



# Black Walnuts & Juglone

The black walnut (*Juglans nigra*), produces the allelochemical **juglone**, which can inhibit the growth of some plants. Juglone is produced by the leaves, stems, fruit hulls, inner bark and roots. Other trees can also produce juglone, but in lower concentrations than black walnut. Plants located beneath the canopy of black walnut trees are most at risk because juglone from the roots and fallen leaves accumulates there. Certain plants planted near or under this shade tree tend to yellow, wilt and die. Here are some suggestions to help deal with this problem.

## Reducing the effects of juglone from walnut trees

- Regularly clean up all fallen leaves and fruit from the black walnut tree, keeping debris away from desired landscape plants.
- Compost plant debris to degrade any toxins present in the compost pile, and to detoxify the compost. If composting is impractical, do not use any part of the walnut tree as compost or mulch for other plants.
- Maintain high organic matter levels in the soil because organic matter encourages healthy soil microbial populations that can metabolize toxins.
- Plant in containers.
- Plant juglone tolerant trees, shrubs, vines, ground covers, flowers and grasses under walnut trees or in areas that might contain walnut roots.

## List of Juglone Tolerant Plants

### Tolerant grasses

**Tall fescue** and **Kentucky bluegrass** grow well near black walnut except during drought conditions when soil moisture is low. When moisture is adequate these grasses may grow better under walnut trees than in other parts of the lawn, possibly because the soil may be more basic. Soil under black walnuts tends to be alkaline, with the pH often 0.7 points higher than beyond the roots, thus influencing the growth of many different plants.

## Trees (deciduous)

Botanical name	Common name
<i>Acer negundo</i>	Boxelder
<i>Acer nigrum</i>	Black maple
<i>Acer palmatum</i> Japanese maple 'Dissectum'	Cutleaf Japanese maple
<i>Acer saccharum</i>	Sugar maple
<i>Amelanchier canadensis</i>	Serviceberry
<i>Asimina triloba</i>	Pawpaw
<i>Betula nigra</i> 'Heritage'	Heritage river birch
<i>Catalpa bignonioides</i>	Common catalpa
<i>Celtis occidentalis</i>	Common hackberry
<i>Cercis canadensis</i>	Eastern Redbud
<i>Cornus florida</i>	Flowering dogwood
<i>Crataegus</i> spp.	Hawthorn
<i>Fraxinus americana</i>	Ash white
<i>Gleditsia triacanthos</i> f. <i>inermis</i>	Thornless honey locust
<i>Halesia carolina</i>	Carolina silverbell
<i>Hibiscus syriacus</i>	Rose of Sharon
<i>Koelreuteria paniculata</i>	Goldenrain tree
<i>Liquidambar styraciflua</i>	Sweetgum
<i>Liriodendron tulipifera</i>	Tulip tree
<i>Morus alba</i>	White mulberry
<i>Nyssa sylvatica</i>	Black gum
<i>Platanus occidentalis</i>	Sycamore
<i>Populus</i> sp.	Poplar
<i>Prunus cistena</i>	Purple leaf sandcherry
<i>Prunus serotina</i>	Black cherry
<i>Pyrus calleryana</i>	Callery pear
<i>Quercus alba</i>	White oak
<i>Quercus imbricaria</i>	Shingle oak
<i>Quercus rubra</i>	Northern red oak
<i>Sassafras albidum</i>	Sassafras
<i>Syringa</i> spp.	Lilac
<i>Tilia platyphyllos</i>	Bigleaf linden
<i>Viburnum lantana</i> viburnum	Wayfaring tree

## Evergreens

Botanical name	Common name
<i>Juniperus chinensis</i> 'Pfitzeriana'	Pfitzer Chinese juniper
<i>Juniperus virginiana</i>	Eastern red cedar
<i>Picea abies</i>	Norway spruce
<i>Pinus jeffreyi</i>	Jeffrey pine
<i>Pinus strobus</i>	White pine
<i>Thuja occidentalis</i>	American arborvitae
<i>Tsuga canadensis</i>	Canadian hemlock

## Shrubs

Botanical name	Common name
<i>Daphne mezereum</i>	February daphne
<i>Euonymus europaea</i>	European spindle tree
<i>Euonymus hamiltoniana</i>	Hamilton euonymus
<i>Forsythia suspensa</i>	Weeping Forsythia
<i>Hamamelis virginiana</i>	Witchhazel
<i>Ilex opaca</i>	American holly
<i>Kerria japonica</i>	Kerria
<i>Kerria japonica</i> 'Pleniflora'	Double-flower kerria
<i>Lindera benzoin</i>	Spicebush
<i>Physocarpus opulifolius</i>	Ninebark
<i>Philadelphus coronarius</i>	Mock orange
<i>Rosa multiflora</i>	Multiflora rose
<i>Sambucus canadensis</i>	American elderberry
<i>Viburnum carlesii</i>	Korean spice viburnum

## Vines

Botanical name	Common name
<i>Lonicera maackia</i>	Amur honeysuckle
<i>Lonicera tatarica</i>	Tatarian honeysuckle
<i>Lonicera xylosteum</i>	European fly honeysuckle
<i>Parthenocissus quinquefolia</i>	Virginia creeper

## Bulbs

Botanical name	Common name
<i>Chionodoxa lucilae</i> ;	Glory-of-the-snow
Crocus	Crocus
<i>Endymion hispanicul</i>	Spanish bluebell
<i>Eranthis hyemalis</i>	Winter aconite
<i>Galanthus nivalis</i>	Snowdrop
<i>Hyacinthus</i> 'City of Harlem'	Hyacinth
<i>Muscari botryoides</i>	Grape hyacinth
<i>Narcissus</i> 'Cheerfulness' 'Yellow Cheerfulness' 'Tete a Tete' 'Sundial' & 'February Gold'.	Daffodil
<i>Scilla siberica</i>	Siberian squill
<i>Tulipa Darwin</i> ; 'White Volcano' and 'Cum Laude', Parrot 'Blue, Parrot', Greigii, 'Toronto'	Tulip

## Herbaceous Annuals

Botanical name	Common name
Begonia; fibrous cultivars and tuberous cultivar 'Nonstop'	Begonia;
<i>Calendula officinalis</i>	Pot marigold
Impatiens	Impatiens
<i>Ipomoea</i> 'Heavenly Blue'	Morning glory
<i>Viola cornuta</i>	Horned violet
<i>Viola tricolor</i>	Johnny jump up
<i>Viola wittrockiana</i>	Pansy
<i>Zinnia</i> species	Zinnia

## Herbaceous Perennials

Botanical name	Common name
<i>Ajuga reptans</i>	Bugleweed
<i>Alcea rosea</i> ;	Hollyhock
<i>Anemone quinquefolia</i>	American Wood Anemone
<i>Arisaema triphyllum</i>	Jack-in-the-Pulpit
<i>Asarum europaeum</i>	European wild ginger
<i>Astilbe</i> species	
<i>Athyrium</i>	Lady Fern
<i>Campanula carpatica</i>	
<i>Campanula latifolia</i>	Bellflower
<i>Chelone</i>	Turtlehead
<i>Chionodoxa luciliae</i>	Glory-of-the-Snow
<i>Chrysanthemum</i> species	hardy chrysanthemum
<i>Claytonia virginica</i>	Spring Beauty
<i>Clematis terniflora</i> (syn. <i>C. maximowicziana</i> )	Sweet autumn clematis
<i>Clematis</i> 'Red Cardinal'	
<i>Dicentra cucullaria</i>	Dutchman's Breeches
<i>Dicentra spectabilis</i>	Bleeding Heart
<i>Doronicum</i> species	Leopard's bane
<i>Dryopteris cristata</i>	Crested wood fern
<i>Echiantheae purpurea</i>	Coneflower
<i>Endymion hispanicus</i>	Spanish bluebell
<i>Galium odoratum</i>	Sweet woodruff
<i>Geranium robertianum</i> , Herb Robert G. sanguineum	Cranesbill
<i>Gramineae</i> family	Grasses
<i>Helianthus tuberosus</i>	Jerusalem artichoke
<i>Helenium</i>	Sneezewort
<i>Hemerocallis</i> species	Common daylily
<i>Hesperis matronalis</i>	Dame's Rocket
<i>Heuchera x brizoides</i> 'Pluie de Feu'	Coral bells
<i>Hieracium aurantiacum</i>	Orange hawkweed
<i>Hosta fortunei</i> 'Glaucua'	Hosta Plantain lily

<i>H. lancifolia</i>	Hosta
<i>H. marginata</i>	Hosta
<i>H. undulata</i> 'Variegata'	Hosta
<i>Hydrophyllum virginianum</i>	Virginia waterleaf
<i>Iris siberica</i> ;	Siberian iris
<i>Monarda didyma</i>	Bee balm
<i>M. fistulosa</i>	Wild bergamot
<i>Myrrhis odorata</i>	Sweet Cicely
<i>Oenothera fruticosa</i>	Sundrops
<i>Onoclea sensibilis</i>	Sensitive fern
<i>Osmunda cinnomnea</i>	Cinnamon fern
<i>Phlox paniculata</i>	Summer phlox
<i>Phlox subulata</i>	Creeping phlox
<i>Podophyllum peltatum</i>	Mayapple
<i>Polemonium reptans</i>	Jacob's ladder
<i>Polygonatum commutatum</i>	Great Solomon's seal
<i>Primula x polyantha</i>	Polyanthus primrose
<i>Pulmonaria species</i>	Lungwort
<i>Sanguinaria canadensis</i>	Bloodroot
<i>S. canadensis</i> 'Multiplex'	Double-flowered bloodroot
<i>Sedum acre</i>	Gold moss
<i>S. spectabile</i>	Showy sedum
<i>Stachys byzantina</i>	Lamb's ear
<i>Tradescantia virginiana</i>	Spiderwort
<i>Trillium cernuum</i>	Nodding trillium
<i>T. grandiflorum</i>	Wide wake-robin
<i>Uvularia grandiflora</i>	Big merrybells
<i>Vinca minor</i>	Periwinkle
<i>Viola canadensis</i>	Canada violet
<i>V. sororia</i>	Woolly blue violet

## Vegetables

Allium (onions)
Beans
Carrots
Corn
Melons
Squash

## Fruits

Botanical name	Common name
<i>Prunus species</i>	Peach Nectarine Cherry Plum
<i>Pyrus species</i>	Pear
<i>Rubus occidentalis</i>	Black Raspberry

## Plants **sensitive** to juglone

Juglone sensitivity is dependent on other growing conditions. What will or won't grow under one black walnut tree may be fine under another. However, the following flowers and vegetables are considered extremely sensitive to juglone:

Apple	Asparagus
Azalea	Baptisia (Blue False Indigo)
Birch (white)	Blackberry
Blueberry	Cabbage
Chrysanthemum	Autumn crocus
Eggplant	Forget-me-not
Grape (domestic)	Hydrangea
Linden	Mountain laurel
Pepper	Petunia species
Pine	Potato
Rhododendron	Rhubarb
Tomato	Thyme

### References:

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- [www.ext.vt.edu/pubs/nursery/430-021/430-021.html](http://www.ext.vt.edu/pubs/nursery/430-021/430-021.html)
- [www.uwex.edu/ces/wihort/landscape/Juglone.htm](http://www.uwex.edu/ces/wihort/landscape/Juglone.htm)



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