

# Soil Solarization to Increase Yield and Reduce Weeds, Nematodes and Diseases

by Jenny Broome and Chuck Ingels, UC Davis and UCCE Sacramento

## WHAT IS SOLARIZATION?

**Solar** means SUN. Solarization means laying clear plastic on your field to make the soil HOT to kill weeds, nematodes (tiny worms in the soil that eat roots), and bad pathogens and bugs without using chemicals like Vapam. It helps make plants grow stronger and can help make more fruit. No permit is needed.

## WHAT DO I HAVE TO DO?

Prepare your field as usual and then lay out clear plastic on the soil in early July. If you add compost, it has better results. Solarization only works by making the soil VERY HOT, so plastic MUST be put on DURING hot weather.

## HOW TO SOLARIZE, STEP BY STEP:

### April and May

Prepare the soil. Use **Roundup** to kill deep-rooted weeds, especially bindweed (morning glory). Spray when you see the first flowers. Make sure the soil has the correct moisture content, not too wet or too dry, and then completely disc in cover crops or previous vegetation cover such as pasture. Make use of spring rains and work the soil after them, or use sprinklers to evenly wet the soil before disking. If you have no extra ground, you can do everything in June after harvest, but it is better to plant strawberry plants on soil that didn't have strawberries last year.

### June

Rip the soil, as deep as possible so the field will drain and improve rooting depth. Disk or rototill to break up clods. Remove any trash that might tear the plastic. Test your soil for nutrients, and if deficient add fertilizer. Add ½ ton **Tiger Sulfur per acre or 3-5 tons of Gypsum per acre** if your plants were yellow last year. Add phosphorus, potassium or good quality "*finished*", weed-free compost at this time.

Make beds, install drip tape and pre-irrigate to test and fix leaks. Spray any new weeds with **Roundup**. Lay clear 1-2 mil, UV-stable plastic on beds either by hand or using a tractor and borrow UCCE mulch layer. The sides and ends of the plastic must be buried and as airtight and flat as possible. Irrigate again to completely wet beds.

### July

Wait. Fix plastic if any tears or holes appear, and water again if the soil dries out. Plastic should be on beds for 4 to 6 weeks.

### August

Wait until at least mid August to plant Chandlers. Keep plastic on longer for other varieties to be planted later in the fall.

### October and November

Spray bottoms of furrows with **Devrinol 50-DF**, or spread granules with **Devrinol 10-G**, before the first rain.

### December, January, February, and March

Keep field drained of rain water, use ditches on ends of rows to remove water. **Do not let weeds make seeds.** One weed can make thousands of seeds.



Disking new ground.



Marking beds and creating furrows.



Disking and shaping beds.



Using bed shaper.



Using mulch layer to place clear solarization plastic on beds.



Laying clear plastic by hand, place soil along both edges to hold plastic down.



Solarization, early August.





Solarized, later no weeds around plants.



Not solarized, later lots of weeds.



Use solarization to avoid plant dieback from pests in the soil.



Try to avoid "J rooting" when planting, this increases chances of plant dieback.

## WHAT DO I NEED? HOW MUCH DOES IT COST? WHERE CAN I GET MATERIALS?

1. Clear Plastic: What: UV-protected solarization plastic. Cost: 4-foot wide, 3,000-foot long roll costs \$68 a roll. You will need 3 rolls to solarize an acre at a cost of \$204 an acre. Contact: MIP-Co Ag Plastics in San Luis Obispo, Ca. Phone: 805-549-9540. If you order in advance, they can arrange free shipping.
2. Compost: What: Compost made from cow and chicken manure, rice hull ash and wood particles. Cost: \$10 per yard. Delivery costs extra. Contact: Lopez Agricultural Services, 11499 Florin Rd., west of Sunrise Blvd. Phone: 916-682-5450.
3. Plastic Mulch Layer: Cost: FREE! Contact: Chuck Ingels: 916-835-7458
4. Other materials:
  - **Roundup** (only use before you plant strawberries)
  - **Tiger Sulfur** or **Gypsum** (before prepare soil if your plants were yellow last year)
  - **Devrinol 50 DF** or **Devrinol 10-G** (in furrows only before first rain)