

Home & Garden Education Center



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The Barberry – Lyme Disease Connection

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The past few weeks have seen a flush of bright green color under the relatively leafless canopy in many wooded areas around the state. While quite cheery and spring-like, this exuberant growth is produced by the invasive Japanese barberry (*Berberis thunbergii*). This plant was introduced to the U.S. as an ornamental around 1875. It became widespread in the nursery trade because it was tough, resistant to deer and drought, and offered attractive fall foliage as well as bright red elongated berries.

The Japanese barberry also has a multitude of thorns with a sharp barb at each of its many nodes. This led to it being used widely as a hedging plant as it kept wayward creatures, including children, from passing through. Leaves are small, oval and plentiful making this a fairly dense shrub.

Like many exotic plants, the Japanese barberry did not really become a problem until it escaped from residential and commercial landscapes into our native forested ecosystems and wetlands. Some of the most popular cultivars produced a proliferation of berries. While not a preferred food source, the berries are consumed by birds and other critters and the seeds dispersed throughout the landscape. Foragers may note that a jelly can be made from the berries.



Image by D. Pettinelli

Once Japanese barberry becomes established in wild areas, it outcompetes native tree seedlings, shrubs and herbaceous plants. Wild barberries can grow from two to 8 feet high. This plant may be able to alter the soil pH, nitrogen cycling and biological activities. Among those biological activities altered is the increase of Lyme disease-carrying blacklegged ticks (*Ixodes scapularis*). This tick species also may carry human babesiosis and human granulocytic anaplasmosis so it is in our best interest to keep populations to a minimum.

Researchers at the Connecticut Agricultural Experiment Station discovered that stands of barberry harbor many more times the number of Lyme disease-carrying blacklegged ticks than those free of barberry. Further collaborative research by state scientists including those at the University of Connecticut indicated a potential reason or more specifically, reasons why.

The first is increased humidity in heavily populated barberry stands. To understand why this is important it helps to become familiar with the life cycle of ticks. Like many insects (technically an arachnid), its life stages include eggs, larvae, nymphs and adults. Adult females can lay up to 1500 eggs on the ground usually in late spring. The eggs hatch in the summer and 6-legged larvae emerge. The larvae remain in the litter until around August when they then attach themselves to small rodents like white-footed mice and chipmunks to feed on their blood.

The dense barberry cover retains a greater amount of humidity than more open areas so the young tick larvae are less likely to be desiccated during the hot days of summer. Secondly, thick barberry stands provide a relatively safe habitat for white-footed mice as the thorny stems like thwart predators. These two factors may be responsible for the scientists finding 12 times the number of Lyme disease infected ticks per acre in these areas than in forested areas devoid of barberry.

Even if the adult ticks are carrying tick-borne diseases, the larvae are disease free when they hatch. The white-footed mice they feed on, however, are known reservoirs for *Borrelia burgdorferi*, the organism that causes Lyme disease as well as *Babesia microti*, the organism that causes most human babesiosis, and *Anaplasma phagocytophilum*, the organism that causes human granulocytic ehrlichiosis. The larvae will attach themselves to the mice, feed for 3 or 4 days, drop off and overwinter.

The next spring, the larvae emerge as 8-legged nymphs that are about the size of poppy seeds. Any infected nymphs can transmit tick-borne diseases to humans, pets or some other animals. Because the nymphs are so tiny, they are more difficult to see and remove than the slightly larger adults. The nymphs engorge themselves with blood, drop off their hosts and morph into adults by the fall.

Adults look for their blood meal ticket in order to finish their life cycle and usually it is in the form of a white-tailed deer. Both male and female ticks attach themselves to deer but usually only the female feeds. They mate and then the engorged female drops off and lays eggs in the spring. The deer transport the ticks but they are not good reservoirs for Lyme and other tick-borne diseases.

As a property owner, or even a visitor to natural areas, be on the lookout for invasive barberry seedlings and plants. Remove any that have naturalized on your property. They are usually quite recognizable because of their thorns and their early spring green up. Large plants can be controlled by mechanical removal, burning, herbicides or repetitive cutting to the ground.



If Japanese barberries were previously planted in foundation plantings or ornamental beds, see if they produce copious amounts of berries in the fall. If they do, perhaps you can replace them with one of the sterile cultivars developed by Dr. Mark Brand at the University of Connecticut or with another plant without invasive tendencies.

For information on control of naturalized barberries, substitutes for barberries in the landscape or on other gardening topics, feel free to contact us, toll-free, at the UConn Home & Garden Education Center at (877) 486-6271, visit our website at www.ladybug.uconn.edu or contact your local Cooperative Extension center.

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