Canada Thistle Management Suggestions

**Original Question from Rowan Steele, EMSWCD Incubator Farm:**

I'm dealing with acres of heavy Canada Thistle outbreak and, short of spraying, don't have a great strategy for getting it under control or managing it long term.

Has anyone out there found an effective way to control thistle? Preferably using a cultivation and cover crop program.

**From Heidi Noordijk, North Willamette Research and Extension Center:**

I checked with Andy Hulting from Extension and here is his response:

Heidi-The best and most effective work that I am aware of for managing Canada thistle with cover/smother crops and tillage is John Masiunas¹ work out of the University of Illinois. See link below for details. This system could be tweaked to work in OR depending on the goals of the producer.

http://www.sare.org/Learning-Center/From-the-Field/North-Central-SARE-From-the-Field/Illinois-Researchers-Explore-Use-of-Sorghum-Sudangrass-In-the-Battle-Against-Weeds

**From Chris O’Brien, Big Leaf Farm:**

I've had good luck with a buckwheat cover crop on thistle infested ground that has been cultivated a couple of times in the spring. In my experience the buckwheat can stay ahead of the thistle and shade it out, especially on thistle regrowth which isn't as vigorous. It's too late in the year to try this with buckwheat, and while I haven't tried it, the same thing might work with diakon or tillage radish, or with sudan grass, which all make a nice cover crop going in to the winter.
This year I'm growing on a half acre (corn and dry beans) for a seed contract, and some potatoes as well, on thistle infested ground. The alleys are easy to cultivate with the wheel hoe every few weeks, and I've just been hand pulling thistles in the row. Hand pulling is easy on my ground (after irrigation), and thistles don't seem to regrow that have been hand pulled if you get a good 6-8 inches of below-ground stalk. If you wait until they are tall, you don't have to bend over too far. By now, there aren't any thistles resprouting in the alleys and my rows are clean, so I'm hoping for a much cleaner field next year.

In short, for me thistles are relatively easy to manage compared to bindweed, which is a whole another story. Anyone have any ideas on that one?

**From Josh Volk, Our Table Farm:**

Just to chime in briefly, my experience matches this. Basically frequent tillage, and I like to make at least one of those deep with something like a chisel to break up the deep roots. This does cause a flush of more plants, which many people seem to think is bad, but in my mind as long as I kill those new plants quickly and don't let them put more back into reserves, I'm depleting the roots more quickly that way. Buckwheat is good because it's quick. For similar reasons I find quick cash crops like braising greens and lettuce give a good excuse to work the field repeatedly with the tractor, both before planting, and after and unlike buckwheat there's some income coming off of the ground as a result.

Chris, you might check the lime and fertility balance in the field to help deal with bindweed. Additionally my suggested approach is the same as with the thistle. Frequent tillage, with an initial deep round to break up deep roots. The chisel, or something like a danish S tine, tends to help drag roots to the surface, as opposed to tools like a tiller or disk which bury pieces.

**From Jeff Lesh, Clackamas County Soil & Water Conservation District:**

After a little research this is what I've found:

A book called "Weed Control in natural areas in the western unites states" states that to be effective, cultivation must be repeated every 21 days during the growing season and roots can extend 6-15ft deep and 20ft horizontally.

Additionally, a Penn State document ([http://extension.psu.edu/pests/weeds/weed-id/canada-thistle](http://extension.psu.edu/pests/weeds/weed-id/canada-thistle)) states:
"Seed production and vegetative root propagation should be prevented by depleting the energy reserves in the long, creeping roots. Cutting, plowing, cultivating, and applying herbicides are common practices for depleting the energy reserves of thistle roots.

In pastures and other noncultivated areas, repeated mowing reduces the infestation of Canada thistle by weakening the plants. This practice prevents seed production and destroys the current year's growth. Mowing for several years depletes the underground root reserves.

Tillage is a more effective control measure than mowing. Repeated cultivation exposes thistle roots to drying or freezing and, more important, prevents the buildup of food reserves in the root system. Soil should be tilled 3 to 4 inches (8 to 10 cm) deep. Fields should be disked or cultivated when thistle plants are 2 to 3 inches (5 to 7.5 cm) tall or when the seedling has emerged 4 to 6 inches (10 to 15 cm) in the spring. To eradicate Canada thistle, top growth must be destroyed by cultivating every three weeks for the rest of the season. In many areas, this practice eliminates almost all of the plants; tillage can destroy the remaining plants the following spring.

Perennial forage crops and winter-annual cereal crops compete very effectively with Canada thistle and, therefore, inhibit its emergence."

Additionally, this document from Colorado state (http://www.ext.colostate.edu/pubs/natres/03108.html) states:

"Canada thistle develops from seed or vegetative buds in its root system. Horizontal roots may extend 15 feet or more and vertical roots may grow 6 to 15 feet deep. Canada thistle emerges from its root system in mid- to late spring (late April through May) and forms rosettes (Figure 2).

The greatest flush of root-derived plants occurs in spring, but another flush occurs in fall. A flush can occur anytime during the growing season when soil moisture is adequate. This is particularly a problem when Canada thistle growth is disturbed by tillage or herbicides. This feature can be manipulated to the land manager's advantage.

Plants that germinate from seed do so at about the same time as root-derived shoots. Seedlings grow slowly and are sensitive to competition, particularly if shaded. Canada thistle seedlings develop a perennial habit (the ability to reproduce from their root systems) about seven to eight weeks after germination."
Combining these documents together, my take-away is that established populations are best controlled by ~21 day tillage cycles starting sometime in Spring after first flush of rapid growth. Tillage should be timed to ALLOW for growth flushes. That is, if the plant is growing rapidly, wait for the growth to slow before tilling--especially after wet weather and in spring and fall--staying as close to 21 days as possible. Rapid growth depletes root reserves. another consideration would be management of the seed bank, since seeds survive for up to 20 years when buried deep in the soil. Considering that, you may actually want to encourage seed germination in the first year to deplete the seed bank so that seeds don't just stay dormant until you start cropping the spot and expose seeds to abundant water and light. since seedlings emerge in the spring, consider mowing any winter cover late in the winter preceding initiation of tillage control (and the following year) to allow for light to penetrate to the ground so that seeds will germinate. also attempt to allow for seedling germination when timing initiation of tillage at the beginning of the season. However, don't let seedlings get beyond 7-8 weeks old when their roots can regrow after disturbance.

These are just some ideas. I don't have experience with this management method for Canada Thistle. My experience with this weed is with herbicide treatments in natural areas mixed with native plants. speaking of which a well-timed and smart spray strategy would likely take a min of 2-3 years of treatment.

Regarding vinegar, I recently found this document: [http://oregonstate.edu/dept/nursery-weeds/weedspeciespage/acetic_acid_factsheet.pdf](http://oregonstate.edu/dept/nursery-weeds/weedspeciespage/acetic_acid_factsheet.pdf), which includes the following quote:

"Perennial weeds (Canada thistle) treated with 5% vinegar showed 100% shoot burndown but roots were not affected, therefore shoots always re-grew."

It appears that using vinegar at that rate amounts to no more than a chemical mow.