

## AGRICULTURAL PROPANE APPLICATIONS:

# WEED CONTROL TECHNOLOGY

### FACT SHEET

*Flaming can be as effective as chemical weed control treatments. The benefits of flaming are that it does not leave chemical residues and it's not affected by weather variability.*

— Organic Farming Research Foundation

Thermal weed control is an environmentally friendly alternative to herbicides that is approved for use in organic farming and conventional farming operations.

After successful research efforts, new easy-to-use propane flaming technology is being developed to better address the diverse weed control needs of growers seeking more sustainable, energy-efficient farming practices. This weed control

machine is safe and effective in a variety of weather conditions and crop growth stages, and it allows farmers to return to the field immediately after weed treatment.



### KEY BENEFITS OF PROPANE FLAMING TECHNOLOGY

- An approved solution for organic farming. Can use when soil is wet, or under windy conditions.
- Controls herbicide resistant weeds.
- Allows farmers to return to the field immediately after treatment, in contrast to herbicide application.
- More than doubles the level of weed control obtained using only cultivation.
- Does not damage soil microbes, reduces tillage and moisture loss.
- Enables more cost-effective treatment than hand weeding and organic herbicides.

### CURRENT STATUS

RESEARCH

DEVELOPMENT & TESTING

DEMONSTRATION

COMMERCIALIZATION

#### COMMERCIALIZATION PHASE

- PERC and the University of Nebraska, Lincoln have collaborated on several research projects leading to this development effort.
- Today, new technology is available from AFI and training materials are available from PERC.
- The weed control machine is available in several configurations and a variety of row-widths for multiple applications.

#### TECHNOLOGY FEATURES

- Multiple hood configurations to enable treatment throughout the growing season.
- Versatile torch designs for various crop treatments.
- Dual-stage filtering process to prevent plugged torch nozzles.
- Easy-to-use safety features, including flame sensors and remote re-ignition



## PROPANE FLAMING TECHNOLOGY: HOW IT WORKS

- The weed control machine uses propane-fueled flames to transfer heat to weeds, causing them to wither and die. Torch hoods better focus the heat and protect flames from wind, to kill weeds more effectively and reduce fuel consumption.
- A split-hood configuration allows more mature crops to flow through the machine undamaged while an adjustable torch mount enables a wider range of treatment capabilities.
- A flamer-cultivator prototype has been designed to control weeds by flaming in the intra-row space and cultivating in the inter-row space. The unit dramatically increases energy efficiency (four gallons of propane per acre per application), reduces task time, and consolidates two tasks into one piece of equipment.



Testing of propane flaming with torch hood

## WHAT'S NEXT?

Commercialization of the weed control machine and other models is expected in fall and winter of 2013/2014 and beyond.

## ADDITIONAL INFORMATION

PROJECTS
<ul style="list-style-type: none"> <li>• Commercialization of the AFI flame weed control machine (Docket 17385)</li> <li>• Integration of Propane Flaming and Mechanical Cultivation for Effective Weed Control in Agriculture (Docket 16711)</li> <li>• Innovative Propane Flaming Technology for Crop Production (Docket 15920)</li> </ul>
PARTNERS
<ul style="list-style-type: none"> <li>• University of Nebraska, Lincoln</li> <li>• Agriculture Flaming Innovations, Behlen Manufacturing</li> </ul>

## RESEARCH PROCESS

DEVELOPMENT AND TESTING			
TORCH HOOD	UPCOMING	IN PROGRESS	COMPLETED
Propane Flame Technology	—	—	•
<ul style="list-style-type: none"> <li>• Evaluated newly designed torches with protective hoods and incorporate them into a four-row flamer.</li> <li>• Conducted testing of four-row flammers on corn and soybeans at two different testing sites.</li> <li>• Evaluated six methods of weed control that include hand weeding, mechanical cultivation, and flaming to determine the most effective treatment plan.</li> <li>• Performed an economic analysis of each weed control program to assess fuel consumption and the cost of flaming compared with other methods of weed control.</li> </ul>			
COMMERCIALIZATION			
TORCH HOOD	UPCOMING	IN PROGRESS	COMPLETED
Propane Flame Technology	—	—	•
<ul style="list-style-type: none"> <li>• Commercialize the four-row system and proceed with commercialization of larger units immediately. Kits to convert an existing row-crop cultivator into a hybrid flame-cultivator will be available.</li> </ul>			

## FOR MORE INFORMATION

To learn more about propane-fueled weed control technology and the Propane Education & Research Council, visit [agpropane.com](http://agpropane.com). To learn more about the new equipment, visit Agriculture Flaming Innovations at [agriculturalflaming.com](http://agriculturalflaming.com).

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*The Propane Education & Research Council was authorized by the U.S. Congress with the passage of Public Law 104-284, the Propane Education and Research Act (PERA), signed into law on October 11, 1996. The mission of the Propane Education & Research Council is to promote the safe, efficient use of odorized propane gas as a preferred energy source.*