



## Method of soil solarization in vegetable crops

Manoj Kumar Singh and A.K. Pandey

Krishi Vigyan Kendra, Pampoli, EAST KAMENG (ARUNACHAL PRADESH) INDIA

(Email : [mr.mk Singh2008@rediffmail.com](mailto:mr.mk Singh2008@rediffmail.com))

Solarization is a method of hydrothermal disinfection. This is done by covering moist soil with transparent polythene sheet and exposing it to direct sunlight during the hottest period of the year.

### Methods of solarization :

**Nursery bed:** The nursery bed for raising seedlings is to be levelled and pebbles present on the surface removed before solarization. Incorporate the required quantity of organic manure in the soil and irrigate at the rate of 5 litres per m<sup>2</sup>. Cover the beds with 100-150 gauge transparent polythene sheets. Seal the edges of the sheet with soil to keep it in position in order to maintain the temperature and moisture inside the polythene mulch. Adequate care is also to be taken to see that the sheet is in close contact with the surface of soil to prevent the formation of air pockets between the soil and polythene sheet. Keep the sheet in this way for 20-30 days. Protect it from stray animals and birds. After the period of solarization, remove the sheet and the bed is ready for sowing and transplanting.

**Potting mixture:** The required type of potting mixture is to be prepared as per the recommended practice. Spread this mixture on a levelled ground to a height of 15-20 cm. Moisten with water using a rose-can and cover the soil with polythene sheet and solarize for 20-30 days as described above. After solarization, the soil can be used for sowing/planting. This method is found to be very effective to raise disease free pepper cuttings.

**Main field:** Solarization can also be effectively used for the control of soil borne diseases in the main field. The land used for planting is initially prepared to a fine tilth and pebbles removed. Solarization and planting can then be done as already described. All the other agronomic practices are to be followed as per the package of practices recommendations. Biopesticides and fertilizers can be incorporated in soil after removing the polythene sheet.

### Hints for solarization:

- Solarization is to be done in open field without any shade.
- Transparent thin polythene sheet (100 to 150

gauge) is to be used, as it is both cheaper and more effective in heating due to better radiation transmittance than thicker sheets.

- Summer months are more suitable for solarization.
- Soil should be kept moist during solarization to increase the thermal sensitivity of resting structures of soil-borne plant pathogens and weeds, and to improve heat conduction.

- Solarization period may be extended to one month or more to ensure pathogen control at deeper layers.

- Summer showers will not affect solarization. However, excessive seepage of water into the bed during solarization should be avoided.

- Potting mixture should never be heaped and solarized, as this will drastically reduce the efficiency of the technique.

- Soil should be in good tilth allowing close contact between the plastic sheet and the soil to prevent the formation of air pockets, which will reduce heat conduction.

### Benefits of solarization:

- *Control of fungal pathogens:* Several soil borne pathogens can be controlled by solarization. This includes fungi like *Pythium*, *Phytophthora*, *Fusarium*, *Rhizoctonia* etc.

- *Control of nematodes:* Population reduction of nematodes like *Meloido-gyne*, *Heterodera*, *Xiphinema*, etc. can be achieved by solarization.

- *Control of weeds:* A number of commonly occurring weeds particularly annuals can be effectively controlled by solarization. These include, among monocots, *Cynodon dactylon*, *Cyperus rotundus* and *Digitaria ciliaris* and among dicots, *Crotalaria muconata*, *Indigofera hersuita* and *Noxia* sp.

- *Plant growth response:* Increased growth response is observed in plants cultivated in solarized soil. This is mainly evident as increase in plant height, number of leaves, better root formation, increased root nodulation in legumes and yield.