



The Nurturing Leaves

Fall 2005, Volume 14 Number 3

Plant Choices for Clay Soils



Autumn Purple® white ash has great fall color and grows vigorously in clay soils.

If you live in an area of Milwaukee with heavy clay soils, you may think that means you can't have a beautiful garden. But just because you are "stuck" with clay soils doesn't mean you can't have an attractive landscape. Yes, there are many plants that struggle in clay soils but you may not be aware of the many trees, shrubs and perennials that do well.

First, let's talk about some of the basics of soil. Soil is formed from rocks and decaying plants and animals. It is made of four basic components 1) mineral matter (i.e. fragmented rocks) 2) organic matter (i.e. decomposed plants and animals) 3) water; and 4) air. In most soils, the mineral matter is the major component and main determining factor of the soil's properties. The average soil sample contains 45% minerals, 25% water, 25% air and 5% organic matter. In the southern part of the state the mineral matter comes from the weathering of limestone bedrock, so the resulting soil tends to be alkaline (has a high pH). On the other hand, in the northern parts of the state, the bedrock is granite and the soil tends to be more acidic (has a low pH). The organic matter from decaying plants and animals combines with fragmented minerals derived from the weathered bedrock and the empty spaces between the mineral and organic matter are filled with air or water. You begin to understand just how precious soil is when you realize that it can take natural processes more than 500 years to make 1 inch of topsoil!

Today, many sites have disturbed soil as a result of the building and construction process. Before construction begins the topsoil may be scraped off and removed from the lot. After excavating for the basement, the subsoil (clay, sand or gravel) is typically spread over the lot, and often times building materials such as limestone, rubble and asphalt are buried and the whole mess is compacted by heavy equipment. Then a thin layer of topsoil (sometimes only a couple inches thick) is spread on top. This process often leaves the homeowner with a compacted, poorly drained site in which to plant. Whenever possible, a homeowner should take measures to preserve and stockpile as much of the original topsoil on site.

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Most crabapples including Golden Raindrops® (pictured) are tolerant of heavy clay soils.



Gateway Joe-Pye weed flowers beautifully on wet sites.



Even in heavy clay soils, Sunrise forsythia produces bright yellow blossoms in spring.

Plant Sale

Our Retail Plant Sale
Has Been **Extended**
through November 30, 2005.

**20% off fountains, statues,
urns and pottery**

**15% off ALL container trees
and shrubs**

**15% off deciduous B&B
shrubs in our holding yard**



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Obedient plant behaves well in clay.

Client Questions?

This year I purchased an Endless Summer™ Hydrangea do I need to do anything to prepare it for winter?

Keep the soil moist with regular waterings through the Fall until the ground is frozen. Once the plant is fully dormant, after a couple hard freezes, you should cover the plant with a 4" layer of organic mulch (such as bark mulch or leaves) It's not necessary to cover all the stems to the tip or to cut them back. You can leave the spent blooms on the plant for winter interest. In Spring, uncover the plant when the ground is no longer frozen and remove any spent blooms that were left on through winter.

Endless Summer™ Hydrangea flowers on old and new wood - it will grow new branches from the base as well as from old branches that survived winter. Growth will be very slow at first - until the weather heats up sufficiently to stimulate new growth. After you see the new green growth, prune back the old branches to a finger width above the new growth. Be patient, in our climate, Endless Summer™ Hydrangea may not start producing its blooms until mid-summer. Once the plant starts blooming, deadheading (removing the spent blooms) or cutting the blooms for use in vases helps encourage the plant to produce more blossoms. *KS*

Winter protection for your Endless Summer™ Hydrangea can help ensure more vigorous regrowth next season.



Why do clay soils cause problems for plants? The tiny, flat, plate-like particles of clay soils trap water between them. Imagine stacks of wet poker chips but so small they are sub-microscopic in size. Because clay soils have such excessively small pore spaces, air and water move through them slowly. The tiny pore spaces of clay soils absorb and retain water and limit aeration which in turn limits root growth because of the lack of oxygen. This can cause the root system of plants to stay only at the surface. In addition to being slow to drain, clay soils compact easily and when they dry out, can become brick hard making it difficult for roots to penetrate. This may further cause stunted root development. Lastly, in this part of the state our clay soils are most likely, alkaline (high pH) and that can cause its own set of problems.



Redosier dogwoods are a perfect match for clay soils.

As you probably already know clay soil is heavy, sticky and hard to work with. In smaller planting areas you can improve the soil by working 2-4" of organic matter (compost, peat, aged manure) into the top 6-12" of soil. But for large trees and shrubs, the root system will one day extend far beyond the plant so trying to incorporate organic matter in such a large area may be very costly. Berms and raised beds may offer a solution on heavy clay and poorly drained sites.

When planting trees and shrubs in clay soils we recommend using the existing soil that came out of the hole as backfill. Organic matter may be added to the backfill; however, it should not exceed 20% of the backfill and should be thoroughly mixed with the existing soil. When dealing with clay soils, another simple thing to improve plant health and establishment is to mulch with shredded bark. Bark mulch slowly biodegrades, adding organic matter to the soil and enhancing it for better root development. The easiest course when dealing with clay soils is to select plants that are adapted to your site. (See the list on the facing page.) *KS*



Eye Stopper™ corktree performs admirably in heavy clay soils.

Nature's Best To You™ Questions?

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Plants Tolerant of Heavy, Clay Soils

Listed below are some trees, shrubs and perennials that should adapt well for clay soils, but it is very important to be sure that their other cultural requirements be met (sun/shade, acid/alkaline, well-drained or moist soil).

* **indicates tolerant of poor drainage** (i.e. soil where water sits on top rather than soaking into and can puddle for a longer period of time - by contrast, in well-drained soil, excess water drains away quickly).

Shade and Ornamental Trees

Amur Corktree (*Phellodendron amurense*)
 Black Alder (*Alnus glutinosa*)*
 Black Ash (*Fraxinus nigra* & cvs.)
 Blue Ash (*Fraxinus quadrangulata*)
 Bur Oak (*Quercus macrocarpa*)
 Callery Pear (*Pyrus calleryana* & cvs.)
 Chinakapin Oak (*Quercus muehlenbergii*)
 Common Hackberry (*Celtis occidentalis* & cvs.)*
 English Oak (*Quercus robur* & cvs.)
 Eye Stopper™ Corktree (*Phellodendron lavallei* Longenecker)
 Freeman Maple (*Acer x freemannii* & cvs.)*
 Ginkgo (*Ginkgo biloba* & cvs.)
 Green Ash (*Fraxinus pennsylvanica* & cvs.)
 Hawthorns (*Crataegus* spp. & cvs.)
 Hoptree or Waferash (*Ptelea trifoliata*)
 Hybrid Elms (*Ulmus* spp. & cvs.)
 Hybrid Swamp x Bur Oak (*Quercus x schuettei*)
 Kentucky Coffeetree (*Gymnocladus dioica* & cvs.)
 Manchurian Ash (*Fraxinus manshurica* cvs.)
 Musclewood (*Carpinus caroliniana*)
 Norway Maple (*Acer platanoides* & cvs.)
 Ornamental Crabapple (*Malus* spp. & cvs.)
 Quaking Aspen (*Populus tremuloides*)
 Silver Maple (*Acer saccharinum* & cvs.)*
 State Street™ Maple (*Acer miyabei* 'Morton')
 Swamp White Oak (*Quercus bicolor*)
 Tatarian Maple (*Acer tataricum*)
 Thornless Honeylocust (*Gleditsia tri. var. inermis*)
 White Ash (*Fraxinus americana*)
 Willows (*Salix* spp. & cvs.)*

Conifers and Broad-leaved Evergreens

American Arborvitae (*Thuja occidentalis* & cvs.)
 Austrian Pine (*Pinus nigra*)
 Baldcypress (*Taxodium distichum*)*
 Boxwood (*Buxus* cvs.)
 Black Hills Spruce (*Picea glauca* var. *densata*)
 Chinese Juniper (*Juniperus chinensis* cvs.)
 Eastern Redcedar (*Juniperus virginiana* & cvs.)
 Norway Spruce (*Picea abies* & cvs.)
 Savin Juniper (*Juniperus sabina* & cvs.)
 Scots Pine (*Pinus sylvestris*)
 Wintercreeper (*Euonymus fortunei* & cvs.)
 White Spruce (*Picea glauca*)

Shrubs

American Bladdernut (*Staphylea trifolia*)
 American Elderberry (*Sambucus canadensis* & cvs.)*
 Arrowwood Viburnum (*Viburnum dentatum* & cvs.)
 Barberries (*Berberis* spp. & cvs.)
 Black Chokeberry (*Aronia melanocarpa* & cvs.)*
 Creeping Willow (*Salix repens* & cvs.)*
 Burningbush (*Euonymus alata* & cvs.)
 Buttonbush (*Cephalanthus occidentalis*)*
 Common Ninebark (*Physocarpus opulifolius* & cvs.)
 Cornelancherry Dogwood (*Cornus mas* & cvs.)
 Cutleaf Stephanandra (*Stephanandra incisa* 'Crispa')
 Dappled Willow (*Salix* x 'Hakura Nishiki')*
 Dwarf Bushhoneysuckle (*Diervilla lonicera*)
 European Elderberry (*Sambucus nigra* & cvs.)*

Shrubs (cont.)

European Euonymus (*Euonymus europaea*)
 Fiveleaf Aralia (*Acanthopanax sieboldianus*)
 Forsythia (*Forsythia* x spp.)
 Fragrant Sumac (*Rhus aromatica* & cvs.)
 Gray Dogwood (*Cornus racemosa*)
 Kalm St. Johnswort (*Hypericum kalmianum*)
 Nannyberry Viburnum (*Viburnum lentago*)*
 Nikko Slender Deutzia (*Deutzia gracilis* 'Nikko')
 Panicle Hydrangea (*Hydrangea paniculata* & cvs.)
 Potentilla (*Potentilla fruticosa*)
 Purledosier Willow (*Salix purpurea* & cvs.)*
 Redosier Dogwood (*Cornus sericea* & cvs.)*
 Siberian Peashrub (*Caragana arborescens*)
 Smooth Hydrangea (*Hydrangea arborescens* & cvs.)
 Spireas (*Spiraea* spp. & cvs.)
 Staghorn Sumac (*Rhus typhina* & cvs.)

Perennials

Bergamot (*Monarda fistulosa* & cvs.)
 Bergenia (*Bergenia* spp. & cvs.)
 Blazing Star (*Liatris* spp. & cvs.)
 Blue False Indigo (*Baptisia australis*)
 Compass Plant (*Silphium laciniatum*)
 Cupplant (*Silphium perfoliatum*)
 Daylilies (*Hemerocallis* cvs.)
 Geranium (*Geranium* spp. & cvs.)
 Goatsbeard (*Aruncus* spp. & cvs.)
 Hosta (*Hosta* spp. & cvs.)
 Ironweed (*Veronia fasciculata*)
 Joe-Pye weed (*Eupatorium maculatum* & cvs.)*
 Lady's Mantle (*Alchemilla* cvs.)
 New England Aster (*Aster novae-angliae* & cvs.)
 Nodding Pink Onion (*Allium cernuum*)
 Obedient plant (*Physostegia virginiana* & cvs.)*
 Pale Purple Coneflower (*Echinacea pallida*)
 Prairie Dock (*Silphium terebinthinaceum*)
 Purple Prairie Clover (*Petalostemum purpureum*)
 Rattlesnake Master (*Eryngium yuccifolium*)
 Red Beardtongue (*Penstemon digiatis* & cvs.)
 Yucca (*Yucca filamentosa* & cvs.)

Ornamental Grasses

Big Bluestem (*Andropogon gerardi*)
 Fall Feather Reed Grass (*Calamagrostis brachytricha*)
 Indiangrass (*Sorghastrum nutans* & cvs.)
 Karl Forester Grass (*Calamagrostis acutiflora* 'Karl Forester')
 Switchgrass (*Panicum virgatum* & cvs.)



Black alder tolerates sites with poor drainage and its fruit resembles tiny pine cones.



Adams crabapple has disease resistance to apple scab and like most other crabapples, a tolerance for clay soils.



Bridal Rice creeping willow has silvery blue foliage and tolerates clay soils and wet sites.



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Most types of spireas do well in clay soils including Fritsch spirea (pictured here) which has white flowers in late spring and golden yellow fall color.



Common hackberry has interesting pebbly bark.



Meet our Staff!

Landscape

Rick Naleid, RLA

Landscape Architect
rick@johnsonsnursery.com

Bill Reichenbach

Landscape Manager /
Horticulturist
bill@johnsonsnursery.com

Gregory John

Landscape Designer /
Horticulturist
greg@johnsonsnursery.com

Vickie Garcia, RLA

Landscape Architect, ASLA
vickie@johnsonsnursery.com

Retail

Lou Messina

Retail Manager / Horticulturist
lou@johnsonsnursery.com

Kathy Kober

Horticulturist
kathy@johnsonsnursery.com

Jillian Zetting

Horticulturist
jill@johnsonsnursery.com

Kira Johann

Horticulturist
kira@johnsonsnursery.com

Pat Williams

Horticulturist
patw@johnsonsnursery.com

Fall planting? Yes, fall is one of the very best times to plant deciduous trees and shrubs.

In mid to late October, we dig hundreds of deciduous trees and shrubs from our Jackson and Menomonee Falls farms and we continue planting these types of plants until the ground freezes. By planting a deciduous tree or shrub in fall, your

Come in and see our great selection of fall dug trees and shrubs.



plant gets a jump start on growth next spring - because by planting when it is dormant in fall, the plant doesn't suffer as much transplant stress as does spring planted material. So stop by and check out our great selection of fresh dug trees and shrubs.

Johnson's Nursery Hours

FALL (September - October)
Monday - Friday 8:00 am - 5:00pm
Saturday 8:00am - 4:00pm

WINTER (November - March)
Monday - Friday 8:00am - 4:30pm



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Address Service Requested

262-252-4988
Menomonee Falls, WI 53051
W 180 N 6275 Marcy Road

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