


Using Bark Mulch to Control Weeds and Build Soils In Organic Apples

Chris McGuire, Two Onion Farm

A photograph of a farm in winter. In the background, there is a large, weathered wooden barn with a red roof and a smaller house with a gabled roof. The foreground is a snow-covered field with rows of young, bare trees planted in the ground, each supported by a wooden stake. A large, semi-transparent white circle is overlaid on the left side of the image, containing text.

One system which
has worked for us

- Costs
- Management

Two Onion Farm





Two Onion Farm

- Began by growing veggies
- Transitioned to fruit
- Apples: 2 acres
- *Ribes*: ½ acre
- Certified organic
- Markets
- Fresh fruit & value-added products





Dwarf Apple Trees

- Return on investment
- Less labor
- Less disease
- Better fruit



Shallow Roots!

- Require irrigation
- Trees must be staked
- **Weed competition**



Weed Control

- Non-organic:
 - Herbicide strip
- Organic:
 - Don't grow dwarf trees!
 - Cultivation (tractor, hoe)
 - Mulch





Hardwood Bark Mulch

- Sawmill by-product
- Prevent erosion
- Discourages rodents (vs. straw)
- Suppress weeds
- Build organic matter, nutrients (vs. wood chips)

Mulching at Two Onion Farm



- Applied since 2014
- 6.5-8 foot band
- 4" inch initial layer
- 2" annual maintenance layer
- Applied late fall (early spring)



Costs

- Bark:
 - ~\$10/yard delivered
 - \$5.00 per tree initial application
 - \$2.50 per tree maintenance application
 - 600-700 trees per acre
- Labor: 3 minutes per tree per year
- Justified for valuable crop? (\$100+ per tree)

Successes



- Control of annual weeds
- Soil protection
- Organic matter buildup

Challenges



- Mulch gradually raises soil line
- Plant graft union well above initial soil level (6 inches+)

Scion Rooting

Windblown Seeds



- Land and germinate on top of mulch
- 5-10 minutes hand-weeding per tree each year



- Cultivate weed-free strip every 7-14 days (1-2 minutes/tree per year)
- Maintain non-spreading grasses (fescue, etc.) in aisle NOT quackgrass

Sod Encroaches Into Mulch



Buckeye Cultivator

\$1705

Spreading Perennial Weeds

- Grow from seed or by spread from adjacent areas
- Deep rhizomes
- Very hard to eradicate once established



- Canada Thistle (worst!)
- Quackgrass
- Horsenettle
- Field bindweed

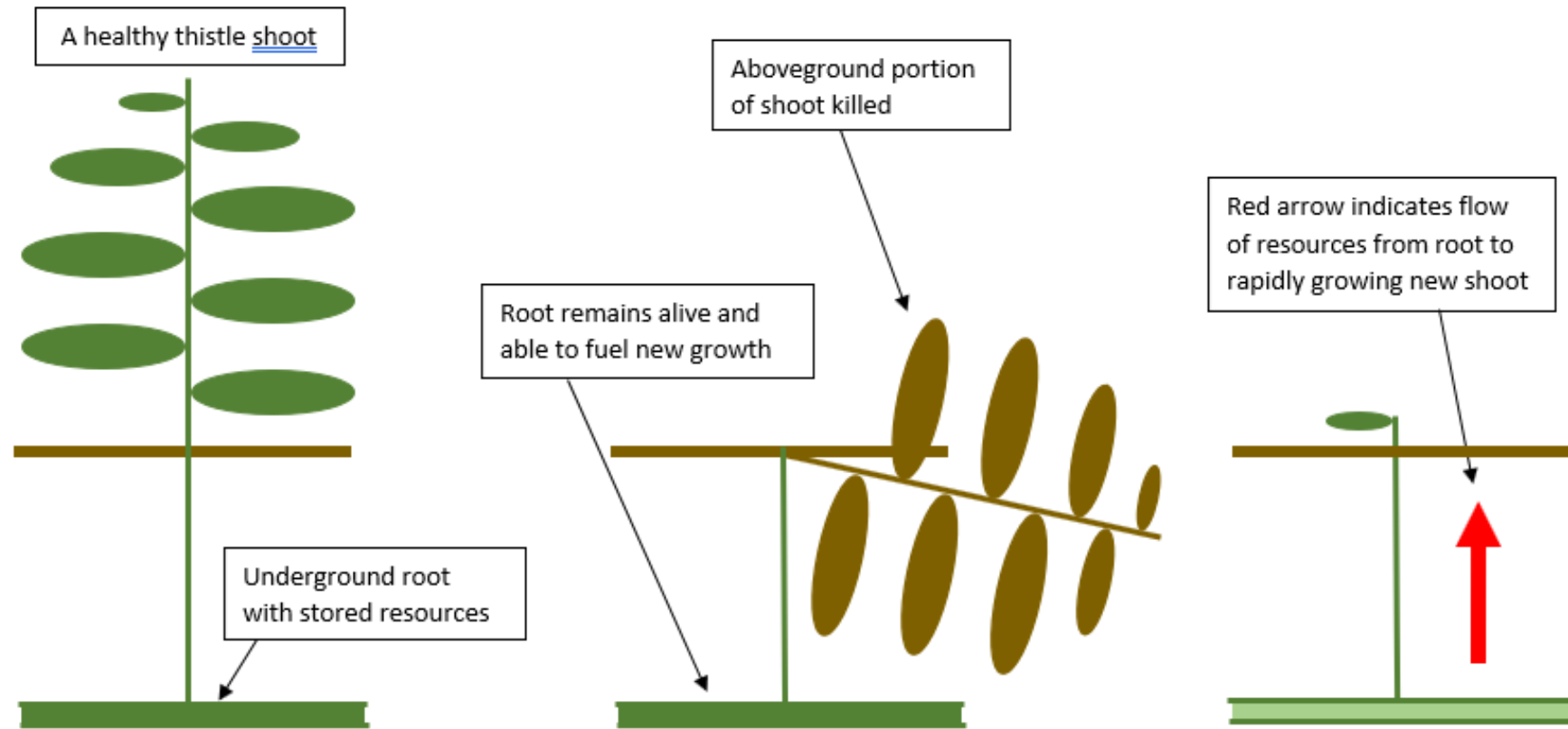


Killing Perennial Weeds

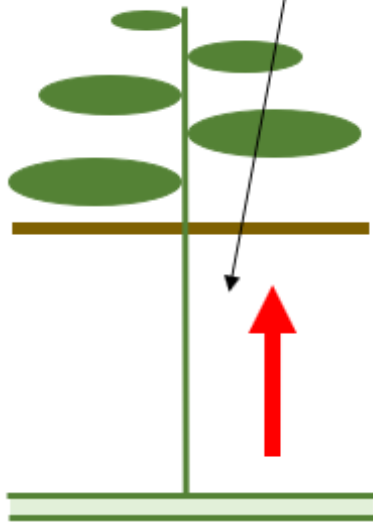
- Repeatedly kill shoots
- Proper interval is key



After Shoots Are Killed, Canada Thistle Depletes Root Reserves to Regrow

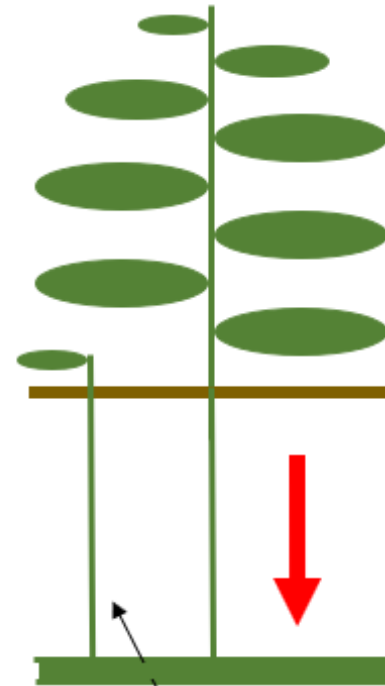


New shoot continues to grow rapidly, depleting resources in the root.



This is the ideal time to kill the thistle shoot again, when resources in the root have been depleted, and the shoot has not begun to return resources to the root.

If not killed, the new shoot is now large enough to support its own growth and to return resources to the root.



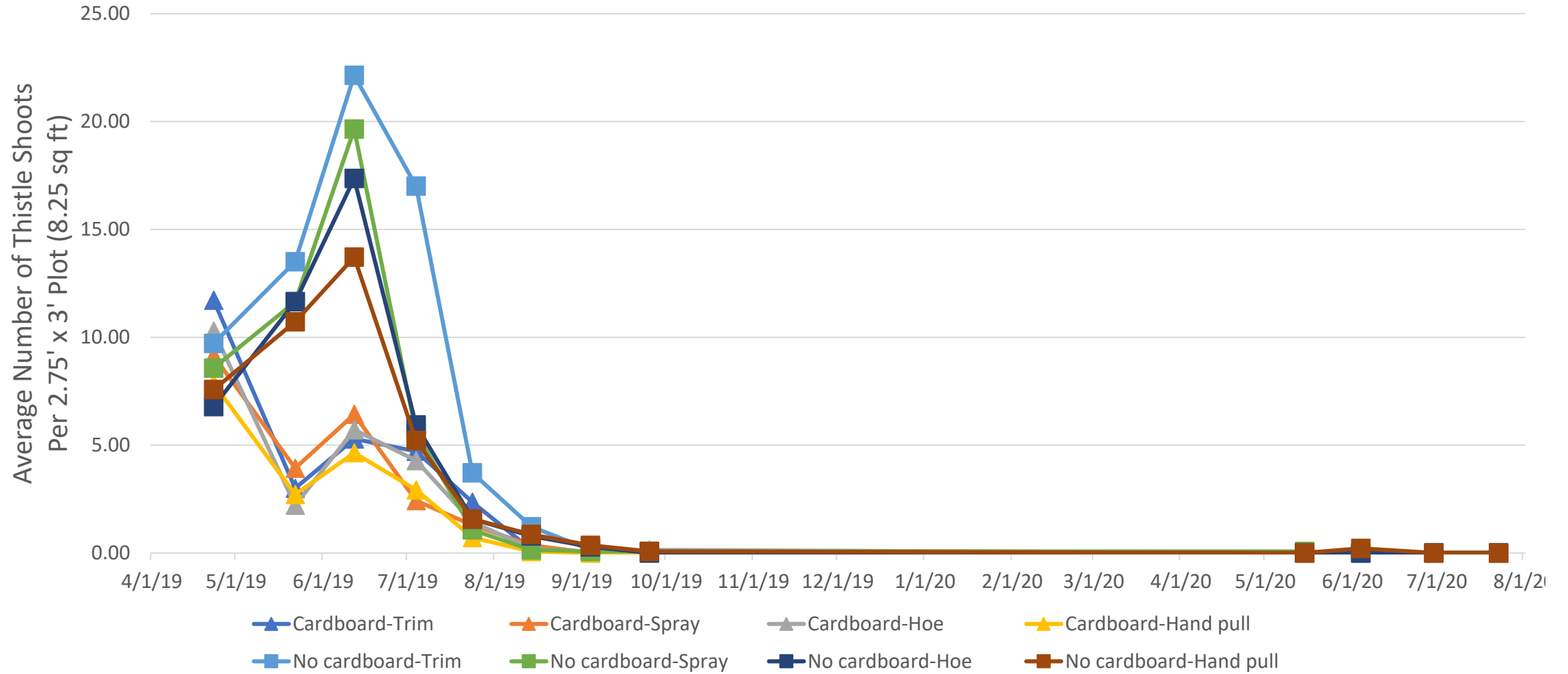
Root now fuels growth of a new thistle shoot, expanding the patch

Canada Thistle Control

- USDA-SARE Farmer Rancher Grant
- Hand pulling
- Hoeing with diamond hoe
- String trimmer
- Avenger organic herbicide
- All treatments without and without cardboard mulch



Average Thistle Shoot Density Under Different Treatments



Cost Per Tree of Applying Treatments To Eradicate Canada Thistle

Treatment	Labor To Cut Thistles and other weeds	Labor To Apply Cardboard	Cost Of Materials	Total Cost
Cardboard-Trim	\$1.57	\$2.28	\$0.03	\$3.87
Cardboard-Spray	\$1.14	\$2.28	\$3.07	\$6.48
Cardboard-Hoe	\$1.67	\$2.28		\$3.94
Cardboard-Hand pull	\$3.21	\$2.28		\$5.49
No cardboard-Trim	\$2.07		\$0.04	\$2.11
No cardboard-Spray	\$1.90		\$5.96	\$7.86
No cardboard-Hoe	\$2.64			\$2.64
No cardboard-Hand pull	\$4.96			\$4.96

Questions?

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