

Performance of Gram in Marathwada Region

S. P. Shingne

Research Scholar,
Deptt. of Agricultural Economics
and Statistics Section,
College of Agriculture,
Nagpur (MS), Maharashtra, India

Nishant V. Shende

Professor (CAS),
Deptt. of Agricultural Economics
and Statistics Section,
College of Agriculture,
Nagpur (MS), Maharashtra, India

A. V. Panajwar

Research Scholar,
Deptt. of Agricultural Economics
and Statistics Section,
College of Agriculture,
Nagpur (MS), Maharashtra, India

S. A. Rathod

Research Scholar,
Deptt. of Agricultural Economics
and Statistics Section,
College of Agriculture,
Nagpur (MS), Maharashtra, India

N. V. Raut

Research Scholar,
Deptt. of Agricultural Economics
and Statistics Section,
College of Agriculture,
Nagpur (MS), Maharashtra, India

Abstract

Gram is the most important pulses crop in the world. However India The world's major producers of pulses crop. India is the world leader in chickpea (Bengal gram) production, and produces approximately ten times as much as second largest producer Australia. Other key producer are Pakistan, Turkey, Myanmar, Ethiopia and Iran. The present study based on the last 30 year time series data on area, production and productivity to identify the trend. The compound growth rate and coefficient of variation here analysed for period I, period II and overall 30 years for Marathwada region. The study indicate that compound growth rate for area, production and productivity for almost all the district where positive in overall period. The highest area of gram is observed in Latur district followed by Nanded and Beed district. i.e 16.66, 11.96 and 09.25 per cent per annum respectively, during the last 30 years i.e. overall production found to be statistically significant at 1 per cent level of probability with the highest coefficient of variation is observed in Latur district followed by Nanded and Beed i.e. 94.72, 75.38 and 64.62 per cent respectively. The production and productivity instability in selected pulses crop were observed in almost the entire district in the Marathwada. The coefficient of variation for almost all the district were less in period I as compared to period II. The similar pattern also observed in production. On the other hand the growth rate of productivity for the gram was positive for almost all the district and both the period. Highest compound growth rate for productivity during the overall period was observed in Parbhani followed by Latur and Nanded i.e. 14.45, 07.67 and 6.53 respectively. The coefficient of variation range in between 23.35 to 50.73 per cent. Thus it is concluded that gram is ascent during the study period. Considering the importance of gram as a low input and less water requirement crop. It is recommended option for the farmer in operating in any environment where other crop not performing well. In the developing and developed economies. It is need to concentrate on the crop specially to cultivate under marginal and stress prone areas to attend the sustainability.

Keywords: Gram, Compound Growth Rate, Coefficient of Variation, Marathwada.

Introduction

Pulses are grown in more than 171 countries. The world's major producers of pulses are India (23.1 per cent.), China (12.08 per cent), Myanmar (7.57 per cent), Canada (6.7 per cent) and Brazil (4.03 per cent) which together account for half of the global output. The pulses industries in India generally refers to a number of crops like chickpea (gram), tur, masur, urad, moong, and peas. The pulses crop occupied 72.3 million ha. area and contributed 64.4 million tones with productivity of 890 kg per ha. In the triennium ending 2010-11. India having the largest share about 25 per cent production, about 33 per cent acreage and about 27 per cent consuming of total pulses of the world.

Gram (*Cicer arietinum* L.) is the high-value of pulse crop belongs to the family Leguminaceae. It is also called chickpea or Bengal gram in south Asia. In Maharashtra it is called as Harbara. Bengal gram is grown in winter season mainly in Northern and Central region of of country. Due to increase in irrigated area, use of improved varieties and modern technology, its area is gradually shifting towards south-central region. It is most important leguminous crop. In a developing country like India, agricultural growth leads to a rising demand for products

Gram contain Protein-18-22 per cent, Calcium-280 mg/100 g, Carbohydrate- 61-62 per cent, Iron-12.3 mg/100 g, Fat-4.5 per cent, Phosphorus-301 mg/100 g and Calorific value-396.

Objective

The objectives of the study are:

- 1) To estimate the annual growth rate of area, production and productivity of gram.
- 2) To work out the instability during last 30 years.

REVIEW OF LITERATURE

Mundinamani *et al.* (1998) work out the growth rates in area, productivity and production of total pulses in general and red grams in particular for Karnataka using time series data. They found that the growth rates of area, productivity and production of total pulses were remained stagnant. District wise analysis showed that the district Bijapur and Gulbarga registered significant positive growth rates in area, productivity and production of total pulses in respect of red gram. The compound growth rate of area, production and productivity of red gram in Bijapur district is 0.45, -3.93, -3.75 and for Gulbarga district 3.99, 2.37, and 5.69 respectively. The contribution of different factor to the growth rates of red gram and total pulses revealed mixed trend.

Chand and Raju (2008) revealed that in a large state like Andhra Pradesh. The study has estimated instability in three major crops before (1981-93) and after (1993-04) the initiation of economic reforms at the state and district levels in Andhra Pradesh. Instability index for area has shown an increase after 1992-93 for rice and cotton and decline in the case of ground nut. It increased from 11.5 to 13.4 in rice and from 17.5 to 18.8 in cotton. The instability status as perceived through the state level data may be vastly different from that experienced at the disaggregate level. The study has concluded that the state level analysis does not reflect complete picture of shocks in agriculture production, and, further, shocks in production underestimates shocks in farm income. They has suggested the need for addressing risks in farm income by devising area-specific crop insurance and other suitable mechanisms. The net effect of fluctuations in production and prices on farm income has depicted that instabilities in area, production, yield and prices do not negate each other. The instability has been found higher in farm income than area, production and prices in all the cases, and it has not changed over time. This underscores the need for addressing risks in farm income by devising area-specific crop insurance or other suitable mechanization.

Hasan *et al.* (2008) studied the change and instability in area, production, and yield of two major cereal crops wheat and maize in Bangladesh based on secondary data during 1980-81 to -2003-04 using different statistical techniques. Area and production of wheat has increased satisfactorily. But yield was not increased to meet the demand of the country. In the case of maize, significant increment happened in yield during the study period. Area and production of maize also increased to fulfill the increasing demand of population. Presently, production of maize has increased more rapidly than its area. The growth in area, production, and yield of wheat slightly improved

in period-II, whereas the growth rate in area, production, and yield of maize improved rapidly. Though both of wheat and maize are unstable crops, maize showed very instability in its area and production because of its increasing tendency in the recent years.

Shaheen and Shiyani (2004) worked out the instability in area, production and productivity of fruit crop in Jammu and Kashmir for the period from 1990-91 to 2001-02 by using Cuddy-Della instability index. The result of instability index indicated moderate to high instability in production and productivity for all fruits, except apple, which showed low instability for all three parameter (area, production and productivity) throughout all the period.

Shende *et al.* (2009) revealed that, Cotton crop is grown in the entire State except Konkan and eastern Maharashtra. In this study, the growth and instability were estimated. Also assess the relative contribution of area and yield to change in the, output of cotton in Maharashtra. For the study the secondary time series data for 45 years were collected. The results indicate that the compound growth rate of area under crop was more over one per cent for the entire district of all three regions and also the region as a whole during the overall period.

Methodology

In this study, for the analysis of growth and instability. The period was equally divided into two sub period of 15 years and overall as shown below.

Period I : 1985-86 to 2000-01

Period II : 2001-02 to 2014-15

Overall : 1985-86 to 2014-15

The compound growth rate of area, production and yield for gram for each gram growing district were estimated to study the growth. It was estimated with the following exponential model.

$$Y = a b^t$$

$$CGR = [\text{Antilog} (\log b) - 1] \times 100$$

The 't' test was applied to test of significance of 'b'

To measure the instability in area, production and productivity, and index of instability was used as measure of variability. The coefficient of variation (C.V) will be calculated by the formula-

$$\text{Coefficient of Variation (\%)} = \frac{\text{Standard deviation}}{\text{Mean}} \times 100$$

Result & Discussion

Growth Performance in Gram

The district-wise compound growth rates of area, production and productivity of gram in Marathwada region for two periods and overall were worked out. Presented in Table No 1. The study reveals that, out of seven districts of Marathwada the area under gram cultivation highest in Parbhani (05.30) followed Beed (-1.46) and Jalna (-12.65) district, statistically positively significant 1 per cent level for during period-I. However, the as compared to period I growth rate were higher side during the period-II. For Beed district it was estimated 18.21 per cent per annum followed by Latur and Nanded district i.e. 15.69 and 13.96 per cent per annum respectively. It was found to be statistically significant.

Table No. 1
District Wise Compound Growth Rate for Gram.

S.R.	District		Period I	Period II	Overall
1	Aurangabad	A	2.193	04.57	0.193
		P	8.140	05.79	3.832
		Y	5.842	01.16	3.654*
2	Jalna	A	-12.656**	12.68 **	7.772**
		P	9.820	04.79	9.091**
		Y	9.717*	-06.87	2.619
3	Beed	A	-1.460	18.21 **	9.259**
		P	5.514	22.75 **	13.33**
		Y	7.078	03.84	3.390**
4	Latur	A	-22.217*	15.69 **	16.669**
		P	27.244**	27.18 **	20.582**
		Y	12.862*	09.97	7.672**
5	Osmanabad	A	4.359	07.11 *	1.161
		P	16.808	14.35	5.688*
		Y	11.968	06.57	04.494*
6	Nanded	A	11.746	13.96**	11.967**
		P	12.004*	22.58**	18.489**
		Y	0.2143	09.59*	6.531**
7	Parbhani	A	5.303*	11.21*	2.965*
		P	8.645*	12.91**	5.391**
		Y	10.01	05.98*	14.451**
8	Marathwada Region	A	1.766	11.52**	0.907**
		P	10.88	17.66**	1.693**
		Y	6.54*	5.022	0.994**

Note: A- Area, P- Production, Y- Yield, * Significant at 5% level and ** Significant at 1% level.

Whereas, for the overall period the compound growth rate of area and production were positive in all most all the district.

The growth rates were also worked out for overall period of 30 years where almost all were found to be significant at 1 per cent level in all districts of Marathwada region both in area , production and productivity of Gram. During this period compound rates for area and production were also found positive. The higher growth rates were recorded in Latur district for Area, production and i.e. 16.66 and 20.58 per annum respectively and for productivity of Parbhani district the Compound growth rate was 14.45 per cent per annum.

Instability in Gram

One should not obvious of instability by taking the growth rates only. Because the growth rates will explain only the rate of growth of over the period. Whereas , instability will judge, whether the

growth performance is stable or unstable for the period for the pertinent variable.

As seen from the Table No. 2, The coefficient of variation indicates the instability the lowest coefficient of variation for area under gram cultivation was observed in Aurangabad district (25.75 per cent) for overall period. On the other hand highest coefficient of variation for area was observed in Latur (66.01 per cent) district during the thirty year. The coefficient of variation of the production during the overall period was range in between 35.59 to 94.72 per cent. The area and productivity was indicating instability in Gram crop in all most all the district in Marathwada region.

The average area under cultivation of Gram for last thirty year was highest in Osmanabad followed by Aurangabad and Latur district viz; 69503, 44597 and 36793 hectares respectively.

Table no. 2
District Wise Instability Indices in Gram.

S.N.	District		Period I			Period II			Overall		
			A	P	Y	A	P	Y	A	P	Y
1	A.Bad	CV	28.61	37.21	23.05	22.60	49.43	32.19	25.75	46.08	31.69
		M	460.40	236.73	504.6	431.5	29.78	655.4	445.9	267.2	580.0
2	Jalna	CV	35.08	34.31	26.23	27.87	49.78	34.05	43.56	58.53	33.41
		M	98.73	60.73	491.2	186.0	118.4	626.6	142.3	89.60	558.9
3	Beed	CV	30.34	35.44	22.04	37.34	50.08	22.04	48.37	64.62	23.35
		M	220.6	105.0	471.6	416.2	241.2	559.1	318.4	173.1	515.4
4	Latur	CV	59.93	45.89	31.66	29.26	73.61	43.18	66.01	94.72	45.17
		M	169.4	132.7	443.6	566.4	413.6	670.6	367.9	273.2	557.1

5	U.Bad	CV	24.29	41.99	28.47	26.86	45.26	33.04	25.16	43.80	32.32
		M	703.6	360.4	490.8	686.4	414.3	593.2	695.0	387.4	542.0
6	Nanded	CV	42.80	77.52	34.40	26.74	49.20	31.15	45.89	75.38	39.19
		M	232.1	117.1	462.2	456.4	329.5	720.5	344.2	223.3	591.5
7	Parbhani	CV	23.84	36.28	38.62	28.57	32.70	17.91	26.63	35.59	50.73
		M	446.9	235.2	227.7	494.9	293.9	589.6	470.9	264.5	408.7
8	M.WADA REGION	CV	21.27	34.03	18.54	22.83	42.25	23.50	27.69	48.48	28.33
		M	2331.8	1248.0	441.7	3236.8	2108.9	630.6	2784.3	1678.4	536.2

Note: CV- Coefficient of variation (per cent per annum). M- Mean. (Area: 00ha, Production: 00 tonne, Productivity: kg/ha).

Conclusion

The results of this study lead to the conclusion that, The compound growth rate of area and production were positive in all most all the district. The compound growth rate of area under gram cultivation was highest in Latur district (16.66 per cent per annum) followed by Nanded (11.96 per cent per annum) and Beed (09.25 per cent per annum) statistically significant. The compound growth rate of gram production highest in Latur district (20.58 per cent per annum) followed by Nanded (18.48 per cent per annum) and Beed (13.33 per cent per annum) statistically significant. The area and productivity was indicating stable growth in gram crop in all most all the district in Marathwada region i.e. the coefficient of variation estimated in the range 25.75 to 66.01 per cent for area and 35.59 to 94.72 per cent for production. Thus, it indicates that the gram is cultivated traditionally in the region during rabi season. Hence, it is a scope to increase the production of gram, especially in western Marathwada zone by providing high yielding varieties and improve technology.

Hence, It is concluded that, gram appears to the important rabi crop in the cropping pattern of Marathwada region. Therefore, it is very big need to concentrate of this crop for policy maker and researcher.

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