Small Farm Shared Soil Steamer – User Guide

Purpose

A soil steamer uses high-temperature steam to sanitize potting mix, compost, raised beds, and in-ground beds by killing weed seeds, pathogens, and pests—without chemicals. This guide is tailored for small farms operating in tight spaces, shared equipment settings, and around nearby residents.

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1. Overview

Target temperature: 160°F for 30 min

Do not exceed 200°F

Safety: Keep kids & public 15 ft away

Always wear PPE when handling equipment

Operation: Moist soil heats faster

Use chains and sandbags to limit steam that escapes

“Quick User Guide” is helpful to reference when starting and running the soil steamer.

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2. Safety Essentials

Small farm sites often have limited space and public foot traffic. Ensure:

- Keep bystanders & children back 15 ft. minimum
- Wear PPE: heat-resistant gloves, boots, long sleeves, eye protection
- Never touch steam socks or hose fittings during operation — burn risk
- Use steamer on level ground only, ensure the level bubble indicates that it is level
- Do NOT run steamer indoors or inside hoop house without full ventilation
- Ensure water supply is clean and unrestricted

⚠ **Do not operate in dry grass or next to flammable materials.**

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3. Equipment Overview

Component	Function
Boiler/Steamer Unit	Creates steam under pressure
Steam Hose	Transfers steam to soil socks
Socks / Tarp	Distributes and contains steam within soil area
Condensate Drain	Removes water buildup
Temperature Probe	Confirms soil temperature

We recommend the use of chains and bricks/sandbags to seal the edges of the tarps on the soil.

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4. Steaming Raised Beds & In-Ground Soil

1. Irrigate lightly before steaming — moisture transfers heat better
2. Insert the temperature probes about 3” inches into the soil, in different parts of the bed to ensure even steaming

3. Lay out milk crates (optional), the steam socks, and connect to steam hose
4. Cover the bed with tarp
5. Seal edges with chains (stepping into ground helps create a nice seal) and/or bricks and sandbags.
6. Start steaming (see Section 5. Operating Instructions)
7. You are hoping for the tarp to lift off the soil, and create a “bubble” of steam that can circulate freely into the soil. If too much steam is leaking from the sides, this tarp “bubble” may not form and the soil may not heat evenly. A small amount of steam will leak out, but carefully readjust chains and sandbags if you see too much steam from one area or if the tarp isn’t lifting evenly after 10 minutes.
8. When soil reaches **160°F**, maintain temperature for 30 minutes. You may need to reduce the amount of steam being transferred into the bed.
9. Turn off machine
10. Wait until steam pressure drops to 0
11. Wait for beds and equipment to cool before moving equipment and setting up for next steaming, or begin disassembly for return

Notes for tunnels & paved sites

- Vent hoop houses to avoid condensation & structural drip
- On asphalt, lay down geotextile or plywood to protect surface from heat

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5. Steaming Potting Mix & Compost

Ideal for reused mix and pathogen suppression.

Potting Mix

1. Fill perforated metal tote or temperature-safe bin
2. Insert probe at center
3. Cover with lid/tarp
4. Steam until mix reaches **160°F for 30 minutes**

Compost

- Steam is only for pathogen control—not for finished curing stage

- Turn pile immediately after steaming for even treatment

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6. Operating Instructions

See “A Farmer’s Guide to the SF-20 Steam Generator (AKA: Soil Steamer)” for machine use instructions and trouble shooting.

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7. Verification of Proper Treatment

Method	What to Check
Temperature logging	160°F for 30 minutes minimum
Visual	Steam exiting edges slowly and evenly, and tarp has formed a “bubble” over the soil
Smell	Soil should have “earthy” smell — not burnt

⚠ Over-steaming reduces soil biology. Never exceed **200°F**.

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8. Shutdown & Storage

1. Turn off machine
2. Wait until steam pressure drops to 0
3. Disconnect hoses only when cool
4. Open steam valve for venting and drain boiler
5. Let socks, hoses, and tarps dry before storing to prevent mold
6. Refill fuel tank to replace the fuel that you used

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9. Shared-Use Expectations & Equipment Checkout

✔ Sign out unit through **Rental Agreement and Checklist for Rental**
✔ Inspect & photograph issues with equipment before and after use

✔ **Report issues immediately** — do not leave problems for next farm
✔ Return:

- Tarp dry
- Fuel tanks refilled
- Machine cleaned of soil/residue
- Checklist for Rental completed

🚫 **Do not loan to third-party farms without permission**

This guide was created as part of our NCR-SARE Farmer Rancher Grant. Our Objectives:

1. Demonstrate the effectiveness of soil steaming for managing weeds and soil-borne diseases on small farms by collecting and analyzing data from four trial plots to evaluate the impact of steaming on weed pressure, disease symptoms, and crop productivity.
2. Educate small-scale farmers in Detroit through three field days and a conference presentation, providing hands-on demonstrations and practical resources.
3. Foster collaboration and resource-sharing within the farming community in Southeast Michigan by developing and implementing a subsidized rental model for soil steamer access. This will include creating a user guide, while also tracking usage and impact.

NORTHEAST SARE Sustainable Agriculture Research & Education

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