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Analysis of technology gap with respect to pesticides and chemical fertilizers of ginger (*Zingiber officinale*)

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Abstract
India is a major producer and consumer of ginger, accounting for about 21 per cent of the global production, followed by China, Nepal and Indonesia. In India it is growing on an area of 1.42 lakh hectares with production 7, 63,000 tonne (Anonymous, 2016). The study was conducted in Shivamogga district of Karnataka State during the year 2016-17. Ex-post facto design was decided to be used for the present study. The total sample size of respondents is 120. Majority of the respondents (74.16%) belonged to medium category of technology gap followed by 16.67 per cent of the respondents belonged low category of technology gap and 9.17 per cent of the respondents belonged to high technology gap category. Regarding Land preparation, cent per cent of the ginger growers had adopted recommended practice of size of bed for planting rhizomes and filling material used in bed, suitable soil for ginger crop and 6.67 % of technological gap was observed regarding ploughing of the land. it was revealed that there was no technological gap found regarding correct time of planting Rhizomes, spacing , seed treatment, and the least gap was found in rhizome weight(0.83%)and there was 100.00 per cent technological gap regarding the quantity of rhizomes used per acre. In case of irrigation and weeding, higher technological gap (99.20%) was found. There was a least (0.83%) technological gap found regarding the use of control measures for the major pest shoot borer.

Keywords: Technological gap, Zinger, Fertilizer

Introduction
India is a major producer and consumer of ginger, accounting for about 21 percent of the global production, followed by China, Nepal and Indonesia. In India it is growing on an area of 1.42 lakh hectares with production 7, 63,000tonne (Anonymous, 2016) [2].
Indian economy is vitally linked with agricultural development. 75 per cent of the population is directly or indirectly dependent upon agriculture. It is often seen that a good harvest leads to economic stability, its failure spells havoc. Educating farmers about scientific farming, for increasing production to replace traditional methods followed earlier, in order to increase agricultural production and to bring awareness for adoption of scientific methods, an agricultural extension education plays an important role to educate farmers to equip them with knowledge to adopt scientific technologies.

Methodology
The study was conducted in Shivamogga district of Karnataka State during the year 2016-17. Shivamogga district was purposively selected as it had the largest cultivable area and production of ginger in Karnataka. Out of these seven taluks, Shikaripura and Hosanagara were the major area covered under ginger cultivation. Taking in to consideration the highest production as the criteria, Shikaripura (13710.00 tons), Hosanagara (12260.00 tons) taluks from Shivamogga district were selected for the study. From each taluk 60 ginger growers were selected. Thus, the total sample size of respondents is 120.Ex-post facto design was decided to be used for the present study.

Result and Discussion

Table 1: Overall Technology gap in Ginger cultivation among ginger growers N=120

Category	Range	Frequency	Percentage
Low	<0.33	20	16.67
Medium	0.33 – 0.34	89	74.16
High	>0.34	11	9.17

It shows that majority of the respondents (74.16%) belonged to medium category of technology gap followed by 16.67 per cent of the respondents belonged low category of technology gap and 9.17 per cent of the respondents belonged to high technology gap category.

Table 2: Technological gap regarding specific recommended practices of Ginger cultivation N=120

Sl. No	Recommended practices	Technology gap	
		Frequency	%
1.	Land preparation- 4 to 5 times ploughing	8	6.67
2.	Soil- loamy is the best suited	0	0
3.	Rain- moderate is preferable	0	0
4.	Variety- Himachala	0	0
5.	Sowing time- last 15 days of April and first 15 days of May	0	0
6.	Bed size- 1meter width,15cm height, between beds spacing is 50 cm 3-5 m Long and 3 m width	0	0
7.	Mulching- paddy straw	1	0.83
8.	Alternate crops-ragi, paddy, sesame, maize	0	100.00
9.	Inter crops- ragi, toor dal or pigeon pea	0	0
10.	Rhizomes- 1500 kg per ha	120	100.00
11.	FYM- 25 tonnes per ha	120	100.00
12	N:P:K – 150:50:50	120	100.00
13.	Rhizome weight- 15- 20 gm	1	0.83
14.	Seed treatment- for one lt,add 2 gm of bleaching powder,1 gm of metaloxil,1 gm of streptocyclinfor 30 mins and dry under shade	0	0
15.	Irrigation- once in 6 to 8 days	119	99.20
16.	Weeding- 2 to 3 times	119	99.20
17.	Plant protection- A.PESTS 1.Shoot borer– 1.7 ml Dimethoate 30.EC,1 ml Monocrotophos,2ml Malathion to one liter	1	0.83
18	2.Leaf roller- 1.7 ml Dimethoate 30.EC,1 ml Monocrotophos,2ml Malathion to one liter	0	0
19	1.Soft rot- trichoderma 1 kg per acre, for disease infested beds, drench one liter of copper oxichloride, seed treatment should be done,	0	0
20.	2.Leaf spot- trichoderma 1 kg per acre, for disease infested beds, drench one liter of copper oxichloride, seed treatment should be done,	0	0
21.	Harvesting- eight months	119	99.20
22.	Processing	120	100.00
23.	Storage	120	100.00

Technological gap regarding specific recommended practices of Ginger cultivation the information with respect to the technological gap for different practices of Ginger cultivation is presented in Table 2. Regarding use of recommended variety, there was no technological gap observed. It means, cent per cent of the Ginger growers had adopted recommended variety viz., Himachal. Since farmers are more prone to make a profit out of the production they were aware of the variety that gives better yield. Due to participation in the extension activities and contact with the extension workers, they gained the knowledge about good variety of Ginger. Regarding Land preparation, It can be inferred that, cent per cent of the Ginger growers had adopted recommended practice of size of bed for planting rhizomes and filling material used in bed, suitable soil for ginger crop and 6.67% of technological gap was observed regarding ploughing of the land. No technological gap was noticed due to their simplicity in use which required no or minimum information in using it.

Regarding Propagation, from the data, it was revealed that there was no technological gap found regarding correct time of planting Rhizomes, spacing, seed treatment, and the least gap was found in rhizome weight(0.83%)and there was 100.00 per cent technological gap regarding the quantity of rhizomes used per acre. As ginger is more prone to disease and pest, farmers take correct measures by maintaining correct time of planting rhizomes, spacing, seed treatment but they use more quantity of rhizomes per acre as they believe even if one rhizome fails to germinate other will catch up.

Regarding Irrigation and weeding, higher technological gap (99.20%) was found regarding frequency of irrigation and frequency of weeding carried out. Higher gap in frequency of irrigating plants could be attributed to the climatic conditions of the study area. Now a days, Malnad region receives poor rainfall, so the farmers do not depend on rain for the irrigation. They irrigate more frequently because, ginger crop is very sensitive to moisture stress.

Manures and fertilizer application, Cent per cent technological gap was observed regarding use of recommended chemical fertilizers with respect to time and doses in all aspects. Fertilizer management calls for greater attention as the results showed greater technological gap. This might be due to application of more fertilizers adds to more yield. Farmers tend to apply more nitrogenous fertilizers like urea which is relatively cheaper and whose effect is more pronounced than the other nutrients. This might be the reason why technological gap in respect of major fertilizer elements was the greatest for potassium. Farmers showed a tendency to use higher levels more than the recommended levels. This was mainly due to lack of knowledge and guidance regarding the use of those chemicals. Non availability of organic manure, its high cost, cost involved in its transportation added up to the total cost of production, etc., must have been the reason for not applying the recommended levels of organic manure in field. Regarding control measures for major pests and control measures for major diseases there was no technological gap found but there was a least (0.83%) of the technological gap found regarding the use of control measures for the major pest Shoot borer. Because farmers were aware of the measures as ginger is attacked majority by pests and diseases.

Conclusion

Regular participation in extension activities and regular contact with extension personnel and extension agencies, would lead to enhancement of the knowledge and eventually a better adoption of new technologies can be observed and which in turn gradually reduces the technology gap in ginger cultivation.

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