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### Creating a Tick-Free Zone

By Kathy Connolly

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The weather finally beckons us outdoors, but some people feel safer watching from their windows. Others avoid a walk in the woods. And though much has been written about the value of getting kids into nature, some parents quietly express relief that, when their kids are indoors, "at least they won't get tick bites."

It's been about 40 years since Lyme disease was named. Have we learned anything?

"There was hope we'd find one solution," says Kirby Stafford III, Ph.D., the entomologist at Connecticut Agricultural Experiment Station (CAES) in New Haven who specializes in ticks and tick-borne diseases. "We hoped for a vaccine, but we don't have that."

Stafford says that's why experts today refer to tick avoidance as integrated tick management, or ITM.

"It's really integrated pest management [IPM] for ticks," he says, referring to a collection of solutions that operate in tandem. "And for homeowners, we refer to the idea of creating a tick-safe zone on their landscapes."

The tick in question here is the black-legged tick, aka deer tick, aka *Ixodes scapularis*. Indeed, deer are part of its life cycle, but so are smaller mammals, particularly white-footed mice, squirrels, and other warm-bodied creatures. All tick management strategies involve, at some point, our encounters with these mammals, direct or indirect.

Stafford and CAES have been very active in tick ecology research for a number of years. CAES researchers Jeffrey Ward, Scott Williams, and Thomas Worthley recently showed, for instance, that tick populations are about 10 times higher in woods infested with Japanese barberry (*Berberis thunbergii*) than woodlands without the plant. The barberry canopy creates a tick-nurturing humid environment. This invasive plant species is under voluntary ban in Connecticut and mandatory ban in Massachusetts as well as a number of other states.

Stafford and fellow researchers have spent a great deal of time reviewing landscape products. Organophosphates have been banned as tick sprays for many years, he says. Most of the newer anti-tick products are pyrethroids, synthetic versions of the natural pyrethrins from chrysanthemum.

"Pyrethroids are both effective and persistent," he says. "But while these are relatively low-toxicity products, they are not acceptable under organic certification standards."

Stafford has found that a combination of pyrethrin with piperonyl

butoxide and insecticidal soap is probably one example of a cost-effective botanical spray. There are also compounds derived from the essential oils of Alaska yellow cedar, aka Nootka cedar, that have been studied in the laboratory and field, but Stafford says most would find this prohibitively expensive.

Expense aside, some professional pesticide applicators offer botanical spray programs to satisfy demand for low-toxicity solutions. In general, though, botanically derived compounds must be reapplied every two to three weeks.

"Botanicals have low persistence in the outdoor environment," says Stafford.

CAES recently conducted successful ITM experiments combining the use of a biopesticide spray called Met52EC with placement of rodent bait boxes that treat mice with the same chemical as used in FRONTLINE for dogs and cats.

"Met52 contains a naturally occurring entomopathogenic fungus, *Metarhizium anisopliae*," says Stafford, pointing out that this approach is safe around humans as well as most non-target species such as bees. "It's not quite ready for market but perhaps it will be available sometime later this year."

Commercial products aside, landscaping practices offer some practical solutions.

Ticks are nurtured by shade, leaf litter, and dense vegetation.

"I find 82 percent of ticks on a residential yard within nine feet of woodland edges," says Stafford.

Far fewer ticks are found in sunny, open areas such as lawns. Stafford points out that popular, easy-to-grow pachysandra can be a tick haven, as can other ground covers that form a dense canopy.

Meadow-style plantings, however, may offer the same benefits as open lawn.

"I've done sampling at wildflower meadows," says Stafford, "and found most ticks along the edge, similar to a lawn."

While not conclusive, this points toward the idea that tall grasses and perennials in a sunny environment may also be relatively tick-safe.

Dry ground covers such as river stone, pea stone, sand, gravel, bark mulch, and hardscapes are unfriendly to the insects. It helps to surround the tick-safe zone with a three-foot border of these materials. Ticks do not fly, jump, or drop from above.

While it may seem tempting to think that deer fencing will keep your property safe, this is generally not true. Researchers have found that deer fencing reduces ticks only when enclosures are 15 acres or larger.

For more information, visit [www.ct.gov/CAES](http://www.ct.gov/CAES).

Kathy Connolly is a garden coach, writer, and speaker from Old Saybrook. Find her presentation schedule at [www.speakingoflandscapes.com](http://www.speakingoflandscapes.com) or email her at [kathy@speakingoflandscapes.com](mailto:kathy@speakingoflandscapes.com).