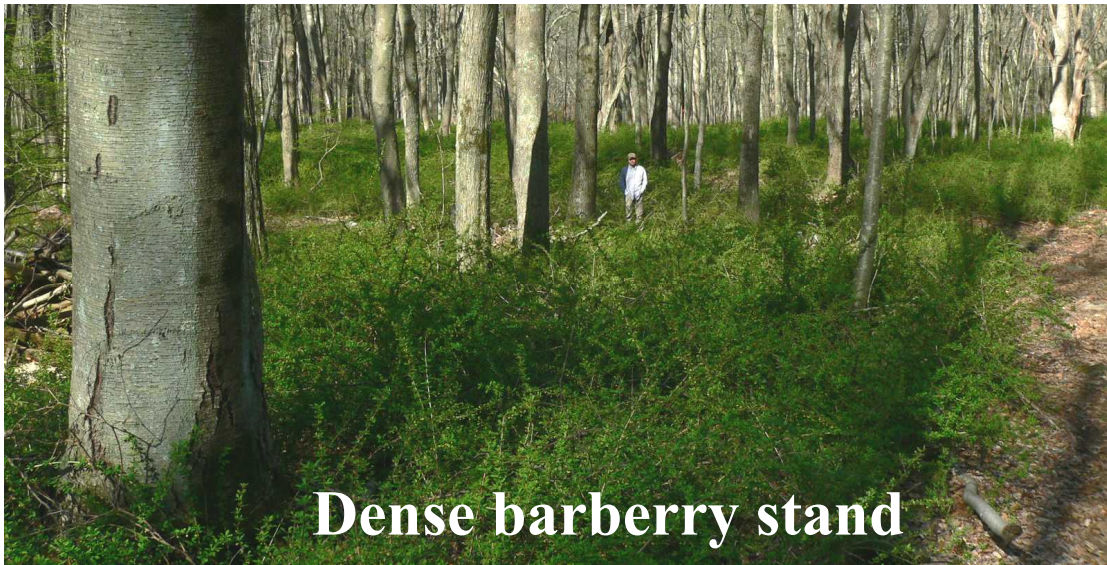


JAPANESE BARBERRY CONTROL OVERVIEW



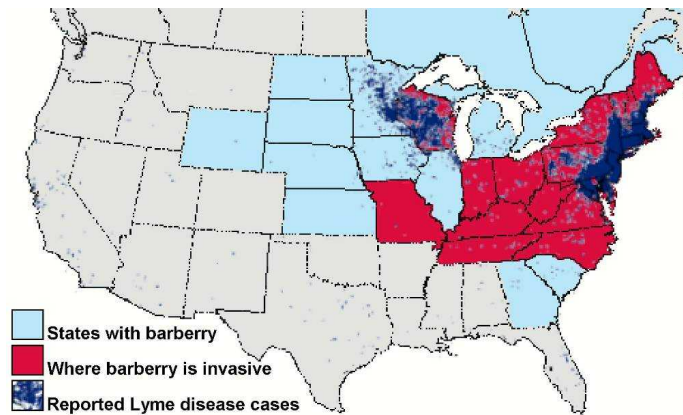
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Lyme disease incidence is high in many states where barberry is reported invasive.



These results based on research partially sponsored by Aquarion Water Company, Connecticut Chapter ó The Nature Conservancy, Propane Education and Research Council, South Central Connecticut Regional Water Authority, and Weed-It-Now Program ó The Nature Conservancy with additional assistance from Connecticut Department of Environmental Protection-Division of Forestry, Towns of Mansfield and Greenwich, Norcross Wildlife Foundation, New England Propane Gas Association of New England, Providence Water, and Lord Creek Farm.

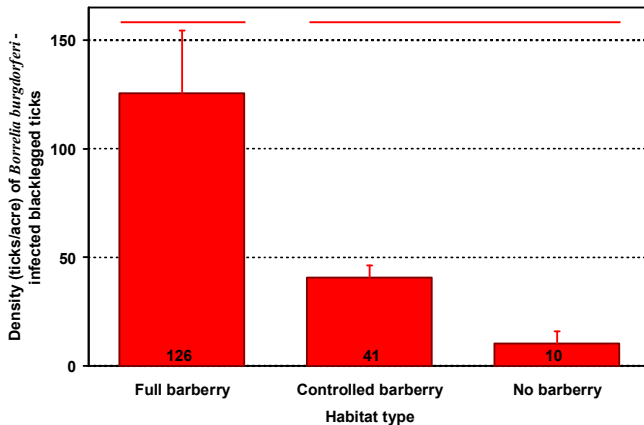
Japanese Barberry – The problem

Health

- Increased nitrification (may affect drinking water quality)
- Decreased litter layer (may affect drinking water quality)
- Increased tick populations (may increase exposure to Lyme disease)

Habitat

- Lower tree regeneration
- Lower herbaceous plant cover
- Increased earthworm densities



Barberry and Ticks

Controlling Japanese barberry reduces the number of blacklegged (deer) ticks infected with *Borrelia burgdorferi*, the causal agent of Lyme disease. Thus, controlling barberry may benefit human health by reducing a major vector of the disease agents that cause Lyme disease, human granulocytic anaplasmosis, and human babesiosis.

Barberry Control Overview

Our work has found that a two-step process can control barberry.

2-Step Procedure



**Initial
healthy
plant**



**Step 1 – Kill
aboveground
tissues with
prescribed
fire, torch, or
mechanically**



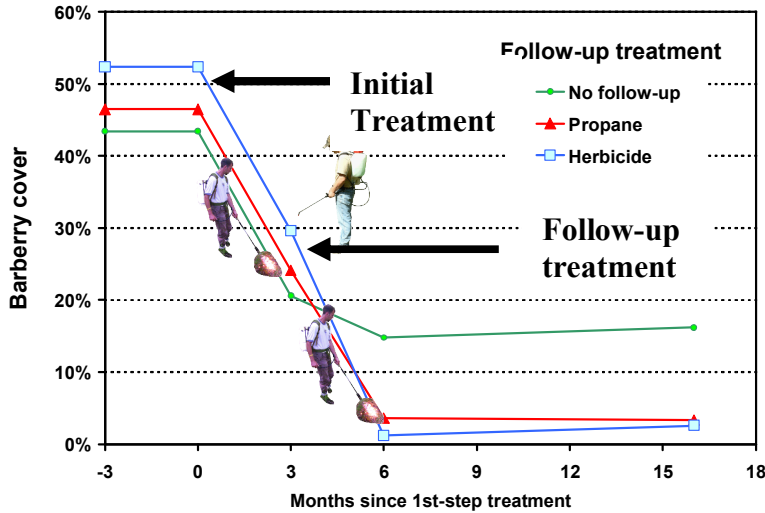
**Root reserves
used to grow
new shoots,
lowers root
reserves**



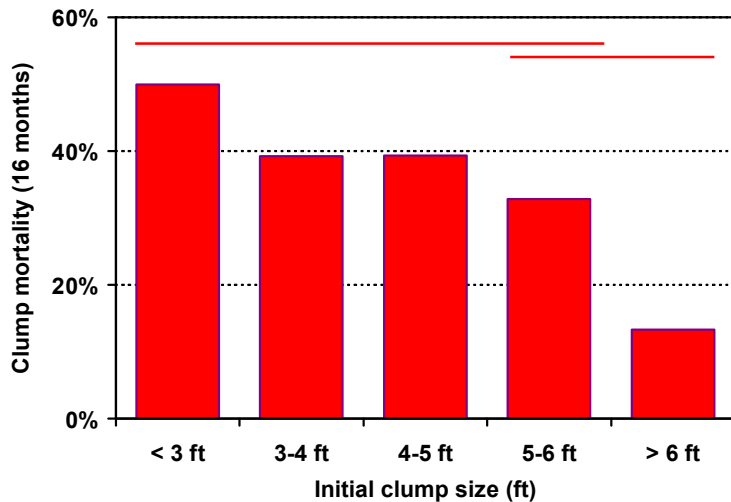
**Step 2 – Kill
much smaller
plant with
heat or
herbicides**

Initial Treatments

- Initial treatments (prescribed burning, propane torch, mechanical mowing with a drum chopper, or mechanical mowing with a brush saw) reduces the size of established barberry clumps and causes some mortality of clumps less than 3-ft tall.
- All initial treatments were equally effect for reducing barberry cover. Brush saw treatment was half the cost of using a drum chopper. Nevertheless, we recommend using medium or heavy (bulldozer) equipment to cut or flatten corridors in barberry that is waist high or taller to increase worker efficiency.



The graph above shows barberry cover in relationship to timing of initial (April) and follow-up (July) treatments.



The graph above shows that without follow-up treatments, most barberry clumps larger than 3-ft were still alive 16-months after initial treatment. Therefore, successful control of barberry infestations requires a follow-up treatment.

Prescribed fire
 Effective (except dense clumps)
 Relatively cheap (20+ acres)
 Site/personnel limited



Propane torch
 Effective (if ≤ 3 ft tall)
 Moderate cost
 Limited by weather

Drum chopper

Needs follow-up
 Expensive
 Needed if barberry taller than 3 ft



Brush saw

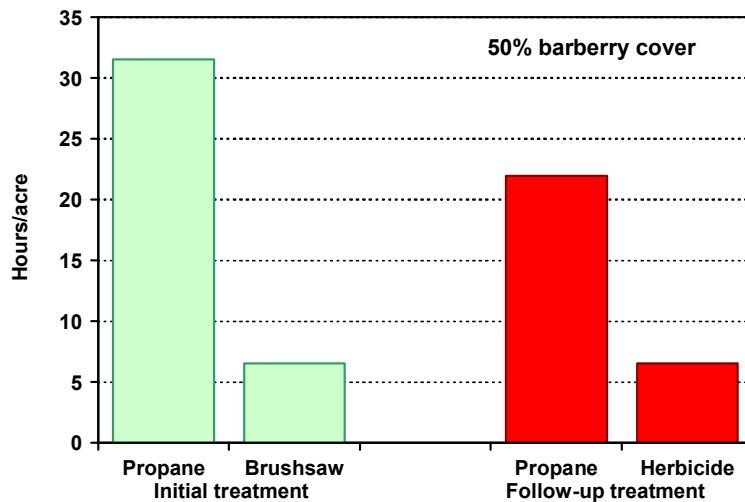
Effective (if ≤ 3 ft tall)
 Moderate cost
 Must get all stems/clumps



Initial treatment can be before or after leafout. Excellent control of barberry can be achieved using either propane torches or herbicides.

Follow-up Treatments

- The second, follow-up steps (directed heating with a propane torch, application of herbicide (triclopyr, glyphosate) treats the sprouts that develop after initial treatments.
- As shown in the graph below, labor costs vary among treatment alternatives. Propane torches provide an "organic" alternative where in parks, nature preserves, or forests where herbicide use is restricted. Cost of propane torches is similar to herbicides where a volunteer labor pool is available. Larger barberry clumps (> 3 feet) may require two or three follow-up propane



treatments. Where herbicide use is permitted, initial treatment with propane torches or brushsaws reduces the amount of herbicide that would be needed.



Individual species and directed heating with propane torches

The following are from our research and research by Peter Smallidge at Cornell University (pis23@cornell.edu). Species with * are based on field observations, not scientific study.

Japanese barberry (*Berberis thunbergii*) ó effective in CT

Japanese stiltgrass (*Microstegium vimineum*) ó effective in CT

Burningbush (*Euonymus alatus*) ó effective after 2-yrs in CT

Multiflora rose (*Rosa multiflora*) ó effective in CT in shade*, not in NY in sun

Bush honeysuckle (*Lonicera* spp.) ó effective in NY, not in CT*

Autumn olive (*Elaeagnus umbellata*) ó effective control in NY in August

Tree of heaven (*Ailanthus altissima*) ó in CT, effective in shade but not sun*

American beech (*Fagus grandifolia*) ó moderately effective after 2-yrs in NY

Striped maple (*Acer pensylvanicum*) ó marginally effective in NY

Buckthorn (*Rhamnus cathartica*) ó poorly effective in NY

Oriental Bittersweet (*Celastrus orbiculatus*) ó not effective in CT*

Swallow-wort (*Cynanchum* spp.) ó not effective in CT*

Japanese knotweed ó probably not effective, but merits examination