

# An Introduction to Flaming for Wildland Weed Control

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Flaming, sometimes called boiling, wilting, or blanching, is an old method of controlling weeds in row crops, but is now being adapted to wildland weed control. It is effective on most annual weeds and many broadleaf species when they are in the very early stages of growth, and presents a viable alternative to spraying in these circumstances. Flaming does *not* involve incinerating the plant. Heat is applied just long enough to produce visible wilting. Mortality will be apparent the following day, and is produced by a combination of factors. Heat causes cell walls to burst which interrupts the flow of water and nutrients in the cambium layer. In addition, the heat produces rapid loss of moisture as steam, causing rapid desiccation.

Flaming is most effective on most species when plants are in very early stages of growth. With broad leaved species, the ideal stage is when only the dicot leaves are present, or just the first few true leaves. Plants at this stage will succumb with one quick application of heat. (Single Pass Flaming.) Plants with significant stored reserves will require repeat applications and/or concentrating enough heat on the root crown to produce mortality. (Repeat Flaming) Flaming when the soil is well soaked will increase the downward transfer of heat to help facilitate this.

Flaming provides an effective way of coping with the huge flush of seedlings which is often triggered by the initial removal of parent plants, when the site is relatively free of vegetation. These conditions usually remain for 2 to 4 years on my sites, and these are the years which typically produce the largest crops of seedlings. Flaming may become less efficient in succeeding years as target weed seedlings become harder to see and treat among native species re-establishing on the site.

**Some advantages of flaming** are that it is done when the ground and vegetation is too wet to carry fire, and this is the time when most weedy species are at the right growth stage; late winter and early spring. I try to flame during or right after a soaking rain, when there is virtually no chance of fire. This also allows me to get an earlier start on the weed control season and work in conditions when other control methods are at least unpleasant -or, as in the case of spraying, infeasible. Flaming is not quite as fast as spraying, but it can be applied more selectively, and there is no spray drift to jeopardize nearby plants or contaminate waterways. And, because plants are killed when very small, there are no residual dead stalks in the way to hinder future follow-up efforts. Flaming causes no ground disturbance to encourage other invasive species.

**Limitations of flaming** are that in dry winters, Site conditions may not be wet enough during the short time when the seedlings are small enough for flaming to be possible. Also, the range of species on which flaming proves useful may be limited. Flaming as presently practiced is thought to be less effective on grasses and other monocots, and it is not as effective on plants such as thistles which develop significant underground reserves very early in their life cycle. And of course, there are safety considerations. Although the equipment has effective built-in safety devices, improper training or careless use could result in injury or wildfire.

**Repeat Flaming** To determine whether flaming can control species with protected meristems such as grasses, or species with large underground storage reserves which one pass of the torch will not completely kill, we are experimenting with successive applications. They must be repeated often enough and at the right times to exhaust the plants' reserves. Since this alternative method differs in the way it produces mortality, I use the terms "repeat flaming" to describe this new method, and "single pass flaming" to describe the more commonly used method described above. Because repeat flaming will require successive applications that may extend into drier seasons, this method may not be usable in more arid regions of the west. In addition, it may require a greater expenditure of time and resources than spraying, so its' usefulness may be limited to situations where spraying is not an option. Species that repeat flaming is currently being tried on locally are veldt grass, bull thistle, English ivy, periwinkle, and hoary cress.