

Cultivating Vegetables Using Mulching

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Introduction to Mulching

Mulching refers to covering the soil around plants with a material to retain moisture and conserve water. Various materials used for mulching include rice straw, sugarcane trash, dried leaves, and small stones. Other materials like used weed plants, fallen leaves, and sawdust can also be utilized.

Plastic Mulching

Covering the soil around plants with a plastic sheet is known as plastic mulching. By applying plastic mulch around plants, soil moisture is retained, leading to water savings of 30-70%. Plastic mulching reduces weed problems by up to 85% and controls the environmental conditions around plant roots. This promotes healthier and stronger plant growth. Plastic sheets also prevent rainwater from directly hitting the soil, reducing soil erosion and protecting soil health. Compared to traditional methods, fields covered with plastic mulch allow plants to utilize fertilizers more efficiently. Transparent mulching sheets allow sunlight to penetrate, killing pests and microorganisms in the soil. Initially, the use of plastic sheets may require labor for installation, but it reduces costs for weed control and other maintenance tasks. Studies have shown that using mulching sheets can increase yields in tomato and pepper crops by up to 50%. Additionally, crops like watermelon, cantaloupe, and capsicum also yield more compared to conventional methods.

Initial Investment and Long-Term Savings

Although the initial investment in mulching materials may be higher, it significantly reduces cultivation costs in the long run. Depending on the spacing of crops and plants, different types of mulching sheets should be used. For crops like peppers, tomatoes, capsicum, cantaloupe, and watermelon, prepare beds with a width of 10 cm and a height of 15-20 cm. Install drip lines between these beds. Generally, a single drip line is sufficient for vegetable crops. Lay 21 to 50-micron thick mulching sheets over the drip lines and cover the bottom part of the beds with soil. Create two-inch diameter holes on either side of the drip line, plant seeds or seedlings in these holes, and provide ample water until seeds germinate or seedlings establish. After this period, adjust the water supply based on the season through drip irrigation. Fertilizers can also be delivered via the drip system. Mulching sheets should be purchased based on the spacing of plants and crops per acre.

Benefits of Mulching

1. **Water Conservation:** By preventing evaporation of moisture around plants, mulching saves 30-40% water for different crop durations. When combined with drip irrigation, additional water savings of 30% can be achieved.
2. **Erosion Control:** Prevents rainwater from directly hitting the soil, thus reducing soil erosion and protecting soil health.
3. **Temperature Regulation:** Creates a microclimate around the plants, controlling soil temperature, which

enhances microbial activity and improves soil structure, ensuring that plants receive all necessary nutrients.

4. **Pest and Disease Control:** Transparent films used during summer allow sunlight to penetrate, thereby controlling pests and diseases in the soil.

5. **Fertilizer and Pest Control Savings:** Prevents fertilizers from leaching away, reduces weed growth, and decreases the need for pesticide applications, contributing to environmental balance.

Mulching Application Methods:

1. Pre-Planting Mulching:

- o For vegetables, create trenches 5-10 cm deep on either side of the plants or around trees.
- o Cut the mulching sheets to the required size and lay them over the beds or around the trees, anchoring the edges with soil to prevent the sheets from blowing away.

2. Post-Planting Mulching:

- o Use sheets with pre-made holes suited for planting.
- o Plant seeds or seedlings through these holes and cover them with soil.
- o This method saves about 20-25% of seeds.
- o Choose the thickness of the mulching sheet according to the crop duration. Generally, for vegetables and flowers with a 3–4-month duration, use sheets 15-25 microns thick.

Precautions:

- Avoid stretching the mulching sheets too tightly.
- Apply the sheets during morning or evening hours to ensure better adhesion.
- Do not apply mulching during high wind conditions.
- Remove and store the mulching sheets after the crop season.



Fig.1: Mulching sheet placed over beds and planting seeds or seedlings in the holes



Fig.2: Pepper field growing with the use of mulching sheets