You Ain't From Around Here! Exotic Invasive of the Quarter: Chinese Privet *(Ligustrum sinense)*
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This winter, the Virginia Forest Landowner Update is a focusing on agroforestry. Agroforestry is a land management system in which crops or livestock are combined with trees in order to maximize benefits to all the species, with sustainability being the ultimate goal. Chinese privet (*Ligustrum sinense*) is the invasive of the quarter because it is a species that can potentially be controlled using agroforestry practices. These practices could provide a means for long-term suppression of invasive plants and restoration of native communities.

Chinese privet is native to Asia and was introduced to the United States in 1852 for use as an ornamental shrub. It has since invaded Virginia, Georgia, Kentucky, North Carolina and Tennessee. This shrub has been widely used as a hedge because of its fast growth, low maintenance, and attractive flowers. Unfortunately, it can easily take over the ground cover in forests and on disturbed sites. The greatest threat is that it displaces native vegetation and hinders seedling regeneration, resulting in alteration of the ecosystem.

Chinese privet fruits. Photo by: Ted Bodner, Southern Weed Science Society.

This persistent plant is tolerant of many sites, but prefers wet, damp conditions. Most often it is found in bottomland forests, riparian areas and abandoned fields. It has been known to grow as tall as 30 feet, but typically is between 5 to 12 feet tall. Chinese privet produces multiple stems which gently arch in all directions. This species is considered to be semi-evergreen because it retains some of its leaves throughout the winter, giving it a competitive advantage over many native plants which are dormant in the winter. And,

prolific sprouting and birds, which gobble up its berries, help spread this plant far and wide.

Despite its status as an invasive species, Chinese privet is sold widely in the nursery and gardening industry. Because of its invasiveness in the southeast, planting is not recommended in this region.

Variations in Chinese privet leaf sizes. Photo by: Karan A. Rawlings, University of Georgia.

How to identify Chinese privet:

Leaves: Opposite, simple, ovate and 1 to 2 inches long; the upper surface appears glossy and the underside is pubescent (fuzzy) and whitish.

Stem: Densely covered in hairs that protrude at a right angle from the stem.

Flowers: White to cream colored; tube like shape; occur in terminal clusters; blooms June to July.

Fruit: Blue to purple and less than a quarter inch in diameter; mature late summer-early fall and persist through winter.

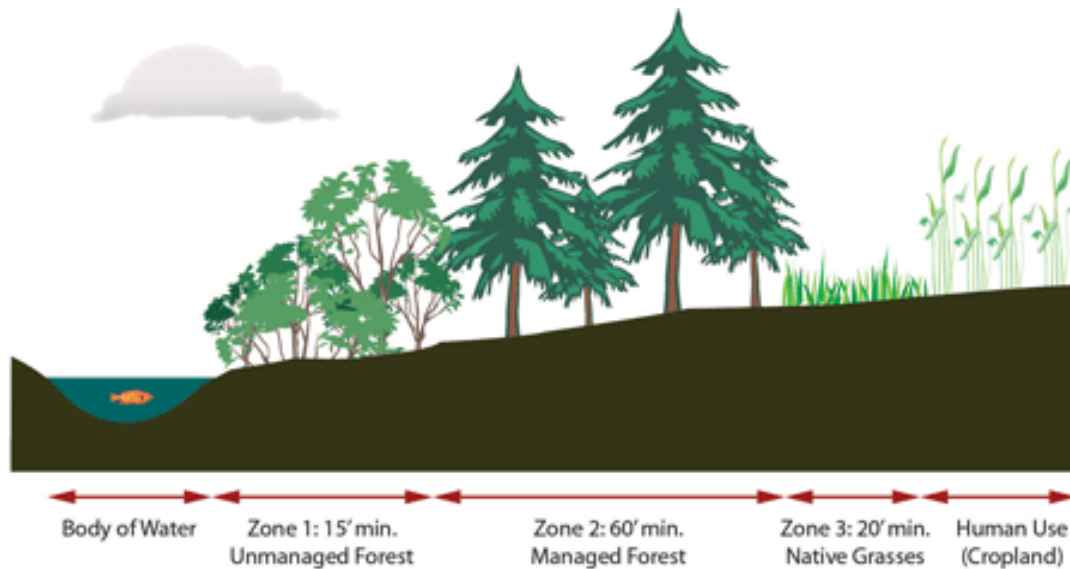**How an agroforestry system can control Chinese privet:**

Long-term weed control usually requires active suppression. Common suppression tactics include mechanical or physical removal of invasive plants and/or chemical treatment. Agroforestry practices can serve both as a means of restoring natural ecosystems and long-term suppression of future infestations. Implementation of such systems would first require the removal of the invasive, but would decrease or eliminate the need for subsequent treatments.

Black walnut, a common species used in agroforestry, is mentioned in each of the following control methods because it has a competitive advantage over privet. Black walnut roots exude an allelochemical, called juglone, which inhibits the growth of some species, including Chinese privet. An **allelochemical** functions similarly to an herbicide, but it is produced naturally by a plant. Other allelopathic trees include honey locust, black locust and American sycamore, but they do not exhibit as high concentrations of their allelochemical. Many invasive plants are also allelopathic, but Chinese privet is not.

Common places where privet invades, and agroforestry solutions to kick privet out:

Invaded Space 1 - Riparian Areas: Many plants like the fertile soil located in riparian areas (areas adjacent to a body of water), including crops and invasive plants. However, crops and invasive plants often have shallow root systems which do not help improve water quality like forested buffers do. Forest vegetation in riparian areas maintains high water quality by reducing sedimentation, filtering nutrients and toxins and regulating stream temperature.

| Body of Water | Zone 1: 15' min. Unmanaged Forest | Zone 2: 60' min. Managed Forest | Zone 3: 20' min. Native Grasses | Human Use (Cropland) |

USDA 3-Zone Buffer Planning Model. Source: Virginia Outdoors Foundation.

Agroforestry Solution-Riparian Area Restoration: Reintroducing native species in a riparian buffer is a viable solution to excluding some invasive plants like Chinese privet. Inclusion of trees that exude allelochemicals increases the capability of this proposed solution. The figure above depicts a typical three-zone multi-species buffer strip plan that will protect the stream from nutrient and sediment runoff, provide wildlife benefits and exclude invasive plants. Zones 2 and 3 of the buffer can be managed for products that provide an economic return such as timber, fruit, nuts, woody florals or a combination of products.

Invaded Space 2 - Abandoned Fields: Chinese privet will readily occupy abandoned crop land and take over. There are several agroforestry practices that could potentially control

invasive plants by way of competitive exclusion and allelochemicals. The **competitive exclusion principle** states that two similar species competing for the same resources cannot stably coexist. In agroforestry this principle is usually applied by designing a system of plants that complement each other and exert minimal competition so a stable coexistence can occur. In the case of excluding unwanted plants, efficient utilization of resources by the crop plants leads to competitive exclusion of the invasive plants.

Agroforestry Solution-Alley Cropping: Alley cropping is planting trees in widely spaced rows with a companion crop grown in the alleyways between the rows. Alley cropping in the United States and elsewhere is often considered a good means of restoring soil fertility in a degraded landscape. It is also a way to diversify farm income, improve crop production and provide conservation benefits. Common alley crops include wheat, corn, soybeans or hay. Black walnut is an ideal alley cropping species because its wood is highly valuable and its nuts are also marketable. An alley cropping system very efficiently uses resources, and leaves little room for outside intruders. The presence of juglone in the system would also suppress the re-invasion of Chinese privet.

The use of agroforestry and allelopathy as a means to control invasive species is a budding science in need of further research. Research conducted by the University of Hawaii has had success in restoring a natural ecosystem by way of agroforestry practices. University of Georgia is conducting a study on silvopasture as an invasive control measure for Chinese privet on its campus. Many scientists are researching allelopathy in hopes that it could be harnessed as a natural alterative to herbicides.

Agroforestry offers many benefits, including economic returns and conservation value. It also has the potential to successfully restore native ecosystems and suppress exotic invasive plants like Chinese privet.

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