Black Walnut (Juglans nigra) and Butternut (Juglans cinerea) are allelopathic; that is, they both produce a substance called juglone (mainly through their roots) that can inhibit the growth of other plants. Many plants may be injured or killed in a relatively short period of growth (1 or 2 months) within the root zone of these plants. The toxic zone from a mature tree extends on average 50 to 60 feet from the trunk but can reach as far as 80 feet. The toxic area extends outward each year as the tree roots spread since most of the juglone is secreted by the roots of the walnut or butternut tree. A tree can have a root diameter twice the height of the tree and or the spread of its branches. Keep sensitive plants far away.

Many plants are reported to be resistant to the toxic juglone and are capable of growing in close proximity to a walnut tree. However, some of these “juglone resistant” plants may grow even better when planted where there is no juglone present, even though they can tolerate some juglone. The list of plants we have compiled comes primarily from published sources. Research on this subject is limited so our information is based on observations of native woodlands, gardens, orchards, ornamental plantings, etc. and not from clinical tests. This makes our plant lists a wonderful compilation of suggestions and/or guidelines but by no means are they definitive nor complete. Cultivars of some species may do poorly even though their family appears on the resistant list. The same holds true for sensitive plants.

For sensitive plants, symptoms such as stunting or deformed growth can occur as well as wilting and death. If you want to grow sensitive plants in the same area it is recommended that you plant in containers. (Plants will not overwinter in containers without winter protection in Minnesota.) Juglone is poorly soluble in water and for that reason does not move very far in the soil. The greatest concentrations of juglone are generally found in the area directly under the canopy of the tree. However, as mentioned above the root zone of the tree can reach well beyond the canopy. Slowly decaying roots will continue to release juglone for some years after a tree has been removed so cutting down the tree will not remove the toxins immediately. Allow several years or more for juglone to breakdown before planting sensitive plants where a walnut has been removed. There is no chemical control to stop the toxic effect of the juglone.

The juglone toxin occurs throughout the walnut tree with the highest concentrations being found in the root zone. The leaves can be composted because the toxin breaks down when exposed to air, water and bacteria within 2 to 4 weeks. It is not recommended that you mulch plants that are sensitive to juglone with fresh sawdust, chips, prunings or mulch from walnut. However, if allowed to compost for a minimum of six months, the bark should provide a safe mulch for sensitive plants. Walnut pollen can cause allergic symptoms in both horses and humans (typically in May). Horses may be affected by black walnut chips or sawdust when used as bedding material. At the end of the day it is probably best to avoid using leaves, twigs, chips, and sawdust from walnut trees for mulch, compost or bedding material.
Resistant To Juglone:
Trees: Shade, Ornamental & Fruit
Ash, White & Black Beech
Birch, River Blackgum
Black Locust Blue Beech Catalpa
Cherry, Pin, Wild Black Chestnut
Elm American & Slippery Forsythia
Fringe Tree Hawthorn Hickory
Honeysuckle Maple (Most but not all)
Mulberry Oak, White & Red Ohio Buckeye Peach
Pin Cherry Plum Red Bud Serviceberry Sycamore
Winged Euonymus Vines
Bittersweet Boston Ivy Clematis
Dutchman's Pipe Englemann Ivy Honeysuckle
Morning Glory Poison Ivy Wild Grape
Shrubs
Alder, Speckled Beautybush Currant
Dogwood, Pagoda & Silky Euonymus Forsythia
Fringe Tree Hazelnut, American Honeysuckle
Ninebark Rhododendron Sumac, Fragrant & Smooth Viburnums
Wild Roses Witchhazel
Small Fruits & Vegetables
Beets Black Raspberries Carrot
Corn Lima Beans Melon
Onion Parsnip Snap Beans Squash
Wild Grapes
Evergreens
Arborvitae Eastern Red Cedar Hemlock
Juniper, Chinese & Common
Perennials
Aster Astilbe Astilbe
Barrenwort Epimedium Bee Balm Monarda
Bellflower Campanula Black-eyed Susan Rudbekia
Bleeding Heart Dicentra Bugleweed Ajuga
Bugloss Brunnera Buttercup Ranunculus
Cinnamon Fern Osmunda Coral Bells Heuchera
Cranesbill Geranium Daisy Dendranthema
Daylily Hemerocallis Evening Primrose Oenothera
Ferns (Most) Foamflower Tiarella
Resistant Perennials Cont.
Garden Phlox P. paniculata Ginger Asarum
Goatbeard Aruncus Golden Ray Ligularia
Goldenrod Solidago Grasses (Most)
Hollyhock Alcea Hosta
Iris Iris Jack-in-the-pulpit Arisaema
Jacob's Ladder Polonium Japanese Spurge Pachysandra
Joe-pyeweed Eupatorium Lady's Mantle Alchemilla
Lamb's Ear Stachys Leopard's Bane Doronicum
Lungwort Pulmonaria May Apple Podophyllum
Mint Peppermint
Obdient Plant Physostegisa Peony (Some) Paonia
Pig Squeak Berenicia Plantain Lily Hosta
Primrose Primula Rose of Sharon Hibiscus
Shasta Daisy Leucanthemum Solomon's Seal Polygonatum
Speedwell Veronica Spiderwort Tradescantia
Stonecrop Sedum Sunflower Helianthus
Sweet Woodruff Galium Toad Lily Tricyrtis
Trillium Trillium Violet Viola
Virginia Bluebell Mertensia Waterleaf Hydrophyllum
Sensitive To Juglone:
Trees: Shade, Ornamental & Fruit
Alder Apples Birch
Crabapple Hackberry Japanese Larch Lindens (Basswood)
Ornamental Cherries Pear Silver Maple
Annuals Nicotiana Petunia
Field Crops
Alfalfa Crimson Clover Tobacco
Perennials
Chrysanthemum (Some) Coumune (Some) Aquilegia
False Indigo Baptisia Grass (Few)
Lily Lilium Peony (Some) Paonia
Bulbs
Autumn Crocus Colchicum
Small Fruits & Vegetables
Asparagus Beans (Some) Blackberry
Blackberry Blueberry Cabbage
Cranedill Geranium Domestic Grapes
Eggplant Pepper Potatoes
Rhubarb Tomatoes
Shrubs
Amur Honeysuckle Azaleas Cotoneaster
Doronicum Hydrangea Lilac
Potentilla Privet Red Chokeberry
Rhododendrons Viburnum (Few)
Evergreens
Norway Spruce Pines Yew