOMMENDED PLANT SPECIES.

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THE CITY OF FRUITA IS LOCATED IN USDA HARDINESS ZONE: 6-7

LANDSCAPE PLANTS SUITABLE FOR THE CITY OF FRUITA

Compiled using the CSU Extension Office recommended landscape and planting publications

PLANT TYPE:

GC=Ground Cover; ET= Evergreen Tree; OG= Ornamental Grass; P=Perennial; S=Shrub; T= Tree; V=Vine

PLANT SIZE:

S=Small; M=Medium; L=Large

If the Xeriscape cell is selected, plant/tree/shrub is considered suitable for a Xeriscaping landscape.

Tree size at time of planting not to exceed 3" caliper. (Trunk measured at 6" above finished grade)

Staking and Guying of trees shall be completed immediately upon planting and stay for 1-2 years.

TREES					
BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Acer campestre	Maple, Hedge	1" Caliper	T	S	
Acer freemanii 'Jeffersred'	Maple, Autumn Blaze	1" Caliper	T	L	
Acer ginnala	Maple, Amur	1" Caliper	T	S	
Acer platanoides	Maple, Norway	1" Caliper	T	L	
Acer platanoides 'Emerald Queen'	Maple, Emerald Queen	1" Caliper	T	L	
Acer tataricum	Maple, Tatarian	1" Caliper	T	S	
Betula nigra	Birch, River	1" Caliper	T	L	
Catalpa speciosa	Catalpa, Western	1" Caliper	T	L	✓
Celtis occidentalis	Hackberry, Western	1" Caliper	T	L	✓
Cercis canadensis	Redbud, Eastern	1" Caliper	T	S	
Crataegus crus-galli inermis	Hawthorn, Thornless Cockspur	1" Caliper	T	S	
Crataegus laevigata 'Paul's Scarlet'	Hawthorn, Paul's Scarlet	1" Caliper	T	S	
Crataegus phaenopyrum	Hawthorn, Washington	1" Caliper	T	S	
Crataegus viridis	Hawthorn, Winter King	1" Caliper	T	M	
Corylus colurna	Filbert, Turkish	1" Caliper	T	L	
Fraxinus americana 'Autumn Purple'	Ash, Autumn Purple	1" Caliper	T	L	
Fraxinus pennsylvanica	Ash, Green	1" Caliper	T	L	✓
Fraxinus pennsylvanica 'Marshall'	Ash, Marshall's seedless	1" Caliper	T	L	✓
Ginkgo biloba	Maidenhair Tree	1" Caliper	T	L	

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Gleditsia triancanthos inermis	Honeylocust, Thornless	1" Caliper	T	L	✓
Gymnocladus dioica	Kentucky Coffeetree	1" Caliper	T	L	✓
Juniperus scopulorum	Juniper, Rocky Mountain	1" Caliper	ET	M	✓
Koelreuteria paniculata	Golden Rain Tree	1" Caliper	T	S	✓
Liriodendron tulipifera	Tulip Tree	1" Caliper	T	L	
Malus spp.	Crabapple (Spring Snow, Adams, Radiant)	1" Caliper	T	S	
Morus alba 'Pendula'	Mulberry, Weeping	1" Caliper	T	S	
Morus alba 'Stribling'	Mulberry, Fruitless	1" Caliper	T	L	
Picea glauca 'Conica'	Spruce, Dwarf Alberta	1" Caliper	ET	M	
Picea pungens	Spruce, Colorado	1" Caliper	ET	L	
Pinus aristata	Pine, Bristlecone	1" Caliper	ET	S	✓
Pinus cembroides edulis	Pine, Pinyon	1" Caliper	ET	M	✓
Pinus nigra	Pine, Austrian	1" Caliper	ET	L	
Pinus strobiformis	Pine, Southwestern White	1" Caliper	ET	L	
Pinus sylvestris	Pine, Scotch	1" Caliper	ET	L	
Platanus acerifolia	Planetree, London	1" Caliper	T	L	
Populus angustifolia	Cottonwood, Narrowleaf	1" Caliper	T	L	
Populus fremontii	Cottonwood, Fremont	1" Caliper	T	L	
Prunus cerasifera	Plum, Cherry	1" Caliper	T	S	
Prunus cerasifera 'Newport'	Plum, Newport Purple-Leaf	1" Caliper	T	S	
Prunus cerasifera 'Thundercloud'	Plum, Thundercloud Purple-Leaf	1" Caliper	T	S	

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Prunus cerasifera 'Mt. St. Helens'	Plum, Mt. St. Helens Cherry	1" Caliper	T	S	
Prunus maackii	Chokecherry, Amur	1" Caliper	T	S	
Prunus virginiana	Chokecherry	1" Caliper	T	M	
Pseudotsuga menziesii	Fir, Douglas	1" Caliper	ET	L	
Pyrus calleryana	Pear, Ornamental (Aristocrat, Autumn Blaze, Redspire, Bradford)	1" Caliper	T	S	
Quercus bicolor	Oak, Swamp White	1" Caliper	T	L	
Quercus macrocarpa	Oak, Bur	1" Caliper	T	L	✓
Quercus shumardii	Oak, Shumard	1" Caliper	T	L	
Robinia ambigua 'Idahoensis'	Locust, Idaho	1" Caliper	T	M	
Sophora japonica	Japanese Pagoda Tree	1" Caliper	T	L	
Thuja occidentalis	Arborvitae, American	1" Caliper	ET	M	
Tilia americana	Linden, American	1" Caliper	T	L	
Ulmus parvifolia	Elm, Lacebark	1" Caliper	T	L	

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Perennials listed below are recommendations.

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SHRUBS, GROUND COVER, GRASSES, PERENNIALS & VINES					
BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Achillea hybrids	Yarrow	#1	P	S	✓
Agastache cana	Hyssop, Wild	#1	P	S	✓
Agastache rupestris	Hyssop, Sunset	#1	P	S	✓
Alcea rosea	Hollyhock	#1	P	M	✓
Alyssum saxatile 'Compactum'	Basket of Gold	#1	P	S	
Andropogon gerardii	Big bluestem	#1	OG	L	✓
Aegopodium podagraria 'variegatum'	Variegated Bishop's weed	#1	GC	M	✓
Amelanchier alnifolia	Serviceberry	#5	S	L	
Aquilegia hybrids	Columbine	#1	P	S	✓
Arctostophylos x coloradensis	Manzanita, Colorado	#5	S/GC	S	
Artemisia filifolia	Sage, Sand	#5	S	S	✓
Artemisia 'Powis Castle'	Sage, Silver	#1	P	S	
Artemisia schmidtiana	Sage, Silver Mound	#1	GC	S	✓
Artemisia tridentata	Sage, Basin	#5	S	M	✓
Aster spp.	Aster	#1	P	S-M	
Berberis thunbergii 'Crimson Pygmy'	Barberry, Crimson Pygmy	#5	S	S	✓

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Berberis thunbergii 'Rosy Glow'	Barbery, Rosy Glow	#5	S	M	✓
Buddleia davidii	Butterfly bush	#5	S	M	
Buxus microphylla 'Wintergreen'	Boxwood, Wintergreen	#5	S	S	
Calamagrostis x acutiflora 'Karl Foerster'	Reed Grass, Karl Foerster	#5	OG	M	
Calamagrostis x acutiflora 'Overdam'	Reed Grass, Overdam Feather	#5	OG	M	
Callirhoe involucrata	Poppy Mallow	#1	P	S	
Campanula persicifolia	Bellflower, Peachleaf	#1	P	S	
Campsis radicans	Trumpet Vine	#5	V	L	
Caragana arborescens	Siberian Peashrub	#5	S	L	
Carex buchananii	Japanese Red Sedge	#1	OG	S	
Caryopteris incana	Spirea, Bluemist	#5	S	S	
Centaurea montana	Bachelor Button	#1	GC	S	✓
Cerastium tomentosum	Snow-in-Summer	#1	GC	S	✓
Chaenomeles speciosa	Flowering quince	#5	S	M	
Chrysothamnus nauseosus	Rabbitbrush	#5	S	M	✓
Coreopsis grandiflora 'Sunray'	Coreopsis, Sunray	#1	P	S	✓

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Coreopsis verticillata 'Moonbeam'	Coreopsis, Moonbeam	#1	P	S	✓
Cornus sericea	Dogwood, Redtwig	#5	S	L	
Cornus sericea 'Kelseyi'	Dogwood, Kelsey Redtwig	#5	S	S	
Cortaderia selloana 'Pumila'	Dwarf Pampas grass	#1	OG	M	
Cotinus coggygria 'Purple Robe'	Smoketree, Purple	#5	S	L	
Cotoneaster apiculatus	Cotoneaster, Cranberry	#5	S	S	
Cotoneaster horizontalis	Cotoneaster, Rock	#5	S	M	✓
Cotoneaster acutifolia	Cotoneaster, Peking	#5	S	L	✓
Dalea purpurea	Purple Prairie Clover	#1	P	S	
Delphinium elatum 'Magic Mountain Mix'	Delphinium, Dwarf	#1	P	S	
Delosperma nubigenum	Iceplant, Hardy Yellow	#1	GC	S	✓
Dianthus 'Brilliancy'	Dianthus, Pinks	#1	P	S	
Dianthus barbatus	Sweet William, mixed	#1	P	S	
Echinacea purpurea	Coneflower, Purple	#1	P	S	✓
Erianthus ravennae	Pampas Grass	#5	OG	L	
Erigeron hybrids	Daisy, Fleabane	#1	P	S	✓
Euonymus alatus	Burning bush	#5	S	L	

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Euonymus alatus 'Compacta'	Dwarf Burning bush	#5	S	M	
Euonymus fortunei 'Emerald Gaiety'	Euonymus, Emerald Gaiety	#5	S	M	
Euonymus fortunei 'Emerald'n Gold'	Euonymus, Emerald'n Gold	#5	S	M	
Euonymus fortunei 'Moonshadow'	Euonymus, Moonshadow	#5	S/GC	S	
Euonymus kiautschovicus 'Manhattan'	Euonymus, Manhattan	#5	S	M-L	
Euphorbia marginata	Snow-on-the-mountain	#1	GC	M	✓
Fallugia paradoxa	Apache Plume	#5	S	M	✓
Festuca ovina glauca	Fescue, Blue	#1	OG/GC	S	✓
Festuca idahoensis	Fescue, Idaho		OG	S	✓
Forestiera neomexicana	Privet, New Mexican	#5	S	L	✓
Forsythia spp.	Forsythia	#5	S	L	
Gaillardia x grandiflora 'Dazzler'	Dazzler Blanketflower	#1	P	S	✓
Gaillardia x grandiflora 'Goblin'	Goblin flower	#1	P	S	✓
Gaura lindheimeri	Whirling butterflies	#1	P	S	✓
Geranium sanguineum	Bloody Cranesbill	#1	P	S	

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If the Xeriscape cell is selected, plant/tree/shrub is considered suitable for a Xeriscaping landscape.

SHRUBS, GROUNDCOVER, GRASSES, PERENNIALS & VINES					
BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Geum hybrids	Geum	#1	P	S	
Helianthemum nummularium	Yellow sunrose	#1	P	S	✓
Helictotrichon sempervirens	Blue oat grass	#1	OG	S	✓
Heliopsis helianthoides 'Summer Sun'	False sunflower	#1	P	M	
Hemerocallis spp.	Daylily	#1	P	S	✓
Heuchera sanguinea	Coral bells	#1	P	S	
Hibiscus syriacus	Rose-of-Sharon	#5	S	L	
Holodiscus dumosus	Rock Spirea	#5	S	M	✓
Hydrangea arborescens 'Annabelle'	Hydrangea, Annabelle	#5	S	S	
Iberis sempervirens	Candytuft	#1	P	S	✓
Imperata cylindrica 'Rubra'	Japanese Blood Grass	#1	OG	S	
Iris hybrids	Bearded Iris	#1	P	S	✓
Juniperus 'Blue Star'	Juniper, Blue Star	#5	S	S	
Juniperus 'Calgary Carpet'	Juniper, Calgary Carpet	#1	GC	M	✓
Juniperus chinensis 'Armstrong'	Juniper, Armstrong	#5	S	M	✓
Juniperus chinensis 'Blue Point'	Juniper, Upright	#5	S	M	

LANDSCAPE PLANTS SUITABLE FOR THE CITY OF FRUITA

Compiled using the CSU Extension Office recommended landscape and planting publications

PLANT TYPE:

GC=Ground Cover; ET= Evergreen Tree; OG= Ornmental Grass; P=Perennial; S=Shrub; T= Tree; V=Vine

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Juniperus chinensis 'Old Gold'	Juniper, Old Gold	#5	S	M	✓
Juniperus 'Hetzii'	Juniper, Hetzi	#5	S	L	✓
Juniperus horizontalis 'Blue Chip'	Juniper, Blue Chip	#1	GC	M	✓
Juniperus horizontalis 'Hughes'	Juniper, Hughes	#1	GC	M	✓
Juniperus horizontalis 'Prince of Wales'	Juniper, Prince of Wales	#1	GC	M	✓
Juniperus scopularum 'Gray Gleam'	Juniper, Gray Gleam	#5	S	L	✓
Kniphofia uvaria	Red Hot Poker	#1	P	S	✓
Lavandula angustifolia	Lavender	#1	P	S	✓
Leucanthemum x superbum	Daisy, Shasta	#1	P	S	
Liatrus spicata 'Kobold'	Blazing star	#1	P	S	✓
Ligustrum x vicaryi	Privet, Golden Vicary	#5	S	M	
Lilium asiatica	Lily, Asiatic	#1	P	S	
Lilium orientalis	Lily, Oriental	#1	P	S	
Lonicera japonica 'Halliana'	Hall's Japanese Honeysuckle	#1	V/GC	L	✓
Mahonia aquifolium	Oregon Grapeholly	#5	S	M	

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Mirabilis multiflora	Desert Four O'Clock	#1	P	S	✓
Miscanthus sinensis 'Gracillimus'	Maiden Grass	#5	OG	L	
Miscanthus sinensis 'Silberfeder'	Variegated silver Maiden Grass	#5	OG	L	
Miscanthus sinensis 'Zebrinus'	Zebra grass	#5	OG	L	
Oenothera speciosa	Primrose, Mexican Evening	#1	P	S	✓
Paeonia hybrids	Peonies	#1	P	S	
Panicum virgatum	Switch grass	#1	OG	L	
Papaver orientale	Poppy, Oriental	#1	P	S	
Parthenocissus quinquefolia	Virginia Creeper	#1	V	L	
Parthenocissus tricuspidata	Boston Ivy	#1	V	L	
Pennisetum alopecuroides	Fountain grass	#5	OG	M	
Pennisetum alopecuroides 'Hamelin'	Dwarf Fountain grass	#5	OG	S	
Penstemon caespitosus	Penstemon, Mat	#1	GC	S	✓
Penstemon strictus	Penstemon, Rocky Mountain	#1	P	S	
Perovskia atriplicifolia	Russian Sage	#5	S	M	
Phalaris arundinacea 'Picta'	Ribbon grass	#1	OG	M	

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Philadelphus x virginialis	Mockorange	#5	S	L	
Phlox subulata	Phlox, Creeping	#1	GC	S	✓
Physocarpus opulifolius	Common ninebark	#5	S	L	
Picea glauca 'Conica'	Spruce, Dwarf Alberta	#5	S	M	
Pinus mugo	Pine, Mugo	#5	S	S-L	
Pinus mugo 'Slowmound'	Pine, Dwarf Mugo	#5	S	S	
Platycodon grandiflora	Balloonflower	#1	P	S	
Polygonum aubertii	Silver Lace Vine	#1	V	M	
Potentilla fruticosa	Cinquefoil	#5	S	S	✓
Potentilla verna	Creeping potentilla	#1	GC	S	✓
Prunus x cistena	Plum, Cistena	#5	S	M	
Prunus tomentosa	Cherry, Nanking (Manchu)	#5	S	L	
Prunus virginiana	Chokecherry	#5	S	L	
Prunus virginiana 'Shubert'	Chokecherry, Shubert	#5	S	L	
Rhamnus frangula 'Columnaris'	Columnar buckthorn	#5	S	L	
Rhus trilobata	Sumac, Three-leaf	#5	S	M	✓
Rhus aromatica 'Grow-low'	Sumac, Grow Low	#5	S	S	
Ribes alpinum	Currant, Alpine	#5	S	S	
Ribes aureum	Currant, Golden	#5	S	M	
Rosa spp. (Climbing)	Climbing roses	#5	S	M-L	

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Rosa spp. 'Meidiland or other'	Shrub roses	#5	S	S-L	
Rosa hybrid (Florabunda)	Florabunda roses	#5	S	M	
Rosa hybrid (Hybrid-Tea)	Hybrid-Tea roses	#5	S	M	
Rudbeckia fulgida	Black-eyed Susan	#1	P	S	✓
Salix purpurea nana	Willow, Dwarf arctic	#5	S	M	
Salvia nemorosa 'May Night'	Salvia, May Night	#1	P	S	
Sambucus canadensis 'Aurea'	Elderberry, Golden	#5	S	L	
Santolina chamaecyparissus	Gray Santolina	#1	GC	S	✓
Scabiosa caucasica	Pincushion flower	#1	P	S	
Schizachyrium scoparium	Little bluestem	#1	OG	M	✓
Sedum 'Autumn Joy'	Steoncrop	#1	P	S	✓
Sedum 'Dragon's Blood'	Stonecrop, Dragon's Blood	#1	GC	S	✓
Sedum pinifolium	Blue Spruce Sedum	#1	GC	S	✓
Sorbaria sorbifolia	Spirea, Ash-leaf	#5	S	L	
Spiraea x bumalda 'Anthony Waterer'	Spirea, Anthony Waterer	#5	S	S	
Spiraea x bumalda 'Froebelii'	Spirea, Froebel	#5	S	S	

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Spiraea x bumalda 'Goldflame'	Spirea, Goldflame	#5	S	S	
Spiraea x vanhouttei	Spirea, Vanhoutte	#5	S	M	
Symphoricarpos albus	Snowberry	#5	S	M	
Symphoricarpos x chenaultii 'Hancock'	Hancock Coralberry	#5	S	S	
Syringa patula 'Miss Kim'	Lilac, Miss Kim	#5	S	M	
Syringa vulgaris	Lilac	#5	S	L	
Tanacetum niveum	Daisy, Snow	#1	P	S	
Tanacetum x coccineum	Daisy, Painted	#1	P	S	
Thuja occidentalis	Arborvitae, American	#5	S	L	
Thymus pseudolanuginosa	Thyme, Wooly	#1	GC	S	✓
Thymus Serpyllum	Thyme, Wild	#1	GC	S	✓
Veronica pectinata	Speedwell, Blue Woolly	#1	GC	S	✓
Veronica prostrata	Speedwell, Prostrate	#1	GC	S	✓
Veronica spicata	Blue Spike Speedwell	#1	P	S	
Viburnum opulus	Cranberry bush, European (Snowball bush)	#5	S	L	
Viburnum opulus 'Compactum'	Cranberry bush, Compact European (Snowball bush)	#5	S	M	
Viburnum trilobum 'Compactum'	Cranberry bush, Compact American	#5	S	M	

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BOTANICAL NAME	COMMON NAME	MIN. SIZE REQUIRED	PLANT TYPE	PLANT SIZE	XERISCAPE
Vinca minor	Periwinkle		GC	S	✓
Weigela florida 'Java Red'	Weigela, Java Red	#5	S	M	
Weigela florida 'Variegata'	Weigela, Variegated	#5	S	M	
Yucca baccata	Yucca, Banana	#5	S	M	✓
Yucca filamentosa 'Golden Sword'	Yucca, Golden Sword	#5	S	S	✓
Yucca harrimaniae	Yucca, Harriman's	#5	S	S	✓
Zinnia grandiflora	Zinnia, Rocky Mountain	#1	P	S	✓

Choosing a Soil Amendment

by J.G. Davis and C.R. Wilson¹(5/05)

no. 7.235

Quick Facts...

- Soil amendments improve the physical properties of soils.

- Amendments are mixed into the soil. Mulches are placed on the soil surface.
- The best soil amendments increase water- and nutrient-holding capacity and improve aeration and water infiltration.
- Wood products can tie up nitrogen in the soil.
- Sphagnum peat is superior to Colorado mountain peat.
- When using biosolids, choose Grade 1 biosolids.

A soil amendment is any material added to a soil to improve its physical properties, such as water retention, permeability, water infiltration, drainage, aeration and structure. The goal is to provide a better environment for roots.

To do its work, an amendment must be thoroughly mixed into the soil. If it is merely buried, its effectiveness is reduced, and it will interfere with water and air movement and root growth.

Amending a soil is not the same thing as mulching, although many mulches also are used as amendments. A mulch is left on the soil surface. Its purpose is to reduce evaporation and runoff, inhibit weed growth, and create an attractive appearance. Mulches also moderate soil temperature, helping to warm soils in the spring and cool them in the summer. Mulches may be incorporated into the soil as amendments after they have decomposed to the point that they no longer serve their purpose.

Organic vs. Inorganic Amendments

There are two broad categories of soil amendments: organic and inorganic. Organic amendments come from something that is or was alive. Inorganic amendments, on the other hand, are either mined or man-made. Organic amendments include sphagnum peat, wood chips, grass clippings, straw, compost, manure, biosolids, sawdust and wood ash. Inorganic amendments include vermiculite, perlite, tire chunks, pea gravel and sand.

Not all of the above are recommended by Colorado State University. These are merely examples. Wood ash, an organic amendment, is high in both pH and salt. It can magnify common Colorado soil problems and should not be used as a soil amendment. Don't add sand to clay soil -- this creates a soil structure similar to concrete.

Organic amendments increase soil organic matter content and offer many benefits. Organic matter improves soil aeration, water infiltration, and both water- and nutrient-holding capacity. Many organic amendments contain plant nutrients and act as organic fertilizers.

Organic matter also is an important energy source for bacteria, fungi and earthworms that live in the soil.

Application Rates

If your soil has less than 3 percent organic matter, then apply 3 cubic yards of your chosen organic amendment per 1,000 square feet. To avoid salt buildup, do not apply more than this. Retest your soil before deciding whether to add more soil amendment.

Wood Products

Wood products can tie up nitrogen in the soil and cause nitrogen deficiency in plants. Microorganisms in the soil use nitrogen to break down the wood. Within a few months, the nitrogen is released and again becomes available to plants. This hazard is greatest with sawdust, because it has a greater surface area than wood chips.

If you plan to apply wood chips or sawdust, you may need to apply nitrogen fertilizer at the same time to avoid nitrogen deficiency.

Sphagnum Peat vs. Mountain Peat

Sphagnum peat is an excellent soil amendment, especially for sandy soils, which will retain more water after sphagnum peat application. Sphagnum peat is generally acid (i.e., low pH) and can help Gardeners grow plants that require a more acidic soil. Colorado mountain peat is not as good a soil amendment. It often is too fine in texture and generally has a higher pH.

Mountain peat is mined from high-altitude wetlands that will take hundreds of years to rejuvenate, if ever. This mining is extremely disruptive to hydrologic cycles and mountain ecosystems. Sphagnum peat is harvested from bogs in Canada and the northern United States. The bogs can be revegetated after harvest and grow back relatively quickly in this moist environment.

Are Biosolids Safe?

Biosolids are byproducts of sewage treatment. They may be found alone or composted with leaves or other organic materials. The primary concerns about biosolids are heavy metal content, pathogen levels and salts. To avoid excessive levels of heavy metals and to ensure that pathogens have been killed, always choose a Grade 1 biosolid. While Grade 1 biosolids are acceptable for food Gardens, do not use them on root Crops because they will come in direct contact with the edible portion of the plant. Do not use biosolids below Grade 1.

Manure vs. Compost

Fresh manure can harm plants due to elevated ammonia levels. To avoid this problem, use

only aged manure (at least six months old). Pathogens are another potential problem with fresh manure, especially on vegetable Gardens. Compost manure for at least two heating cycles at 130 to 140 degrees F to kill any pathogens before applying the manure to vegetable Gardens. **Most home composting systems do not sustain temperatures at this level.** Home-composted products containing manure are best used in flower Gardens, shrub borders and other nonfood Gardens. See fact sheets [9.369, *Preventing E. coli From Garden to Plate*](#), and [7.212, *Composting Yard Waste*](#).

During composting, ammonia gas is lost from the manure. Therefore, nitrogen levels may be lower in composted manure than in raw manure. On the other hand, the phosphorus and potassium concentrations will be higher in composted manure. Modify fertilizer practices accordingly. Salt levels also will be higher in composted manure than in raw manure. If salt levels are already high in your Garden soil, do not apply manures.

Other composts are available that are made primarily from leaf or wood products alone or in combination with manures or biosolids.

Factors to Consider When Choosing an Amendment

There are at least four factors to consider in selecting a soil amendment:

- how long the amendment will last in the soil,
- soil texture,
- soil salinity and plant sensitivities to salts, and
- salt content and pH of the amendment.

Laboratory tests can determine the salt content, pH and organic matter of organic amendments. The quality of bulk organic amendments for large-scale landscape uses can then be determined.

Longevity of the Amendment

The amendment you choose depends on your goals.

- Are you trying to improve soil physical properties quickly? Choose an amendment that decomposes rapidly.
- Do you want a long-lasting improvement to your soil? Choose an amendment that decomposes slowly.
- Do you want a quick improvement that lasts a long time? Choose a combination of amendments.

Amendment	Decomposition rate
Grass clippings, manures	Rapid decomposition (days to weeks)
Composts	Moderate decomposition (about six months)
Wood chips (redwood, cedar), hardwood bark, peat	Slow decomposition (possibly years)

Soil Texture

Soil texture, or the way a soil feels, reflects the size of the soil particles. Sandy soils have large soil particles and feel gritty. Clay soils have small soil particles and feel sticky. Both sandy soils and clay soils are a challenge for Gardeners. Loam soils have the ideal mixture of different size soil particles.

When amending sandy soils, the goal is to increase the soil's ability to hold moisture and store nutrients. To achieve this, use organic amendments that are well decomposed, like composts or aged manures.

With clay soils, the goal is to improve soil aggregation, increase porosity and permeability, and improve aeration and drainage. Fibrous amendments like peat, wood chips, tree bark or straw are most effective in this situation.

Use Tables 2 and 3 for more specific recommendations. Because sandy soils have low water retention, choose an amendment with high water retention, like peat, compost or vermiculite. Clay soils have low permeability, so choose an amendment with high permeability, like wood chips, hardwood bark or perlite. Vermiculite is not a good choice for clay soils because of its high water retention.

Soil Texture	Permeability	Water Retention
Sand	high	low
Loam	medium	medium
Silt	low	high
Clay	low	high

Amendment	Permeability	Water Retention
Fibrous Peat Wood chips Hardwood bark	low-medium high high	very high low-medium low-medium
Humus Compost Aged manure	low-medium low-medium	medium-high medium
Inorganic Vermiculite Perlite	high high	high low

Soil Salinity and Plant Sensitivity to Salts

Some forms of compost and manures can be high in salts. Avoid these amendments in soils that are already high in salts (above 3 mmhos/cm) or when growing plants that are sensitive to salts. Raspberry, strawberry, bean, carrot, onion, Kentucky bluegrass, maple, pine, viburnum and many other landscape plants are salt sensitive. In such cases, choose sphagnum peat or ground leaves instead of compost or manures.

Salt Content and pH of the Amendment

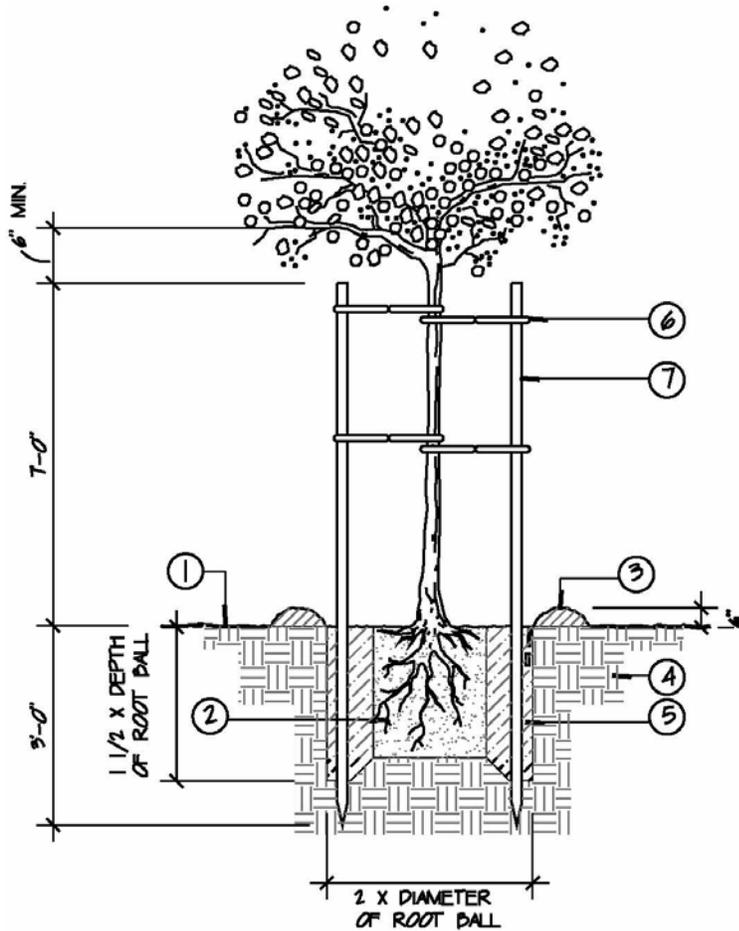
Always beware of salts in soil amendments. High salt content and high pH are common problems in Colorado soils. Therefore, avoid amendments that are high in salts or that have a high pH. Amendments high in salts and/or pH include wood ash, Colorado mountain peat and composted manures. An amendment with up to 10 mmhos/cm total salts is acceptable if well mixed into low-salt soils (less than 1 mmhos/cm). Amendments with a salt content greater than 10 mmhos/cm are questionable. Choose a low-salt amendment for soils testing high in salts.

Sphagnum peat and compost made from purely plant sources are low in salts and are good choices for amending Colorado soils. Ask for an analysis of the organic amendments that you are considering, and choose your amendments wisely. If no analysis is available, test a small amount of the amendment before purchasing a large quantity.

¹J.G. Davis, Colorado State University Extension soil specialist and associate professor, soil and crop sciences; and C.R. Wilson, Extension horticulture agent, Denver County. 6/00. Reviewed 5/05.

EXAMPLE OF TYPICAL STAKING/GUYING OF TREE

DETAIL



KEY

- ① FINISH GRADE
- ② ROOTBALL
- ③ TEMPORARY 6" WATERING BASIN
- ④ NATIVE SOIL
- ⑤ BACKFILL MIX (PER PLANTING SPECIFICATIONS)
- ⑥ TREE TIES (MIN. 4 REQUIRED) SECURE TO POLE W/GALV. NAIL.
- ⑦ 2" DIA. TREATED LODGEPOLE PINE STAKE

NOTE:

- STAKES SHALL NOT PIERCE ROOTBALL AND SHALL EXTEND INTO UNDISTURBED SOIL.

- PLACE PRE-MANU. TIES ACCORDING TO MANU. RECOMMENDATIONS.