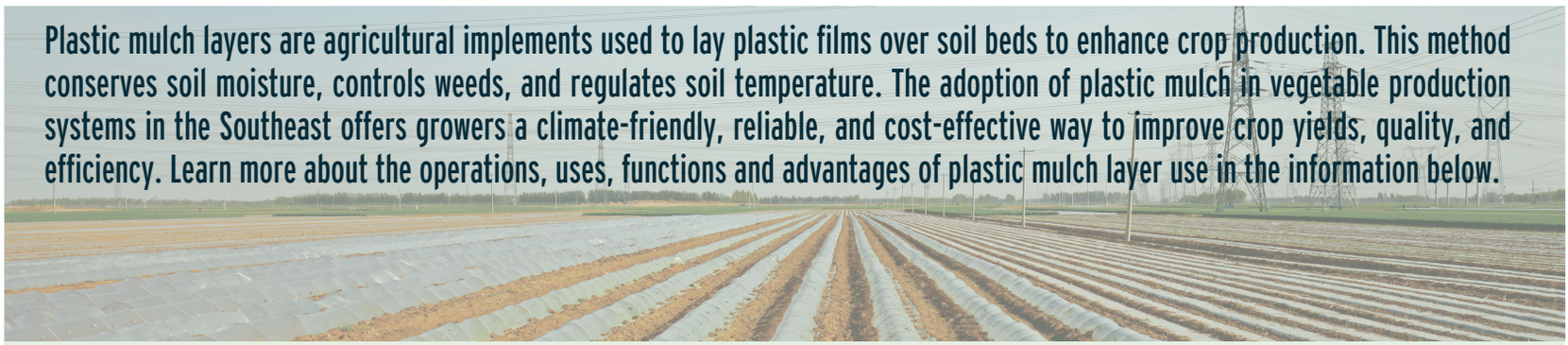
SOUTHERN PIEDMONT
CLIMATE-SMART PROJECT led by: RODALE INSTITUTE

What is a Plastic Mulch Layer?

Plastic mulch layers are agricultural implements used to lay plastic films over soil beds to enhance crop production. This method conserves soil moisture, controls weeds, and regulates soil temperature. The adoption of plastic mulch in vegetable production systems in the Southeast offers growers a climate-friendly, reliable, and cost-effective way to improve crop yields, quality, and efficiency. Learn more about the operations, uses, functions and advantages of plastic mulch layer use in the information below.



What is Mulching?

Mulching is a common practice in vegetable production in the Southeastern United States, offering a range of benefits to farmers in this region. It can be made of organic (plant and wood-based products such as straw, hay, peanut hulls, compost, sawdust, wood chips, shavings, etc.) and animal-based materials such as composted animal manures) or inorganic materials such as plastic mulch, landscape fabrics, woven polypropylene, etc. Plastic mulching is laying down sheets of plastic film over the soil to create a favorable environment for plant growth while minimizing weed pressure and conserving water.

Photo: Kennco Manufacturing

Photo: The Mechanical Transplanter Co.

Photo: NCAT

Plastic Mulch Installation

- Preparation: Till the soil to incorporate plant residues to form a friable and clod-free bed.
- Fertilization: Incorporate fertilizer through plastic laying equipment while the bed is formed, or apply during soil preparation before laying the plastic mulch, or inject water-soluble fertilizer through a drip irrigation system after the mulch is installed.
- Bed Shape and Width: It can be either flat or raised beds and the width of the bed depends on the crop type, number of crops, per bed, plastic cost, etc., e.g., a 2-3 feet wide bed for tomatoes, squash, and melons whereas, 3-feet wide bed for peppers and eggplant.
- Irrigation: Install the drip irrigation tubing while the plastic is being laid either on top of the soil or buried below the surface e.g., one center drip line for 1-2 rows/bed or two lines for 3-4 rows/bed, make sure the drip emitter holes are facing upward to reduce clogging.
- Contact and Anchoring: Stretch it tight and secure the plastic firmly at the edge to make good contact with the soil to maintain optimal heating underneath.

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What is a Plastic Mulch Layer?

Removal and Disposal

At the end of the growing season, plastic must be removed and disposed of. Removal can be time-consuming and care should be taken to avoid leaving any sections of plastic in the field since most do not decompose. Special equipment such as a Plastic Wrapper (winds up the plastic and irrigation drip tape smoothly to recycle or dispose of it easily) or Plastic Mulch Lifter (remove the leftover mess of plastic, hose, and tape at the end of a season) may help remove plastic mulch if resources are available. Disposal of the mulch may raise environmental concerns as large amounts of plastic enter the landfill system. Recently, biodegradable plastics have become available that may mitigate this concern, but the most commonly used plastic mulches are polyethylene-based plastics that do not break down.

Benefits of Plastic Mulching

- Retaining soil moisture
- Regulates temperature
- Enhanced nutrient management
- Depressed weed growth
- Reduced soil-born disease

Specialized Equipment

While it is possible to install plastic mulch by hand, vegetable producers in the Southeast use specialized equipment that can be time- and labor-efficient. Plastic layers can be installed over a raised bed or on flat ground. Those equipment prices range from one thousand to several thousand dollars depending on size, number of beds covered, and add-ons. A tractor is also required to pull the equipment. Additional equipment such as bed presses, drip tape layer, fumigator, and fertilizer dispenser may also be needed.

Dig Deeper

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Planting Consideration

- Mechanical Planting: Water wheel transplanters can be used for small-scale vegetable framing that punches a hole in the mulch and fills the hole with water, while workers on the sides of the equipment set plants into each hole.
- Fully-automated Transplanters: Allow for direct seeding, while a similar planter is used that punches a hole and delivers the seed or a mix of potting soil and seed(s); all of that can be adjusted to various spacing and are pulled behind a tractor.
- Hand Planting: While more time-consuming, hand transplanting is effective and commonly used on smaller operations such as creating a 2-3-inch wide hole using a long-handed bulb setter, a sturdy can, or any other cylinder-shaped object.
- Transplants vs. Seed; Growers often use transplants (have a head start over direct seeding, more uniform, allowing for earlier harvest and possibly premium prices in early markets) or direct seeding (usually less expensive than transplanting, can cause over-seed, thinning may be necessary and can cause stand issues; e.g., with rising seed costs transplants can be better for seedless watermelon.

Photo: NCAT

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