Int.J.Curr.Microbiol.App.Sci (2018) *7*(3): 3348-3352

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 7 Number 03 (2018)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2018.703.386

Growth Rate of Wheat Crop in Azamgarh Division of Eastern Uttar Pradesh, India

Neeraj Singh*, Piyush Kumar Singh and Shri Sunil Kumar

Department of Agricultural Statistics, Narendra Dev University of Agriculture and Technology, Kumarganj – Faizabad (UP), 224-229, India

**Corresponding author*

Keywords

Wheat, Growth, Trend, Tabular analysis, Linear Growth Rate (LGR), Compound Growth Rate (CGR)

Article Info

Accepted:
26 February 2018
Available Online:
10 March 2018

A B S T R A C T

Wheat (*Triticum aestivum* L.) is an important constituents of Indian agriculture and nutritional security due to their high yield, economic viability, ability to generate on-farm and off-farm employment so this makes it one of the most important cereal crops in India and a main source of vitamins and minerals such as thiamine, niacin, iron, riboflavin, vitamin D, calcium, and fiber. Wheat covers approximately 25% of the total global area devoted to by cereal crops. Since the consumption of wheat is directly proportional to the population growth. Feeding burgeoning population through the next 25 years remains an uphill task. Increasing domestic demand owing to population growth should meet the future challenges of food and nutritional security. On this prospective for the planning purposes decision to invest accordingly for the short and long-term plans, the present study has been undertaken to evaluate the growth in production, area and productivity of Wheat crop in Azamgarh division of eastern Uttar Pradesh, India by using tabular analysis and different growth models.

Introduction

Wheat (*Triticum species*) is a crop of global significance. It is grown in diversified environments. It is a staple food of millions of people. Approximately one-sixth of the total arable land in the world is cultivated with wheat. Whereas paddy is mainly cultivated in Asia, wheat is grown in all the continents of the world. It supplies about 20 per cent of the food calories for the world's growing population. Global wheat production touched 729 million tonnes in 2013-14. India is the second largest producer of wheat after China. Wheat has a distinct place among the food grain crops. Carbohydrate and protein are two main constituents of wheat. On average wheat contains 11-12% protein.

Wheat is grown mainly in two seasons in the world viz., winter and spring. Winter wheat is grown in cold countries like Europe, U.S.A., Australia, Russia Federation etc. while spring wheat is grown in Asia and a part of U.S.A. Spring wheat matures in 120-130 days while winter wheat takes 240-300 days for maturity. Due to this reason productivity of winter wheat is higher in comparison to spring wheat. Considering the quality wheat has been divided into two categories (1) soft wheat, (2)

hard wheat. *Triticum aestivum* (bread wheat) is known as soft wheat and *Triticum durum* is known as hard wheat.

In India mainly three species of *Triticum* mainly *aestivum*, *durum* and *dicoccum* are cultivated in which area is approximately 95, 4 and 1 per-cent, respectively. *Triticum aestivum* is cultivated in all the regions of the country while *durum* is cultivated in Punjab and Central India and *dicoccum* in Karnataka.

Wheat has got an important role in 'Green Revolution'. The highest quantity of wheat in the country is in Uttar Pradesh. 28.36 % of Wheat is produced only in Uttar Pradesh followed by Punjab with 17.74 % and Madhya Pradesh with 15.94 % in 2014-15.

Materials and Methods

The present study was primarily based on the time series secondary data Area, Production and Productivity of Principal Crops in Azamgarh division of eastern Uttar Pradesh at in hectare, tonne, kg/ha from 2000-01 to 2014-15 are extracted from the published sources like Sankhikiya Patrika, Agricultural Statistics at a Glance, etc.

Estimation of Growth Rate

Linear growth rate (LGR) and compound growth rate (CGR) were used for the estimation of growth rates in crop characteristics i.e., area, production and productivity of Wheat crops in Azamgarh division of eastern Uttar Pradesh, India.

By linear function

Linear function is given by the equation:

$X_t = at + b$

Where,

t is the time in years, independent variable
X_t is the trend value of the dependent variable
a and b are constants

The above equation is fitted by using the least squares method of estimation.

The linear growth rate is calculated by the formula:

Linear growth rate (LGR %) = $\frac{b}{\bar{y}} \times 100$

By Compound function

Compound function is given by the equation:

$X_t = ab^t$
$\text{Log } X_t = \text{Log } a + t \log b$

Where,

X_t is the characteristic (area, production or productivity of dependent variable)

t is the time in years, independent variable

a is intercept

b is regression coefficient.

The ‘a’ and ‘b’ are calculated by applying the method of Least Squares.

Finally the compound growth rates were worked out as described below:

Compound growth rate: CGR (%) = (antilog b - 1) x 100

Results and Discussion

The linear growth rates and compound growth rates for the study period of 2000-01 to 2014-15 were estimated by fitting the linear function and compound function to the area,

production and productivity of Wheat crops, respectively.

Growth rates in production, area and productivity of wheat crops in Azamgarh division of eastern Uttar Pradesh

Growth rates in production

In Azamgarh division of eastern Uttar Pradesh the average production during the study period (2000-01 to 2014-15) was 1164.93 thousand tonnes with coefficient of variation 14.79. Linear and compound growth rates were 2.21 and 2.20 per-cent per annum respectively. The production of wheat in Azamgarh division of Eastern Uttar Pradesh exhibited a positive trend and it was significant at 1% level of significance (Table 1 and Fig. 1).

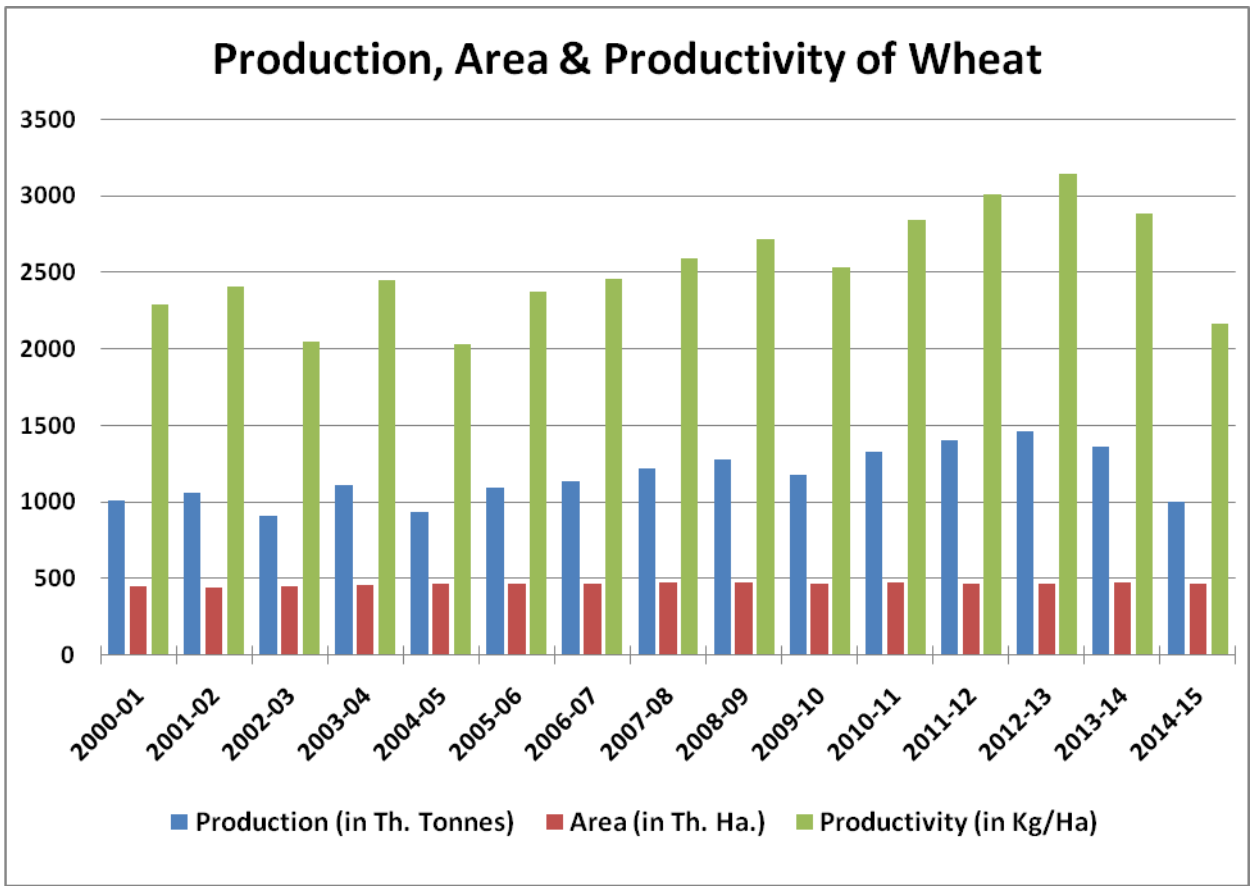
Growth rates in area

It was found that, in Azamgarh division of eastern Uttar Pradesh average area under Wheat during the study period (2000-01 to 2014-15) was 459.40 thousand hectares. The coefficient of variation recorded for the study period was 2.29 per-cent and the linear and compound growth rates recorded during study period were 0.42 and 0.49 per-cent per annum respectively (Table 1). The area of wheat in Azamgarh division of Eastern Uttar Pradesh exhibited a positive trend and it was found significant at 1% level of significance.

Table.1 LGR, CGR and C.V. of Azamgarh division in respect to production, area and productivity 2000-01 to 2014-15

Year	Production (in Th. Tonnes)	Area (in Th. Ha.)	Productivity (in Kg/Ha)
2000-01	1011.10	440.90	2293.26
2001-02	1061.33	440.27	2410.63
2002-03	908.14	444.30	2044.00
2003-04	1105.15	450.48	2453.29
2004-05	933.53	459.33	2032.40
2005-06	1092.75	459.50	2378.12
2006-07	1132.39	461.13	2455.69
2007-08	1214.87	468.78	2591.55
2008-09	1279.59	470.66	2718.71
2009-10	1178.76	465.13	2534.26
2010-11	1328.32	467.17	2843.35
2011-12	1397.90	463.41	3016.59
2012-13	1463.76	465.21	3146.47
2013-14	1363.84	471.81	2890.67
2014-15	1002.51	462.92	2165.61
Average	**1164.93**	**459.40**	**2535.77**
LGR (%)	**2.21****	**0.42****	**1.80****
CGR (%)	**2.20****	**0.43****	**1.77****
CV (%)	**14.79**	**2.29**	**13.38**

Fig.1 Time series data of Azamgarh division of eastern Uttar Pradesh from 2000-01 to 2014-15



Growth rates in productivity

Regarding the productivity of wheat in Azamgarh division of eastern Uttar Pradesh during the study period (2000-01 to 2014-15) was 2535.77 kg/hectare. Productivity of Azamgarh division of Eastern Uttar Pradesh showed a coefficient of variation 13.38 per-cent. Linear and Compound growth rate observed were 1.80 and 1.77 per-cent respectively. The productivity growth rates of wheat in India exhibit positive trend and it was also significant at 1 % level of significance (Table 1).

As a whole, the growth rates of production were higher than area and productivity.

In conclusion, the present investigation has been undertaken to evaluate the growth in area, production and productivity of Wheat crop in Azamgarh division of eastern Uttar Pradesh. The linear growth rates and compound growth rates for the study period of 2000-01 to 2014-15 were estimated by fitting the linear function and compound function to the area, production and productivity of Wheat crop, respectively. The average area, production and productivity under Wheat in Azamgarh division of Eastern Uttar Pradesh during the study period were 459.4 thousand hectares, 1164.93 thousand tonnes and 2535.77 kg/hectare respectively and exhibited significantly increasing trend with the linear and compound growth rates of 0.42 and 0.43 per-cent, respectively for area and for the production it was 2.21 and 2.20 per-cent, respectively. However, the productivity of Wheat exhibited a positive trend with the linear and compound growth

rates of 1.80 and 1.77 percent, respectively. Among the area, production and productivity in Azamgarh division of Eastern Uttar Pradesh, the production exhibited higher growth rates with an increasing trend due to increased trend in growth rates of area and productivity.

References

Manvendra Singh and K. Supriya (2017) Growth Rate and Trend Analysis of Wheat Crop in Uttar Pradesh, India. *Int.J.Curr.Microbiol.App.Sci*, *6*(7): 2295-2301.

Prajneshu and K. P. Chandran (2005) Computation of Compound Growth Rates in Agriculture. *Agricultural Economics Research Review*, Vol. 18: 317-324.

Singh, R. P. (2003) Analysis of Growth Performance of Wheat Crop in Jharkhand; *J. Res. Birsa Agri. Univ.*, 15(2): 217-223.

Srivastava S.C., Singh, B.K., Sudeep S Tomar and Yadava, H.S (2013) Growth Pattern of Major Pulses in Eastern Uttar Pradesh. *International Journal of Farm Sciences*, 3(2): 1-9.

How to cite this article:

Neeraj Singh, Piyush Kumar Singh and Shri Sunil Kumar. 2018. Growth Rate of Wheat Crop in Azamgarh Division of Eastern Uttar Pradesh, India. *Int.J.Curr.Microbiol.App.Sci.* 7(03): 3348-3352. doi: https://doi.org/10.20546/ijcmas.2018.703.386