FACTSHEET

Foamstream vs. Steam
Comparison of alternative herbicide–free methods.

"Hot water insulated by a biodegradable foam (Foamstream) has been considered as the most efficient thermal weed control option as compared with hot air, open flame, or steam."
Determining treatment frequency for controlling weeds on traffic islands using chemical and non-chemical weed control - Rask et al., 2013

THE BENEFITS OF FOAMSTREAM OVER STEAM SYSTEMS:

+ Most cost-effective solution on the herbicide-free market, due to the following reasons:
    - Requires over 75% less treatment cycles than any steam system.
    - Suitable for use on all surfaces (hard, soft and artificial) unlike steam systems.
    - No addition of strong decalcifying chemicals unlike steam systems.
+ Most effective solution on the market to treat weeds, moss and algae.
+ None of the health risks of working with steam systems
+ Suitable for use in all weather – meaning year-round use and no downtime due to bad weather.

WHAT OUR CUSTOMERS SAY:

"Our company has tried various alternative weed control solutions since 2010 and Foamstream is without doubt the most effective. Whereas hot water solutions only killed 50-60% of weeds on site, Foamstream instantly killed over 95% of weeds on first application, with just 2-3 applications (depending on the state of the soil) needed each year from then on. Foamstream is now the only weed control product for us."
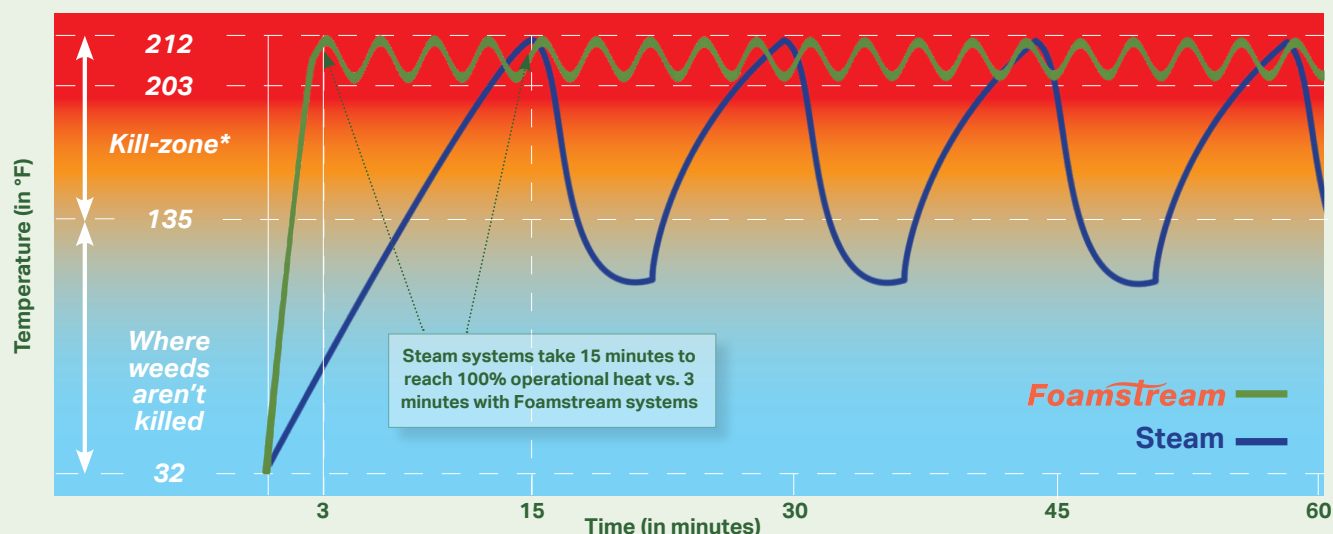**Mr. Lemire, MD, Lemire Greenspace, France.**

WHY IS FOAMSTREAM SO MUCH MORE EFFECTIVE THAN STEAM ALONE?

The zone above 135°F is known as the kill-zone. The heat in hot water must stay within this temperature zone in order to damage the plant structure and allow effective and efficient thermal heat transfer from the leaf to the root. Research shows that stable delivery of heat at 176°F and above for the first 5 seconds is crucial to ensuring the most effective plant kill. Outside of the kill-zone (below 135°F) there is little to no effect on killing or substantially damaging the plant.

Unlike most steam systems, Foamstream systems are the only systems on the market with an electronically-automated dual phase burner, which guarantees stable temperature and pressure. Stabilizing temperature and pressure means that we can guarantee the system stays consistently in the kill-zone unlike steam systems that fluctuate in and out of the kill-zone.

Graph showing the effect on temperature stability when comparing Foamstream dual-phase boilers to steam single-phase boiler systems.
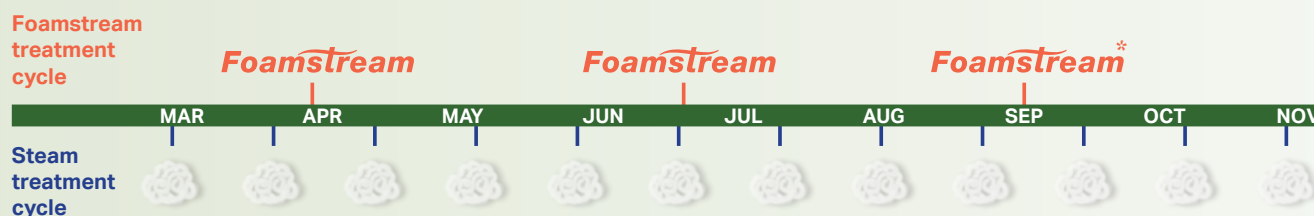
Temperature (in °F)

- 212
- 203
- **Kill-zone***
- 135
- **Where weeds aren't killed**
- 32

Steam systems take 15 minutes to reach 100% operational heat vs. 3 minutes with Foamstream systems

Foamstream ▬

Steam ▬

Time (in minutes): 3 · 15 · 30 · 45 · 60

Kill-zone = 135+ Fahrenheit. The high temperature causes the plant structure to break down.

"Weeds treated with Foamstream require just two to three treatments per season or as little as one if you're treating moss and algae. Steam systems would require ten to twelve treatments per season. Fewer treatment cycles mean lower labor costs and greater cost savings including less use of water and diesel."

Dr Mike May

Treatment cycle rate for Foamstream vs steam systems

Foamstream treatment cycle

Foamstream · *Foamstream* · *Foamstream**

MAR · APR · MAY · JUN · JUL · AUG · SEP · OCT · NOV

Steam treatment cycle

**Foamstream requires over 75% less applications per year than steam systems**

Third application may not be required

HOW CAN FOAMSTREAM CONTAIN MORE ACTIVE INGREDIENTS BUT BE MORE COST-EFFECTIVE TO USE THAN A STEAM SYSTEM?

"The foam ensures that the heat is retained in the hot water for longer. This allows the most efficient transfer of heat energy from water to plant by preventing heat loss to the atmosphere. The result is the most effective thermal transfer from the leaf to the root ensuring the plant is killed or severely damaged. The Foamstream process sterilizes seeds and spores therefore requires fewer annual treatments due to minimizing new growth. Overall this means that using Foamstream unequivocally represents the lowest total cost of ownership for users."
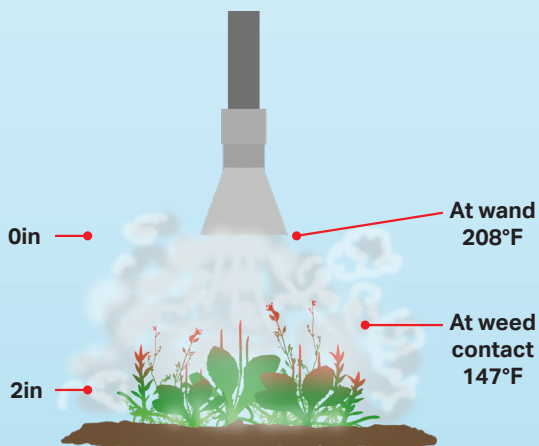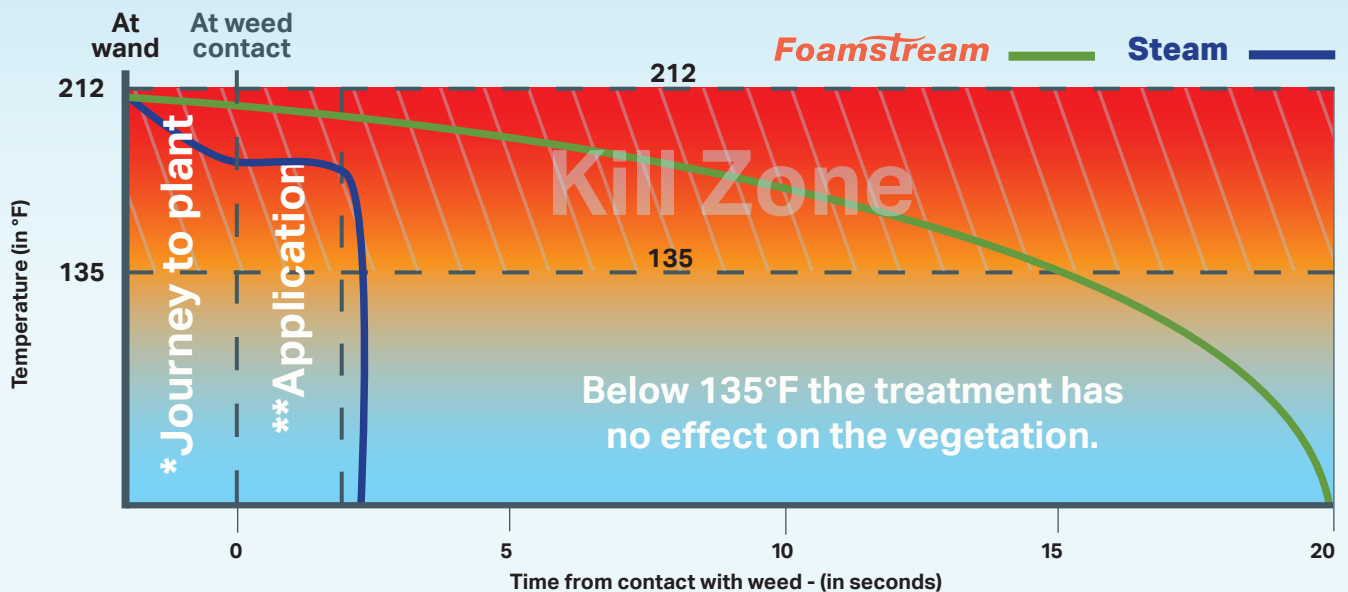
Dr Mike May

Foamstream

At wand 208°F

At weed contact 203°F

0in

2in
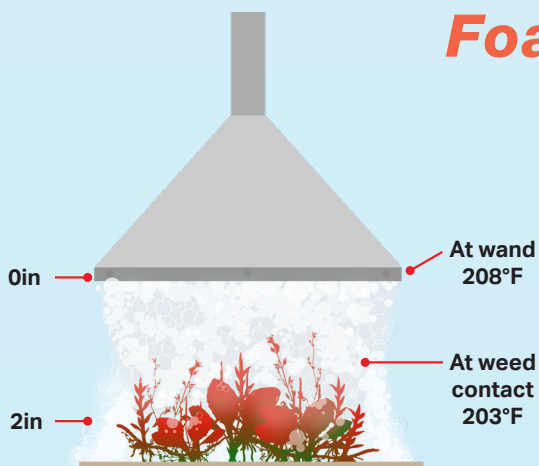
Ⓦ **Kills the weeds**   Ⓦ **Sterilizes seeds and spores**   Ⓦ **Kills or sufficiently damages the root**

Steam

At wand 208°F

At weed contact 147°F

0in

2in

Ⓦ **Kills the leaves**   Ⓦ **Some effect on seeds**   Ⓦ **Very weak effect on root structure**

At wand   **At weed contact**

Foamstream ——   **Steam** ——

212   212

Kill Zone

135   135

Temperature (in °F)

*Journey to plant   ****Application**

Below 135°F the treatment has no effect on the vegetation.

0   5   10   15   20

Time from contact with weed - (in seconds)

*Time taken for the steam/Foamstream to travel from wand to weed.

**Time taken to cover the weed with the steam/Foamstream

WHY FOAMSTREAM OVERTIME WILL COST YOU LESS THAN A STEAM SYSTEM DESPITE HAVING A HIGHER CAPITAL COST AND ONGOING CONSUMABLE COST.

Parameters	Unit	Steam	Foamstream
Hourly labor rate	$	25	25
Number of hours worked in a day	Hours	5	5
Daily labor cost	$	125	125
Consumable cost (Foamstream, diesel, petrol and anti-lime)*	$	52.5	174.5
OPEX per day (5 hours of actual work)	$	177.5	299.5
100% treatment area in an hour	sq. ft./hour	750	5250
Treatment area covered in 5 hours	sq. ft.	3750	26250
Cost per sq. ft.	$	0.0473	0.0114
Comparative cost of single treatment area of 10,000 sq. ft.	$	473	114
Treatment cycles per year	Treatments	10	3
Comparative cost of annual treatment of area of 100,000 sq. ft.	$	4,733.33	342.29

*Assumptions: (L = litre)

Steam system consumes: 9 L diesel, 0.3 L of anti-lime, 1 L of gasoline per hour: $7.20 + $2.50 + $0.80 = $10.50

Foamstream consumes: 8 L of diesel and 3 L of foam = $6.40 + $28.50 = $34.90

Price of gasoline: $0.75 per L (0.21 gal)   **Price of diesel:** $0.80 per L (0.21 gal)   **Price of Foamstream:** $28.50 per hour

ENVIRONMENTAL CREDENTIALS OF FOAMSTREAM

+ Made from 100% biodegradable and environmentally friendly nautral plant oils and sugars.
+ Approved for organic use by multiple accreditation bodies across Europe and the USA.
+ Safe for use around people, animals and delicate ecosystems including waterways.
+ Uses less water and diesel to achieve the same results as a steam system.

WHAT DO OPERATORS AND THE PUBLIC THINK ABOUT THE FOAM?

"There are so many benefits to choose from but the single best thing about Foamstream has to be the cleanliness and the finish once the Foamstream has been applied. We're excited about Foamstream's possibilities as a public engagement tool as well as the positive feedback from potential clients and increased chances of getting onto new approved supplier lists."

Terry Burns, Senior Contract Manager, idVerde, UK.

"One of our highlights was the interest of passers-by and interaction with the public when we were out and about using the product".

Neil Reeves, Countryside Manager, SWLT, UK.