

## Organic Landcare Practices

Standards for organic land care practices for design and maintenance of ecological landscapes have been developed and published by the Connecticut and Massachusetts chapters of the Northeast Organic Farming Association (NOFA). Tick IPM practices are covered under pest and wildlife management guidelines. Practices that are preferred to manage ticks would include personal protection measures, making the environment unsuitable for the pest (i.e., landscape modifications), deer resistant plantings (natives recommended), fencing against deer, and herbal-based deer repellents. The use of arthropod pathogens like entomopathogenic fungi (fungi that kill insects), diatomaceous earth, insecticidal soaps and botanical insecticides are allowed under the standards. However, botanicals cannot be formulated with aromatic petroleum distillates. Ammonia or hot sauce based deer repellents are allowed. Prohibited under the organic standards are all synthetic insecticides and piperonyl butoxide as an insecticide synergist, rodenticides containing warfarin, predator urine (due to collection practices), and products containing sewage sludge (e.g., Milorganite).

## Biological Control of Ticks

Ticks have relatively few natural enemies, but the use of predators, parasites, and pathogens has been examined for tick control. Tick predation is difficult to document and observations are sporadic. Most arthropod predators are non-specific, opportunistic feeders and probably have little impact on ticks. Anecdotal reports suggested that guinea-fowl or chickens may consume ticks and impact local tick abundance. However, there is no good evidence to support this and turkey foraging was not found to reduce the local density of adult ticks. A minute parasitic wasp, *Ixodiphagus hookeri*, parasitizes blacklegged ticks in a few areas of New England with superabundant deer and tick populations. However, studies indicate that the usefulness of this wasp to control *I. scapularis* is very limited. Insect parasitic nematodes have been studied as possible biological control agents. Engorged female *I. scapularis* are susceptible to certain types of nematodes, but these nematodes are too sensitive to the colder autumn temperatures when the ticks are present. The application of entomopathogenic fungi, however, is a promising approach for controlling ticks. Several fungi have been shown pathogenic to *I. scapularis*. A perimeter treatment of existing commercial formulations of the fungus *Beauveria bassiana* and with *Metarhizium anisopliae* at residential sites has been shown to control *I. scapularis* in small experimental trials. The EPA has approved *M. anisopliae* for residential outdoor grub and tick control (Tick-Ex™, an oil formulation, and Taenure™, a granular formulation; Earth BioSciences, Glastonbury, CT). At the time of this writing, additional trials and commercial development are in progress. Entomopathogenic fungi, applied like a traditional pesticide, may be an option in tick management programs, and an oil-free formulation could meet organic standards.

## Lyme disease can be a preventable disease!

Surveys have consistently shown most residents in Lyme disease endemic areas consider the disease an important or very important issue that poses a high risk to members of their family. A few precautions and the management of infected ticks in the residential or recreational landscape can substantially reduce the risk of Lyme disease and other tick-associated illnesses. Prompt recognition of infection and treatment can prevent more serious manifestations of disease. While education is important to preventing or mitigating disease, landscape and host management practices combined with the judicious use of acaricides can provide excellent tick control with minimal risk or impact to the environment.