Are There Vigorous Native Plants that Exclude Unwanted Plants?

By Kathy Connolly, 10/29/24

People often ask, "Is there a list of plants that 'hold out the weeds'? The question is more complex than it may seem at first.

Which plants are you trying to exclude? If the answer is one of the growing number of "super-weeds," the answer may be no. Phragmites, knotweed, mugwort, black swallowwort, barberry, burning bush, and a host of non-native invasive vines don't seem to have effective competitors among regional native plants.

Are there desirable plants that exclude other plants? Maybe! But it depends on what plant you're trying to exclude and the site. This article offers plants native to southern New England as examples of potential "weed excluders." The list is based on a literature search as well as personal observations.

How do plants dominate a site? Like all living creatures, plants have competitive strategies. Unlike many other creatures, they are confined to a location. They compete with other plants for light, water, nutrients, germination sites, canopy growth space, pollinators, and soil microbes. Below, see a few competitive strategies used by plants.

- **Allelopathy:** A plant can exude toxic root substances that discourage germination and seedling development in other plants. Allelopathy seems well-studied in non-native invasive plants and agricultural cover crops but not in native plants. [1] However, agricultural studies note that some sunflowers (*Helianthus spp*.), milkweeds (*Asclepias spp*.), and goldenrods (*Solidago spp*.) are allelopathic. [2], [3]
- **Light competition**: Plants with the biggest leaves win the most sunlight. The leaf canopy may be a few feet above the ground, as with hay-scented ferns, or hug the ground, as do pussytoes, wild strawberries, and barren strawberries. The ground-huggers probably exclude competitive seed germination.
- **Microbial populations:** Plants control microbial populations in their locations with root exudates. They can favor "friendly" microbial populations or disfavor microbes needed by competitor plants.

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[1] See Biol Invasions (2021) 23:367–371, "Allelopathy is pervasive in invasive plants," https://link.springer.com/article/10.1007/s10530-020-02383-6.

[2] https://www.researchgate.net/publication/256486001_Biology_and_control_of_common_milkweed_Asclepias_syriaca

[3] https://pubmed.ncbi.nlm.nih.gov/30547327/

- **Pollinators:** Plants can make themselves easier to discover in a location, thus robbing nearby plants of the available pollinators.

Competitive Native Plants

I've observed the plants listed below as good competitors.

Low-growing—Under 1'

Sedges: Healthy fine-leaf sedges such as Pennsylvania, Appalachian, White-tinged, and Rosy sedges create a ground-level canopy where few other plants seem to grow. Sedges prefer part to full shade. *Carex pensylvanica, C. Appalachica, C. albicans, and C. rosea*.

Barren strawberry: *Geum fragarioides (A.k.a. Waldsteinia)* is a ground-hugging shade lover that seems to defy unwanted ground-huggers such as creeping Charlie.

Wild strawberry: *Fragaria virginiana* seems adaptable to a range of conditions, from moist to dry and from part shade to full sun. Once established, it covers the ground densely. Light foot traffic and occasional mowing don't seem to hurt it.

Canada Wild Ginger*:* The plant thrives in moist shade, where it appears to crowd out ground-level competitors. I have found it slow to establish. *Asarum canadense* shows up on some lists as possibly allelopathic.

Medium height 1' – 3'

Hayscented fern: *Dennstaedtia punctilobula* may be allelopathic, according to at least one source. Whether it is or not, no one can deny how thoroughly it covers the understory of shady woodlands and sunny openings. [4]

Pussytoes: The leaves of both *Antennaria plantaginea* and *A. neglecta* form dense, ground-hugging leaf covers that seem to eliminate competition. At least one source refers to pussytoes as possibly allelopathic.[5]

Lance self-heal: The native self-heal, *Prunella vulgaris var. lanceolata*, is a low-care vigorous Northeastern native plant that tolerates many conditions. Its flowers are about 12" tall, but the leaves form a dense, low-growing canopy that appears to deter ground-level competitors. It can be

[4] Hay scented fern: https://pubmed.ncbi.nlm.nih.gov/24248724/

[5] Coal Mine Reclamation with Native Allelopathic Plants, https://warnercnr.colostate.edu/frs/coal-mine-reclamation-native-allelopathic-plants/

used in low-mow "bee lawns" because it can take occasional mowing, according to University of Minnesota Bee Lab. (https://beelab.umn.edu/bee-lawn)

Common juniper 'Blueberry Delight', *Juniperus communis,* seems to thrive on neglect. It grows about 4' wide and 18" tall in part to full sun. After the initial establishment period, water sparingly. Keep it out of range from irrigation systems.

Common juniper, 'Repanda', *Juniperus communis,* also grows about 4' wide and 18" tall.

Taller, 3' +

Bergamot, *Monarda fistulosa,* grows to 5' tall and forms dense stands that exclude other plants. A strong spreader.

Mountain mint, *Pycnanthemum muticum,* forms dense stands up to 4' tall that seem to defy invasion by other plants.

Ostrich fern: *Matteuccia struthiopteris* is an aggressive fern in both shade and sun. Very few plants appear to compete with it, except the native Virginia creeper. I have also observed non-native invasive porcelainberry vines among ostrich fern.

Rough goldenrod 'Fireworks', *Solidago rugosa,* forms dense colonies about 4-5' tall in sunny, dry spaces. The 'Fireworks' cultivar is shorter and less aggressive than Canada goldenrod.

Trees

Some trees appear in lists of plants with allelopathic or other exclusionary tendencies:

- American elm: (Ulmus americana)
- Black cherry: (Prunus serotina)
- Black locust: (Robinia pseudoacacia)
- Cottonwood or Eastern Poplar: (Populus deltoides)
- Hackberries: (Celtis)
- Maples: (Acer)
- Pines: (Pinus)
- Red oak: (Quercus rubra)
- Sassafras: (Sassafras albidum)
- Sumacs: (Rhus) Fragrant sumac shrub (R. aromatica) is noted by one study as allelopathic.
- Sycamore: (Platanus occidentalis)