
SOIL SOLARIZATION

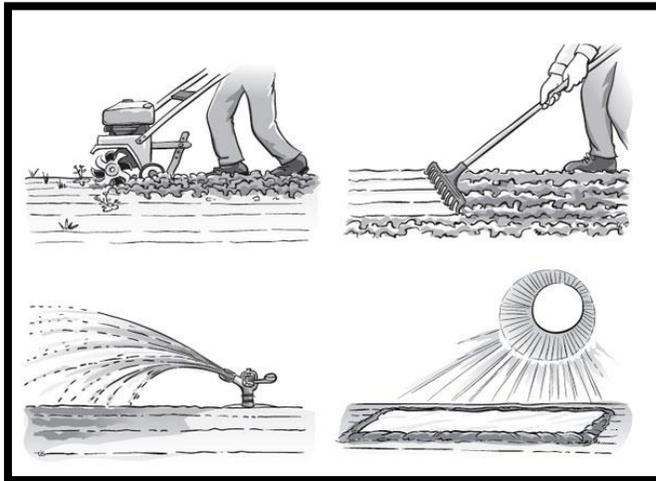
Soil solarization is a pest and disease control technique that uses the **radiant heat** from the sun to eliminate many soilborne pathogens. In this process, the soil is mulched and covered with a tarp, usually a transparent polyethylene cover, which traps **solar energy**. Since heat is captured and used, this method causes some physical, chemical, and biological changes in the soil in the most natural way. These changes result to control or suppression of pathogens and soilborne diseases.

This technique works best in areas with lots of sun and high temperature. However, recent modifications have proven that it can also work in cooler areas and for cooler times of the year.

How to Solarize Soil

- 1) Identify level land and remove weeds, debris, or large clods which could raise the plastic off the ground.
- 2) Anchor transparent (not black or colored) plastic tarps or sheeting 1 to 4 mils¹ thick (0.001 to 0.004 inch), to the soil by burying the edges in a trench around the treated area. Lay the plastic out so that it covers both the garden area and the surrounding trench. As the plastic is pulled tight, hold the plastic in place by covering it with soil in the trench. As you move around the perimeter covering the plastic, keep pulling it tight. A tight fit against the soil surface allows for better heating. Burying the edges will also prevent the wind from picking up the plastic tarp and blowing it off.
- 3) Ensure that very little space exists between the tarp and the soil surface to prevent air pockets that retard the soil heating process.
- 4) Use water to soak the soil under the plastic. If the soaking step is impractical, the soil may be irrigated before laying the plastic, but care should be taken to apply the plastic as soon as possible to avoid water loss. If, however, heavy machinery is used, the soil must be dry enough to avoid soil compaction.
- 5) Leave the plastic be left in place at least 4 to 6 weeks to allow the soil to heat to the greatest depth possible. The plastic should then be removed and the soil allowed to dry to a workable texture.

¹ Thin plastic (1 to 2 mil) may permit more sunlight to penetrate to the soil. It has also been reported to favor more rapid and deeper control of soil -borne fungi than thicker plastic (6 mil). However, both eventually provide equal control and thicker plastic is less likely to tear.



Benefits of soil solarization

Objectives	Expected outcomes	Impacts
To reduce weed population	Fewer herbicide applications. Lower cost of production	In the absence of high weed population, irrigation water and fertilizer used more efficiently. Greater crop yield and quality.
To reduce soil pests and/or pathogens population	Fewer white grubs, wire worms, weevils, fungal and bacterial pathogens and plant parasitic nematodes	Population of beneficial microflora of soil increased and incidence of soil pathogens decreased. Root health improved. Less losses due to pest damage, improved crop yield and quality. Number of pesticide applications reduced. Safer crop for human consumption.
To empower farmers with effective and sustainable method of soil management	To enhance biological activity of soil.	Organic matter breaks down quicker due to high activity of soil microorganisms. Physical structure of soil improved.

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