

Adaptive Research on Bag Culture in Tomato and Plastic Mulching in Cucumber

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Bag Culture

Crop rotation is a very important factor to the farmer for getting sustainable production. But most of the farmers are unaware of crop rotation, its cultivation and benefits. Because of this, farmers are growing same vegetable in the same field continuously over the years. In such condition, several problems such as soil borne diseases like rootrot nematodes and root rot are emerging. In field condition, it is also very difficult to remove and change all soils of the cultivated land. So bag culture in drip irrigated plastic house could be one of the solutions to cope the problem of soil borne diseases and pest. Bag or pot culture could be equally important in city area, where space for vegetable cultivation is not enough.

Smallholder Irrigation Market Initiative (SIMI), Nepal conducted an adaptive research on bag culture in tomato in Lalitpur, Kavre and Kaski districts in FY 2009/10. There were two plastic houses in each of the districts. The Srijana tomato variety was cultivated in all plastic houses. The tomato seedlings were transplanted in the plastic houses from late May to early June 2009. The main objective of this adaptive research was to compare the plant growth and production between bag culture and normal cultivation inside the plastic house in drip irrigated condition.

Plastic houses with the dimension of 12 X 5 meter were constructed in all six research sites. Silpaulin (120 GSM) was used for roofing (rain shelter). Half area of the plastic house was used for bags and half for normal planting. A total of 40 bags with 50 kg capacity were filled with mixture of rice field soil and recommended dose of manure and fertilizers for tomato cultivation. In other half part of plastic house, 40 pits were prepared and filled with the same amount of manure and fertilizers as used in the bags. All bags and pits were maintained at 60 cm distance and adjusted with drip hole. A medium size (12 meter long 4 lines) drip irrigation was installed for irrigation.

Plant growth, weed growth, diseases and pests condition were visually observed and recorded every week and yield data were collected in each harvesting. There was no significant difference between bag culture and normal plants for weed, disease and pest. Plant growth was very fast in bag culture and harvesting started two weeks earlier in bag culture. In bag culture harvesting lasted about one month longer than in field planting. More irrigation was required in bag culture. Productivity of tomato was higher in bag culture (300 kg from 40 plants) than in normal planting (278 kg from 40 plants). However, labor requirement was higher in bag culture because of additional work for filling the soil in bags. So bag culture is an appropriate technology for plastic house tomato cultivation especially to control soil borne diseases like root knot nematode.

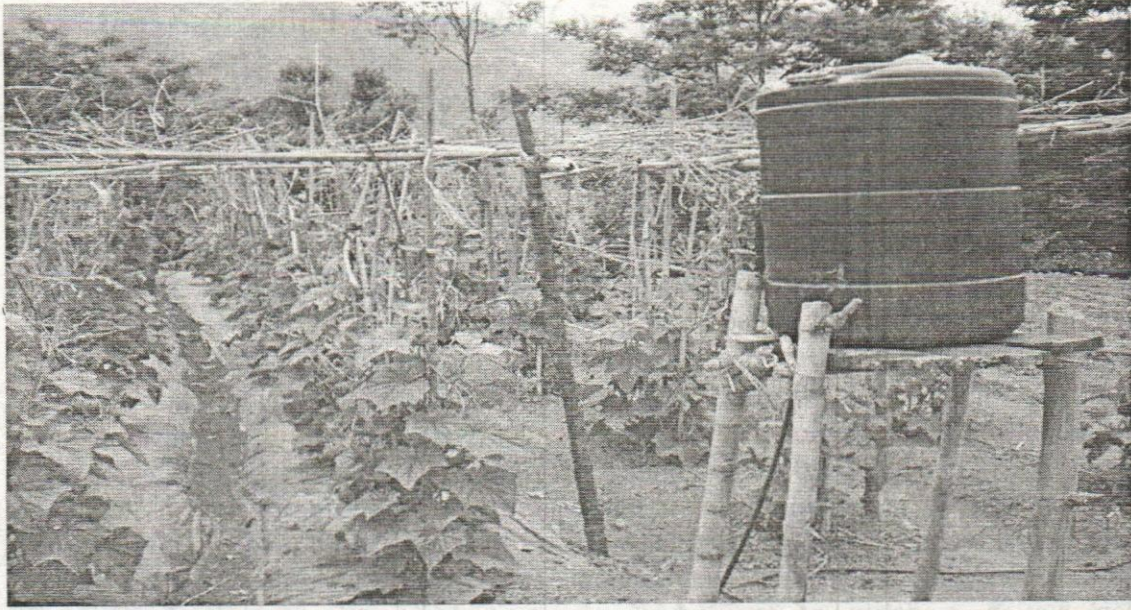
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Plastic Mulching

Mulching is an agricultural technique that involves placing organic or synthetic materials on soil surface to provide a favorable environment for crop growth and production. Traditionally used materials for organic mulches are being limited and application techniques are also labor intensive. Main advantages of plastic mulching are: faster crop development and earlier yields, reduced evaporation, weed control, reduced fertilizer leaching, increased growth, cleaner product and aids on fumigation. In other countries, inorganic plastic mulches have been used by commercial growers since decades and are very popular. But in Nepal the plastic mulching is not in practice yet. In many countries, plastic mulches normally are used in conjunction with drip irrigation to maintain optimum soil moisture and for improved stand establishment. As drip irrigation was an entry point for SIMI program, the plastic mulching could be an intermediate and appropriate technology for Nepalese high value crop producer. So Nepal SIMI conducted plastic mulching researches under its Adaptive Agriculture Research Program in 2009.

The main objective of this research was to compare the plant growth, weed and other insect pest problem and yield between mulching and non mulching field. A total of six plastic mulching researches were conducted in Lalitpur, Kavre and Kaski districts (two in each district). Cucumber variety Bhaktapur Long was used in this adaptive research. The research was started in March and was completed in September, 2009. A medium size (12 meter long 4 lines) drip irrigation was installed in the selected field. Recommended manure and fertilizers was incorporated in the soil surrounding the drip hole before placing the plastic sheet. Among the four drip line, two lines were covered by plastic mulching and two lines were open. However the inputs were applied equally in these two opened line also. A small hole was made in the mulched plastic near the drip hole and seedlings were planted in that hole. The side of the plastic was covered by soil so that wind can not blow out the plastic.

Plant growth, weed growth, diseases and pest condition was visually observed/recorded every week and yield data was also collected separately for mulched and non mulched plot in each harvesting. Plant growth, flowering and fruiting was faster in mulching which fetched higher piece in early market. Since there were no weeds in mulching labor cost for weeding were saved. Irrigation requirement in mulching was less i.e. irrigation in two days alternate in mulching while one day alternate in non-mulching. The productivity was higher in mulching (180 kg) than in non-mulching (135 kg) (difference: 45 kg x Rs 30/kg= Rs. 1350). The technology was found useful for water scarcity areas. Plastic mulching could be an intermediate and appropriate technology for Nepalese high value crop producer.



Plastic mulching on cucumber in Lele, Lalitpur.

नेपालमा उत्पादित विभिन्न जातका तरकारी बाली, अन्न बाली, फलफूल र फूलका उन्नत तथा हाईब्रिड विउ, बेर्ना, विषादी, कृषि औजार, बेर्ना, विषादी, कृषि औजार, माटो परीक्षण, माटो परीक्षण र निःशुल्क प्राविधिक सेवाको लागि हामीलाई सम्भन्नुहोस ।



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