Effect of mulches on growth and yield of sweet pepper (Capsicum annuum L.)

Kumara N*
AVRDC, ICRISAT Campus, Hyderabad-502319, India
*e-mail: nkumar278@gmail.com
(Received: February 12, 2015; Revised received: July 25, 2015; Accepted: July 28, 2015)

Abstract: A field study was conducted during Rabi season of 2013-14 in the farmer field to study the effect of mulches. The Experiment conducted in 04 replication of Black polythene mulched and Unmulched treatment in bell pepper, Green hybrid, Indra variety of syngenta India Company. Plant height was maximum in black polythene mulched (44.46 cm) and was least in unmulched (39.30 cm) plots. Whereas significant increasing of 14.25 per cent Green fruit yield in mulched which compared to non mulched plots which was maximum (8.96 tonne per ha) and (7.85 tonne per ha) respectively. Mulched treatment reduces labour cost of 39 % compare to Unmulched which is highest among variable costs. Use of Black polythene mulch in sweet pepper brought the benefit cost ratio, from 2.61 to 2.81.

Key words: Black polythene, Plant growth, Mulches, yield, Bell pepper

Introduction
Sweet pepper (Capsicum annuum var. grossum L.) belongs to the family solanaceae. Sweet pepper and chilli, the Capsicum, are native to Tropical South America. It is the world’s second most important vegetables after tomato. This crop has got high export potentiality considering its high nutritive value and export potentiality. Capsicum is one of the important vegetable crops in India. It is not only used as vegetable but also it occupies a maximum place in kitchen with more demand from hotel industry. Growing capsicum in field condition is very difficult because it is much sensitive to both insufficient and excess supply of water and temperature which is not suitable for capsicum cultivation. Among the variable costs, the costs on labourers were the highest in capsicum cultivation, (Anonymous, 2012) need to be addressed. Mulch is a covering placed over the soil around your tomatoes. It’s key step to take in effective tomato care. Mulching was found to reduce evaporation losses of water from soil apart from other advantages like reduced weed problem, maintaining thermal regime in the root zone etc. (Bhella, 1988). In the recent years, plastic mulches of different colours are coming up in place of Organics.

Benefits to mulching:
- It keeps moisture in- A layer spread over bare soil allows the area to soak up more water. The outer layer dries faster than the soil below it. That reduces the rate of evaporation from the soil, plus it lets the soil to retain moisture for your tomato plants.
- It regulates soil temperature- In hot summer months, a layer helps keep the underlying soil cooler. In the fall when temperatures fall off, the layer around your tomato plants keep roots warm.
- It smothers weeds- Fewer weeds sprout because seeds are buried beneath the surface. And the weeds that sprout are weak and easy to pull.
- It prevents disease and fruit rot- A layer keeps water from splashing on the soil, absorbing bacteria and fungi, and bouncing up onto your plants. Likewise, when a tomato falls onto a layered area, it is less likely to rot quickly than if it falls onto soil.
- It improves the soil- Organic varieties can be turned into the soil at the end of the season.

During Rabi season temperature and moisture play vital role in vegetative growth and yield of green fruits in capsicum, where mulch plays a vital role in order to maintain the temperature and moisture content (Patel et al., 2009).

Materials and Methods
Experimental site, geographical location of experimental site and climate: A Study was conducted during rabi season of 2013-14 in the farmer field, Uddeboranahally Village, Lakya Hobli, Chikmagalore Taluk of Chikmagalore District of Karnataka State India. This location is classified under central dry zone, situated in the south-western part of Karnataka lies between 12°54' and 13°53' North latitude and 75°04' and 76°21' East longitudes receives annual rainfall of about 1925 mm with maximum temperature of 35°C and minimum of 14°C.

Planting material: Planting material used was bell pepper, variety Green hybrid Indra of syngenta India. The polythene mulch (black) was laid after establishment of the crop. Black polythene mulch film of 25 micron thickness was cut into pieces of 6.50 m x 50 cm to cover...
80 per cent of the area in the main field. Before laying the film, small circular holes were made with scissors as per the intra row spacing (45 cm) of the crop and the sheet was spread on the crop rows by carefully taking out the established plants through the holes made already. Then the sides of the polythene film were anchored with soil. The experiment was laid out with 04 replication of mulched and non mulched treatment.

**Sampling procedure and collection of experimental data:**
Plant height was recorded at 15 days interval starting from transplanting to 75 days after transplantation and at harvest. The data were collected on plant height at 15, 30, 45, 55, 75 days after transplanting and at the time of harvesting from five plants randomly selected in each 04 replication of mulched and non mulched treatment. Green fruit yield were picked and recorded from five plants randomly selected in each 04 replication of mulched and non mulched treatment and total yield was reported as tone per ha.

**Statistical analysis:** The data collected for the study was tabulated, processed and analyzed using simple statistical tools like frequency and percentage.

**Results and discussion**
All the growth parameters were maximum with black polythene mulch, followed by non mulched, Table 01 indicates that there was no specific trend in height of plant growth up to 45 days after transplanting. The effect of mulches on plant height was significant from 55 days on wards. However, there was a significant difference in plant height recorded after the 55 days after transplanting which was highest in black polythene mulch treatment (44.46 cm) and least in unmulched (39.30cm) plots. Choudhary and Bhambri (2012) reported the growth parameters were maximum with black polythene mulch.

**Green fruit yield:** Use of black polythene mulch produced highest fruit yield of capsicum of 8.96 tonne per ha, there was a significant green fruits yield increased by 14.25 per cent compare to no mulch treatment, where green fruits yield was low and it was 7.85 tonne per ha.

**Economics:** It is implied from table-2 that average material cost including seedlings, fertilizers, pesticides, and others incurred was Rs 0.24 lakh, and labour cost was Rs 0.21 lakh, which was 39 % more compare to mulched, Total cost of cultivation was worked out to Rs 0.44 lakh per ha.

It can be concluded that the Black polythene Mulching increased the yield over non mulch. Which might be due to favorable soil physical environment in the root zone. Mulched plots reduced the labour costs and also pest incidence.

**References**