

# Gardening in Heavy Clay Soils



The perfect garden soil is well-drained, but moisture-retentive, loose enough to dig easily and rich in organic material and mineral elements plants need to grow well. This perfect soil is typically a mixture of sand, silt and clay in a proportion where each is more or less equal to the others. When clay dominates the mix, the soil can become undesirable with waterlogged clumps of soil one week and rock-like clods the next. While clay soil does pose challenges to the home gardener and is a difficult environment for many plants, it is usually a fertile soil that has great potential. By choosing suitable plants and by making even small changes to the soil structure, it is possible to have a garden with many kinds of beautiful and healthy trees, shrubs, perennials, and annuals.

## Clay Soil Basics

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The particles that make up clay soils are so small and tightly packed together that there is little room for the air or water that plant roots need to grow. Gardeners often compound this problem by working clay soil when it is wet, actually decreasing the space between soil particles. Clay soils hold onto moisture well, but when dry, water may run off without soaking in. Consequently plants have problems with root rot or drought and may do poorly because their roots have difficulty growing through the dense soil. While soil improvements can be made slowly over time, choosing plants that can tolerate clay soils is the best way to garden successfully in these challenging conditions.

## Amending the Soil

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Most soil improvement methods involve adding materials to the soil to separate or break up the clay particles. These amendments may be inorganic like sand, calcined clay, or vermiculite or they may be organic like compost, aged manure, shredded leaves, decomposed sawdust

or peat moss. Organic amendments are usually less expensive, add nutrients to the soil and are less likely to cause problems if too much is applied. For both types, improving the soil will be an ongoing process and not a quick fix. Other methods for dealing with clay soil include simply replacing the clay with better soil or using raised beds.

## How to Choose Plants

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There are many plants that will do well in clay and as in other aspects of gardening, a little experimentation may be valuable. Keeping some basic concepts in mind when choosing plants to grow in clay soils may improve your success rate.

Plants native to an area that has clay soil have adapted to that soil and are a good choice. It is especially helpful to learn the native habitat of these plants. For example, plants that naturally grow in an environment that is poorly drained or consistently wet are a good choice for a low wet area of the garden.

In general, plants that are aggressive and have a vigorous root system or spread by creeping along the ground do well in clay. This may include some invasive species and gardeners should be careful not to choose plants that will take over the garden or are harmful to the environment.

Take advantage of microhabitats in your yard. A hilly or sloped area may drain well enough, even

with clay soil, to grow plants that do better with good drainage.

Don't choose plants that would be difficult to grow in your area under the best circumstances. Plants that are finicky or require very specific growing conditions may not do well in clay soils that can fluctuate between very dry and overly moist.

## Plant Lists

The plants listed here were chosen for their ornamental qualities, suitability for use in the Lower Midwest, and tolerance of clay soils.

### Herbaceous perennials, ornamental grasses, and sedges

| Scientific name                                  | Common name                | Plant type           |
|--------------------------------------------------|----------------------------|----------------------|
| <i>Amsonia hubrichtii</i>                        | threadleaf blue star       | Herbaceous perennial |
| <i>Amsonia illustris</i>                         | shining blue star          | Herbaceous perennial |
| <i>Andropogon ternarius</i>                      | silver bluestem            | Ornamental grass     |
| <i>Anemone canadensis</i>                        | windflower                 | Herbaceous perennial |
| <i>Asclepias incarnata</i>                       | swamp milkweed             | Herbaceous perennial |
| <i>Baptisia australis</i>                        | blue false indigo          | Herbaceous perennial |
| <i>Boltonia asteroides</i>                       | false aster                | Herbaceous perennial |
| <i>Carex albicans</i>                            | white-tinged sedge         | Sedge                |
| <i>Carex cherokeensis</i>                        | Cherokee sedge             | Sedge                |
| <i>Carex muskingumensis</i>                      | palm sedge                 | Sedge                |
| <i>Carex vulpinoidea</i>                         | fox sedge                  | Sedge                |
| <i>Chelone obliqua</i>                           | turtlehead                 | Herbaceous perennial |
| <i>Coreopsis tripteris</i>                       | tall tickseed              | Herbaceous perennial |
| <i>Dianthus chinensis</i>                        | pink                       | Herbaceous perennial |
| <i>Echinacea pallida</i>                         | pale purple coneflower     | Herbaceous perennial |
| <i>Echinacea purpurea</i>                        | purple coneflower          | Herbaceous perennial |
| <i>Echinacea paradoxa</i>                        | yellow coneflower          | Herbaceous perennial |
| <i>Echinacea simulata</i>                        | wavyleaf purple coneflower | Herbaceous perennial |
| <i>Eryngium yuccifolium</i>                      | rattlesnake master         | Herbaceous perennial |
| <i>Filipendula rubra</i>                         | queen of the prairie       | Herbaceous perennial |
| <i>Gentiana andrewsii</i>                        | bottle gentian             | Herbaceous perennial |
| <i>Geranium sanguineum</i>                       | bloody cranesbill          | Herbaceous perennial |
| <i>Helenium autumnale</i>                        | sneezeweed                 | Herbaceous perennial |
| <i>Heliopsis helianthoides</i>                   | oxeye sunflower            | Herbaceous perennial |
| <i>Hemerocallis</i> species and hybrid cultivars | daylily                    | Herbaceous perennial |
| <i>Iris fulva</i>                                | copper iris                | Herbaceous perennial |
| <i>Iris virginica</i>                            | southern blue flag         | Herbaceous perennial |
| <i>Liatris pycnostachya</i>                      | prairie blazing star       | Herbaceous perennial |
| <i>Liatris spicata</i>                           | marsh blazing star         | Herbaceous perennial |

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|---------------------------------------------|---------------------------|----------------------|
| <i>Melanthium virginicum</i>                | bunchflower               | Herbaceous perennial |
| <i>Monarda didyma</i>                       | bee balm                  | Herbaceous perennial |
| <i>Monarda fistulosa</i>                    | wild bergamont            | Herbaceous perennial |
| <i>Oenothera macrocarpa</i>                 | Missouri evening primrose | Herbaceous perennial |
| <i>Panicum virgatum</i>                     | switch grass              | Ornamental grass     |
| <i>Penstemon digitalis</i>                  | foxglove beardtongue      | Herbaceous perennial |
| <i>Perovskia atriplicifolia</i>             | Russian sage              | Herbaceous perennial |
| <i>Phlox paniculata</i>                     | garden phlox              | Herbaceous perennial |
| <i>Physotegia virginiana</i> 'Miss Manners' | obedient plant            | Herbaceous perennial |
| <i>Pycnanthemum tenuifolium</i>             | slender mountain mint     | Herbaceous perennial |
| <i>Ratibida pinnata</i>                     | grey-head coneflower      | Herbaceous perennial |
| <i>Rudbeckia fulgida</i>                    | black-eyed Susan          | Herbaceous perennial |
| <i>Silphium integrifolium</i>               | wholeleaf rosinweed       | Herbaceous perennial |
| <i>Silphium terebinthinaceum</i>            | prairie dock              | Herbaceous perennial |
| <i>Solidago drummondii</i>                  | cliff goldenrod           | Herbaceous perennial |
| <i>Solidago nemoralis</i>                   | gray goldenrod            | Herbaceous perennial |
| <i>Solidago rugosa</i> 'Fireworks'          | rough goldenrod           | Herbaceous perennial |
| <i>Solidago speciosa</i>                    | showy goldenrod           | Herbaceous perennial |
| <i>Sporobolus heterolepis</i>               | prairie dropseed          | Ornamental grass     |
| <i>Symphyotrichum novae-angliae</i>         | New England aster         | Herbaceous perennial |
| <i>Symphyotrichum oblongifolium</i>         | aromatic aster            | Herbaceous perennial |
| <i>Tradescantia virginiana</i>              | Virginia spiderwort       | Herbaceous perennial |
| <i>Vernonia baldwinii</i>                   | western ironweed          | Herbaceous perennial |
| <i>Zizia aurea</i>                          | golden Alexander          | Herbaceous perennial |

## Annuals and bulbs

| Scientific name                               | Common name      | Plant type                                 |
|-----------------------------------------------|------------------|--------------------------------------------|
| <i>Camassia leichtlinii</i>                   | large camas      | Bulb                                       |
| <i>Coreopsis tinctoria</i>                    | plains coreopsis | Annual                                     |
| <i>Crocus vernus</i>                          | Dutch crocus     | Bulb                                       |
| <i>Galanthus nivalis</i>                      | snowdrop         | Bulb                                       |
| <i>Gomphrena globosa</i>                      | globe amaranth   | Annual                                     |
| <i>Impatiens capensis</i>                     | jewelweed        | Annual                                     |
| <i>Lantana camara</i>                         | lantana          | Tender perennial                           |
| <i>Leucojum aestivum</i>                      | summer snowflake | Bulb                                       |
| <i>Muscari armeniacum</i>                     | grape hyacinth   | Bulb                                       |
| <i>Narcissus</i> species and hybrid cultivars | daffodil         | Bulb                                       |
| <i>Rudbeckia hirta</i>                        | black-eyed Susan | Annual, biennial, or short-lived perennial |
| <i>Salvia farinacea</i>                       | mealycup sage    | Tender perennial                           |
| <i>Tagetes erecta</i>                         | African marigold | Annual                                     |
| <i>Tagetes patula</i>                         | French marigold  | Annual                                     |

## Shrubs and vines

| Scientific name                                  | Common name               | Plant type                    |
|--------------------------------------------------|---------------------------|-------------------------------|
| <i>Aesculus pavia</i>                            | red buckeye               | Deciduous shrub or small tree |
| <i>Aronia arbutifolia</i>                        | chokeberry                | Deciduous shrub               |
| <i>Callicarpa americana</i>                      | beautyberry               | Deciduous shrub               |
| <i>Calycanthus floridus</i>                      | Carolina allspice         | Deciduous shrub               |
| <i>Chaenomeles</i> species and hybrid cultivars  | quince                    | Deciduous shrub               |
| <i>Clematis crispa</i>                           | blue jasmine              | Vine                          |
| <i>Clethra alnifolia</i>                         | sweet pepperbush          | Deciduous shrub               |
| <i>Cornus sericea</i>                            | red twig dogwood          | Deciduous shrub               |
| <i>Corylus americana</i>                         | American hazelnut         | Deciduous shrub               |
| <i>Cotinus coggygria</i>                         | smoketree                 | Deciduous shrub or small tree |
| <i>Deutzia gracilis</i>                          | slender deutzia           | Deciduous shrub               |
| <i>Diervilla</i> species and hybrid cultivars    | bush honeysuckle          | Deciduous shrub               |
| <i>Euonymus americanus</i>                       | strawberry bush           | Deciduous shrub               |
| <i>Forsythia</i> hybrid cultivars                | forsythia                 | Deciduous shrub               |
| <i>Hamamelis</i> species and hybrid cultivars    | witch hazels              | Deciduous shrub or small tree |
| <i>Hydrangea arborescens</i>                     | smooth hydrangea          | Deciduous shrub               |
| <i>Hypericum prolificum</i>                      | shrubby St. John's wort   | Deciduous shrub               |
| <i>Ilex decidua</i>                              | possumhaw                 | Small tree                    |
| <i>Ilex verticillata</i>                         | winterberry               | Deciduous shrub               |
| <i>Itea virginica</i>                            | Virginia sweetspire       | Deciduous shrub               |
| <i>Lagerstroemia</i> hybrid cultivars            | crape myrtles             | Deciduous shrub               |
| <i>Lindera benzoin</i>                           | spicebush                 | Deciduous shrub               |
| <i>Lonicera sempervirens</i>                     | trumpet honeysuckle       | Vine                          |
| <i>Philadelphus</i> species and hybrid cultivars | mock orange               | Deciduous shrub               |
| <i>Physocarpus opulifolius</i>                   | ninebark                  | Deciduous shrub               |
| <i>Potentilla fruticosa</i>                      | shrubby cinquefoil        | Deciduous shrub               |
| <i>Rhus aromatic</i>                             | fragrant sumac            | Deciduous shrub               |
| <i>Ribes odoratum</i>                            | clove currant             | Deciduous shrub               |
| <i>Sambucus canadensis</i>                       | American black elderberry | Deciduous shrub               |
| <i>Symphoricarpos albus</i>                      | snowberry                 | Deciduous shrub               |
| <i>Symphoricarpos orbiculatus</i>                | coralberry                | Deciduous shrub               |
| <i>Thuja occidentalis</i>                        | American arborvitae       | Needled evergreen             |
| <i>Viburnum dentatum</i>                         | arrowwood viburnum        | Deciduous shrub               |
| <i>Weigela</i> species and hybrid cultivars      | weigela                   | Deciduous shrub               |

## Trees

| Scientific name                 | Common name         | Plant type           |
|---------------------------------|---------------------|----------------------|
| <i>Amelanchier arborea</i>      | serviceberry        | Small tree           |
| <i>Betula nigra</i>             | river birch         | Medium tree          |
| <i>Carpinus caroliniana</i>     | American hornbeam   | Small to medium tree |
| <i>Carya ovata</i>              | shagbark hickory    | Large tree           |
| <i>Cercidiphyllum japonicum</i> | katsura tree        | Medium tree          |
| <i>Cercis canadensis</i>        | eastern redbud      | Small tree           |
| <i>Chionanthus virginicus</i>   | fringe tree         | Small tree           |
| <i>Cornus florida</i>           | flowering dogwood   | Small tree           |
| <i>Cotinus obovatus</i>         | American smoke tree | Small tree           |
| <i>Crataegus viridis</i>        | green hawthorn      | Small tree           |
| <i>Ginkgo biloba</i>            | ginkgo tree         | Large tree           |
| <i>Magnolia virginiana</i>      | sweet bay magnolia  | Medium tree          |
| <i>Malus sargentii</i>          | Sargent crabapple   | Small tree           |
| <i>Nyssa sylvatica</i>          | black gum           | Medium tree          |
| <i>Parrotia persica</i>         | Persian ironwood    | Small to medium tree |
| <i>Quercus lyrata</i>           | overcup oak         | Medium tree          |
| <i>Syringa reticulata</i>       | Japanese tree lilac | Small tree           |
| <i>Taxodium distichum</i>       | bald cypress        | Large tree           |
| <i>Tilia americana</i>          | American linden     | Medium to large tree |