

# Facilitated solarization reduces weeds, pests in a week

In developing countries women often carry out the time- and labor-intensive work of hand-weeding, and pests are often controlled with chemicals by small-scale farmers with little knowledge of proper handling or application. Misuse of pesticides and herbicides can result in water contamination, pest resurgence and unsafe produce. Soil solarization is a well-studied technique that can reduce heat-sensitive weeds, pests, and diseases without chemicals. But this process typically requires a minimum of six weeks of sunny skies and high temperatures, which can be difficult and costly for smallholder farmers with a continuous rotation of crops. Instead, facilitated soil solarization is a technique that has shown promise for control of heat-sensitive weeds and soil-borne pests and diseases, in only one week.

## How facilitated solarization works

Facilitated solarization reduces the time needed by covering the clear solarizing plastic with an insulating layer at night to reduce the heat lost during cool nights. First, prepare beds and irrigate soil down to about 30 cm, as wet soil better conducts and holds heat. Then place clear plastic directly over the soil, and secure by burying the edges in a trench around the beds. Just after the hottest time of the day, apply insulation materials, such as wool, fiberglass, old blankets, bags packed with rice hulls or chicken feathers. Remove the insulation in the morning as the sun is rising and store in a safe location for re-applying in the late afternoon.



Facilitated solarization can speed up the standard soil solarization process with the addition of insulation to reduce heat loss at night.

## Benefits

- Reduces need for hand-weeding
- Reduces soil-borne pests and diseases without using chemicals
- Simple and cost effective, using only clean solar energy, clear plastic and reusable insulation
- Reduces the time a field needs to remain unplanted for traditional solarization

## Basic costs

- Clear plastic:** 1.5–2 mm thick, optimal to provide greatest heat transfer while reducing tearing
- Insulation materials:** Industrial insulation, blankets, packed rice hulls or chicken feathers

The costs of these items are subject to local variation.

## What's next? Scaling up

- Further research:** Conduct adaptive research in different climate zones to fine-tune recommended exposure time, identify a more complete spectrum of weeds and soil-borne pests that are affected, and identify affordable, effective insulation options for small-scale growers in resource-poor areas.
- Adoption:** Work with NGOs, extension agencies, farmer groups and other trainers to demonstrate the efficacy of facilitated soil solarization.

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