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Use of Plastics in Horticulture Production

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Introduction

The use of plastics in horticulture has made good sized development during the remaining decade. We are aware the plastics make contributions from planting to post harvest handling and processing in many fruit crops. Plastics are used at each and every stage of horticultural life cycle, from seeds packaging, planting, propagation, mulching, irrigation, harvesting, fruit packaging and preservation.

This application of plastics in agriculture sector is popularly known as Plasticulture. Plasticulture is one of the most useful indirect agricultural/horticultural inputs which hold the promise to transform agricultural and assist in bringing the dawn of the "Second Green Revolution". Plastics are used in greenhouse to promote growth and production mulching soil temperature and moisture as well as in containers for seedling and soil solarization to reduce pest and disease. Plastics is very useful because it can be coloured melted, shaped, squashed cheapness, light weight impermeable to moisture and grasses rolled into sheets or made into fibers. For qualitative and quantitative horticultural production plastics can be used for various purposes are:

- Mulching
- Drip irrigation
- Soil solarisation
- Propagation and nursery
- Packaging
- Sleeving

Mulching

Mulching is the activity of covering the soil around the plant with material like sawdust, compost, grass, hay, dry leaves, stones or plastic sheet to reduce evaporation maintain soil temperature prevent erosion control, weeds, enrich soil or keep fruit clean. It helps in moderating the soil temperature and micro climate in the plant root zone, which helps to increase yield and early maturity crops. Generally black plastic mulch film is used in fruit production but two sided coloured plastics mulch film such as yellow/black, white/black, red/black or silver/black also used in specific crops which determine its energy radiating behavior and also influence the macro climate around the plant.

White/Black: It helps in cooling the soil.

Silver/Black: It also helps in cooling of the soil but not much white and black plastic mulch.

Red/Black: It is translucent in nature.

It helps to the soil warm.

Plastic mulch film having different thickness and choose based on type and age of plant, it available from 7 to 100 micron thickness but for medium duration crop 25 to 50 micron and for long duration crop 50 to 100 micron thickness is suitable.

Now-a-days LDPE (Low Density Polythene) and LLDPE (Linear Low Density Polythene) plastics covers use in mulching thickness used for plastic mulch is 25 to 40 micron in fruit cultivation.

Drip Irrigation

Precise and regulated software program application of irrigation water and plant nutritional at low stress and conventional interval through drippers/emitters without lengthen into the root place of plant with the assist of close neighborhood of pipes is mentioned as drip irrigation system.

Advantage of Drip Irrigation

- To improve quality, ensure early maturity of the crops, water saving upto 40-70%.
- Weed growth controls, saving of fertilizer (30%) and labour cost (10%).
- Fertization/chemigation can be made efficiently control diseases; use of saline water is possible.
- Soil erosion is eliminated suitable for undulating land, high water use efficiency and increase in production and productivity of fruit crops.
- The most important features of plastics in drip irrigation system is the used made by plastics are rust proof. This system is mostly mase up of HDPE (High Density Polythene). The sub lines and lateral lines having wide range of wall thickness from 0.5 to 2 mm.

Protected Cultivation

Green house is a framed structure covered with glass or plastics film in which plants are grown under partially controlled environment. The greenhouse technology has been use in better space utilization growing in crop is extremely elevation conditions and high rainfall areas. The plastics film used in greenhouse act as selective radiation filters.

Greenhouse cultivation is very important because it can moderates temperature and humidity, increase yield quality and reduces crop duration, conserve moisture thus needs less irrigation, cultivation of off-season crops possible helps to grow crops in different climatic conditions to plant and to grow high value crops for export market.

Soil Solarisation

Soil solarisation is normally done during summer months when the air temperature more than 35°C. This is done by covering the moist soil with a transparent polythene film exposed to sunlight.

Soil solarisation can prevent weed growth, occurrence of bacteria, fungi, nematode and other soil borne pathogens and pests help in reducing usage of weedicide/herbicide and pesticides. The effect of soil solarisation enhances plant growth by improving soil colour, structure, temperature, moisture etc.

Propagation and nursery

Generally, polythene used in propagation like layering, budding and grafting.

In grafting polythene film are used to tie stock and scion so that the vascular cambium match with each other then rooting became easily occurring. Red, blue and black polythene wrappers having higher success in rooting and survival by increasing physiological activities which is necessary for cell division and cell enlargement.

Packaging

Packaging is one of the most critical areas in the distribution and marketing of agricultural production. More than 30% flexible, light weight, cost effective, hygienic, transparent so product visible from the outside and increase shelf-life of the produce.

Sleeving

Sleeving technique involves a cylindrical plastic bag of 16-18 micron thickness having both end open and is used for protection of banana bunch from wind, rain, hail, dust, pest etc.

It protects the skin of fruit against leaf insect and bird damage as the fruit mature. Due to sleeving fruit size is uniform and larger throughout the bunch and also fruit gets better color.

Conclusion

- For qualitative and quantitative horticultural production plastics can be used for various purposes i.e., mulching, cladding materials for protective structures, nets pressurized irrigation, soil solarization plastic traps propagation, sleeving and packaging.
- Plastic used in fruit crops not only increase production, it also reduce the pest, disease and weed populations.
- It also extends the shelf life of fruit crops as well as saving fertilizers and water.
- It minimize the use of herbicides and pesticides as compared to conventional methods.

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