SUMMARY

Solarization is a very cheap and simple technique to capture the solar radiations/energy to heat up the soil. Effect of solarization and its integration with bio-agents and seed dressing fungicides on the incidence of damping off of vegetable in nurseries are investigated and summarized as follows.

(A) Effect on physio-chemical properties

1. Solarization is a hydrothermal heating process, covering of soil with polyethylene in humid condition and water droplets attached under surface of polyethylene ensures conservation of trapped heat.

2. In the process of solarization, temperature of solarized soil increased about 10-13°c as the soil temperature ranged between 51-52.80°c.

3. Solarization was most effective under the wet soil condition. Soil pH observed similar under the solarized and un-solarized plots.
B. **Effect of thickness and colour of polyethylene**

1. In white colour polyethylene mulching, soil temperature significantly increased than the black colour polyethylene mulching.

2. Low density polyethylene is best for solarization because of its flexibility, tensile strength and resistance to physical damage.

C. **Effect on pre and post emergence of damping off diseases**

1. Soil solarization technique significantly reduced pre and post damping off of cauliflower by 32.3-45.7 per cent.

2. Integration of seed treatment with fungicides and bio-agents reduced disease incidence significantly. Integration of fungicides and bio-agents reduced damping off by 20-42 per cent than non-solarized soil.

3. White colour mulching was superior than black colour mulching in reducing the disease incidence.

4. After 30 days of cauliflower nurseries removed, then brinjal nurseries were raised. Disease incidence of brinjal nurseries was reduced by 42-44 per cent. Integration of seed treatment improved disease controlling potential of solarized soil.

5. In onion nurseries raised after brinjal, disease incidence also reduced significantly. Solarization with white polyethylene
sheeting reduced disease incidence by 5-16 per cent than non-solarized soil.

**D. Growth promotory effect on crop**

1. Solarization has invariably recorded that health of seedlings raised in solarized soil is significantly improved. Improvement of growth response measured various changes as fresh shoot weight, shoot length and fresh root weight etc.

2. Fresh shoot weight recorded in succession raised crops (cauliflower-brinjal-onion) was significantly improved. In seed treatment with bio-agent in cauliflower, crop growth was improved significantly (about 63 per cent in non-solarized plots and over 92 per cent in solarized ones). Integration of bio-agent (*P. fluorescens*) was found superior than fungicides.

3. Fresh shoot weight of brinjal recorded highly significant and it was also improved significantly in succession crop onion.

4. Shoot length of cauliflower was increased significantly by over 58.10 per cent. Integration with bio-agents had positive effect over the fungicides on the shoot length of cauliflower. In succession nursery crops brinjal and onion raised after cauliflower, effect on shoot length was observed to be non-significant.
5. Fresh root weight of cauliflower increased about 42-78 per cent approximately. Integration with *T. harzianum* was observed to be superior to other treatments in cauliflower nurseries.

6. Fresh root weight of brinjal increased significantly upto 64 per cent). In succession crop onion raised after the brinjal the increase in fresh root weight was observed to be significant. *T. harzianum* was distinctly superior over other treatments in increasing fresh root weight of onion.

**F. Soil microflora**

1. Solarization for a month reduced population of *Pythium* below detectable levels. Population of *Pythium* propagules was suppressed to about 52-86.3 per cent over initial counts. *Pythium* population was non-significantly recovered after 90 days of solarization.

2. Population of *Trichoderma* spp decline significantly just after solarization. The decline ranged from 76-93 per cent over initial counts. Population of *Trichoderma* increased and completely recovered within 30 days after solarization. After 90 days, increased by 45-58 per cent over initial counts.

3. Population of total fungi reduced below detectable levels by solarization for a month. After 60 days of solarization, and
growth of 2nd nursery crop, total fungal population recovered non significantly.

4. Total bacterial population reduced significantly after solarization. The recovery of total bacteria counted after the harvest of second nursery crop (60 days after solarization) increased 48-52 per cent over initial counts.

5. Population of *P. fluorescens* reduced but recovered within 30 days after solarization over initial counts. Effect of solarization persisted up to 60 days, since further significant increase over initial counts and after 90 days of solarization population fluctuation observed to be non-significant.

6. White transparent polyethylene mulching reduced population of micro-organism significantly over the black colour mulching.

**G. Effect on weed density**

1. Soil solarization markedly decreased weed growth. All the seventeen species of weeds like *C. rotundus*, *C. dactylon*, *Chenopodium album* etc. were killed after solarization except *Cyperus rotundus*.

2. *C. rotundus* was reduced by 83.20 per cent under the black polyethylene mulching but eliminated completely under white polyethylene mulching.