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Study on package of practices adopted by ginger growers of Satara District

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Abstract

The survey on Adoption of package of practices in ginger was conducted in three Talukas viz Satara, Koregaon and Karad comprising 12 villages. of Satara District. Present survey was an approach, which can be gainfully employed by extension functionaries and farmers to analyze the field situations with regards to cultivation practices, pests, soil conditions, plant health and the influence of climatic factors and their relationship for growing a healthy crop. Majority of farmers (43.24 percent) have 10 R size of area under ginger cultivation. All respondents replied that seed replacement ratio is very high. Among all the disease complex, rhizome rot and blight causes maximum damage (100 percent). The survey also revealed that about 90 % of the farmers sell the product in fresh form and none of the farmer was involved in processing. Majority of farmers follows perenated cropping system when rates are low. Future thrust should be on Integrated Nutrient Management especially well decomposed organic manures and biofertilizers based on the soil test results with efficient utilization of drip system for fertigation.

Keywords: Ginger, Fertigation, Rhizome

Introduction

Ginger (*Zingiber officinale* Rosc.) (Family: *Zingiberaceae*) is an herbaceous perennial, the rhizomes of which are used as a spice. India is a leading producer of ginger in the world. Ginger is cultivated on area of 1, 05,500 hectares with production of 5.17 lakh tonnes in India (Salunke,2017). States namely Karnataka, Orissa, Assam, Meghalaya, Arunachal Pradesh and Gujarat together contribute 65 per cent to the country's total production.

In Satara District, the Ginger has been produced as an important commercial spice crop. Farmers produce different varieties and apply traditional management practices. To have a systematic knowledge and adoption of recommended technology of ginger this survey was carried out in major ginger producing areas of the region with the objectives of identifying pre and post-harvest management practices, processing techniques and marketing factors.

Objectives

1. To study the profile of ginger farmers.
2. To know the constraints experienced by the ginger growers.
3. To obtain the suggestions and strategy to be adopted for future research and extension work.

Methodology

The study was mainly confined to three Talukas of Satara District. In Three Talukas, Satara, Koregaon and Karad 12 villages were surveyed .A brief questionnaire regarding technological details were prepared. With the help of questionnaire one to one ginger growing farmers were interviewed. Respondents were selected by random sampling method.

Field preparation and Planting system: In Satara, the general tendency of the farmers is to select small rhizomes and raised bed method of planting for ginger cultivation is followed. It is customary to plant ginger in the dry months. Planting commences with the local festival *AkshayTrithiya* (i.e. from second week of May to First week of June).With the help of tractor drawn implement FYM /Press mud cake/Compost is well mixed with soil. Plant population and spacing varies with irrigation system. In sprinkler seed rhizome are placed at a distance of 22.5 cm x 22.5 cm and in case of drip system spacing followed are 30cm x 22.5 cm and 30cm x 30 cm with depth of 10 cm to 15cm.

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Seed Rhizome Storage: Ginger is always propagated by portions of the rhizomes, known as seed rhizomes. There is a gap of 2 to 3 months between harvesting and planting of ginger. The rhizomes are preserved during this period. The rhizomes to be stored are heaped and are allowed to dry in a shady place for 02 months. The indoor storage method is common practice that most farmers are practicing in the region. Rhizomes of the previous crop are harvested in month of February/March. Once sprouting is initiated, during planting time, the sprouted rhizomes are cut into pieces of the required sizes and are immediately planted. In this case, it takes 15-21 days for the emergence of the new plants.

Findings

The information on package of practices adopted by farmers were collected with the help of specially designed schedule through face to face interview method. The result of distribution of respondents according to practices adopted by farmers are presented in tables.

Area under ginger crop

Table 1: Distribution of farmers according to area under ginger crop

Sr. No	Size	Farmers (N= 74)	
		Number	Percentage
01	10 R	32	43.24
02	20 R	18	24.32
03	30 R	12	16.21
04	40 R	10	13.51
05	More than 40 R	02	02.70

Land is fragmented and land holding is very small in Satara District. From table 1, it is found that majority of farmers (43.24 percent) have 10 R size of area under ginger cultivation. Out of 74 farmers under survey have 32 of size 10 R followed by 18 R (24.32 percent). The aforesaid survey reveals that the cost benefit ratio (CBR) changes according to the different size of holdings in ginger cultivation. Pawar and Phule (2001) reported that size of holding is crucial socio economic criterion providing the base for production efficiency in agriculture and guides the motivations and production efforts of farmers with regard to the choice of agricultural enterprises and production techniques.

Source of planting material

Table 2: Distribution of farmers according to procurement of planting material

Sr. No	Source of planting material	Farmers (N= 74)	
		Number	Percentage
01	Self	03	04.00
02	Relatives/Friends	42	56.75
03	Government Agency	00	00
04	Traders	27	36.48
Total		74	100.00

Seed replacement ratio is very high. One half of the farmers (56.75 percent) have purchased from friends and relatives and remaining farmers purchased from the farmers of Kannad Tehsil, District Aurangabad. (36.48 percent). When the reason was asked to the farmers regarding high seed replacement ratio, they replied that rhizome replaced from different soils, climate had a positive impact on the yield.

Size of Rhizome

Table 3: Distribution of farmers according size of rhizome used for planting

Sr. No	Size of rhizome(gm)	Farmers (N= 74)	
		Number of farmers	Percentage
01	10-20	00	--
02	20-30	29	39.18
03	30-40	31	41.89
04	40-50	14	18.91
Total		74	100.00

Rhizome size weighing 20-40 gm with two to three sprouts are used for planting by majority of farmers. Rhizome size is an important factor to have a good yield. It might be due to the fact that plants produced from the largest rhizome size emerged earlier and showed vigorous and rapid growth using the initial reserve food materials in it. It is observed that rhizome sizes and planting methods have significant influence on the growth and yield of crop (Girma and Kindie, 2008). It is likely that both the factors have similar effects on the yield of ginger. Rhizome size influences greatly on ginger growth and yield.

Farmers adoptability for rhizome treatment

Table 4: Farmers adoptability for rhizome treatment

Sr.No	Particulars	Farmers (N= 74)	
		Number	Percentage
01	Pesticide Treatment. (Carbendazim & Quinolphos)	36	48.64
02	Biofertilizer Treatment Azospirillum /Azatobacter + PSB	18	24.32
03	Both (Sr.No1 and 2)	11	14.86
04	None	09	12.16

Out of 74 farmers under survey 48.64 percent farmers adopted the rhizome dipping treatment of Carbendazim (to protect against wilt) and quinolphos (to protect against rhizome fly) before planting in field. From Table 4, it is also revealed that 14.86 % farmers adopted both biological and chemical seed treatment. Ginger rhizomes dipped in 0.2 % copper oxychloride, 1 % Bordeaux mixture, 0.1 % chlorothalnil, 0.01 % metalaxyl MZ, 0.25 % mancozeb or 0.1 % Emison were found effective in the reduction of ginger rhizome rot caused by *P. aphanidermatum* and increased yield (Jayasekhar et al., 2001).

Farmer's adoption of ginger varieties

Table 5: Distribution of farmers according to adoption of varieties

Sr. No	Varieties	Farmers (N= 74)	
		Number	Percentage
01	Satara Mahim (local)	34	45.94
02	Godhra	03	04.00
03	Aurangabadi(local)	31	41.89
04	Maran	06	08.10

From the table 5 it is observed that local variety of these region Satara Mahim is highly adopted by farmers. As per table 5 it is observed that majority (45.94 percent) planted *Satara Mahim* variety, followed by *Aurangabadi* (41.89 percent) each. The variety Godhra is planted by 03 farmers. It is presumed by farmers that variety 'Godhra' performs well in soils having high calcium content. Salunke,(2017) reported that the Maran variety recorded 39,727 kg./ha, Godhra (38,129 kg./ha) and Udaypuri recorded 37,000 kg /ha. Lowest yield per hectare has been observed from Mahim locally called Satari in Satara district is 29,441 kg/ha and Mahim locally called Aurangabadi in Aurangabad district is 31,102 kg./ha.

Irrigation management

Table 6: Distribution of farmers according to means of irrigation

Sr. No.	Method of irrigation	Farmers (N= 74)	
		Number	Percentage
01	Drip	48	64.86
02	Mini Sprinkler	18	24.32
03	Drip +Mini Sprinkler	08	10.81
04	Ridges and furrow	00	00.00
Total		74	100.00

It is observed from table No.06 that 64.86 percent farmers use drip and 24.32 percent farmers uses mini sprinkler for irrigation purpose. In initial stage of this crop, to cope with high temperature 10.81 percent farmers used both Drip and Mini Sprinkler for irrigation purpose. Ridges and furrow is not generally adopted for irrigation of ginger crop in Satara District.

Source of Organic Manure

Table 7: Distribution of farmers according to organic manure used

Sr. No.	Type of manure	Farmer (N= 74)	
		Number	Percentage
01	FYM	35	47.29
02	Poultry Manure	04	05.40
03	Press Mud Cake	22	29.72
04	Combination of FYM and Neem cake	13	17.56
05	Combination of Press Mud Cake and Neem cake	00	00.00
	Total	74	100.00

As per the table No. 7 it is seen that all 100 percent farmers used Organic manure. Non-availability of cattle manure is one of the important problems of ginger growers. It has been a usual practice in ginger production to give a combination of organic and chemical fertilizers. Due to non availability of quality FYM and sugar factories are located in adjoining area, majority of farmers use press mud cake (29.72%) where as neem cake is used during earthing up operation in combination with organic and inorganic source.

Organic manure application is able to increase the fresh weight of the ginger rhizome. Increased growth and yield of ginger in medium with manure may occur due to the availability of some nutrients in the growth medium. Singh (2015) reported that soil application of organic manure and recommended dose of chemical fertilizer i.e. integrated nutrient management showed significant effect on growth and yield of ginger.

Fertilizer application method

Table 8 : Distribution of farmers according to Fertilizer application method

Sr. No.	Type of manure	Farmer (N= 74)	
		Number	Percentage
1	Drenching	08	18.6
2	Fertigation	74	100
3	Spray	18	41.86
4	Combination of 1,2 and 3	8	18.6

From table No. 08 it is observed majority of farmers having drip irrigation system to fertigate the ginger crop. In addition to this 41.86 percent use foliar spray and 18.6 percent farmers apply fertilizers through drenching .It also shows that 18.6 percent farmers use all the three methods for fertilizer application. Farmers not having drip irrigation system apply water soluble fertilizers through drenching method in combination with fungicides. Basal dose and top dressing of fertilizers is applied through broadcasting method. Ginger cultivation using fertigation technology is proven to improve ginger yield and less prone to rhizome rot. The high cost or initial capital will be offset by high production yield.

Table 9: Distribution of farmers according to Technical guidance for fertilizer

Sr. No	Particulars	Farmers (N=74)	
		Number	Percentage
1	KrishiVigyan Kendra	14	18.91
2	Agri. Dept.	11	14.86
3	Private Agro service centre	21	28.37
5	Self Experience	28	37.83
	Total	74	100.00

It is revealed from Table No. 9 that majority of farmers (37.83 percent) rely on self experience for technical guidance regarding fertilizer application, while 28.37 percent farmers depend on private agro service centres. It also showed that 18.91 percent farmers prefer technical guidance from Krishi Vigyan Kendra, Bargaon centre followed by Agriculture Department (14.86 percent).

Maximum Damage Caused by Diseases to Ginger

Table 10: Distribution of farmers according to diseases damage

Sr. No.	Diseases	Number	Percent Incidence
1	Rhizome rot	74	100
2	Blight	74	100

As per the survey all respondents replied that, among the all disease complex, rhizome rot and blight causes maximum damage (100.00 percent). Cost of cultivation is significantly increased for management of this disease. Severity of disease sometimes becomes unmanageable.

Various pests and fungi destroy the crop quantitatively and qualitatively. Many diseases are seed borne and soil borne. The main insect pest found in this plant is shoot borer, leaf roller and rhizome fly. The major diseases in ginger are rhizome rot and blight. Bheemudada (2016) during his studies in Northern Karnataka reported that majority of ginger growers expressed that non-availability of pest and disease resistant variety of ginger is a major concern.

Yield of ginger crop

Table 11: Distribution of farmers according to Yield of ginger (MT)/ ha

Sr. No.	Yield of ginger per ha	Farmers (N=74)	
		Number	Percentage
01	Less Than 25	05	06.75
02	25-30	12	16.22
03	31-35	24	32.44
04	36-40	17	22.98
05	41-45	10	13.51
06	More than 45	06	08.10
	Total	74	100

One half (55.40 percent) of farmers under survey have yield per plant in the range of 31-40 MT / ha. Salunke (2017) reported an average yield of 35.18 MT/ha in the study region.

Ginger is traded in three basic forms – green (fresh), dried and processed.

Three types of fresh ginger products are supplied to market in these areas.

- 1) If ginger rhizome starts rotting in the field due to fungal disease, farmers dig this rhizome right from 5th month onwards
- 2) After nine months of planting rhizome has full aroma, flavor, pungency, when the leaves begin to turn yellow and prices are fair then farmers dig out and sell in the local market.
- 3) If market prices are not fair then perennated crop is practiced and crop is left till the month of July or August and irrigated periodically. In perennated system farmers deliberately leave the matured ginger rhizomes in the field for two or more successive seasons without harvesting, speculating high market price.

The survey conducted as part of this study has found that all the farmers sell the product in fresh form. The cultivators sell fresh ginger either to the village merchants or small traders in nearby towns. The wholesale traders of these markets dispatch the product to consuming centres in other states. The farmers have no control over ginger prices.

Village merchants have a major role in assembling the product. Most of the producers depend on the fellow cultivators or on the village merchants to know the prevailing prices. Out of the surveyed farmers none of the farmer was involved in processing.

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