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MAIZE CROP STATUS IN MADURAI DISTRICT- A STATISTICAL ANALYSIS

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Abstract:-The growth performance of Maize crop in Madurai district was studied using the time series data from 1996-97 to 2011-12.The growth pattern was examined by fitting an exponential function (Y=ABt). The result showed that the growth rates of area were positive and highly significant in the study period and with the average area of 2003.47 ha and also shows high variability. Similar results were also obtained for production and yield as positive and highly significant for the study period. The average Maize production and yield in Madurai District was found to be 6035.31 tonnes and 2483.58 kg/ha respectively and also shows high variability during the study period.

Keywords: Maize crop Status , Statistical Analysis , Maize production , industrial product .

INTRODUCTION

Maize was introduced into India from America at about the beginning of 17th century .It is now next only to Rice, Wheat and Jowar as food crop. In TamilNadu, Maize occupies 83.4% (202830 ha) of the total area among the millets. Maize crop is one of the important millet crop in Madurai district and the cultivation area of Maize crop was about3848 ha(2010-11)(source: statistical hand book).The grain apart from food as bread, pops and gruel are used for many industrial product like starch, syrup, alcohol, acetic and lactic acids ,glucose, paper ,rayon, plastic, textile ,adhesive ,dyes, synthetic rubber, resins, artificial leather and foot polish. Though consumed all over the country it is the stable food of people in the hilly and submontanes tracts of Northern India. It is also grown as fodder which is sweet succulent and fit for feeding green or for ensiling. The starch extracted from the grain is used for industrial purposes as well.

On an average maize grain is composed of 60% carbohydrate, 10% protein, 4.5% oil, 3.5%fibre and 2% minerals. It also contains 10 mg Calcium, 2.3 mg Fe and 90 microgram of carotene (Vitamin A).

METHODOLOGY

In this section selection of crop, the data base, data collection, methodology adopted, and statistical tools applied in the present analysis are presented.

Selection of crop

Maize is one of the important millet crops in Madurai district. It occupies second place among the millets during 2011-2012.Hence, Maize was chosen for this study to analyze its growth performance.

Data base and data collection

Madurai district data for the period 1996-97 to 2011-2012 on area, production and yield of the Maize crop were collected from various issues of season and crop reports, statistical abstracts and hand book of statistics.

Methodology adopted in the estimation of growth rates

(i) Selection of the base year

Madurai district was bifurcated with different districts in different period of time such as Ramnad, Dindigul and Theni.At last; Theni district was separated from Madurai district during 1995-96. Hence 1996-97 was selected as the base year for the present study. The period of study, the effect of technology and changes in cropping pattern could be assessed effectively. Hence the study covered 17 years.

(ii) Estimation of growth rates

An exponential function of the form used is given below:

$$Y = AB^{t}$$

$$\log_e^{y} = \log_e A + t \log_e^{B}$$

Where, y = area / production / yield
A = constant
B = regression coefficient and
t = time in years starting from the base year 1996-97.

Compound Growth Rate (CGR) = [(Antilog of B-1) 100] was used to assess the growth in area, production and yield of maize at Madurai district for the periods and various Descriptive statistics were used such as Mean, Standard deviation and Co-efficient of variation to found the average and variability of various measures.

$$\text{Mean}(x) = (\Sigma x / n) = (x_1 + x_2 + \ldots\ldots + x_n) / n$$

Where, n – Total number of observation.

$$\text{Standard Deviation} = \text{Square root of } ((\Sigma x^2 - ((\Sigma x)^2)/n) / n - 1)$$

n = total number of observation

Co-efficient of Variation (CV) = (SD / Mean) X 100

RESULTS AND DISCUSSION

Growth performance of Maize crop obtained from the exponential function fitted to area, production and yield are presented in Table 1 and the trend for the same presented in Figure 1(a), 1(b) and 1©.

Table:-1 Estimates of Compound Growth Rates (CGR) of Area, Production and Yield of Maize crop in Madurai during 1996-97 to 2011-12

CROP	AREA	PRODUCTION	YIELD
MAIZE	19.89815**	33.54494**	4.710251**

** Significant at 1 % level

It could be seen from table that the compound growth rate of maize area was positive and also highly significant for the period (19.89815). Maize crop production (33.54494) and yield (4.710251) also obtained positive and highly significant. Descriptive statistics computed and results are presented in Table 2.

Table:-2 Descriptive Statistics of Area, Production and Yield of Maize crop in Madurai during 1996-97 to 2011-12

Crop	Area		Production		Yield	
	Mean	CV (%)	Mean	CV (%)	Mean	CV (%)
Maize	2003.47	95.68	6035.31	125.14	2.45	33.93

It could be seen from table 2, the average of Maize crop area was found to be 2003.5 ha and CV will be 95.68%, it indicates that variability of area will be high during the study period. The Average Production and Yield of Maize crop were found to be 6035 tonnes and 2.45 tonnes/ha and the CV will be 125.14 % and 33.93% respectively. It also shows that the variability of production and yield will be high during the study period.

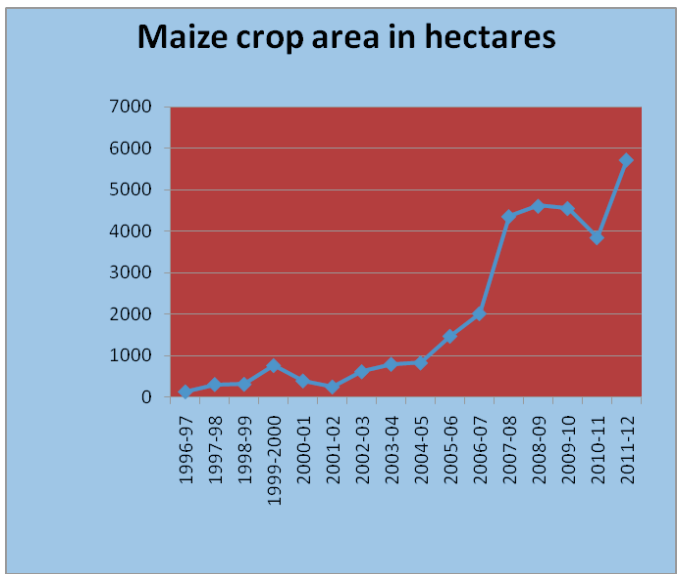

Figure 1(a).Maize crop area trend in Madurai district during 1996-97 to 2011-12

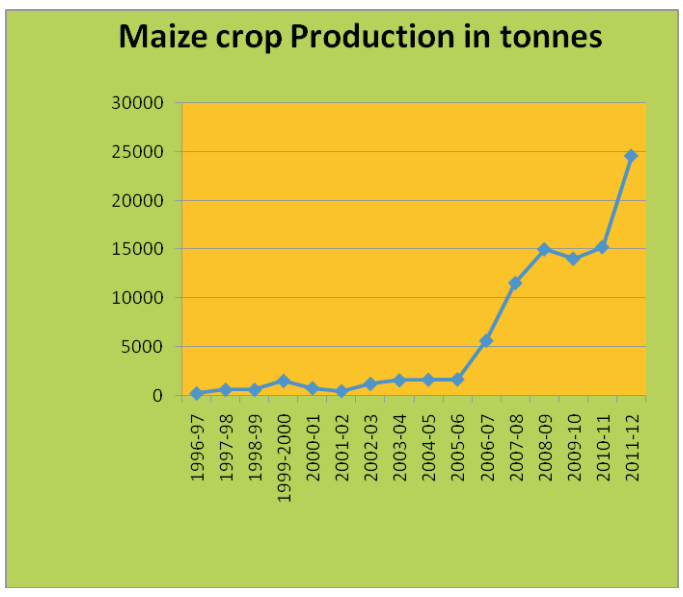

Figure 1(b).Maize crop production trend in Madurai district during 1996-97 to 2011-12

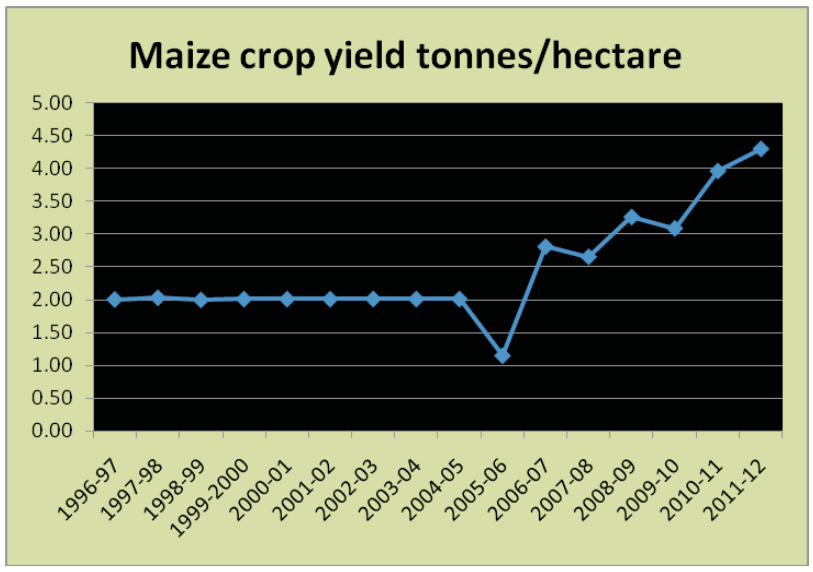

Figure 1(c).Maize crop yield trend in Madurai district during 1996-97 to 2011-12

SUMMARY AND CONCLUSIONS

For estimating the growth performance an exponential function was fitted to the Area, production and yield of the Maize crop and the compound growth rates were obtained for the period 1996-97 to 2011-12. Compound growth rates of Maize crop area had shown positive growth rates for the study period. The growth rates of production and yield of maize was also positive and highly significant results were obtained. The Variability of Maize crop area, production and yield was found to be high during the study period.

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