

Planting Under Trees

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What we want....



Healthy plants under trees. Here is an example of an ideal planting under trees.

Challenge: tree roots

✦ Examples of trees with surface roots:

◆ maple

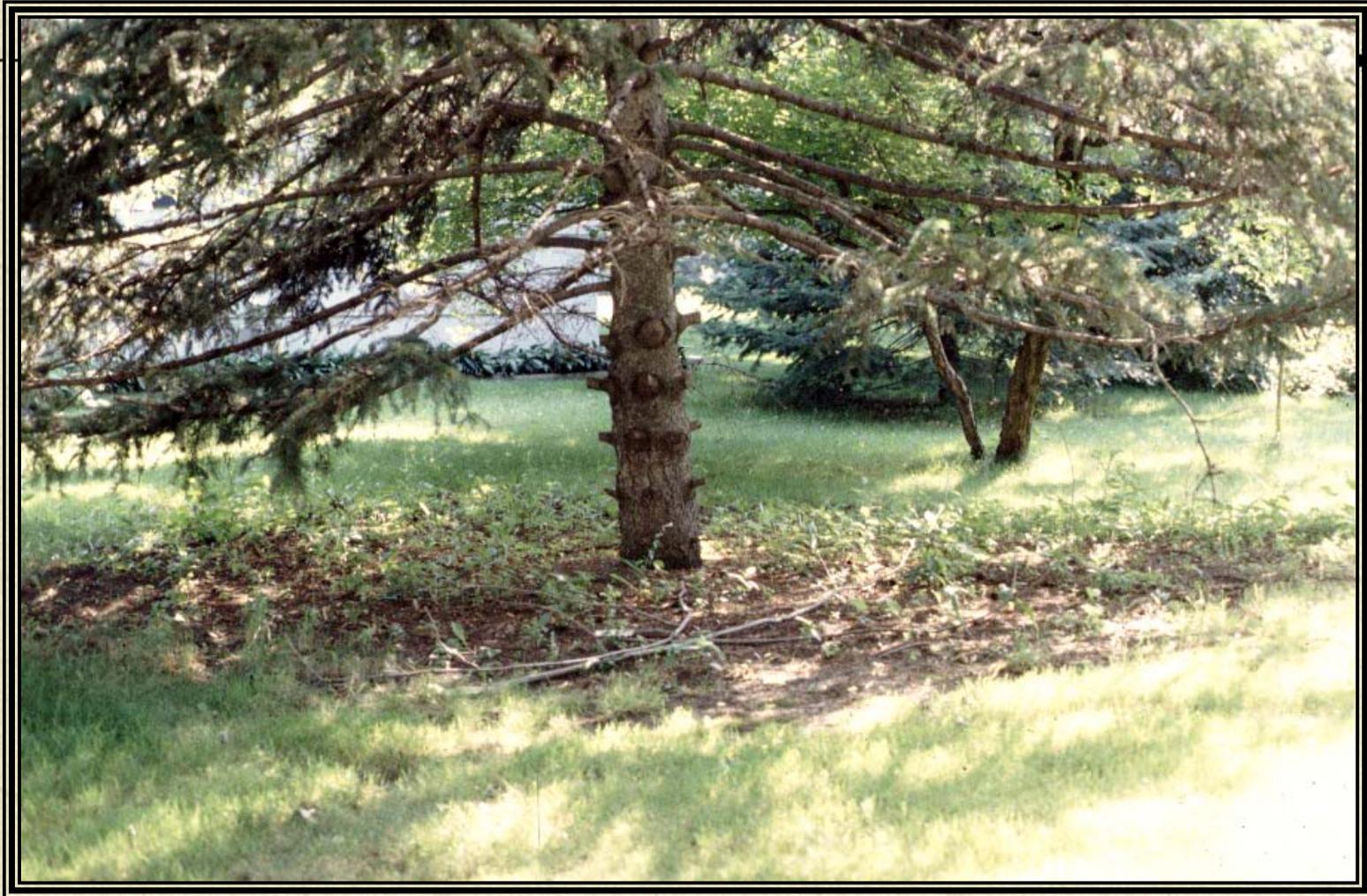
◆ spruce

✦ Examples of trees with few surface roots:

◆ oak

◆ ash

Tree roots: spruce with surface roots



Tree roots: silver maple surface roots



Tree roots: boxelder with surface roots

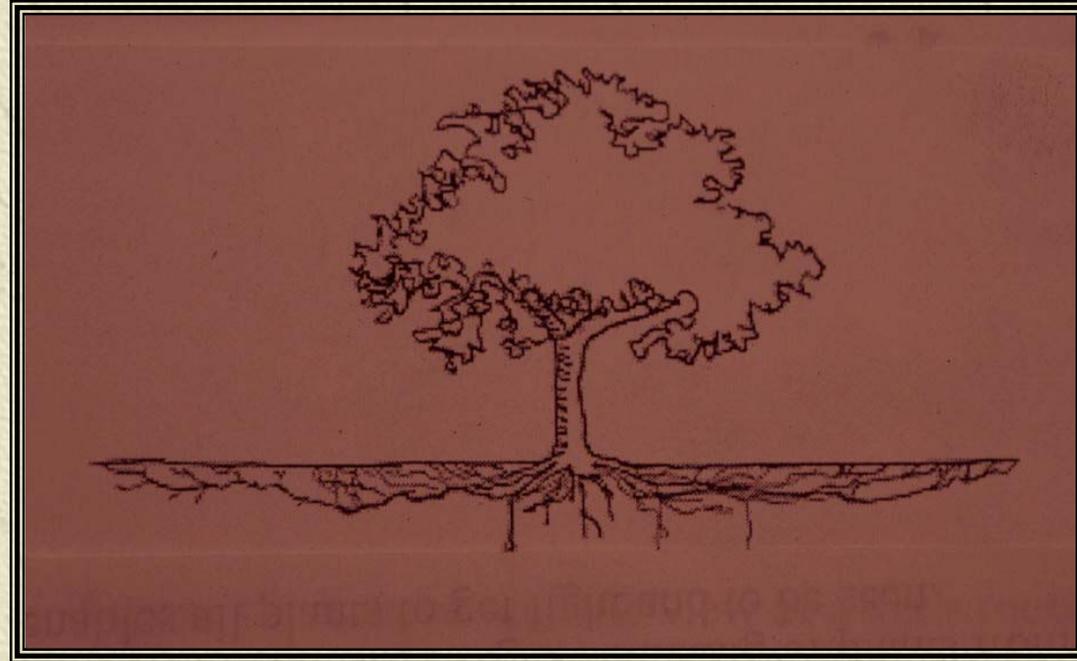


Tree roots

- ✦ This illustration shows an **incorrect image** of tree roots.
- ✦ It's a common misconception that tree roots mirror the branch structure.



Tree roots



- ✦ This illustration is a much more realistic image of tree roots
- ✦ 90% of tree roots are in the top 3 feet of soil
- ✦ 50-75% of feeder roots are in the top 1 foot of soil

Tree roots

- ✦ Adding soil on top of tree roots can kill trees.
- ✦ This is an example of what NOT to do.



Choices for planting under trees:

✦ Keep it natural

✦ Mulch

✦ Plant perennials

✦ Plant annuals

Choices: keep it natural



- ✦ Leaves can provide a natural mulch
 - ◆ Don't rake them up!

Choices: mulch

✦ Mulches offer many advantages:

- ◆ control weeds
- ◆ conserve moisture
- ◆ moderate soil temperature
- ◆ reduce erosion
- ◆ add organic matter
- ◆ look tidy
- ◆ can add concept or bed lines to enhance landscape design

Choices: organic mulch



Shredded bark

- ◆ apply 2-4" deep
- ◆ add every 2-3 years
- ◆ may require additional nitrogen if worked into soil



Compost

- ◆ adds structure and improves soil tilth
- ◆ inexpensive and easy to obtain from a home compost site



Shredded leaves

- ◆ inexpensive
- ◆ easy to obtain



Cocoa shells

- ◆ chocolate aroma
- ◆ may become matted and mildew
- ◆ requires annual application



Pine needles

- ◆ can last 2-3 years
- ◆ harder to find in Minnesota



Wood chips

- ◆ may require additional nitrogen if worked into soil

Choices: mulch

- ✦ Apply mulch under trees
- ✦ Use organic mulch 2-4" thick
- ✦ Use permeable materials that allow water to penetrate and reach the roots
- ✦ Avoid plastics that limit water and air exchange



Choices: mulch or plants



- ✦ Mulched amur maple, *Acer ginnala*, background
- ✦ Boxelder, *Acer negundo*, with perennials, foreground

Choices: plant under trees



- ✦ Shade trials at the University of Minnesota-Morris with drip irrigation

Choices: how to plant under trees



- ✦ Consider pruning lower limbs to allow more light.
- ✦ Remove turfgrass, weeds, or existing plants manually or chemically (RoundUp®), following label directions.
- ✦ Avoid changing the grade so water and air are not limited for the tree roots. Do NOT change grade by adding soil on top of roots.
- ✦ Purchase smaller plants for ease of planting.

Choices: how to plant under trees



Carefully dig holes for the individual new plants between tree roots.



Add organic matter such as compost to individual planting holes.



Apply 2-4 inches of organic mulch between new plants. Do NOT apply more than 4" of mulch.



Water new plantings well especially the first season.

Special sites: black walnut trees

- ✦ Planting under black walnut, *Juglans nigra*, and Butternut, *Juglans cinerea*, trees can be a challenge to due a natural substance they produce called juglone.
- ✦ Many plants are sensitive to juglone and can be injured or killed when grown under the these trees.

Special sites: black walnut trees

✦ Examples of plants **tolerant** to juglone

- ◆ daffodil (*Narcissus* spp.)
- ◆ daylily (*Hemerocallis* spp.)
- ◆ plantain lily (*Hosta* spp.)

✦ Examples of plants **sensitive** to juglone

- ◆ plants in the nightshade family (tomato, pepper, eggplant, potato)
- ◆ peony (*Paeonia* spp.)
- ◆ wild columbine (*Aquilegia canadensis*)

Special sites: black walnut trees

For more information on juglone and individual plant sensitivity, see these references:

- Funt, R.C. and J. Martin. Undated. Black Walnut Toxicity to Plants, Humans, and Horses. HYG-1148-93 Ohio State University Extension Fact Sheet. Accessed 29 December 2005. <http://ohioline.osu.edu/hyg-fact/1000/1148.html>.
- University of Minnesota Extension Service. 1999. H407B. Toxicity of Black Walnuts Towards Other Plants. www.extension.umn.edu.
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Good plants for under trees



- ✦ Azaleas and rhododendron, shown here at the Minnesota Landscape Arboretum, are examples of plants that naturally grow as under-story plants beneath trees.



✿ *Tiarella*, tulips, and hosta planted under trees, also shown at the Arboretum are other good choices for under trees.

Hosta tolerates tree roots well

✦ Planting close to the trunk reduces mechanical damage to trees.



Hosta under trees



- ✦ Mulch and stone edging with hosta creates a functional, but minimal design.

Hosta under trees



This design is pleasing and shows a nice concept line while still protecting the tree trunk.

Native plant communities

- ✦ Look locally to find plants that grow naturally under trees.
- ✦ Explore different plant communities.
- ✦ Look for native plants that thrive in conditions like your own!

Native plant communities



✦ Eastern deciduous woods: Eloise Butler
Wildflower Garden, Minneapolis, MN.

Native plant communities



- ◆ This public woodland garden varies from moist, heavy shade, to drier upland sites.

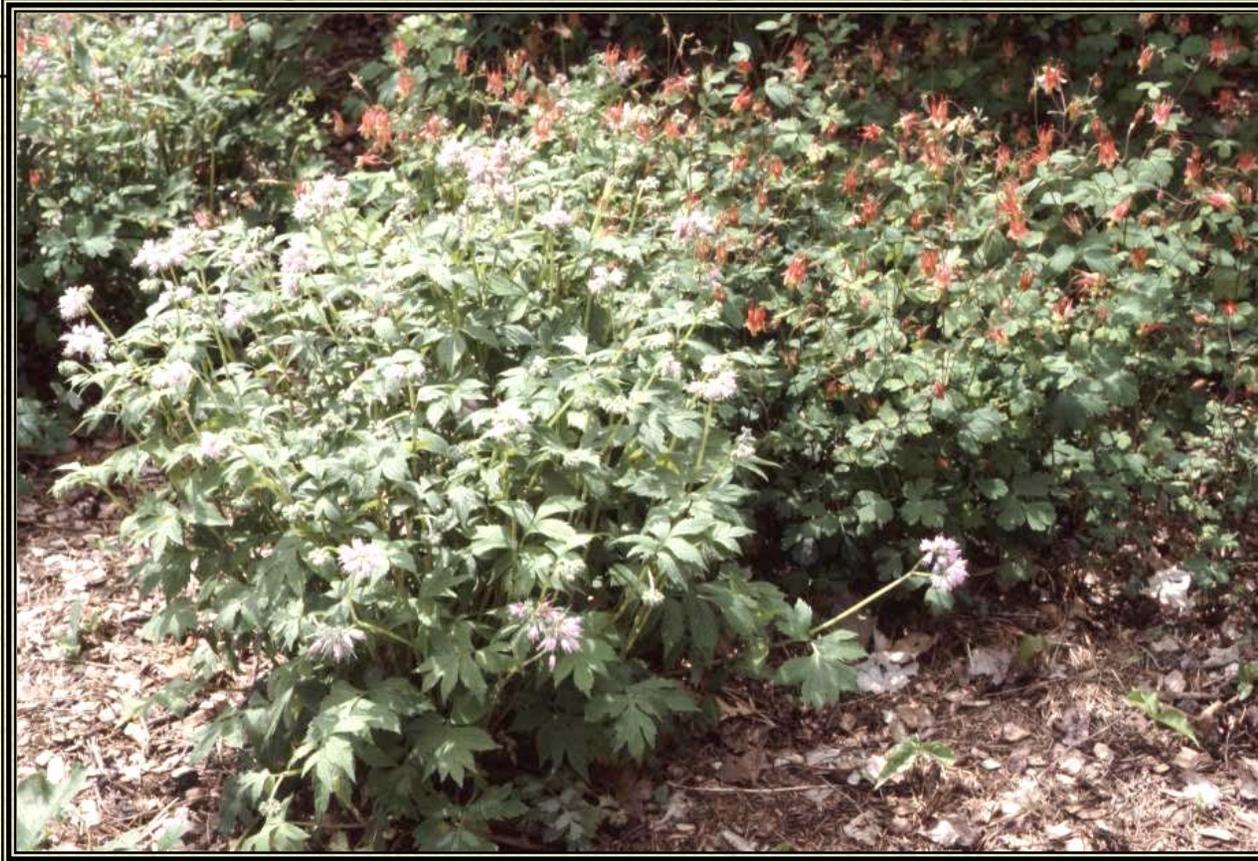
Native plant communities



- ✦ Here is an oak savannah near Waseca, MN. This is a transition vegetative zone, usually a drier site that is found between the Eastern deciduous woods and the prairie.

Native Plants:

There are many good choices for planting under trees



- ✦ In the background *Aquilegia canadensis* wild columbine
- ✦ Foreground *Hydrophyllum virginianum* water leaf

Native plants



✦ *Anemone canadensis* Canada anemone

Native plants



✧ *Anemone canadensis* Canada anemone

Native plants



✦ *Asarum canadense* wild ginger

Native plants



✦ *Aster macrophyllus* large-leaved aster

Native plants



✦ *Carex* spp. sedges

Native plants



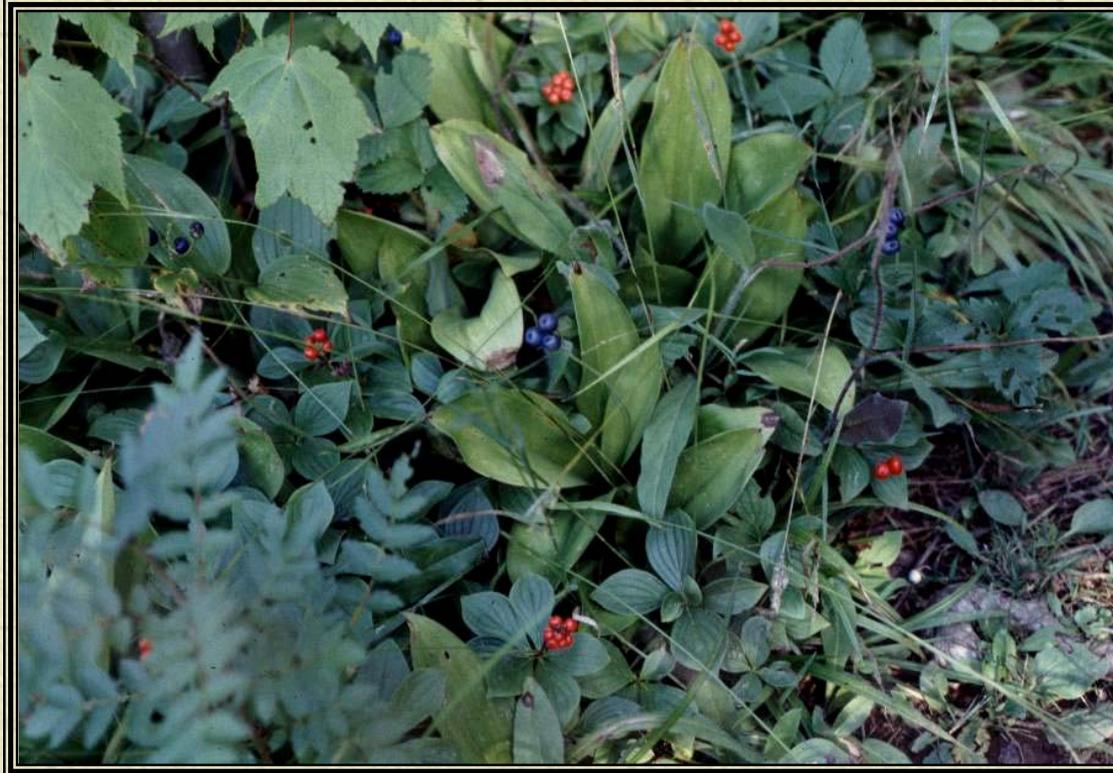
✦ *Carex* spp. sedges shown growing in shade

Native plants



✦ *Carex muskingumensis* palm sedge

Native plants



✦ *Cornus canadensis* bunchberry

✦ *Clintonia borealis* bluebead

Native plants

✦ *Cornus canadensis*
bunchberry



Native plants



✦ *Deschampsia caespitosa* 'Bronzeschleier' bronze veil tufted hairgrass

Native plants



✧ *Erythronium* spp. trout lily

Native plants



✦ *Geum triflorum* prairie smoke

Native plants



✧ *Geum triflorum* prairie smoke

Native plants



✦ *Geranium maculatum* wild geranium

Native plants



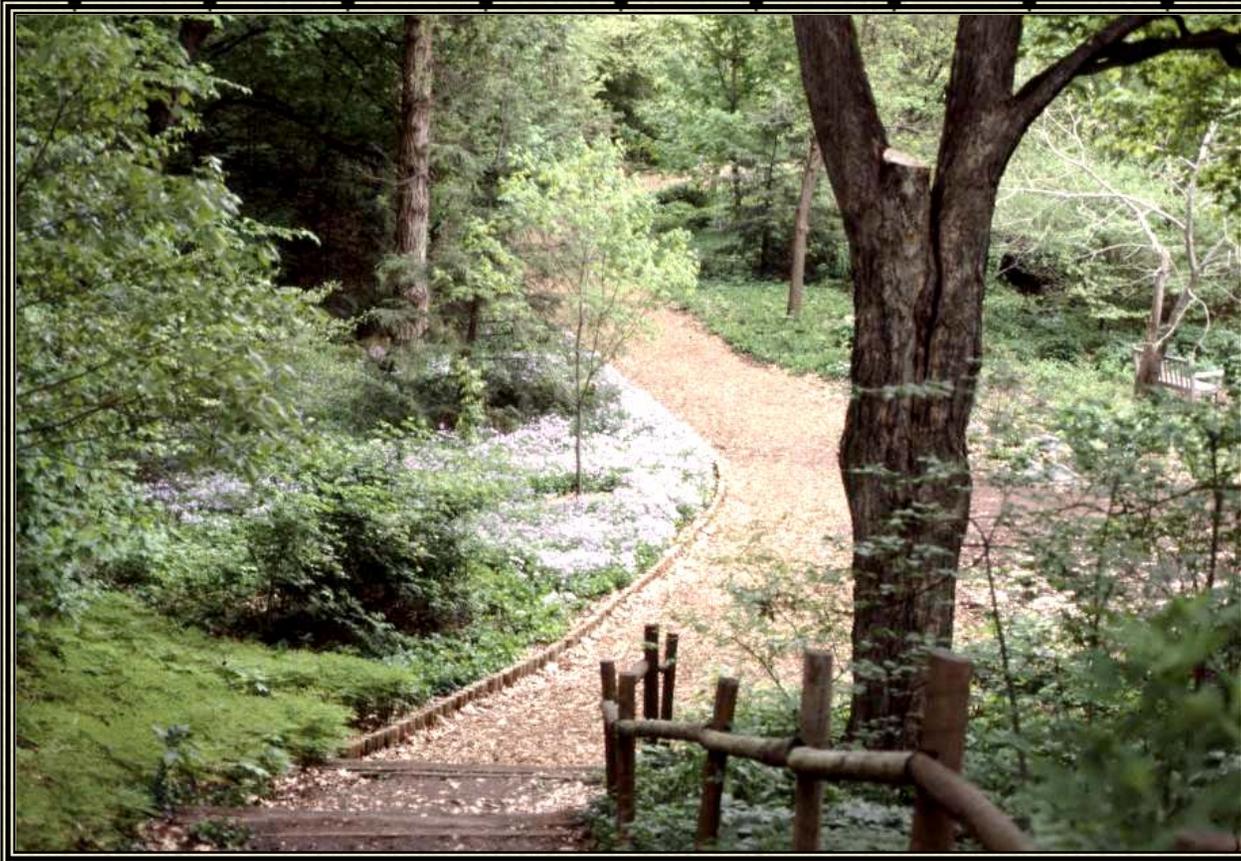
✧ *Hydrophyllum virginianum* water leaf

Native plants



✧ *Hydrophyllum virginianum* water leaf

Native plants



✦ *Phlox divaricata* woods phlox

Native plants



✧ *Tiarella cordifolia* foam flower

Native plants



✦ *Thalictrum* spp. meadow rue

Native plants



✦ *Polygonatum biflorum* 'Variegatum' variegated Solomon's seal

Native plants



✦ *Podophyllum peltatum* mayapple

Native plants



✦ *Trillium grandiflorum* large-flowered trillium

Native plants



✦ *Tradescantia ohiensis* spiderwort

Native plants



✦ *Tradescantia* 'Snowcap' spiderwort

Native plants



✿ *Viola* spp. violets

Native plants



✦ *Osmunda claytoniana* interrupted fern

Native plants: ferns



✦ *Adiantum pedatum* maidenhair fern

Native plants: ferns

✧ *Osmunda claytoniana*
interrupted fern



Native plants: ferns



✦ *Pteridium aquilinum* bracken fern

Native plants: ferns



✧ *Pteridium aquilinum* bracken fern

Non-native plants



✦ *Ajuga reptans* bugleweed

Non-native plants



✦ *Brunnera macrophylla* Siberian bugloss

Non-native plants



✦ *Convallaria majalis* lily-of-the-valley

Non-native plants



✦ *Chasmanthium latifolium* northern sea oats

Non-native plants



✦ *Chasmanthium latifolium* northern sea oats

Non-native plants



✠ *Dianthus barbatus* sweet William

Non-native plants



✦ *Epimedium x rubrum* barrenwort

Non-native plants



✦ *Galium odoratum* sweet woodruff

Non-native plants



✦ *Glechoma hederacea* ground ivy (considered a weed by many, but easily grows in shady tough sites).

Non-native plants



✦ *Glechoma hederacea* ground ivy

Non-native plants



✦ *Hosta* spp. plantain lily

Non-native plants



✦ *Lamiastrum galeobdolon* yellow archangel

Non-native plants



✦ *Lamium maculatum* dead nettle, lamium

Non-native plants



✦ *Narcissus* spp. daffodils

Non-native plants



✦ *Pachysandra terminalis* pachysandra, requires winter protection or snow cover

Non-native plants



✦ *Phalaris arundinacea* 'Feesey's Form' ribbon grass

Non-native plants



✦ *Vinca minor* periwinkle

Grasses: recreational



- ✦ Recreational use may be a requirement when children need play areas. None of the plants previously listed can tolerate foot traffic. Turfgrasses are still the best choice where there will be foot traffic.

Grasses:



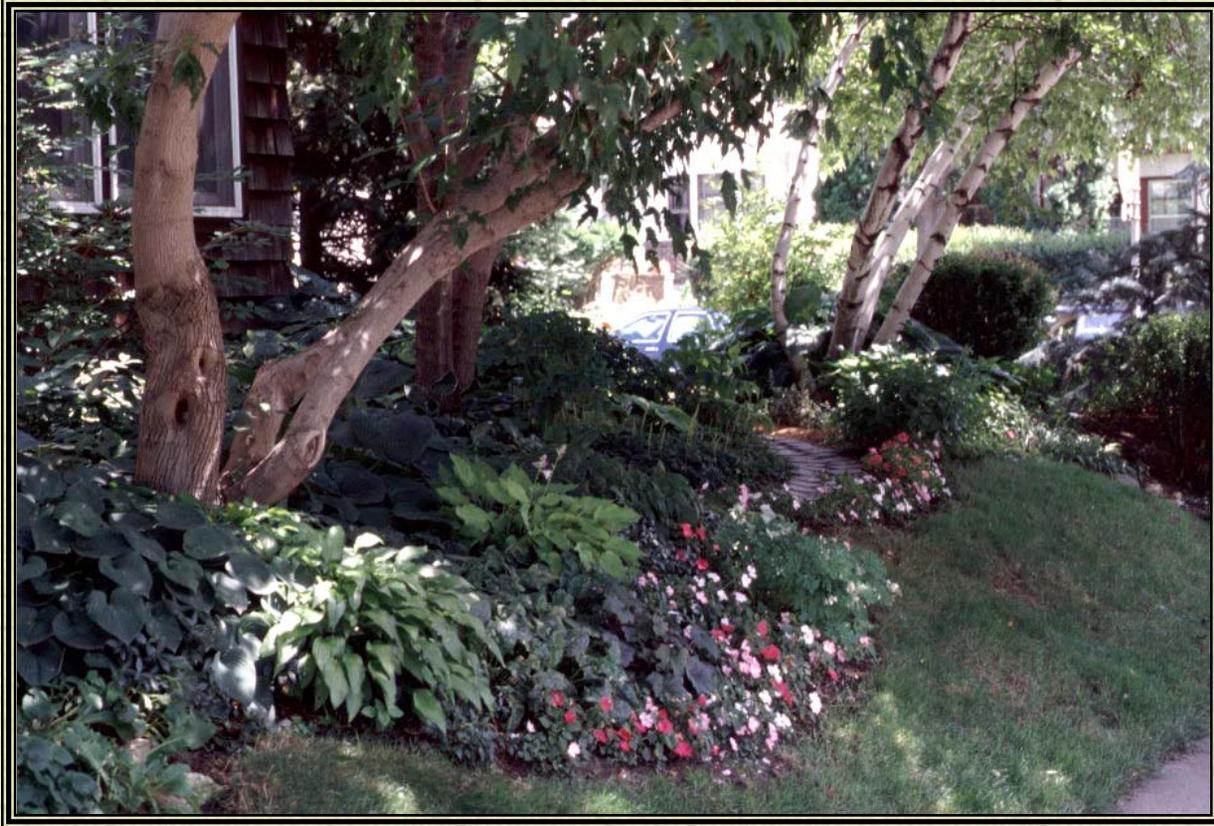
- ✦ The fine fescues, *Festuca* spp., such as red fescue, chewings fescue, and creeping red fescue are good choices for shady sites. Fescues tolerate shade, drought, and low fertility. This photo shows how fine fescues look when they are cut only 1-2 times a year.

Planting under trees: annuals



✦ Yes, you can plant shade tolerant annuals under a spruce tree; don't forget to water them regularly.

Planting under trees: perennials and annuals



✦ A combination of annuals and perennials can make an attractive shade garden.

Planting under trees: perennials

- ✦ Select from the many plants previously shown, such as spiderwort (*Tradescantia* spp.) with hosta, northern sea oats, sweet woodruff, and sweet William.



Final tips for planting under trees:

- ✦ Avoid damaging tree roots
 - ◆ do not add soil on top of tree roots
 - ◆ gently plant between roots
 - ◆ do not cut into roots 2” or larger
 - ◆ use a layer of mulch no deeper than 2-4” thick
- ✦ Look to nature for inspiration in plant selection
- ✦ Be prepared to water the first year or two until plants are established

References

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 3. Dimond, D. 1977. All About Ground Covers. Ortho Books, San Francisco, CA.
 4. Funt, R.C. and J. Martin. Undated. Black Walnut Toxicity to Plants, Humans, and Horses. HYG-1148-93 Ohio State University Extension Fact Sheet. Accessed 29 December 2005. <http://ohioline.osu.edu/hyg-fact/1000/1148.html>.
- ✱ Meyer, M. H. and R. Robison, D.B. White. 1995. Plants in Prairie Communities. North Central Regional Pub. AG-BU-3238-C. Minnesota Extension Service. www.extension.umn.edu.

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- ✱ Meyer, M. H. and Zins, M. 1998. Ground Covers for Rough Sites. FS-1114-A. University of Minnesota Extension Service. www.extension.umn.edu.
 - ✱ Miller, N., D. Rathke, and G. Johnson. 1995. Protecting Trees from Construction Damage: A Homeowner's Guide. FO-6135-S. University of Minnesota Extension Service. www.extension.umn.edu.
 - ✱ Ripke, K. Undated. Planting Under Existing Trees. University of Minnesota Dept. of Horticultural Science. <http://www.sustland.umn.edu/implement/planting.html> accessed 29 December 2005.
 - ✱ University of Minnesota Extension Service. 1999. H407B. Toxicity of Black Walnuts Towards Other Plants. www.extension.umn.edu.
 - ✱ Voigt, T.B., B.Hamilton, F.Giles. 1983. Ground Covers for the Midwest. North Central Regional Publication 400. University of Illinois. Available from U of MN Extension Service, www.extension.umn.edu.
 - ✱ West Virginia University Extension Service. Undated. Black Walnut Toxicity. <http://www.wvu.edu/~agexten/hortcult/fruits/blkwalnt.htm>. accessed 29 December 2005.

Author Credits

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