BIOFUMIGATION AND SOLARIZATION FOR SOIL DISINFESTATION

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Solarization is used commercially in California, primarily in the interior valleys where air temperatures are very high during summer and/or land is out of production (creating a window of opportunity to use solarization between crops). Currently, most growers in California using solarization are those having some aversion to synthetic chemical disinfestants, either because of their close proximity to urban areas or because they are growing "organic" produce. A number of conventional farming operations are routinely solarizing in order to have a basis of knowledge so they could switch practices, if necessary, and maintain a predictable soil disinfestation program.

In many cases, solarization can be economically aided by integrating the treatment with other disinfestation methods. Numerous previous studies have shown that solarization may be productively combined with chemical and biological control methods.

There is considerable interest in combining solarization with organic soil amendments to achieve biofumigation. This integrated method has been shown to be of value in both open field disinfestation and in preparation of containerized planting mixes. For example, <u>in vitro</u> amendment of soil with cruciferous plants including black mustard, bok choy, broccoli, cabbage, cauliflower, and black radish reduced germination of *Pythium ultimum* by 52-91% and of *Sclerotium rolfsii* by 2-65% ($P<0.05$) over the nontreated control after 7 days in incubated soil. Addition of a sublethal, diurnal heating regime (38 C maximum/27 C minimum) to the 7 day incubation period reduced germination of *P. ultimum* and of *S. rolfsii* by 97-100% and 87-100%, respectively.

Reference

Stapleton, J.J., and DeVay, J.E. 1995. Soil solarization: A natural mechanism of integrated pest management. Pages 309-322 in: Novel Approaches to Integrated Pest Management, R. Reuveni, editor. Lewis Publishers, Boca Raton.