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SPATIO-TEMPORAL ANALYSIS OF TUR CROP IN JALNA DISTRICT OF MAHARASHTRA STATE

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Abstract

Agriculture is the main occupation of India and it is through this that humans get their food. Maharashtra plays an important role in the production of Tur. There is financial benefit from this product. Moreover, Tur Dali has a different importance in various ways.

At one time the average yield of Tur was 4 quintals per acre. Now there are farmers who are taking this production up to 20 to 25 quintals using latest technology. In agriculture, crops such as sugarcane and grape produce a large amount, but due to drought, the farmer is facing problems due to the problem of water. Horticultural farmers are also now turning to tur production in a big way as an alternative crop.

Present paper reveals the spatial and temporal analysis of Tur crop in Jalna district of Maharashtra state.

Keyword

Tur, Agriculture, Spatial, Temporal, Concentration, Productivity, Cultivated

Introduction

The history of Tur is very ancient. Tur is mentioned in Buddhist literature as well as in the Charaka Samhita, four hundred years before Christ. It is considered as the most protein producing crop at low cost. Therefore, Tur dal is the most included in the meal.

Tur dal is used everywhere from the poor to the rich. Tur is said to be primarily an African crop, but new research suggests that it is an Indian crop. Tur is produced during Kharif season. Generally, Tur is sown in the first fortnight of June. Medium to heavy soils and well drained soils are preferred.

Present paper is based on the cultivation and Concentration of Tur crop in Jalna district of Maharashtra state.

Objectives

The main objectives of the present research paper as follows,

1) To study cultivation of Tur crop in Jalna district
2) To discuss the concentration of Tur crop in Jalna district
3) To analysis the production of Tur crop in Jalan district
4) To calculate productivity index of Tur crop in Jalna district

Data Source and Methodology

Discussion of present research work is mainly based on the secondary data. Related data is compiled from 'Crop and Seasonal Report', Jalan district, Socio-economic Review.

Concentration index of Tur crop is calculated by using Bhatia's method with the help of following formula,

$$\textbf{Concentration} = \frac{\textbf{Tur Cultivation in 'a' Tehsil}}{\textbf{Total Crop Area in 'a' Tehsil}} \div \frac{\textbf{Tur Cultivation in Entrire District}}{\textbf{Total Crop Area in Entire District}}$$

Productivity index of Tur crop is calculated by Mohammad Shafi's method by using following formula,

$$\textbf{PI} = \frac{\textbf{Y}}{\textbf{Yn}} \div \frac{\textbf{T}}{\textbf{Tn}}$$

PI – Productivity Index

Y – Yield of crop in unit area

Yn – Yield of crop in entire area

T- Area under crop in unit area

Tn – Area under crop in entire area

Collected and calculated data is arranged in table and distribution is shown in the map of the study region. The analysis is based on the data year 2011 and 2021.

Study Region

Jalna district is the part of Marathwada region of Maharashtra state. District is lies in between 19^0 13' north latitude to 20^0 35' north latitude and 75^0 33' east longitude to 76^0 30' east longitude.

District covered total 7687 km^2 area and total population of the district according to the census 2011 is 1959046 and out of them male population is 1011473 and female population is 947573. District is abounded Aurangabad district towards west, Beed district to south, Parbhani towards east and Buldhana towards north and east.

Tur Cultivation in Jalna District

Tehsil wise area under Tur and their share in total cultivated area is presented in table no.1

Table No. 1

Jalna District – Area Under Tur Crop (2011 – 2021)

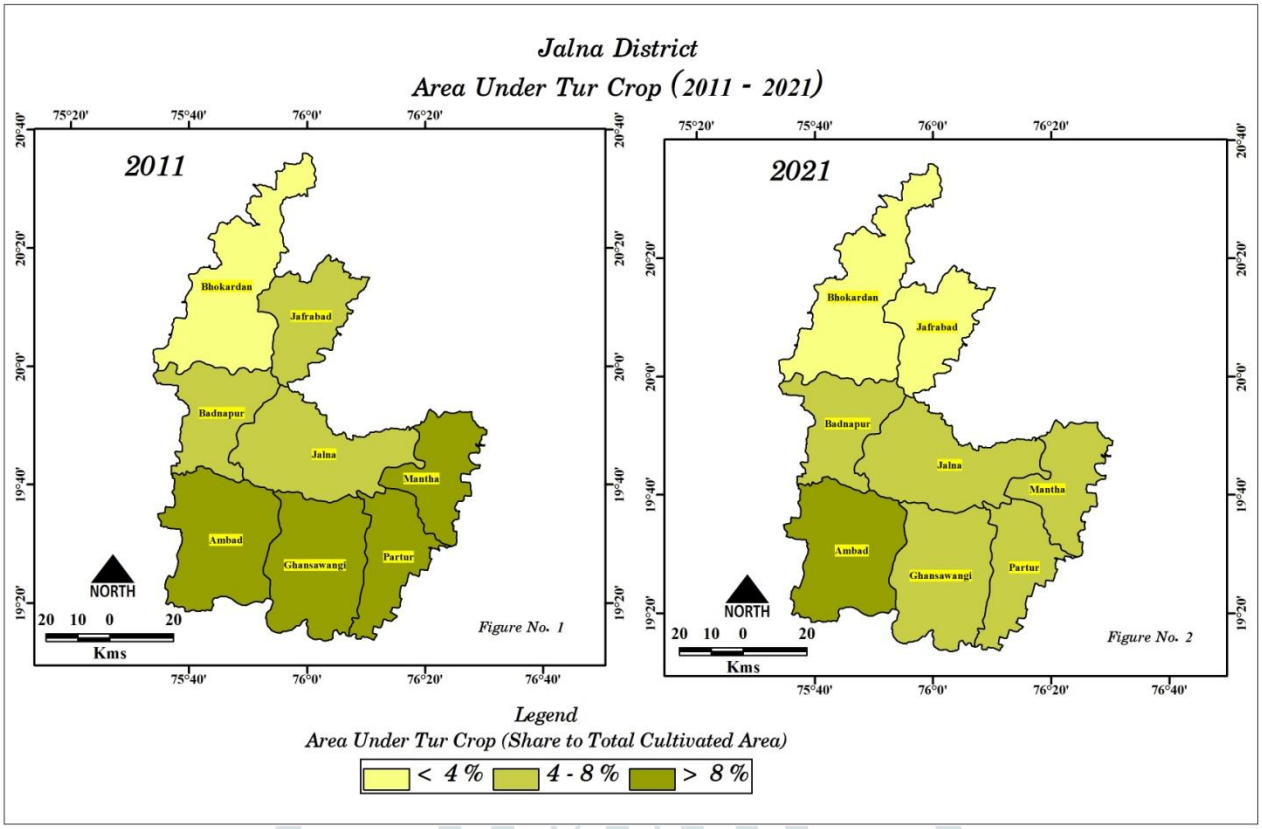
Tehsils	2011		2021	
	Area (Hector)	Share to Total Cultivation %	Area (Hector)	Share to Total Cultivation %
Bhokardan	4400	3.70	3400	1.89
Jafrabad	4500	4.83	2809	2.73
Jalna	9200	6.93	6434	4.67
Badnapur	5900	6.80	4673	4.59
Ambad	11100	9.82	12704	8.71
Ghansawangi	8800	8.04	8503	5.95
Partur	10500	9.87	5497	5.69
Mantha	9300	9.97	6315	5.99
Total	**63700**	**7.46**	**50335**	**4.97**

Source – Crop and Seasonal Report, Jalna District (2011, 2021)

In 2011 total 63700 hector area was found under Tur cultivation and its share to total cultivated land was 7.46%. In 2021 Tur cultivation was 50335 hector and decreased than 2011. The share to total cultivation was 4.97%.

In 2011 Ambad (9.82%), Partur (9.87) and Mantha (9.97%) these three tehsils having 9 to 10% cultivation under Tur crop. Ghanaswangi (8.04%), Badnapur (6.80%), and Jalan (6.93%) tehsil found 6 to 9% cultivation of Tur. Bhokardan (3.70%) and Jafrabad (4.83 %) tehsils found lowest share of Tur crop, Bhokardan recorded less than 4 % land under Tur crop in 2011.

In 2021 area under Tur crop was decreased in every tehsil of the district. In 2021 Ambad (8.71%) tehsil again recorded highest share of Tur crop in total cultivation than other tehsil. But this share was decreased by 1.09% than 2011. Mantha (5.99%), Ghanasawangi (5.95%0 and Partur (5.69) tehsil was found 5 to 6% area of otal cultivation in Tur crop. Badnapur (4.59%0 and Jalna (4.67%) tehsil was fund 4 to 5% and Jafrabad (2.73%) and Bhokardan (1.89%) less than 3% area under Tur crop in their total cultivated area. Bhokardan was also lowest in 2021.



Concentration of Tur Crop in Jalna District

Concentration of Tur crop in the year 2011 and 2021 is presented in table no. 2

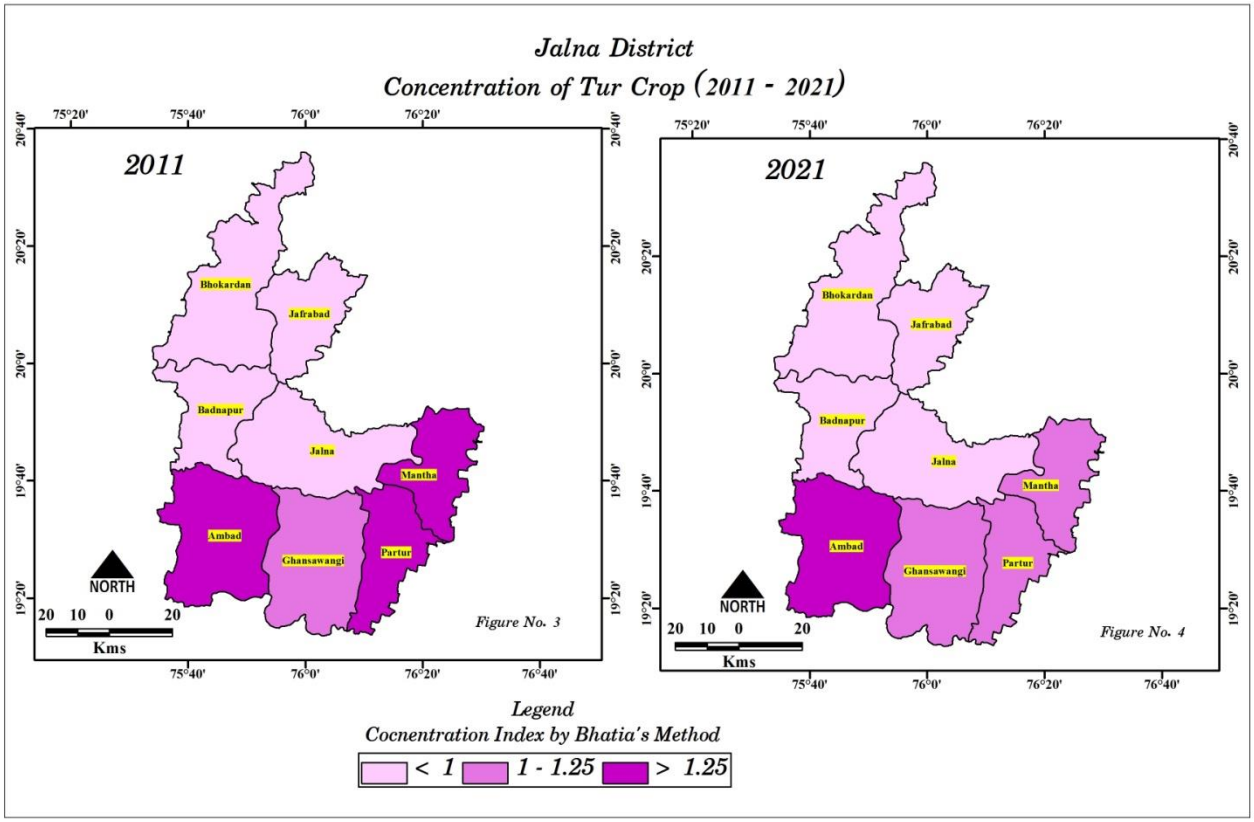
Concentration index of Tur crop is decreased in 2021 than 2011 in maximum part of the district, because the share of Tur crop is degraded in total crop land.

Table No. 2

Jalna District – Concentration of Tur Crop (2011 – 2021)

	Concentration Index by Bhatia's Method	
Tehsils	**2011**	**2021**
Bhokardan	0.50	0.38
Jafrabad	0.65	0.55
Jalna	0.93	0.94
Badnapur	0.91	0.92
Ambad	1.32	1.75
Ghansawangi	1.08	1.20
Partur	1.32	1.14
Mantha	1.34	1.21

Source – Calculated by Author



In the year 2011 mantha (1.34), Partur (1.32), Ambad (1.32) and Ghanaswangi (1.08) tehsil recorded this index more than1. While remaining tehsils found index less than 1. Bhokardan (0.50) tehsil found lowest concentration of Tur in the district.

In the year 2021the picture of the concentration is near about same as 2011. This year Ambad tehsil (1.75) recorded highest index and this index is increased than 2011. Although the area of tur crop decreased during this period, the area of tur cultivation in Ambad tehsil was high in the total district. Therefore, this index is seen to be increased. Ghanaswani (1.20), Partur (1.14) and Mantha (1.21) thesil recorded this index more than 1. In this only Ghansawangi tehsil has increased this index.

In the year 2021, this index was less than 1 as in 2011 in other tehsils. The index increased marginally in Jalna (0.94) and Badnapur (0.92) tehsils, while it decreased in Jaffrabad (0.55) and Bhokardan (0.38). During this period also the concentration of tur crop was least in Bhokardan (0.38) tehsil.

Production of Tur Crop in Jalna District

Table no. 3 indicated the tehsil wise production and productivity index of Tur crop in the district.

Table No. 3

Jalna District – Production and Productivity of Tur Crop (2011 – 2021)

Tehsils	2011		2021	
	Production (Metric Tons)	Productivity Index by Shafi's Method	Production (Metric Tons)	Productivity Index by Shafi's Method
Bhokardan	4074	0.90	5423	1.30
Jafrabad	5486	1.19	4143	1.20
Jalna	11840	1.25	7532	0.95
Badnapur	7036	1.16	5646	0.98
Ambad	12468	1.09	16324	1.04
Ghansawangi	5148	0.57	9421	0.90
Partur	12789	1.19	6676	0.99
Mantha	6600	0.69	6774	0.87
Total	**65441**	**-**	**61940**	**-**

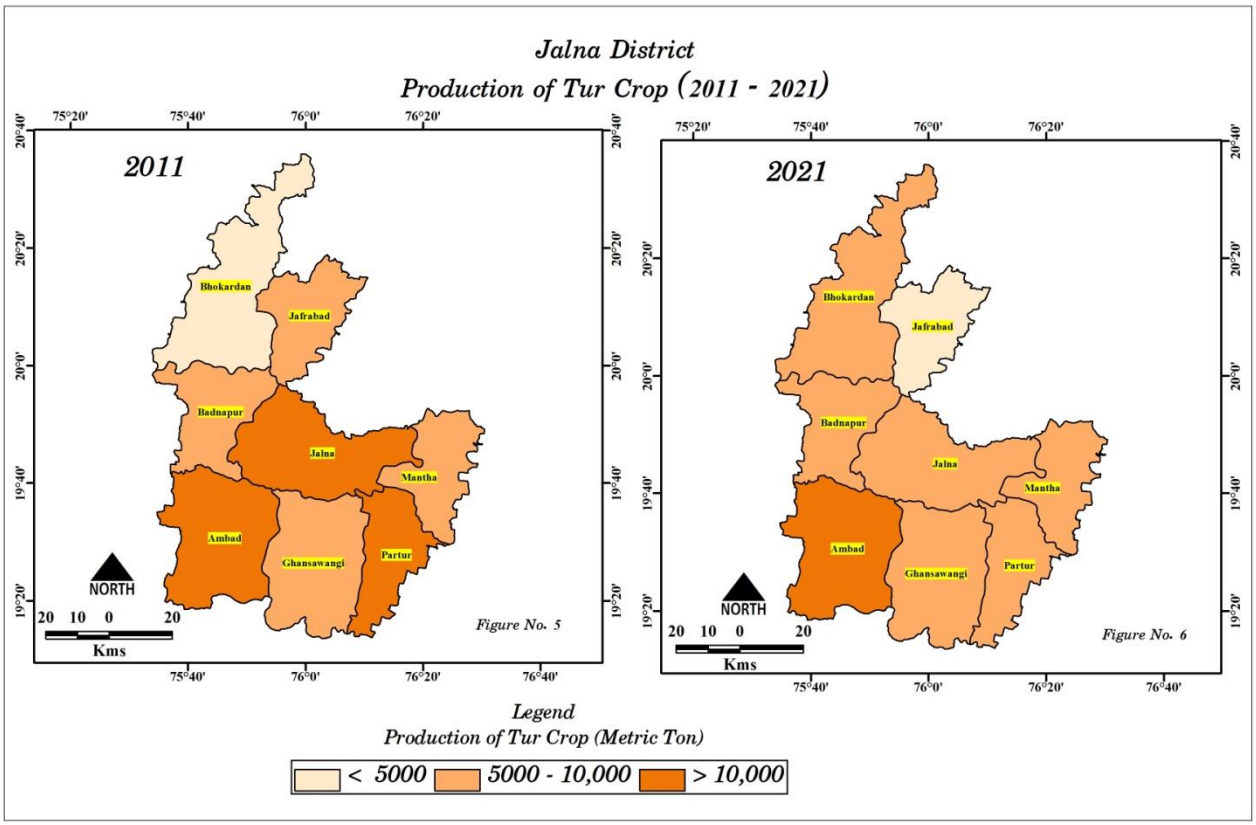
Source – Data is compiled from Crop and Seasonal Report, Jalna District (2011, 2021) and Productivity Index is calculated by Author

Production of Tur (2011 – 2021)

In Jalna district, total production of tur crop was 65441 metric tons in 2011 and 61940 metric tons in 2021. Compared to the year 2011, the production was down by 3501 MT, as the cultivation of tur also decreased.

In the year 2011, more than 11 thousand metric tons were produced in Ambad (12468), Partur (12789), and Jalna (11840) tehsils. Also in Badnapur (7036), Mantha (6600), Jafrabad (5486), the production was more than 5 thousand metric tons. The production is lowest in Bhokardan (4074) tehsil which is less than 5000 MT. Bhokardan tehsil also had the least amount of tur cultivation.

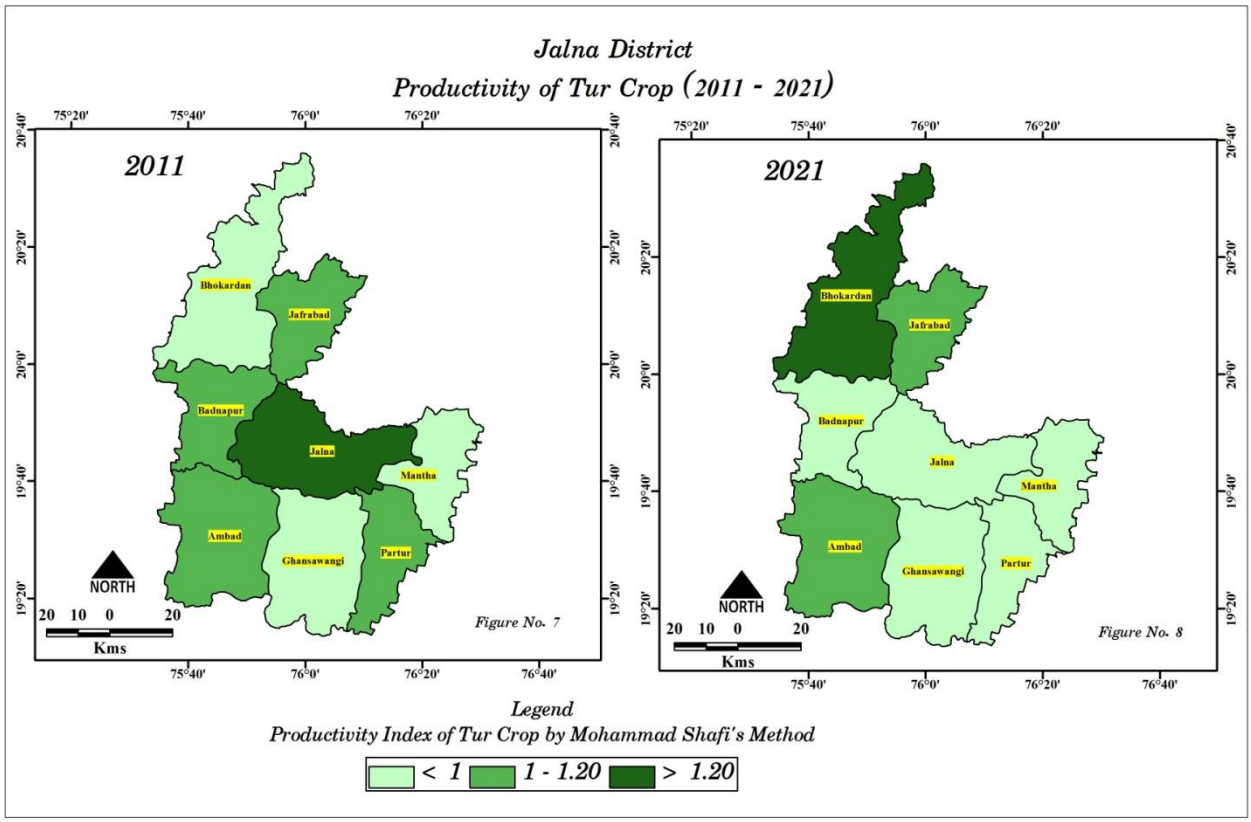
In the year 2021, the total production of tur crop in a single tehsil of Ambad (16324) was more than 15 thousand metric tons. Also, compared to the year 2011, the production in this tehsil had increased by 3856 metric tons. In other tehsils of the district, the production of tur crop in the year 2021 was found to be less than 10 thousand metric tons. During this period, total production of tur crop increased in three tehsils namely Bhokardan, Ghanasawani and Mantha after Ambad in the district. In Bhokardan tehsil, the area of tur crop is the least, but the production is seen to increase in 2021. In other tehsils, however, the production of tur crop was reduced.



Productivity of Tur (2011 – 2021)

There is a variation in the productivity index of tur crop in the district both during 2011 and 2021. In all the tehsils of the district, the cultivation area of tur crop has decreased in 2021. But in some tehsils, despite the decrease in cultivated area, production increased. Therefore, with the increase in productivity per hectare, this index is also seen to increase.

In the year 2011 Jalna (1.25), Partur (1.19), Jafrabad (1.19), Badnapur (1.16), and Ambad (1.09), the productivity index of tur crop was more than 1. It was found high in Jalna Me. In other tehsils i.e. Bhokardan (0.90), Mantha (0.69) and Ghanasawangi (0.57) the index was less than 1.



In the year 2021, the index was more than 1 in Bhokardan (1.30), Jafrabad (1.20) and Ambad (1.04) tehsils. Whereas in Bhokardan adn Jafrabad tehsil, this index was increased as compared to 2011, as the production increased despite the reduction in tur cultivation in these two tehsils. Productivity index in Ambad tehsil was slightly lower as production increased but it was less compared to the total production of the district. In the tehsils of Partur (0.99), Badnapur (0.98), Jalna (0.95), this index was between 0.90 and 1 and there was a decrease in it. The index was lowest in Ghanaswangi (0.90) and Mantha (0.87) tehsils, but increased compared to 2011, as production also increased.

Conclusions and Suggestions

The area under tur crop and production in Jalna district has decreased in the last ten years. However, in the tehsils of Ambad, Ghanaswangi, Bhokardan and Mantha in the district, the production of tur has increased even though the cultivation rate has decreased. Therefore, the production capacity per hectare has also increased. That is, if proper planning is done by increasing the area of tur crop in this tehsil, the productivity of tur crop will increase in this tehsil. Also it will benefit the farmers by getting the right guaranteed price.

In Ambad tehsil in the district, the area and production of tur crop is more during both periods. Also, production has increased even though the area has decreased. That means the climate and soil in this tehsil is suitable for the growth of tur crop. Therefore, it is necessary to find out the exact reason for the decrease in the area of tur crop.

Also it is necessary to increase the area of tur crop and arrange proper fertilizers. The production of tur crop can be further increased in this tehsil by intercropping tur with tur. The following measures need to be taken for the growth of tur crop in the district.

✓ If rainfall is low during the monsoon season and the land is moderately shallow, the moisture does not persist for long. If the soil moisture is too low and watering too late after flowering, the tur will bloom profusely. To avoid this, protect water should be given before the soil moisture decreases and at the beginning of flowering.

✓ In dry land areas, if there is no chance of rain and irrigation facilities are available, first water should be given to the early growing turi crop at budding, second water at flowering and third water at the time of grain filling or two percent urea should be sprayed. Hence, the crop production increases more. Care should be taken that water does not accumulate in the crop while giving water.

✓ Spray growth promoter NAA (Naphthalic Acetic Acid) at the rate of 20 ppm (20 ml NAA in 100 liters of water) to reduce flowering. This can reduce the swelling to some extent.

✓ Farmers who have cultivated tur horticulturally should irrigate the crop at least three times. For that, growth stages should be taken into account. So that the exact amount of water to be given can be determined. Watering at the bud stage, 50 percent flower and pod development stage and grain filling stage increases yield.

In this way, if the area under tur crop is increased by taking appropriate measures, the concentration and production of the crop will increase, at the same time it will help to increase the production capacity of tur crop per hectare.

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