



The black walnut tree (*Juglans nigra*) often presents a challenge in the garden as it is **allelopathic**, meaning that it releases a toxic compound that acts as a herbicide, inhibiting the growth of other plants and organisms. This chemical, **juglone**, can damage certain plants up to 80 feet away.

### SOURCE OF TOXICITY

Juglone can be found in every part of the black walnut tree, including the leaves, stems, and roots. Walnut trees begin causing toxic reactions when they reach 7–8 years old. The largest concentration can be found in the buds, nut hulls, and roots, and in the area immediately under the canopy under a black walnut tree. Even after a black walnut tree has been removed, juglone toxicity can persist in the soil years later due to the presence of decaying roots, which can extend 50-80 feet away from the outer canopy of mature walnut trees.

### JUGLONE TOXICITY SYMPTOMS

Juglone blocks sensitive plants from carrying out respiration, depriving them of necessary energy for metabolic activity. Plants that are sensitive to juglone show signs of wilting, yellowed leaves (chlorosis), and slow or stunted growth, dying within just a few days or months later. There is unfortunately no cure once plants are affected.

### PROTECTING YOUR GARDEN

It is important not to use any leaves, bark, or wood chips from black walnut trees in mulch. Any leaves, twigs, or husks from a black walnut tree should be composted for at least one year to ensure that all juglone has been thoroughly broken down. Gardens should be located away from black walnut trees to prevent damage to susceptible plants, or placed in raised beds for protection. Prevent tree roots from growing into raised beds with the use of plastic or fabric weed barrier. As juglone moves through soil water, ensure any soil is well-drained to help reduce problems with toxicity.



### PLANTS THAT ARE SENSITIVE TO JUGLONE

- |                      |                   |
|----------------------|-------------------|
| Alder                | Linden            |
| Alfalfa              | Loblolly Pine     |
| Amur Honeysuckle     | Magnolia (Saucer) |
| Apple                | Mountain Laurel   |
| Asiatic Lily         | Mugo Pine         |
| Asparagus            | Narcissus (some)  |
| Autumn Crocus        | Nicotiana         |
| Azalea               | Norway Spruce     |
| Baptisia             | Pear              |
| Blackberry           | Peas              |
| Blueberry            | Peony (some)      |
| Broccoli             | Pepper            |
| Cabbage              | Petunia           |
| Chokeberry           | Potato            |
| Chrysanthemum (some) | Potentilla        |
| Columbine            | Privet            |
| Cotoneaster          | Red Chokeberry    |
| Crabapple            | Red Pine          |
| Cucumber             | Rhododendron      |
| Eggplant             | Rhubarb           |
| Forget-Me-Not        | Scotch Pine       |
| Grape                | Silver Maple      |
| Hackberry            | Spruce            |
| Hydrangea            | Tomato            |
| Japanese Larch       | Viburnum (some)   |
| Kale                 | White Birch       |
| Lilac                | White Pine        |
| Lily (some)          | Yew               |



# GUIDE TO PLANTING NEAR A BLACK WALNUT TREE



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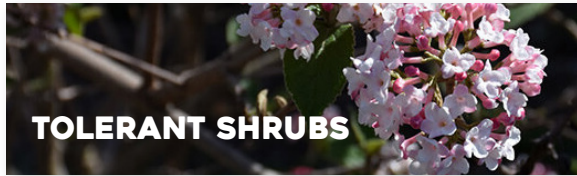


# PLANTS TOLERANT TO BLACK WALNUT



## TOLERANT EVERGREENS

- |  |  |
|--|--|
| Chinese juniper<br><i>Juniperus chinensis</i>    | Arborvitae<br><i>Thuja</i> sp.             |
| Common juniper<br><i>Juniperus communis</i>      | Eastern Hemlock<br><i>Tsuga canadensis</i> |
| Eastern red cedar<br><i>Juniperus virginiana</i> |  |



## TOLERANT SHRUBS

- |  |  |
|--|--|
| New Jersey Tea<br><i>Ceanothus americanus</i>  | Ninebark<br><i>Physocarpus opulifolius</i>           |
| Pagoda Dogwood<br><i>Cornus alternifolia</i>   | Exbury Rhododendron<br><i>Rhododendron hybrids</i>   |
| Euonymus<br><i>Euonymus</i> sp.                | Fragrant Sumac<br><i>Rhus aromatica</i>              |
| Forsythia<br><i>Forsythia</i> sp.              | Currant<br><i>Ribes</i> sp.                          |
| Rose-of-Sharon<br><i>Hibiscus syriacus</i>     | Black Raspberry<br><i>Rubus occidentalis</i>         |
| Wild Hydrangea<br><i>Hydrangea arborescens</i> | Elderberry<br><i>Sambucus</i> sp.                    |
| Juniper<br><i>Juniperus</i> sp.                | Maple-leaved Viburnum<br><i>Viburnum acerifolium</i> |
| Beauty Bush<br><i>Kolkwitzia amabilis</i>      | Korean Spice Viburnum<br><i>Viburnum carlesii</i>    |
| Spicebush<br><i>Lindera benzoin</i>            | Southern Arrowwood<br><i>Viburnum dentatum</i>       |
| Mock-Orange<br><i>Philadelphus</i> sp.         | Yucca<br><i>Yucca</i> sp.                            |



## TOLERANT TREES

- |  |  |
|--|--|
| Japanese Maple<br><i>Acer palmatum</i>           | Silverbell<br><i>Halesia carolina</i>        |
| Red Maple<br><i>Acer rubrum</i>                  | Witch Hazel<br><i>Hamamelis</i> sp.          |
| Sugar Maple<br><i>Acer saccharum</i>             | Sweet Gum<br><i>Liquidambar styraciflua</i>  |
| Serviceberry<br><i>Amelanchier</i> sp.           | Tulip Tree<br><i>Liriodendron tulipifera</i> |
| River Birch<br><i>Betula nigra</i>               | Cucumbertree<br><i>Magnolia acuminata</i>    |
| American hornbeam<br><i>Carpinus caroliniana</i> | Tupelo<br><i>Nyssa sylvatica</i>             |
| Redbud<br><i>Cercis canadensis</i>               | Sycamore<br><i>Platanus occidentalis</i>     |
| Fringe Tree<br><i>Chionanthus</i> sp.            | White Oak<br><i>Quercus alba</i>             |
| Flowering Dogwood<br><i>Cornus florida</i>       | Northern Red Oak<br><i>Quercus rubra</i>     |
| Hawthorn<br><i>Crataegus</i> sp.                 | Black Locust<br><i>Robinia pseudoacacia</i>  |
| Persimmon<br><i>Diospyros virginiana</i>         | Willow<br><i>Salix</i> sp.                   |
| American Beech<br><i>Fagus grandifolia</i>       | American Elm<br><i>Ulmus americana</i>       |



## TOLERANT VINES

- |   |                                 |
|---|---------------------------------|
| Clematis<br><i>Clematis</i> sp.           | Wild Grape<br><i>Vitis</i> sp.  |
| Honeysuckle<br><i>Lonicera</i> sp.        | Wisteria<br><i>Wisteria</i> sp. |
| Virginia Creeper<br><i>Parthenocissus</i> |                                 |



## TOLERANT PERENNIALS, BULBS, & WILDFLOWERS

- |   |   |   |
|---|---|---|
| Yarrow<br><i>Achillea</i> sp.                     | Gentian<br><i>Gentiana</i> sp.                    | Summer Phlox<br><i>Phlox paniculata</i>             |
| Bugleweed<br><i>Ajuga</i> sp.                     | Cranesbill<br><i>Geranium</i> sp.                 | False Dragonhead<br><i>Physostegia</i> sp.          |
| Hollyhock<br><i>Alcea rosea</i>                   | Perennial Sunflower<br><i>Helianthus</i> sp.      | Jacob's Ladder<br><i>Polemonium reptans</i>         |
| Windflower<br><i>Anemone</i> sp.                  | Hellebore<br><i>Helleborus</i> sp.                | Solomon's Seal<br><i>Polygonatum</i> sp.            |
| Jack-In-The-Pulpit<br><i>Arisaema triphyllum</i>  | Daylily<br><i>Hemerocallis</i> sp.                | Christmas Fern<br><i>Polystichum acrostichoides</i> |
| Wild Ginger<br><i>Asarum</i> sp.                  | Coral Bells<br><i>Heuchera</i> sp.                | Primrose<br><i>Primula</i> sp.                      |
| Aster<br><i>Aster</i> sp.                         | Hosta<br><i>Hosta</i> sp.                         | Lungwort<br><i>Pulmonaria</i> sp.                   |
| Astilbe<br><i>Astilbe</i> sp.                     | Siberian Iris<br><i>Iris sibirica</i>             | Black-Eyed Susan<br><i>Rudbeckia</i> sp.            |
| Lady Fern<br><i>Athyrium</i>                      | Bleeding heart<br><i>Lamprocapnos spectabilis</i> | Siberian Squill<br><i>Scilla sibirica</i>           |
| Bellflower<br><i>Campanula</i> sp.                | Shasta Daisy<br><i>Leucanthemum</i> sp.           | Stonecrop<br><i>Sedum</i> sp.                       |
| Chrysanthemum (some)<br><i>Chrysanthemum</i> spp. | Lilyturf<br><i>Liriope</i> sp.                    | Goldenrod<br><i>Solidago</i> sp.                    |
| Bleeding Heart<br><i>Dicentra spectabilis</i>     | Cardinal Flower<br><i>LOBELIA</i> sp.             | Lamb's Ear<br><i>Stachys byzantina</i>              |
| Wood Fern<br><i>Dryopteris</i>                    | Bee Balm<br><i>Monarda</i> sp.                    | Spiderwort<br><i>Tradescantia virginiana</i>        |
| Purple Coneflower<br><i>Echinacea purpurea</i>    | Grape Hyacinth<br><i>Muscari</i> sp.              | Trillium<br><i>Trillium</i> sp.                     |
| Epimedium<br><i>Epimedium</i> sp.                 | Daffodil (some)<br><i>Narcissus</i> sp.           | Tulip<br><i>Tulipa</i> sp.                          |
| Joe Pye Weed<br><i>Eupatorium</i> sp.             | Evening Primrose<br><i>Oenothera</i> sp.          | Speedwell<br><i>Veronica</i> sp.                    |
| Snowdrop<br><i>Galanthus nivalis</i>              | Cinnamon Fern<br><i>Osmunda cinnamomeum</i>       | Violet<br><i>Viola</i> sp.                          |
| Sweet Woodruff<br><i>Galium odoratum</i>          |   |   |