

Q/As About Solarization

By Greg Sykes (greg@grsykes.com)

Folks asked about solarization, a non-chemical means of eradicating weeds and soil pests from a plot. It involves enclosing broad areas under a tarp during the summer months, enabling the sun's heat to cook and kill the plants, weed seeds, and other organisms beneath the cover. Ideally, temperatures reach 60°C (140°F), but even 50°C (122°F) can help, depending on the incubation time and problematic organism. Periods of longer, sustained higher temperatures increase the sterilization efficacy. Variations exist within this general concept, such as whether to use a clear covering (enabling deeper heat penetration) or black tarp (allowing a hotter surface temperature and block photosynthesis). The coverings must be secured to trap the heat and prevent being blown off by the wind.



Figure 1. Securing the solarizing tarp along the edges prevents heat escape and wind damage. This example uses metal rod and stakes; stacked masonry works, too. Include fastenings in the center when covering broad plots and entire lawns.

This technique acts on organisms on and in the soil; decomposing plant material severed from the soil and killing any associated seeds becomes a composting operation—a completely different subject. Solarization's caveats are 1) without a regulated heat, the temperature might not get high enough for a sufficient period to kill the targets and 2) successful solarization may also kill beneficial soil microbes and non-target plant roots.

Q: I read an article about how to solarize weeds so they can be composted and not spread. I tried and found even after a much longer period of time, the roots of invasive stuff (like Bishop's weed [*Aegopodium podagraria*]) were still alive and sprouting. Do you have any tips I may have missed?

A: There are a few tricks to solarizing. One of them is timing: for best results, do it at the beginning of the summer season (meteorological summer starts in May for Fairfax) and keep it going into September or even October. First thing to do is prepare the area, including removing anything that will poke through the tarp (e.g., unwanted shrubs). If possible, mow the plot and let the clippings fall. Never solarize on weeds like bamboo because the shoots will pierce through many types of plastic tarp. Manually remove weeds and roots around the desirable shrubs. Leave space around their root area to protect them from roasting and so that they will continue receiving water, proper gas exchange, etc. Also, add organic fertilizer and water the ground so that the plants to be solarized want to grow. Then, the rude surprise for the weeds will be the tarp that traps heat and helps kill the plants underneath. Furthermore, the wet soil enables heat to transfer better into the soil than through dry ground.

Solarizing is more effective on shallow-rooted clumping plants and not as good on vines like bishop's weed, English ivy, and even clover. The problem with vines, especially ones that travel underground, is that finding and covering the whole plant is difficult. Some of these vines are more than 30 feet long, so covering a small section might beat that piece of it down. If the parts of the plant are too deep or otherwise escape the baking heat, nutrients supplied by other parts of the plant keep it alive. Even if portions of the weed die, the small surviving segments can come back and reinfest the area. Some weeds, like [wisteria](#), have deep roots and vast energy reserves, so solarizing those will not work.

Getting back to the original bishop's weed problem, a recommended strategy that Invasive Management Area (IMA) volunteers apply to English ivy is to manually pull small sections at a time. Proceed progressively across the plot (do not try to hit it all at once), pull up any resprouting plants from missed

root fragments, and continue until the plot is clear. Planting replacements on this plot is fine as long as the target weed is down to small levels and will be pulled immediately upon discovery.

Q: Would you recommend the same strategy for [Japanese stiltgrass](#)?

A: Yes, *Microstegium vimineum* is a perfect plant to hit with tarp and solarization: a shallow-rooted annual without vines or rhizomes. The seeds are relatively short-lived. Folks can get a stiltgrass infestation in their yard under control by simply pulling it. People will likely track in more seeds, but those small germination events are easily controlled. It also underscores the importance of cleaning footwear in a controlled area, especially after walking in the mud.

Q: Thanks for that. The article I read only said to cover with black bags in full sun for 14-15 hours for a couple of days. I left them in the sun for weeks but sounds like this is not the effective method for my issue.

A: Small tarping like that will only beat the weeds back for a little bit. For best results, solarizing is more than blocking light; it needs to cook the roots, which might be deep in the soil. The soil acts as an insulator, hence the need for a long solarization exposure during the hottest time of the year and while the plant wants to grow instead of when it is dormant or some other "hunker down" survival mode.

Additional solarizing techniques and strategies (of which there are many) can be found at:

<https://agrillifeextension.tamu.edu/library/gardening/soil-solarization/>

<https://homeguides.sfgate.com/black-plastic-vs-clear-plastic-killing-weeds-86841.html>

<https://edis.ifas.ufl.edu/in856>

https://ucanr.edu/sites/Solarization/Natural_resources_users/Weed_solarization/

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