

● ALTERNATIVES

# FLAME-WEEDING: A HOT ALTERNATIVE TO HERBICIDES

By BRAD COHEN

Since the beginning of civilization, fire has been a tool for managing vegetative growth in the landscape. One source lists eleven major uses of fire by Native Americans: for hunting, crop management, improving growth and yields, fireproofing, insect collection for consumption, pest management, warfare, “economic extortion,” clearing areas for travel, felling trees, and clearing riparian areas.<sup>1</sup> However, it took quite some time to figure out how to control fire for modern agricultural



**Brad Cohen** is an intern with NCAP. He is currently finishing his B.S., with a focus in Sustainable Agriculture at Evergreen State College in Olympia, Washington.

and home garden usage.

## Flame-Weeding in Agriculture

Flame-weeding as we know it has been around since the mid-1800s. The first agricultural flame-weeder, or flamer, was patented in 1852.<sup>2</sup> However, it wasn't until the 1940s that flame-weeding became recognized as an effective tool in such crops as cotton, sugar cane, and corn.<sup>2</sup> By 1965, there were roughly 25,000 flame weeders in commercial use, but as herbicides became popular, flame-weeding nearly died out. By 1990, flame-weeding was in use on approximately 10,000 acres around the U.S.<sup>3</sup> In recent years, with the renewed interest in non-chemical weed control, gardeners and farmers are taking another look at flame-weeding.

## Non-Agricultural Uses

Flame-weeders have also found favor among home-owners as a maintenance tool for around the yard and driveway. Flame weeders are great tools to use around fence lines, around brick and other garden paths, and on gravel driveways or in driveway cracks. However, don't use them around the lawn; they will leave brown burnt spots that aren't very attractive! Parks departments are using them to maintain cracks in sidewalks and parking lots, around sign posts, and to weed baseball fields.

## What Is Flame-Weeding?

Flame-weeding uses the heat generated from one or more propane

burners to kill weeds.<sup>4</sup>

Flame-weeders can be either hand-held with the propane tank carried in a cart or in a backpack, or tractor-mounted. They all work in the same way. Intense heat sears the leaves of the weeds, causing the cell sap to expand, damaging cell walls. This causes leaves to wilt and prevents water from moving from the roots to the leaves. In a short period of time, the plant withers and dies.<sup>5</sup> The plant is not actually burned.

## How to Flame-Weed in One Easy Lesson

Flame-weeding, like other forms of weeding, must be done in a timely manner. It is very important to catch the weeds at a young state when the cotyledons, the first true leaves, are first beginning to show, usually when the plant is one to two inches tall. Broadleaf plants are much more susceptible to flaming than grasses, because of the thinner, larger leaves. To be effective, the flaming wand is slowly passed three to six inches above the target weeds.<sup>2</sup> An observable “sag” in the weed indicates that it has been heated long enough.

Plants do not die instantly. In fact, there may be little noticeable difference after treatment for a couple of hours, even up to a day. Remember, it is not necessary to burn the plants to the point of ashes; the sag indicates that the weed has been killed.

Please be very careful when flame-weeding. Make sure to check for fire bans in dry areas. Always wear protective clothing: gloves, pants, and closed-toe shoes.

## Three Methods of Use

There are three basic ways of using flame-weeders in gardens and on farms: selectively “spot-flaming,” non-selectively treating entire beds, and as a treatment before planting. With spot flaming, specific weeds are targeted and flamed directly. This method is generally used when the desirable plants or crop are big enough to be readily distinguished from the weeds.

Non-selective flaming is used when both the weeds and desired plants are at a similar height. With certain hardier plants such as corn, onion, and garlic, the tops in their early stages of develop-

Flame Engineering Inc.



Flame-weeders are very effective for weeding hardy perennial beds, as well as for gravel paths and cracks in driveways.

Flame Engineering Inc.



ment can be flamed without doing any lasting damage.<sup>7</sup> The plants may temporarily die back, but should recover without reducing yields while the adjacent, less hardy weeds are destroyed.

Before seeds are planted, or after seeds have been planted and before they have emerged from the ground, flame-weeding can be used to destroy the first emerging round of weeds when they are very young. This helps cut down on the weed pressure the newly emerging crop seeds will experience. Flaming can also be used to reduce weed pressure in garden beds that are being readied for transplants.<sup>4</sup>

### Where to Find Them

Flame-weeders can often be found at your local garden or farm supply store and are also available online. A small number of companies manufacture and sell flame-weeding products.<sup>6</sup> Expect to pay less than \$100 for a model suitable for home use. If the price seems high, maybe you could chip in and buy one with several friends and neighbors.

### Advantages

One other big plus for flame-weeding is that it is easier on your body, cutting down on the amount

## SOME PERSONAL EXPERIENCES

Megan Kemple, Public Education Coordinator at NCAP, has been using the Flame Engineering “Weed Dragon”<sup>7</sup> for several years around her yard and loves it.<sup>8</sup> It cleans up weedy areas quickly, including driveway cracks, garden paths, garden beds and the edges of hardier perennial beds. Megan has also used it in pesticide-free parks in Portland, Oregon. It makes quick work of large areas when helping hands are few. Flame-weeders work very well on young dandelions and young grass, though not so well on ivy, blackberries, or hardier plants, according to Megan.

Melissa Barker, farm manager at the Evergreen State College in Olympia, Washington, uses flame-weeders in the spring and fall for bed preparation and stale beds.<sup>9</sup> She also uses flaming in large open areas, and on the tops of garden beds before plant emergence. Barker finds flame-weeders most effective on broadleaf weeds and believes that the flame weeder to be a great value in that it rarely uses more than five gallons of propane in a year.

Jim Barngrover, the Agriculture and Food Program Manager for the Alternative Energy Resources

Organization of Helena, Montana, considers flame-weeding the best option for some situations. He states, “Flame-weeding carrots just prior to emergence at about seven to nine days after seeding has worked exceedingly well at removing the early germinating weed seeds in the carrot rows.”<sup>10</sup>

The author of this article, Brad Cohen, also has considerable experience with flame-weeders on farms and has used them to create a very manageable weed control program routine in conjunction with hoes, and the most basic tool of all, his hands. With a flame-weeder as the main tool, and a hoe as back-up, two people (we had a little bit of help throughout the season) were able to mostly maintain five acres of vegetables, herbs, and flowers in London, Oregon, at the Territorial Seed Co. seed trial farm. A hoe was used to catch those few weeds the flame-weeder missed. In general, hoeing may be better suited for weeding in-between rows and areas that may be too small for the use of a flame-weeder. When you find weeds that are too close to your crops to hoe, then it’s time to hand weed.

of time you need to spend bent over hoeing or hand weeding. However, the backpack flame-weeder is quite heavy, so be careful when using it. Whatever method you use, staying ahead of the weeds is key to keeping your garden and property at its best.

Flame-weeders are very efficient tools when used correctly. Used along with a hoe, there should be no need to ever use herbicides in the small farm, garden or around the yard. ♣

### References

1. Williams, G.W. 2003. References on the American Indian use of fire in ecosystems. USDA Forest Service, Washington, D.C. <http://www.blm.gov/heritage/docum/Fire/Bibliography%20-%20Indian%20Use%20of%20Fire.pdf>.
2. Daar, Sheila. 1987. Update: Flame-weeding on

- European farms. *IPM Practitioner*. 11(3):1-4.
3. Heiniger, R.W. 1998. Controlling weeds in organic crops through the use of flame weeders. Organic Farming Research Foundation. [www.ofrf.org/publications/Grant%20reports/94.43.Heiniger.pdf](http://www.ofrf.org/publications/Grant%20reports/94.43.Heiniger.pdf).
4. Grubinger, V. 2004. Flaming stale seedbeds for weed control. Univ. of Vermont Extension. [www.uvm.edu/vtvegandberry/factsheets/flameweeding.html](http://www.uvm.edu/vtvegandberry/factsheets/flameweeding.html).
5. Rifai, N. 1997. Flame-weeding in organic vegetable farms. Nova Scotia Agricultural College. [www.nsac.ns.ca/eng/research/flame\\_weeding\\_organic\\_veg\\_farms.htm](http://www.nsac.ns.ca/eng/research/flame_weeding_organic_veg_farms.htm).
6. Diver, S. 2006. Flame weeding for vegetable crops. Has a good list of flame-weeder manufacturers and supplies. <http://attra.ncat.org/attra-pub/flameweederveg.html>.
7. Available from Flame Engineering Inc., La Crosse, Kansas. Their “weed burners” range in price from \$55-\$90. [www.FlameEngineering.com](http://www.FlameEngineering.com).
8. Kemple, M. 2006. Personal Communication. November 9.
9. Barker, M. 2006. E-mail interview. November 8.
10. Barngrover, J. 2006. Email interview. November 7.