

Organic Weed Control



in Perennial Navajo Tea Greenthread

A project funded by a grant from the Western Sustainable Agriculture Research and Education Program

Organic cultivation produces high value, low input, high yield crop.
But what methods of weed control are most effective in reducing hand weeding?

Gallup, NM organic grower, Steve Heil, explored the effects of flame weeding, organic corn gluten meal, and the Williams Tool System, an adaptable spring tine implement, on an established greenthread field.



In 2008 Steve Heil sowed 17,000 row-feet of *Thelesperma megapotamicum* (or *T. gracile*) over 1.5 acres of rangeland and established the first certified organic

field of the Southwest native herb known as **cota, Navajo tea, Hopi tea or greenthread**. A scrappy perennial that returns each year from hardy roots and that spreads by seed and rhizomes, greenthread is an ideally suited alternative organic herb crop, but presents new challenges for organic growing. A clean harvest necessitates good weed control. The default tool for organic weed control is the sharpened hoe, and though this method is extremely cost-effective on a small scale, having no other option than hand weeding sets a daunting example for other

potential growers. The project, funded by Western Sustainable Agriculture Research and Education, presents three different methods of organic weed control methods that Heil hopes will make the crop more appealing to other small scale organic growers. He sees a need for a regional cooperative of growers to meet the demand for this herb on a larger scale.

Agricultural production makes high-demand tea bags possible.

Greenthread grows abundantly in the wild throughout the Colorado Plateau.

Why cultivate it? Any wildcrafter who has gathered more than a few pounds dry knows how arduous the work is. A wildcrafted

harvest of over 900 pounds dry, as Heil's small field produced in only its third season, would devastate both the harvester and the plant population. As demand grows, sustainable cultivation can meet it, benefitting both the land and inhabitants.



Download this booklet free at www.farmwonder.com. Contact Western SARE: 435-797-2257 <http://www.wsare.usu.edu>

Minimize hand weeding

with three weed control methods. Once a field is established, growers may want to reduce the amount of time hoeing weeds before each harvest. Here are three methods from which to choose.

Spring Tine Implement



The Williams' Tool System combines spring tines across the width of the bed with a tool bar for sweeps, knives, raised-bed guidance cones, and gauge wheels to achieve blind cultivation as well as between row cultivation if needed. The stirring action of the spring tines within the row of perennial greenthread plants disturbs annual weed seedlings but not the deep-rooted, perennial crop. It also dries out the surface of the soil, which then acts as a mulch to retain moisture. A very small tractor may be used to pull this implement at top field speeds across an established field, reducing time spent pulling weeds by hand prior to harvest with a cutter bar. Various other harrows may have similar effects.

Corn Gluten Meal



Corn gluten meal is a byproduct of the corn wet-milling process, researched and promoted by Dr. Nick Christians of Iowa State University as a natural preemergence herbicide. It works by inhibiting the root formation of germinating plants and works best when mixed and watered into the soil, then allowed to dry. It continues to work for 5 to 6 weeks after application. It performed well in an established, perennial field when applied in both March, before the crop broke dormancy, and again in August immediately after the first harvest. It is, however, very expensive, and due to the prevalence of genetically modified corn in the market, finding GMO-free corn gluten meal may be difficult.

Backpack Flamer



The backpack flamer's success depends on timing and the susceptibility of the weeds to flame. The grower walks the torch down the row, hitting weeds as with a hoe. Flame implements for tractors are available that will cover more ground at a pass. When the greenthread crop is still dormant in late winter, there may be a few cool season weeds sprouting that are somewhat flame resistant if not dealt with very early. There also may be various taprooted weeds that are less affected by the flame. After the first harvest mid-season, the flamer can be very effective against warm season annual weed seedlings, taking advantage of the fresh exposure to light on the ground where the crop has been cut.



Spring tine weeder is the go-to tool

The results of the Western SARE project point to blind cultivation with the tractor-pulled spring tine implement as the best approach for an acre or more. On the established perennial crop, it can be used any time the crop has a vertical, rather than vasselike shape. The implement can be pulled quickly over a large area in a short time (less than one hour per acre with a single bed-width implement) and requires only small amounts of resources that already exist on most small farms: fuel and operator time. Skill required is minimal, and the cost of the implement may be considered over its long useful life.

The trials showed that it reduced hand weeding necessary for a clean harvest by 23% (early season) and 45% (late season) compared to 3% and 36% for flame weeding and 7% and 45% for corn gluten meal. It seems to be more effective early in the season than other methods and allows more flexibility about timing its use.

Blind cultivation in established perennial crops is simpler than in annual field crops, such as wheat, corn, or beans. A crop of green thread under 12" high may be blind cultivated

with the long tines of the Williams Tool System or similar Lely-weeder. The Williams Tool System is available from Market Farm Implement, Friedens, PA (www.marketfarm.com).

Other blind cultivation methods are explored in, "Look, Ma! No Weeds: Early Season Weed Control Part 2: Blind Cultivation" by Klaas and Mary-Howell Martens:

<http://newfarm.rodaleinstitute.org/features/2005/0205/earlyweeds/index2.shtml>



Corn Gluten Meal

More information on the use of corn gluten meal as a natural preemergence herbicide can be found on the Iowa State University website:

<http://www.hort.iastate.edu/gluten/>

For this project a pallet of OMRI certified organic corn gluten meal called "Bio-Herb" was sourced from Bio-fix Holding, Inc., Denton, TX (www.biofix.com).

A regional source for the corn gluten meal is High Country Gardens of Santa Fe, NM

<http://www.highcountrygardens.com>

Quantity discounts are available from Peaceful Valley, Grass Valley, CA

<http://www.groworganic.com>

Note: Inquire with suppliers about GMO-free corn gluten meal if this is an issue of concern.

Flame Weeding

The flamer is most commonly used for preemergence weed control to create stale seedbeds, though certain crops with below-ground reserves, such as garlic or onions, are expected to rebound after an early flame weeding.

When the crop is still below 4" high, the flame will singe the herb and only set it back a little. By the time the crop is ready for harvest, there is no noticeable difference between flamed rows and rows treated otherwise. For more on the backpack flamer, see SARE's Steel in the Field online:

<http://www.sare.org/publications/steel/pg63a.htm>

Good for the land and its people.



Growing organic greenthread can help farmers care for land by reducing tillage, inputs, and water use, all while strengthening the economic viability of small, family farms

with a high value herb crop. Conventional production of a perennial herb harvested for its aerial parts would likely rely on synthetic herbicides for weed control. The application of synthetic chemicals of any kind on an herb crop that is widely regarded as medicinal could be problematic for the consumer; therefore it is crucial to the future of this crop that an organic production system be pioneered. This Western SARE funded project has explored methods of organic weed



control that may be used to reduce hand weeding and bring in abundant harvests.

Growers can work cooperatively to sustainably grow and meet the demand for an extraordinary native herb of our region.

Your comments welcome online



Heil's blog provides more information, including videos, photos and links that may be of interest to growers:

www.farmwonder.com

Contact Steve Heil using the contact form online or feel free to post your comment on any post.

Farm Wonder LLC
204 E Hill Ave
Gallup, NM 87301