Varietal Response of Turmeric (*Curcuma longa* L.) for spacing under plastic mulching

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Abstract

At the University of Agricultural Sciences, Raichur Karnataka, India during 2020-21 and 2021-22 Salem and Kedaram Turmeric (*Curcuma longa* L.). varieties were studied to know their response for growth and fresh rhizome yield under the different planting geometry of 45 x 30 cm, 30 x 30 cm with plastic mulches of 25 and 30 micron.

Kedaram expressed the significantly higher yield of 15.38 t/ha.(T_3=Kedaram , 30 x 30 cm ,Plastic mulch of 30 micron) followed by Salem with 13.89 t/ha. (T_8=Salem, 30 X 30 cm, Plastic mulch of 30 micron. However, the higher rhizome yield response of Kedaram variety in the experiment might be attributed to the higher plant population under 30 x 30 cm spaced crop with 30 micron plastic mulch which maintained continuous moisture and reduced weed competition. Long durated crops like turmeric need preservation of soil moisture for longer period for growth and rhizome development. The response of both the varieties was significantly higher than the unmulched condition with normal spacing .

Discussion

It was evident from the study that the plastic mulching had influenced significantly on the growth and yield attributes of the Kedaram variety as compared to its cultivation without mulch. The mulched condition would help in continuous supply of moisture throughout the crop duration apart from this the mulches helps in creating a congenial microclimatic condition for plant growth this could be the reason for better plant growth under mulched condition . As the reduced spacing leads to higher plant density which inturn might have contributed for higher rhizome yield per hectare. This could be due to plastic mulch have fully suppressed the weeds growth, check the soil erosion, Greater uptake of nutrients and water availability to plants and thus minimized the crop-weed competition as compared to non-mulched condition. Mulching influenced the plant height and number of leaves per plantThe studies of Mukul Kumar et al.(2018), Annuvarma and sarnaik,(2006) and

Raja Gopala Reddy,(2017) have revealed the similar results in support of the present study.

Introduction

Turmeric*(Curcuma longa* L.) is an important major spice crop of Indian traditional food and is an integral part of the daily diet which possesses the antifungal, antibacterial anti inflammatory and many such medicinal properties preferably finding its use in the pharmaceutical ,cosmetic and drug industries. Its trade in the international market has a considerable share in the GDP from the spice crops.

The successful cultivation of turmeric depends on the scientific adoption and implementation of the defined package s of practice. Turmeric responds best for the improved methods of cultivation. Optimum season, suitable variety soil, water and weed management in the crop cultivation coupled with the effective post harvest handling of the produce adds value to the processed products such as dry rhizomes and powder. The principle compound responsible for its color and properties is said to be curcumin content which ranges from 3.5 to 7.5 depending on the variety ,season and nutritional management of the crop.

Turmeric being the long duration crop of 8 to 11 months which requires the prolonged investment of inputs, labor and adding to the total cost of production. In such an occasion, the objective of getting higher yield of improved quality produce depends mainly on the plant population per unit of area and preservation of soil moisture throughout the crop duration. Turmeric being the high water requiring crop that too for longer duration makes the farmers to use the water economicaly. The moisture preservation practices such as use of either organic or inorganic mulchin g may help in getting higher yield with increased plant population.

Materials and methods

The experiment was planned with the two turmeric vaieties viz. Kedaram and Salem , the y were planted during kharif of 2020-21 and 2021-22.Land was prepared thoroughly with the in carporation of FYM and chemical fertilizers. Planting was done after the installation of drip lines and plastic mulching . of planting was followed through the geometry of 45 X 30 cm and 30 X 30 cm. using the rhizomes. Ten treatments
Imposed ,each replicated thrice in RBD layout . The data were analysed statistically .

T1. V1S1M1	(Kedaram, 45 x 30cm, 25micron)
T2 V1S1M2	(Kedaram,45 x 30, 30 micron)
T3 V1S2M1	(Kedaram, 30 x 30 , 25micron)
T4 V1S2M2	(Kedaram, 30 x 30 , 30micron)
T5 V2S1M1	(Salem, 45 x 30,25micron)
T6 V2S1M2	(Salem, 45 x 30,30micron)
T7. V2S2M1	(Salem, 30 x 30,25micron)
T8. V2S2M2	(Salem, 30 x 30,30micron)
T9. V1S1	(Kedaram, 45 x 30cm, Without)
T10 V2S1	(Salem,45 x 30cm,Without mulch)

Results

The results of the study during 2020-21 and 2021-22 revealed the significant variation in growth and yield and other parameters. plant height ,nomber of leaves per plant nomber of tillrs per plant were differed significantly at all the stages of growth. There was higher fresh rhizome yield of 15.38 t/ha.under closed spacing of 30 X 30 cm. which might be due to more nomber of plants /hectare(111111pl/ha where as in other spacing 74075 pl/ha.) The economics of cultivation under plastic mulching also revealed the higher B:C ratio of 1.62.Hence the T3 treat ment was beneficial.

Conclusion

The cultivation of turmeric variety Kedaram would be effective under plastic mulching of 30 micron and with a spacing of 30 X 30 cm. for better plant growth, rhizome yield and profit of its cultivation. Closed spacing though creates competition between plants for natural resources the availability of moisture for the plants throughout growing period is possible through plastic mulching which prevents the loss of soil moisture through evaporation . Hence, turmeric cultivation could be renumerative using Kedar variety with spacing of 30 x 30 cm grown under plastic mulch.

References

Annu Varmal and A. Samaik,2006, Effect of different types of mulcheson growth and yield of *turmeric(Curcuma longa* L.)Internat.J.agric.sci.2(2):425:426

Rajagopalareddy,K.N.,Tiwari and Santosh D. T.,2007, Yield response of *turmeric(Curcuma longa* L.)under drip fertigationand plastic mulch condition,Int.J. Pure App. Biosci.5(4): 1265-1269

Mukulkumar, Swapnal Dubey, p. K. Dwivedi, A. K.Yadav and Mohit kumar,2018, Influence of different mulch materials on vegetative growth and yield of *ginger(Zingiber officinale* Rose.)under drip irrigation system. Int J. Curr. Sci,2018, 7(2): 2546-2551