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G Venu Gopal SMS

Horticulture, Krishi Vigyan
Kendra, Jammikunta,
Karimnagar, Telangana, India

Dr. N Venkateshwar Rao

Senior Scientist and Head, Krishi
Vigyan Kendra, Jammikunta,
Karimnagar, Telangana, India

Dr. L Mahesh SMS

Agriculture Extension, Krishi
Vigyan Kendra, Jammikunta,
Karimnagar, Telangana, India

D Srinivas Reddy SMS

Plant Protection, Krishi Vigyan
Kendra, Jammikunta,
Karimnagar, Telangana, India

J Vijay SMS

Agronomy, Krishi Vigyan Kendra,
Jammikunta, Karimnagar,
Telangana, India

Impact and effect of plastic mulching and staking in tomato hybrids

**G Venu Gopal SMS, Dr. N Venkateshwar Rao, Dr. L Mahesh SMS, D
Srinivas Reddy SMS and J Vijay SMS**

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Abstract

A field experiment was conducted at the KVK, Jammikunta Mandal and farmer's fields in Karimnagar District to study the effect of plastic mulching and staking techniques on the yield and quality of hybrid tomatoes. Plastic mulching and staking was found best in producing higher yield of hybrid tomato than without mulching practices. Big size tomatoes, number of fruits per plants and quality of fruits and maximum yield was recorded with plastic mulch with staking 158 t/Ha higher than the control plots 86.5 t/ha (without mulching and staking) in Private hybrid of Tomato named Saaho.

Keywords: Mulching, staking, tomato

Introduction

Tomato (*Lycopersicon esculentum*) is one of the popular vegetables extensively grown during the Kharif season in Karimnagar District of Telangana state. The Nutritional Value of tomato is good, water content in tomato is 95% while the rest 5% consists of carbohydrates and fibre. Tomatoes contain good quantities of Vitamin A, Vitamin C and Vitamin K while other vitamins like vitamin B6, folate and thiamine are also present. Minerals like potassium, manganese, magnesium, copper and phosphorus are present in tomatoes. This vegetable also contains dietary fiber and protein and a number of other organic compounds like lycopene which are extremely beneficial for our health. It is mainly grown in all seasons of Telangana. Among various factors responsible for higher yield, supply of nutrient and availability of moisture play vital role in the production and quality of tomato. Its production can be increased by adopting improved cultural practices like plastic mulching which is effectively reduce weed infestation and conserve moisture in the root zone and staking helps in reducing disease infestation and made easy to do cultural operations. This plastic mulch and staking practice also encourages deeper and denser rooting. Mulches have been found to decrease soil moisture losses by reducing soil temperature and evaporation, promoting favourable soil biotic activities, reducing hard soil setting and contributing plant nutrients. Plastic mulching has also been proven many times to provide a favourable soil environment by minimizing crusting at the soil surface and keep it stable. Based on this technology many farmers came forward to do same practices in Karimnagar district.

Materials and Methods

The experiment was conducted for two years during November 2020 to February 2023 at KVK, Jammikunta and in Thimmapur, Mogilipalem and Jammikunta Villages of Karimnagar District. Treatments of the experiment comprised with plastic mulching and Bamboos for staking. Materials viz. Nylon net, Bamboos (7.5 ft height) and black polyethylene (25 μ thick) with control (no mulching and no staking) and two varieties of tomato hybrids. The seedlings were transplanted on the 15th November, 2020 maintaining a spacing 60 cm $\times$ 40 cm. The crop was fertilized with Farm yard manure 5 t/ha, Urea 500 kg/ha, DAP 200 kg/ha, MOP (muriate of potash) 200 kg/ha. Applied Fym and one third of the above fertilizer before installation of mulching.

Corresponding Author:

G Venu Gopal SMS

Horticulture, Krishi Vigyan
Kendra, Jammikunta,
Karimnagar, Telangana, India

Correct time and regular application of fertilizer helps in getting Yield and Quality of Tomato Tipu *et al.* RRJoAST (2014) ^[1] 12-14@ STM Journals 2014. Recorded data were analyzed after Application of fertilizer and management of pest and diseases. A wide variety of vegetables can be successfully grown by using mulches. Cucumbers, capsicums, melons, tomatoes, cole crops and okra have shown significant increase in earliness, yield and quality (Singh Balraj *et al.*, 2005) ^[2]. Adelaine (1976) reported that staking increases fruit yield by 18 to 25%.

Results and Discussion

The results on the effect of plastic mulching and staking in rabi season tomato. The effects of mulching have been presented in Table 1. Staking and mulching significantly increased the total yield over without mulching and staking in tomato. Number of fruits, quality of fruits increased. Yield of tomato significantly

increased in mulches over without mulching practices. The highest yield was recorded in 2021-22 was 145 t/ha and the lowest was in without mulch (80 t/ha). The highest yield was recorded in 2022-23 was 158 t/ha and the lowest was in without mulch (86.5 t/ha). The yield of tomato recorded in staking with plastic mulching Staking and sometimes cultural operations like pruning methods greatly affected fruit diameter and length with the highest fruit diameter and length recorded. Staking with wire trellis might have allowed better aeration and exposure of the foliage, thereby, enhancing photosynthetic activities which might be responsible for larger fruit size. Hesamil *et al.* Reported that increased fruit size of tomato because lateral branches were removed. So result obtained by staking tomatoes Kumar *et al.* who reported higher fruit diameter in staked tomato. The main effect of mulching was found highly significant in most of the parameters.

Table 1: Effect of plastic Mulching and staking -Data on parameters

Particulars	2021-22		2022-23	
	With mulching+ Staking +Tomato Hybrid Saaho	Without mulching +Tomato Hybrid Saaho	With mulching + Staking +Tomato Hybrid Saaho	Without mulching +Tomato Hybrid Saaho
Cost of cultivation	147400.00	76900.00	145500.00	88100.00
Yield t/Ha	145	80	158	86.5
Gross income	875000.00	360000.00	1027000.00	475750.00
Net Income	691600.00	283100.00	881500.00	387650.00
B:C Ratio	1:5.6	1:4.6	1:6.05	1:4.4

The higher yield (158t/ha) and lower 86.5 t/Ha was found in mulching Tomato. The higher 145t/Ha and Lower yield 80t /Ha was recorded in in 2021-22 .Combined Effect of Mulching and staking was found to be insignificant in different yield and yield components. The grass cost of cultivation is higher Rs 1, 47,400.00 and Rs.1, 45,500 in 2021-2022 and 2022-23 lower at without mulching Rs. 76,900.00 and Rs. 88,100.00, but it shows that results of mulching with staking practices gross income shows highly difference between experimental plots and check (farmers practices) the gross income was Rs. 875000.00 in 2021-22 and Rs.10,27,000.00 in 2022-23. Farmers got good yield and good income by cultivating tomato with agronomical practices like mulching and staking. The net income gained by farmers was Rs.6, 91,600 and Rs.8, 81,500 in continuous experiments conducted in rabi season of 2021-22 and 2022-23 with mulching and staking practices. Where profitable incomes were recorded in without mulching also but the utmost net income found in experimental plots. Recorded B:C ratio were in 2021-22 for experimental field 1:5.6 and 1:6.05 in 2022-23 where B:C ratio was recorded for Farmer 's practice without mulching 1:4.6 and 1:4.4 but in all the cases showed that tomato is a profitable crop for every horticulture farmer but with the following cultural operations it makes difference in getting yield and income of the farmer. Staking in tomato laborious and laying mulching also needed skills.

Conclusion

Plastic mulching and staking significantly influenced Yield, quality of the fruits and cost and benefit of tomato production. This study has demonstrated that there is hope of sustaining tomato production in rabi season with high quality fruits which gives high returns to the farmers by producing heavy yields. Plastic mulch and staking should recommend for tomato growers where farmers put their efforts in getting good yields and income. It has many benefits to control soil erosion, reduces weed growth and it is highly recommended practice under soil and water conservation practices. The study once again showed

through reducing cost of cultivation and increased beneficial soil micro organisms.

Impact of the study: Based on the results and agronomical practices farmers come forward from Karimnagar district. This technology spread across all vegetable growing fields area of 1956 Ha of Karimnagar district.

References

1. Tipu MMH, Amin M, Dhar M, Alam MA. Effects of mulching on yield and quality of tomato varieties. Research & Reviews: Journal of Agriculture Science and Technology. ISSN: 2278-2206 (online), ISSN: 2349-3682. 2021;275:1-6.
2. Singh B, Kumar M, Singh GC. Effect of different plastic mulches on growth and yield of winter tomato. Indian Journal of Horticulture. 2005;62:200-202. ISSN: 0972-8538.
3. Almasoum AA. Plastic mulch colours effect on yield and quality of tomato. South Indian Horticulture. 1998;46:35-38. ISSN: 0583-8682.
4. Mangal JL, Sidhu AS, Pandey VC. Effect of staking and pruning on growth, earliness and yield of tomato varieties. Indian Journal of Agricultural Research. 1981;15(2):103-106. ISSN: 0367-8245.
5. Preece JE. The biology of horticulture. New York: John Wiley & Sons; 1995.
6. Quinn JC. An evaluation of methods of mulching and staking tomatoes grown during the rains at Sumaru, Nigeria. Horticultural Research. 1973;13:97-104. ISSN: 0018-0971.
7. Ramirez O, Loria Martinez W, Perez Agruedas O. Pruning systems in tomato cv. Tropic. Bulletin Technico, Universidad de Costa Rica, Facultad Agronomica. 1977;10(6):16.