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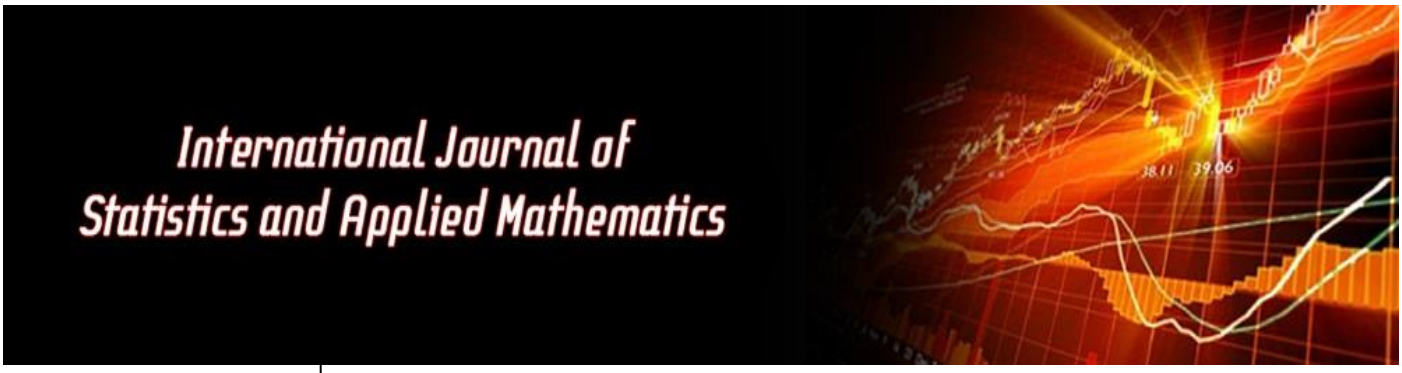

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Study of cropping pattern and cropping intensity of garlic in Etawah District of Uttar Pradesh

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Abstract
The study was conducted in Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.). The enquiry pertained to the agricultural year 2021-22. District and block namely, Etawah & Takha and Basher were purposively selected for the study due to higher concentration of garlic area. List of the respondents from selected blocks were prepared along with acreage under garlic cultivation, 120 respondents (Farmers) proportionally from each category of farms and classified into three categories i.e. marginal (below 1 ha), small (1-2 ha) and medium (2-4 ha & above). Overall average size of farms was found to be 1.56 ha, which varied from 0.81 ha on marginal, 1.74 ha on small and 4.60 ha on medium farms along with total cultivated area 187.48 ha on sample farms. Gross cropped area on marginal, small and medium size of farms accounted to be 1.90, 3.62 and 9.44 ha, respectively. Area under garlic on marginal, small and medium size of farms was found to be 0.20, 0.20 and 0.82 ha, respectively. Overall percentage share of garlic was observed 8.7 per cent among all crops. The maximum cropping intensity was observed (232.27 per cent) on marginal size of sample farms followed by small (207.33 per cent) and medium (204.89 per cent) with an average on sample farms came to 218.90 per cent.

Keywords: Cropping pattern, cropping intensity, respondents and garlic

Introduction
After onions, garlic (*Allium sativum* L.) is the second-most significant bulb crop in the Amaryllidaceae family. Despite the fact that it has been consumed by the majority of Indians for ages and is grown all over the country's plains. The subsurface development component known as bulbs is where the economic yield is found. The garlic bulb is a complex or multiple bulbs made up of bulbs or bulb lets that are commonly known as cloves (Patidar *et al.*, 2018) [8]. The cloves are used to flavour meals, make pickles, curry powder, tomato ketchup, and chutneys. A significant spice crop, garlic is used not only in cooking but also to treat or prevent a number of illnesses and disorders that affect human health. Garlic is one of the most popular spices in the whole world. It is extensively grown in Central Asia and Eastern Region (Meena, 2013) [7]. India is the world's greatest producer of garlic and grows it in mild to cold climates. This plant is grown for both culinary and therapeutic uses. When cooked, clove's unique pungent, spicy flavour greatly softens and sweetens. When used medicinally, it strengthens the immune system, lowers blood pressure, lowers cholesterol, enhances cognitive function, and more. In Indian medicine (Ayurvedic, Unani, and Siddha), it is used as a carminative and stomach stimulant to help digestion and absorption of meals. It provides for domestic necessities as well as being a substantial source of foreign exchange. (Yewatkar, 2019) [10]. Madhya Pradesh recorded the highest production of garlic across India in financial year 2022, amounting to over two million metric tons. The Indian states of Rajasthan, Uttar Pradesh, and Gujarat followed. The country produced over 3.1 million metric tons of the garlic in 2021(According to Statista). Uttar Pradesh produces 34.31 thousand hectares and 227.34 thousand metric tonnes of garlic annually, with productivity rate of 6625 kg/ha (Directorate of Arecanut and Spices Development, 2019). Long-day garlic in particular, as well as garlic improvement in general, have specific researchable elements that are relevant to both the Indian and global garlic research communities.

India would need to grow 30 lakh tonnes of garlic with better nutritional content than other bulb crops (raw 1 clove) by the year 2050 in order to feed its expanding population and satisfy export and processing demands (Kumud *et al.*, 2019) [6]. This food is high in carbohydrates (0.57 g), protein (0.57g), phosphorus (13.77 mg), potassium (36.09 mg), calcium (16.29 mg), magnesium (2.25 mg), and all of the other nutrients (2.98 g). Ascorbic acid is present in green garlic in a significant amount (1%). It is a significant source of human nutrition and offers significant health benefits, playing a crucial role in the immune system for the modern day (Diriba and Shiferaw, 2016) [3]. This is one of the main goals of this paper is:

- To study the cropping pattern on sample farms.
- To study the crop intensity on sample farms.

Material and Methods

a). Sampling Techniques

The multistage stratified, purposive cum random sampling procedure was used for the selection of district, block, village and respondents.

1). Selection of District

The study was purposively undertaken in Etawah district in order to avoid operational inconvenience of the investigator.

2). Selection of Block

At first, a list of all 8 blocks of Etawah district of Uttar Pradesh along with acreage of garlic cultivation were prepared and arranged in descending order. The block namely Takha and Basher having highest area in garlic was selected purposively for the study.

3). Selection of Farmers

A separate list of garlic growers of selected blocks were prepared along with their size of holding and stratified into three categories i.e.

1. Marginal: (Below 1 ha)
2. Small: (1 to 2 ha)
3. Medium: (2 to 4 ha)

From this list, samples of 120 respondents were drawn following the proportionate random sampling technique categories.

b). Methods of Enquiry

The primary data were collected by survey method through personal interview with use of pre-structured schedule, while secondary data were collected from blocks head quarter and district offices etc.

c). Period of Enquiry

The data were pertained to the agricultural year 2021-2022.

d). Methods and Techniques of Analysis

The data collected from the sample farmers were analyzed and estimated with certain statistical tools it evolves the simplest and important measures of average which have been used into statistical analysis i.e. weighted average and geometric mean.

Average

The simplest and important measures of average which have been used into statistical analysis was the weighted average Geometric mean. The formula used to estimate the average is as below-

$$\text{W. A.} = \frac{\sum \text{Wi Xi}}{\sum \text{Wi}}$$

Where,

W. A. = Weighted average

X_i = Variable

W_i = weights of X_i

$$\text{Cropping Intensity:} = \frac{\text{Gross Cropped Area}}{\text{Net Sown Area}} \times 100$$

Result & Discussion

The size of holding was supposed to positively correlate with volume of garlic production. The farmers having larger size of holding are economic better and they are in a position to adopt easily the improved farm practices. On the other hand, the farmer having smaller farm unit have been desired to produce as much they can with a view to marketing both their ends meet and also to improve their economic condition.

Table 1: Average size of holding on sample farm in the study area

S. No.	Size group of farms	Number of farms	Total cultivated area (ha)	Average size of farm (ha)
1	Marginal	70	57.26 (30.54)	0.81
2	Small	35	61.11 (32.59)	1.74
3	Medium	15	69.11 (36.86)	4.60
Total		120	187.48 (100)	1.56

Note: Figures in parenthesis show the per cent to corresponding total

Table 1 indicates that overall average size of farms was found to be 1.56 ha, which varied from 0.81 ha on marginal, 1.74 ha on small and 4.60 ha on medium farms along with total cultivated area 187.48 ha on sample farms.

Cropping pattern

Cropping pattern deals with the distribution of land available for cultivation under different crops in particular season during a year. It is most important factor which determines the investment for different inputs on a farm and income of farmers based on resource availability and its use under various agro-climatic conditions. Cropping pattern of sample farms are given in Table 2.

It is evident from Table 2 that gross cropped area on marginal, small and medium size of farms accounted to be 1.90, 3.62 and 9.44 ha, respectively. Area under garlic on marginal, small and medium size of farms was found to be 0.20, 0.20 and 0.82 ha, respectively. Overall percentage share of garlic was observed 8.7 per cent among all crops.

Table 2: Cropping pattern on different size group of sample farms in the study area.

S. No.	Crops	Size of sample farms (ha)			
		Marginal	Small	Medium	Average
(A)	**Kharif Crops**				
1.	Paddy	0.38 (17.43)	0.78 (17.77)	2.60 (24.88)	0.79 (20.0)
2.	Maize	0.29 (13.30)	0.40 (9.11)	1.27 (12.15)	0.46 (11.6)
3.	cowpea	0.04 (1.83)	0.12 (2.73)	0.30 (2.87)	0.10 (2.5)
4.	Urd	0.05 (2.29)	0.18 (4.10)	0.42 (4.02)	0.14 (3.4)
	Total	0.76 (34.86)	1.48 (33.71)	4.59 (43.92)	1.48(37.5)
(B)	**Rabi Crops**				
1.	Garlic	0.26 (11.93)	0.48 (10.93)	1.42 (13.59)	0.48 (12.1)
2.	potato	0.10 (4.59)	0.10 (4.59)	0.70 (6.70)	0.21 (5.3)
3.	Garlic	0.20 (9.17)	0.20 (9.17)	0.82 (7.85)	0.34 (8.7)
4.	mustard	0.08 (3.67)	0.08 (3.67)	0.40 (3.83)	0.15 (3.8)
5.	Lentil	0.04 (1.83)	0.10 (2.28)	0.26 (2.49)	0.09 (2.2)
	Total	0.68 (31.19)	1.35 (30.75)	3.6 (34.45)	1.27 (32.1)
C.	**Zaid crops**				
1	Vegetable	0.20 (9.17)	0.41 (9.34)	0.67(6.41)	0.33 (8.3)
2	Moong	0.16 (7.34)	0.26 (5.92)	0.31 (2.97)	0.21 (5.4)
3	Chari	0.10 (4.59)	0.12 (2.73)	0.27 (2.58)	0.13 (3.3)
	Total	0.46 (21.10)	0.79 (18.00)	1.25 (11.96)	0.67 (17.1)
Gross Cropped Area (A+B+C)		1.90 (100.00)	3.62 (100.00)	9.44 (100.00)	3.42 (100.0)

Note: Figures in parenthesis show the per cent to corresponding gross cropped area

Cropping intensity

Cropping intensity of sample farms were calculated & given in Table 3.

Table 3: Cropping intensity on different size groups of farms in the study area.

S. No.	Size group of farms	No. of farms	Net cultivated area (ha)	Gross cropped area (ha)	Cropping intensity
1	Marginal	70	0.81	1.90	232.27
2	Small	35	1.74	3.62	207.33
3	Medium	15	4.60	9.44	204.89
Average		120	1.56	3.42	218.90

Table 3 shows the maximum cropping intensity was observed (232.27 per cent) on marginal size of sample farms followed by small (207.33 per cent) and medium (204.89 per cent) with an average on sample farms came to 218.90 per cent.

Conclusion

Overall average size of farms was found to be 1.56 ha, which varied from 0.81 ha on marginal, 1.74 ha on small and 4.60 ha on medium farms along with total cultivated area 187.48 ha on sample farms. Gross cropped area on marginal, small and medium size of farms accounted to be 1.90, 3.62 and 9.44 ha, respectively. Area under garlic on marginal, small and medium size of farms was found to be 0.20, 0.20 and 0.82 ha, respectively. Overall percentage share of garlic was observed 8.7 per cent among all crops. The maximum cropping intensity was observed (232.27 per cent) on marginal size of sample farms followed by small (207.33 per cent) and medium (204.89 per cent) with an average on sample farms came to 218.90 per cent.

References

1. Ahmed B, Jobdi MS, Olukosi JO. Analysis of resource use efficiency in garlic production in Kano state, Nigeria, Nigerian Journal of Agricultural Economics. 2011;2(1):79-88.
2. Anonymous; c2022. www.statistica.com
3. Diriba-Shiferaw GR, Nigussie-Dechassa, Woldetsadik KT, Getachew, Sharma JJ. Effect of Nitrogen, Phosphorus, and Sulphur Fertilizers on Growth Yield, and Economic Returns of Garlic (*Allium sativum* L.). Science, Technology and Arts Research Journal. 2016, 4(10).
4. Gul M, Gul B, Beyza B, Karli B, Akpinar M. Cost and Profitability of Garlic Production in Kastamonu Province. Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, 2018, 18(2).
5. Jain NK, Siddappa M, Anand N. Yield and economics of garlic. Journal of crop breeding and crop Science. 2019;6(11):160-170.
6. Kumud S, Singh N, Kumari MV, Ram C. Constraints experienced by onion growers of Nashik district of Maharashtra. International Journal of Farm Sciences. 2019;9(1):57-60.
7. Meena LK. Economics of Garlic Production in Baran District of Rajasthan; Break-Even Analysis. Asian Journal of Agriculture and Rural Development. 2013;3(10):697-701.
8. Patidar KP, Khan N, Kumar S. An Economic Analysis of Garlic Cultivation in Ratlam District of Madhya Pradesh. International Journal of Agriculture, Environment and Biotechnology Citation. 2018;11(2):371-377.
9. Yadav H, Singh GP, Singh KK. Efficiency of resources used in garlic cultivation. Journal of Rural and Agricultural Research. 2013;13(1):24-25.
10. Yewatkar H, Lahariya KT, Raut A, Salame SK. Constraints and suggestions of garlic growers in Akola district. International Journal of Chemical Studies. 2019;7(3):2859-2860.