Potential Allelopathy In Different Tree Species

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Allelopathy is a significant tree health care issue. Allelopathy is the chemical modification of a site to facilitate better tree growth, and control ecological volume and essential resources. The proportion of allelopathy within each species' interference effect is highly variable depending upon the site, species, and individual. The table below attempts to list trees in three broad categories of allelopathic effect: strong, moderate, and slight.

The table below has been prepared from the research literature to show relative and potential allelopathic effects of a given tree species. The relative ranking of species are based upon the completeness of the allelopathic literature, growth strategies of the species, species successional position, and conjecture of the author. At this point, not all the species listed have been shown to have measurable and demonstrable allelopathic effects in a landscape environment, but each one has been shown to have the chemical potential to be considered allelopathic.

Note that many organisms in a tree-filled landscape will have proven allelopathic impacts greater than most of the trees listed. Many grasses, perennials, and even some lichens can greatly modify the chemical ecology of the site.

Trees As Conveyors of Allelopathic Impacts

Species (Scientific name)	Pathway of Effect	Literature Source
-Strongest Effect		
Acacia spp.	rls	70
Acer saccharum	roots	29
Ailanthus altissima	rls	73,76,84,1,9,18,19
Celtis laevigata	rls	15,16
Celtis occidentalis	rls	58,14
Eucalyptus camaldulensis	volatile, litter	30
Eucalyptus globulus	fog drip , rls	31,32
Eucalyptus spp.	rls	68,79,71,72
Juglans cinerea	rls	21,22,23
Juglans nigra	rls	1,6,20,21,22,23,24,25,2
Leucaena spp.	rls	70
Myrica cerifera	rls	87

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Picea engelmannii	rls	6,32
Platanus occidentalis	rls, litter	13,14,58
Populus deltoides	rls	4,52,53,74
Prosopis juliflora	rls	78,79, 85
Prunus cornuta	rls	81
Prunus serotina	leaf	33
Quercus falcata	leaf	27,12
Quercus marilandica	rls	28
Quercus rubra	rls	58
Quercus stellata	rls	28
Robinia pseudoacacia	bark, roots	20, 6
Sassafras albidum	rls	17
Ulmus americana	rls	58

-Moderate Effect

Abies amabilis	rls	31,36
Abies balsamea	rls	60
Abies grandis	rls	31,36
Acer circinatum	rls	31,36
Acer negundo	root, leaf	37
Acer platanoides	leaf, root	37
Acer pseudoplatanus	leaf, root	38
Acer saccharinum	root	34,35
Aesculus glabra	seed or fruit, leaf	40
Aesculus hippocastanum	rls	3,41
Aesculus octandra	seed or fruit, leaf	40
Arbutus menziesii	stem	31
Carya illinoensis	seed or fruit	42
Carya ovate	seed or fruit	42
Corylus spp.	rls	54
Crataegus spp.	rls	54
Fraxinus excelsior	root	37,39
Ginkgo biloba	seed or fruit	43
Gleditsia triacanthos	root	34,35
Juniperus monosperma	leaf	36
Juniperus scopulorum	volatile, stem	44
Kalmia spp.	rls	63,69,75,83
Picea abies	rls	77,48
Picea mariana	rls	60
Picea pungens	leaf	49
Pinus banksiana	rls	60
Pinus contorta	litter	31
Pinus densiflora	rls	62
Pinus edulis	leaf	45
Pinus elliotii	roots	46
Pinus monophylla	rls	66
Pinus ponderosa	leaf	47,45,46

Pinus ponderosa	rls	56
Pinus sylvestris	rls	36,61
Prunus pumila	leaf	33
Quercus alba	leaf	14,58
Quercus borealis	leaf	14
Quercus douglasii	rls	65
Quercus gambelii	rls	67
Quercus michauxii	leaf	27
Quercus shumardii	leaf	27
Rhododendron maximum	rls	82
Rhus copallina	rls	57,64
Sorbus sitchensis	leaf	31
Tsuga canadensis	rls, litter	1,9,31,55

-Slight Effect

Abies concolor	root	36
Aesculus spp.	rls	54
Betula pendula	leaf, root	50
Carpinus spp.	root	36,9
Casuarina spp.	rls	86
Cupressus macrocarpa	fog drip	32
Fagus spp.	root	36,9
Fraxinus spp.	rls	54
Larix decidua	root	36
Picea excelso	root	36
Pinus palustris	litter	53
Pinus spp.	rls	74
Pinus strobus	root	36
Populus X spp.	rls	59
Populus tremula	leaf, root	50
Pseudotsuga menziesii	fog drip	32
Quercus petraea	leaf	48
Quercus robur	leaf, root	6,50,51
Quercus rubra	leaf, root	52
Salix pellita	leaf	33
Sambucus racemosa	leaf	31
Sequoia sempervirens	fog drip, leaf	6,32
Taxus brevifolia	rls	31,36
Thuja plicata	litter	31,36
Tilia americana	root	6
Tilia cordata	leaf, root	50
Tilia planifolia	root	6
Ulmus laevis	leaf	37
Ulmus parvifolia	root	6
Umbellularia californica	leaf, wood, seed or fruit	40

Notes for Table:

"rls" = Denotes root, leaf, and stem pathways.

"fog drip" = Occurs in specialized forest communities as a cause of foliage leaching

Pinus litter has an inhibiting effect on its own seed germination and seedling growth.
Old growth pine stands slow in growth rates partially due to an auto-toxic effect.

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