

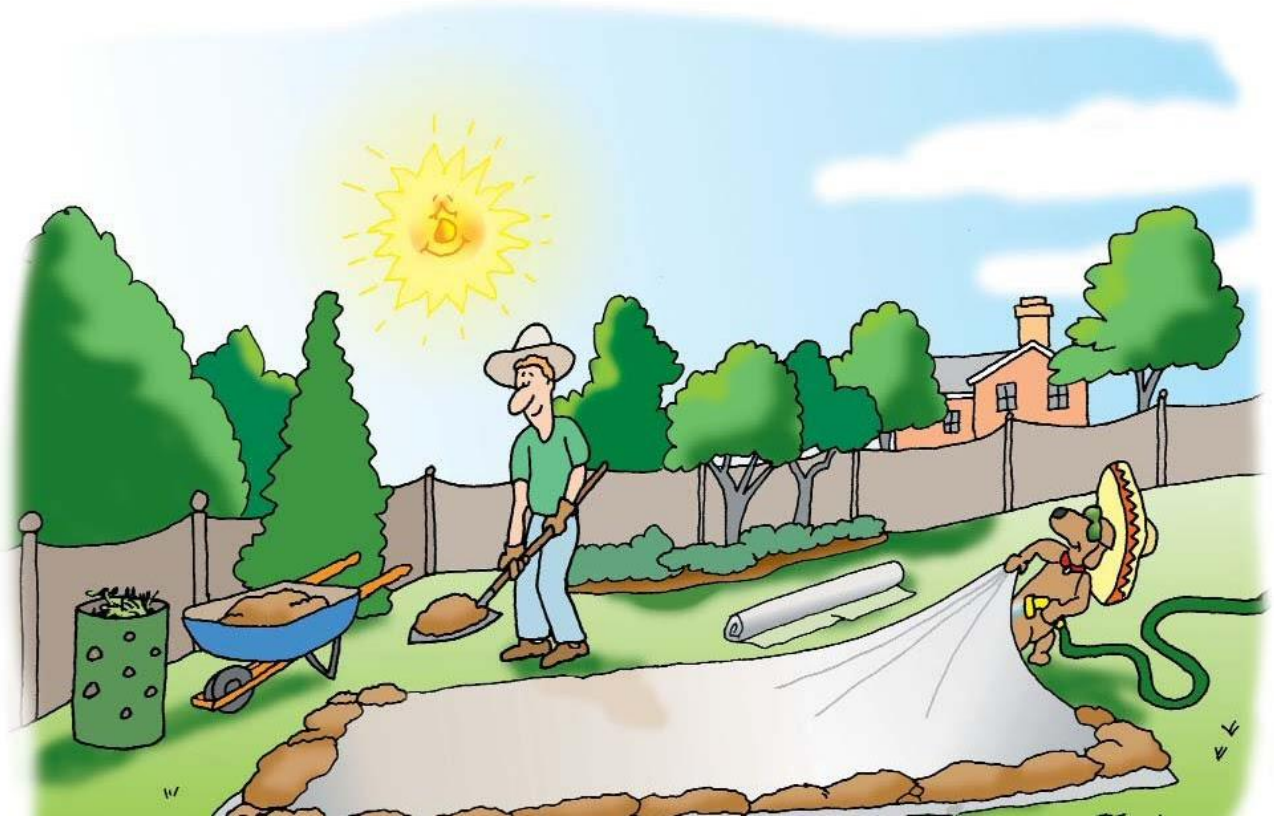
# Soil Solarization

Control soilborne pests & weeds

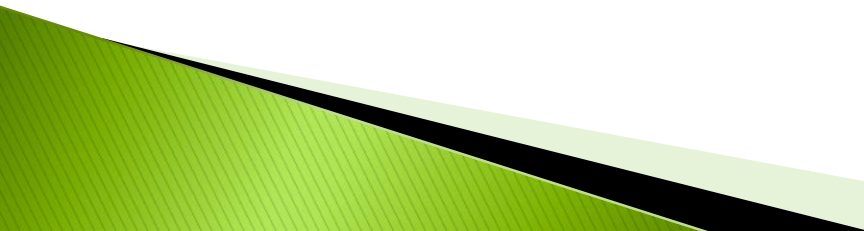


# Basic Concept

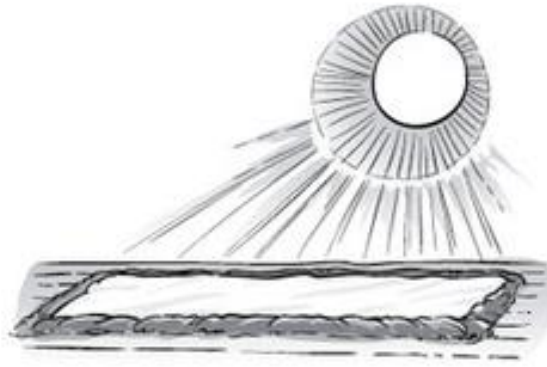
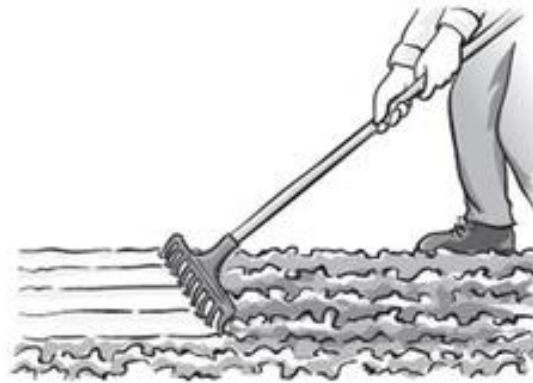
- ▶ Uses high temps from solar energy
- ▶ Heat soil by covering with clear plastic for 4–6 weeks



# Pests controlled


- ▶ Soilborne fungal & bacterial plant pathogens
    - (Verticillium wilt, fusarium wilt, phytophthora, damping off, potato scab, etc)
  - ▶ Nematodes – in top 12” of soil
  - ▶ Weeds (mostly kills the seeds & seedlings)
    - Best with annual weeds
    - Will kill yellow starthistle & crabgrass seed (but not runners)
    - Can kill shallow rhizomes of bermudagrass
    - Less successful with perennials with deep roots, like field bindweed.
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# How to Basics



- ▶ 4-6 weeks when daytime temps are above 90°F (July & Aug)
- ▶ Rototill or turn over
- ▶ Rake smooth
- ▶ Irrigate to 12" deep
- ▶ Cover with clear plastic (1 mil)

# Solarization Effects

- ▶ Speeds up the breakdown of organic matter, releasing soluble N and other nutrients
  - ▶ Shifts soil microorganisms to predatory soil pests and decreases pests associated with plants & roots.
  - ▶ Kills pests in top 1' of soil. Earthworms move and mychorrhizae repopulate quickly. May need to inoculate rhizobia.
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# Secrets for Success

- ▶ Smooth, finely graded soil, no clods or sticks to puncture plastic.
- ▶ Rake flat to eliminate air spaces under plastic. Bury edges of plastic to keep heat in.
- ▶ Does not work well in areas with afternoon shade.
- ▶ Should heat to  $>158^{\circ}\text{F}$  for one hour to kill pests – get soil thermometer
- ▶ In raised beds, use as part of crop rotation. Or focus on spring/fall crops.
- ▶ After removal of plastic, don't till to bring up weed seeds, just plant fall crop or wait til freezing to till

# Final thoughts

- ▶ Great for organic farmers
- ▶ If not done correctly, you're just creating a greenhouse to grow healthy weeds
- ▶ Can be used to kill lawns – sort of
- ▶ Solarization can kill weed seeds in piles of pulled weeds or diseased plants

