



LPG-Powered Pest Management Practices for Agriculture

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Propane Education & Research Council



Why Propane in Agriculture?



- Due to a unique combination of benefits, propane is well suited for use in a variety of applications in the home and on the farm.
 - Clean-burning
 - Portable
 - Suitable for long term storage
 - Non-toxic, will not contaminate soil or water
 - Approximately 80 % of farms already use propane in some capacity

Thermal Pest Control

- Pest control is a major focus because all major pests are sensitive to heat. Heat typically provides broad spectrum control.
- Potential for growth in counter seasonal consumption
- Applications include:
 - Insect control
 - Weed control
 - Pathogen control

Heat

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Mobile Heat Treatment



TEMP-AIR (Minneapolis, MN)

MHT 1500

- 1.5 MM Btu/hr heater
- 30 kW generator
- 185 gallon (700 liter) propane storage

Testing at Purdue University (West Lafayette, IN)
and Kansas State University (Manhattan, KS)

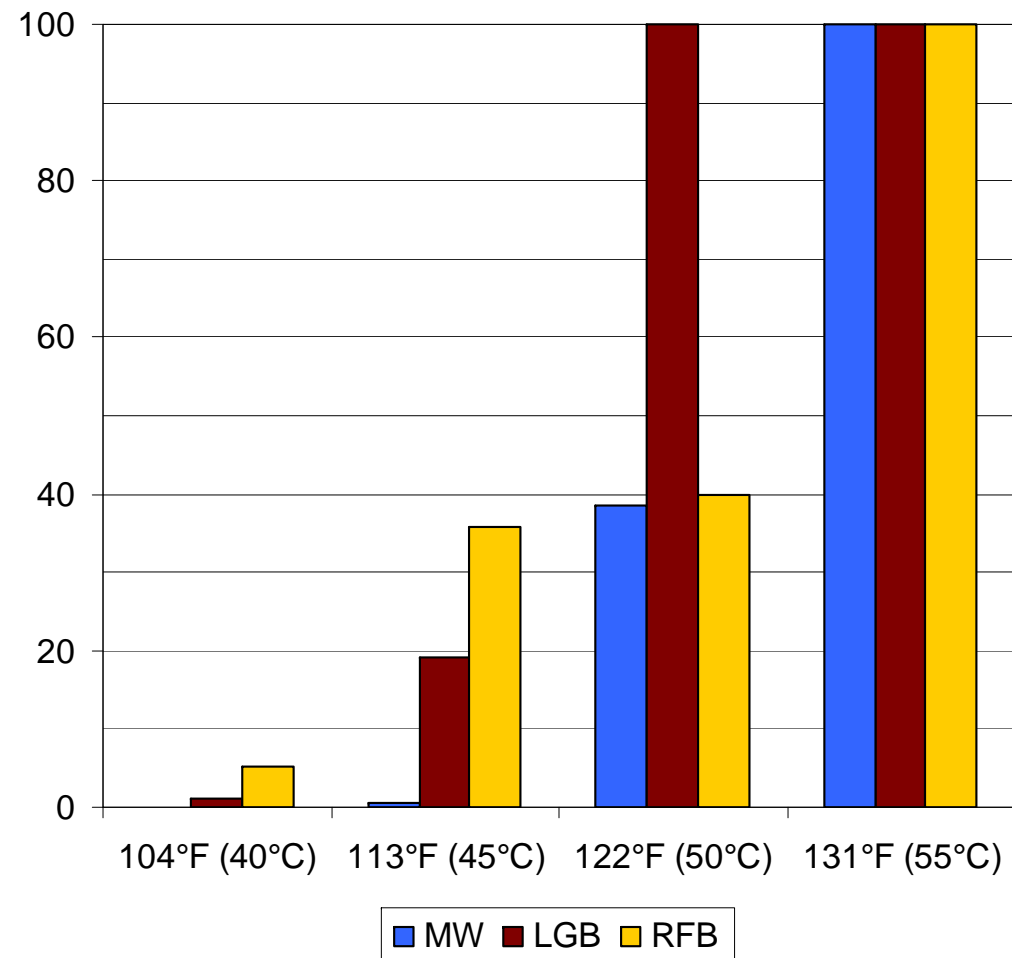
Lab Tests of Insect Mortality

Maize weevil (MW)
Lesser grain borer (LGB)
Red flour beetle (RFB)

100% mortality for all

- 131°F (55°C)
- 3 hours

17.7 (67 liters) gallons
per treatment



Steam

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Soil Nematode Solution



U.S. Clean Air Act, 1963

Montreal Protocol on Substances that Deplete
the Ozone Layer, 1989

Methyl bromide phase out, 2005

Soil Nematodes

- soil parasites
- cause plant root damage

Soil Nematode Solution

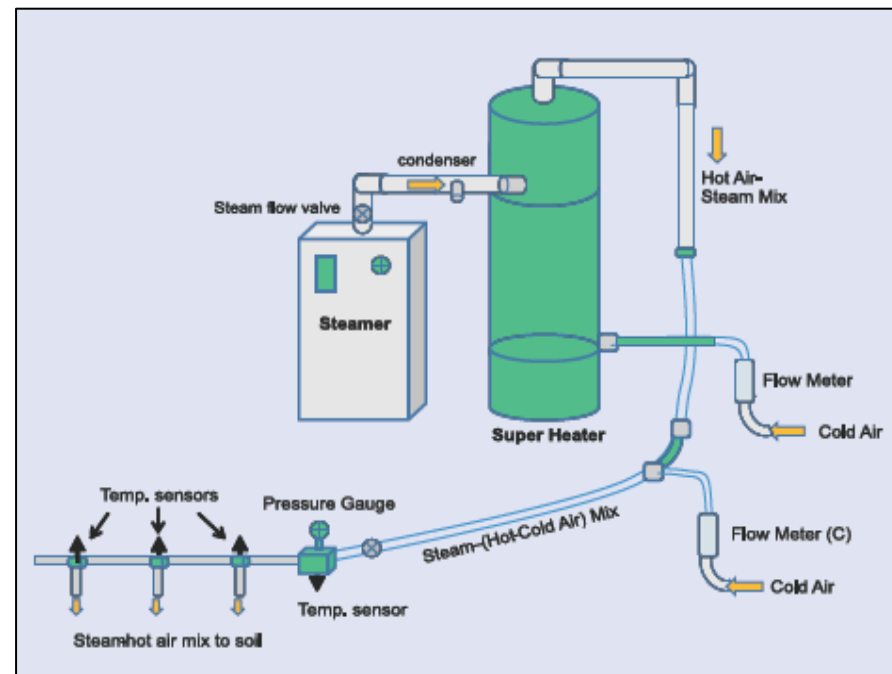
130°F (54°C) – 140°F (60°C) for 1 hour

Steam Injection System

- 72,000 lb/hr boiler
- 200 hp blower

Buried pipe

- 8" to 10" (20 to 25 cm)



Soil Nematode Solution

Potential Crops

- tomatoes
- Strawberries
- floriculture

Industry Potential

- 500 gallons/acre
- 10 MM gal/yr

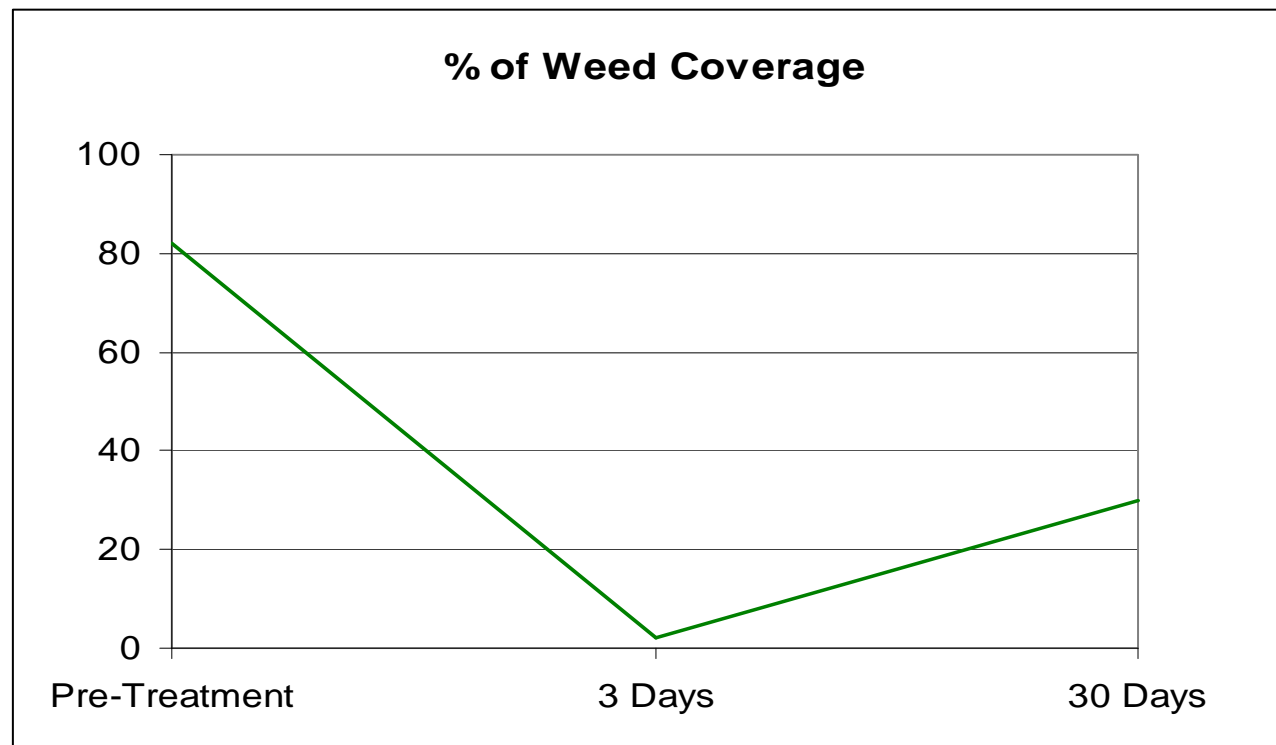


Batchen Stinger



Steam weed control device

806°F (430°C) super-heated steam



Batchen Stinger

Field tested, 2005-06

Begun Redesign for U.S. market, 2007

- 2 sided (double capacity)
- Larger water capacity

One-sided machine

- 7 gallons (26 liters)/hr
- 2 – 2.5 acres/hr



Flame

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Flame Weed Control

Organic row crop production has grown to nearly 2 million acres in U.S.

- corn
- soybean
- sunflower
- sorghum

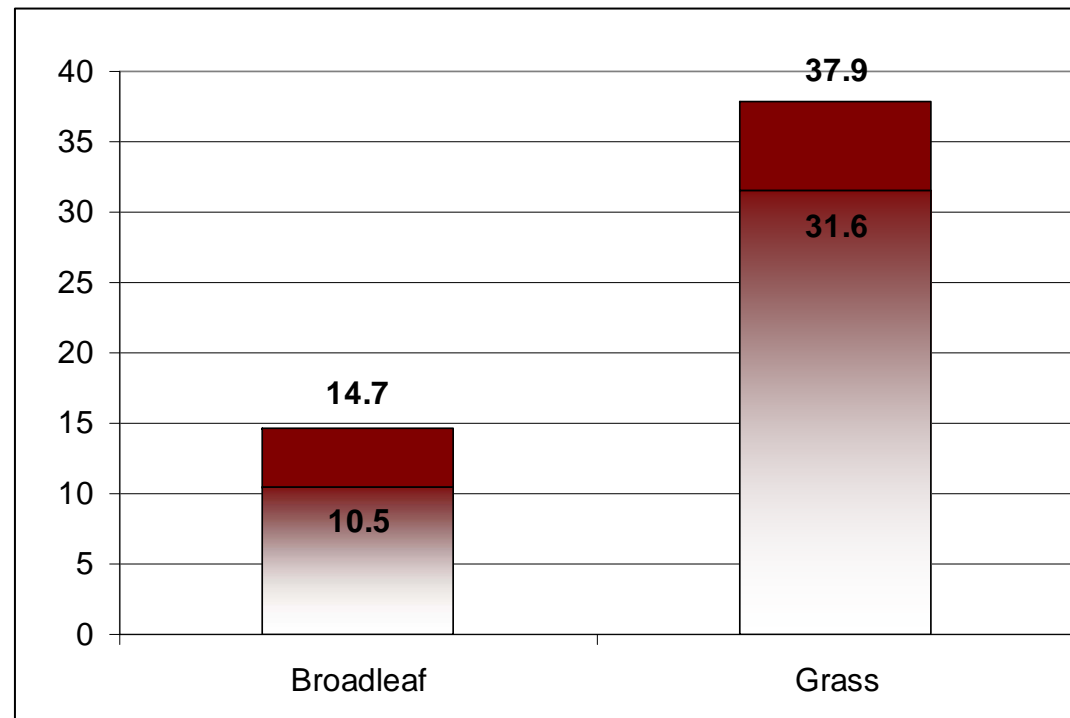
Weed species

- Broadleaf
- grass



Flame Weed Control

- Propane Required to Achieve 90% control (gal/acre)



- 80% control for both can be achieved at 14.7-18.9 gal/acre

Dairy Bed Sanitation

Mastitis reduces milk production and quality

Mississippi State University

- 10 week trial 2007 (Florida)
- Flame burners mounted on dairy bed rake
- Flamed once daily



Dairy Bed Sanitation

Increase production

- 2.9 lbs / head / day

Decreased moisture,

- 20% reduction in moisture
- 14% reduction in organic matter
- 9.5 % fewer somatic cells



Heat, Flame, Steam

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To learn more visit . . .

www.agpropane.com



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