



Soil solarization can be easy and beneficial (Garden Talk)

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Sterilizing soil is an easy process that can be very beneficial to the home garden.

By Hunter McBrayer

As some summer crops are beginning to wind down, now is the time to consider what's next. There is still plenty of time to get that second planting of squash, beans and even tomatoes in the ground. If you are like many home gardeners, you may be scratching your head trying to figure out ways to prevent weeds in the coming months and even next year. For the perennial veggie grower, you might be trying to trouble shoot problems that your

garden experienced this year that were not present in the years past. Instead of letting parts of your garden lie fallow for a year, consider trying soil solarization, an easy and beneficial process that can add vigor to your garden, as well as reduce the occurrence of disease and help with weed control.

Solarization of soils is a non-chemical method of controlling soil borne pests including disease, root-knot nematodes and weeds by utilizing heat from the sun. The process is inexpensive and can drastically improve garden soils. There are three steps that must be taken to assure proper amounts of heat are distributed down into the soil: soil preparation, irrigation, and tarp placement.

The area to be solarized should be void of debris and large clumps; tilling and raking to smooth the soil will provide a flat bed for the plastic, helping to evenly distribute the heat, preventing the tarp from flapping in the wind. This will also minimize the formation of puddles of water on top of the plastic. After the area is raked smooth, a shallow trench should be dug along the outside edges of the space. Next, the area needs to be irrigated well, letting water penetrate deeply into the soil. Wet soils will conduct heat better than dry soils and will make soil pests more vulnerable to heat. After the soil is saturated, place the tarp of your choosing (we'll discuss different tarps a little later) over the prepared soil, letting one edge fall into a trench. Cover that edge with soil to keep it in place then move to the opposite side of the tarp. Pull the plastic tight and bury that edge in the trench. Repeat the process on the other two sides and then step back and inspect your work. The plastic should be tight, smooth and free of wrinkles.

The next part is easy; allow the plastic to remain on the soil for 4 to six weeks. Periodically check the plastic for holes or cracks and seal them with good packing tape or some other patch to prevent heat from escaping. In ideal conditions, i.e. time of year, smooth surfaces, and moisture content, location etc., the soil beneath the plastic can reach up to 140°F at the surface and 99°F at 18 inches! This amount of heat can kill most annual weed seeds, some perennial weeds (including some control against my arch-nemesis nutsedge!), many soil borne pathogens and bacteria that cause diseases like Fusarium and Verticillium wilt, and Southern Blight, just to name a few. The added heat can also increase the decomposition of organic matter already present in the soil, leading to an increase of available nitrogen, potassium, calcium and magnesium for plants.

When choosing your plastic, choose a thick, heavy duty CLEAR plastic, available at most hardware and big box stores. While it may seem that black or some other dark color would be better at raising temperatures, consider this: black plastic will get VERY hot on the surface, but the black color will absorb and release the heat, not allowing it to pass into the soils. Clear plastic allows the rays to move into the soil and traps the heats *under* the plastic, allowing the heat to deeper penetrate the soil, thus increasing the benefits deeper down. Heavier plastics will withstand UV rays from the sun for longer periods, but most plastics will break down after about 5 to 8 weeks. Try to remove the plastic before it degrades badly; trying to remove little shreds of plastic could be irritating and time consuming. When removing the tarp or planting, disrupt the soil as little as possible to avoid bringing viable weed seeds from deeper in the soil to the surface. There is no need to till the soil when planting after solarization, dig only in the areas where the plants will be set.

Although many soil pests are killed by soil solarization, many beneficial soil organisms are able to either survive solarization or recolonize the soil very quickly afterwards. Important among these beneficials are the mycorrhizal fungi and fungi and bacteria that parasitize plant pathogens and aid plant growth. The increased populations of these beneficials can make solarized soils more resistant to pathogens than non-solarized or fumigated soil. Earthworms are generally thought to burrow deeper in soil to escape the heat. For more information about soil solarization and other gardening techniques, contact your local extension office.

*Garden Talk is written by Hunter McBrayer of the Alabama Cooperative Extension System, C. Beaty Hanna Horticulture & Environmental Center, which is based at the Birmingham Botanical Gardens. This column includes research-based information from land-grant universities around the country, including Alabama A&M University and Auburn University. Email questions to Hunter at rh0015@auburn.edu or call 205 879-6964 x19. Learn more about what is going on in Jefferson County by visiting the ACES website, www.aces.edu/Jefferson. Like us on **Facebook** and follow us on **Twitter***

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