

Organic Mulches “An eco-friendly Method for Pest Control”

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INTRODUCTION

Mulching is the process of spreading organic matter around plants to prevent the evaporation of moisture, and freezing plant roots. Organic mulches are derived from any kind of organic material such as leaves, grass clippings, peat moss, wood chips, cardboard, newspaper, hay, straw, crop residues, pine needles, shredded bark etc. The use of organic mulches is safe for the environment and is a chemical-free method for pest control.

Different Ways to use Mulches

Organic mulches can be used in different forms (dry or fresh mulches), and in different ways such as ploughing mulches in field, cutting and spreading material in field where required, or using plants as living mulches. Crops can be grown on fields, followed by harvesting before they reach maturity and finally chopping of harvested crops. Chopped organic material can be used as mulch by spreading it along plants. This technique is easy to use in kitchen garden or on small-acreage farming but not on commercial scale due to the labour-intensive process of growing and harvesting of crops followed by carrying chopped material to site where it's required or needed. For commercial farming, we can grow crops (i.e. the crop we want as mulch, e.g. leguminous crops as they can supply nitrogen in addition to standard benefits mulches have) on field and plough in field before they reach maturity. The other way to use organic material is by means of cover crops. Cover crops are crops grown between cash crop cycles or incorporated with cash crops to cover the ground in vegetable fields, orchards, and agricultural sites. Cover crops are mainly planted to improve soil fertility, soil structure, decrease soil erosion, and to suppress weeds, insects, nematodes, and other plant pathogens. Cover crops also help to enhance many beneficial organisms, and also possibly contribute to carbon sequestration. Cover crops are used to manage nematodes because nematodes can move only very short distances on their own. Residues from cover crops can be incorporated as "green manure" to supply macro and micronutrients for increasing the soil fertility for the next crop.

Fallow soil can help to keep nematode populations at lower levels, but problems like soil erosion and others are possible with keeping soils fallow. Many different types of cover crops are adapted for cultivation in the southern United States. Most of the below mentioned crops can be easily grown and used as mulches in many parts of India. Popular cover crops are cowpea, sorghum-sudangrass, sunnhemp, marigolds, jointvetch, velvetbean, sesame, grasses, rye, wheat, oats, crimson clover, vetch, and lupine. Currently, there is an interesting trend toward using legumes as cover crops, because they supply nitrogen to subsequent crops or can be used as high-quality forage in silage production.

Advantages of Organic Mulches

Mulches are an effective way to provide shelter for predatory insects. Mulches help to maintain soil moisture required for plant vigor and to promote plant tolerance to the attack of insect pests. Organic mulches provide hiding space for earthworms which help in soil enrichment with their castings and also aerate soil with burrows. A few organic mulches such as composts and residues act as slow-releasers of nutrients for plant growth and also help in improving chemical and physical properties of soil. Studies conducted in various parts of world using mulches such as strawberry, clover, white clover, and yellow sweet clover, alfalfa, and kura clover were found effective to control spiders, soybean aphid, European corn borer, and other Lepidopteran insects. Winter cover crops like wheat, rye, oat, lupine, hairy vetch, and crimson clover, and poultry mulch controlled a variety of insects including aphids, leafhoppers, plant bugs, and thrips, beet armyworm, spotted tentiform leaf-miner moth, and nymphs of migrating woolly aphid. **Considerations while using Mulches**

A few things need to be considered while using mulches. Make sure to use weed-free mulch in field because some of the mulches such as hay and grass clippings can act as weed sources and therefore can introduce weeds in the field. Some mulches may lead to increase in numbers of slugs, snails, and sow bugs (crustaceans) especially in

gardens, where they feed on young and succulent plants. Pine needle mulch can cause fire hazards and in some cases moist organic mulches can encourage the seedling disease "damping-off". Despite the above mentioned disadvantages, use of mulches can be a very cheap, effective, and eco-friendly method for pest management if managed appropriately. Some management methods that can be used are flipping the mulch material frequently to avoid incidence of bad bugs and pathogens, bringing weed free mulches in field, scouting for the pest populations in mulches and then managing them.

Why there is a need of this Technique in India

With the booming population of country, and environment becoming a concern for everyone, it is critically important that something need to be done. India has been ranked as one of the most polluted countries among many other countries in world based on several surveys. This makes it further important for government to encourage and facilitate adoption of eco-friendly tools like organic mulches. First of all, awareness needs to be created among the state and central universities about mulching. Farmer's awareness can be improved by active involvement of universities in national and local research trials, extension programs focusing on this technique including Kissan Melas etc. Several steps need to be taken at different levels such as government, universities, local agricultural advisors, and grower level before this technique can be profitably and practically available. Factors to consider before using mulching in local conditions would be soil type, weather conditions, pest type and diversity etc. Government and probably NGO's may have to help by providing funding in form of subsidies and other measures to share the initial cost.

Mulching provides enormous benefits that can be utilized not only at the national scale but also locally. It is a cheaper alternative for pest management when compared to chemicals and other pesticides. Use of this technique can reduce environmental pollution, pesticide hazards, and toxic wastes.