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VIVEKANAND COLLEGE, KOLHAPUR (Autonomous)

DEPARTMENT OF STATISTICS

A PROJECT REPORT
on
"STATISTICAL ANALYSIS OF SUGARCANE PRODUCTION"
Submitted by

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in partial fulfillment for the award of

the degree of

BACHELOR OF SCIENCE

in

STATISTICS

2020-21

(स्वायत्त) कोल्हापूर

VIVEKANAND COLLEGE, KOLHAPUR(Autonomous)
DEAPRTMENT OF STATISTICS

Certificate

This is to Certify that,

Sr. No.	Name	Roll No.
1	Mr. Prathamesh Ekal	8164
2	Mr. Alex Carvalho	8163
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4	Mr. Siddhant Kasar	8166

Have satisfactorily completed the project work on **"STATISTICAL ANALYSIS OF SUGARCANE PRODUCTION"** as prescribed by *Vivekanand College, Kolhapur* in partial fulfilment for **B. Sc. III** skill enhancement course in **STATISTICS**, in the academic year **2020-21**.

This project has been completed under our guidance and supervision. To the best of our knowledge and belief, the matter presented in this project report is original and has not been submitted elsewhere for any other purpose.

Project Guide

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ACKNOWLEDGEMENT

We take great pleasure in submitting this project report on"STATISTICAL ANALYSIS OF SUGARCANE PRODUCTION". It is our foremost duty to express our deep sense of gratitude and respect to the supervisor prof. Smt. V.V.Pawar, Prof. Ajit Pawar for their up lifting tendency and inspiring us for making of this project work complete and successful.

We are indebted to the library personal for offering all the help in completing the project work. Lastly, we are thankful to our colleagues and those helped us directly or indirectly throughout this project work.

Sincerely,

Project Team

DECLARATION

We undersigned hereby that the project report entities "STATISTICAL ANALYSIS OF SUGARCANE PRODUCTION" written and submitted to Vivekanand College, Kolhapur partial fulfilment of B.Sc. III (statistics) under the guidance of prof. Ajit Pawar sir in original work. The empirical results in this project are based on the data collected by ourselves.

We understand that any copying is liable to be published as the authorities deem fit.

Date:

Place: Kolhapur

Mr. Prathamesh Ekal

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INTRODUCTION

India is the agricultural country. About 70% populations are depending on agriculture. And Kolhapur is one of the well-known district for agricultural production. There are lots of crops have been taken from past years. Among these 'sugarcane' is one of the main cash crop, which plays very important role as the backbone of economy. And from this crop land 90 % area is occupied by only sugarcane.

But the average sugarcane production of these district is about only 30-40 tonnes per acre. And these is the problem .Because many times we read in agro newspaper that '120, 130, 150, tone per acre sugarcane production is taken by xyz'. Can this possible? Yes! Off course. This is possible, but how? To overcome this problem, we tried to identify the issue of less production.

For these we took an population under study which is 'near murgud city'. We collected the primary data by the goggle forms. In these form there was a questionnaires'', which was related to various factors which are affecting to the sugarcane production like soil testing, water system ,intercroping,distance between two successive rows ,used fertilizers , harvesting etc. And performed further statistical analysis.

Sugarcane refers to several species and hybrids of tall perennial grass in the genus Saccharin, tribe Andropogoneae that are used for sugar production. The plants are 2–6 m (6–20 ft.) tall with stout, jointed, fibrous stalks that are rich in sucrose, which accumulates in the stalk internodes. Sugarcanes belong to the grass family, Poaceae, an economically important flowering plant family that includes maize, wheat, rice, and sorghum, and many forage crops. It is native to the warm, temperate tropical regions of India, Southeast Asia,

and New Guinea. The plant is also grown for biofuel production, especially in Brazil, as the canes can be used directly to produce ethyl alcohol (ethanol).

Kolhapur district also has a presence of many sugar refineries and collectively they process more than 5000000 metric ton of sugarcane. Sugarcane farmers of Kolhapur itself bring in approximately 13 billion to the economy. Sugar from this region is exported all across India and abroad.

AIM AND OBJECTIVES

Aim:

Statistical analysis of sugarcane production in Murgud.

Objectives:

1. To study the sugarcane production of interested area.
2. To study the main factors of sugarcane production by graphical method.
3. To check dependency of ration card and soil testing.
4. To check whether row distances affect the sugarcane production or not.
5. To check covariance between yield with intercropping and yield without intercropping.
6. To give suggestions to the farmers to increase their sugarcane production.

MAIN FACTORS AFFECTING ON SUGARCANE PRODUCTION

Soil-

1. Soil testing

2. Colour of soil

Harvesting method-

1. Method of seeding

2. Distance between two successive rows

3. Method of Grubbing up.

4. Crop is taken by counting the no of sugarcanes per plot
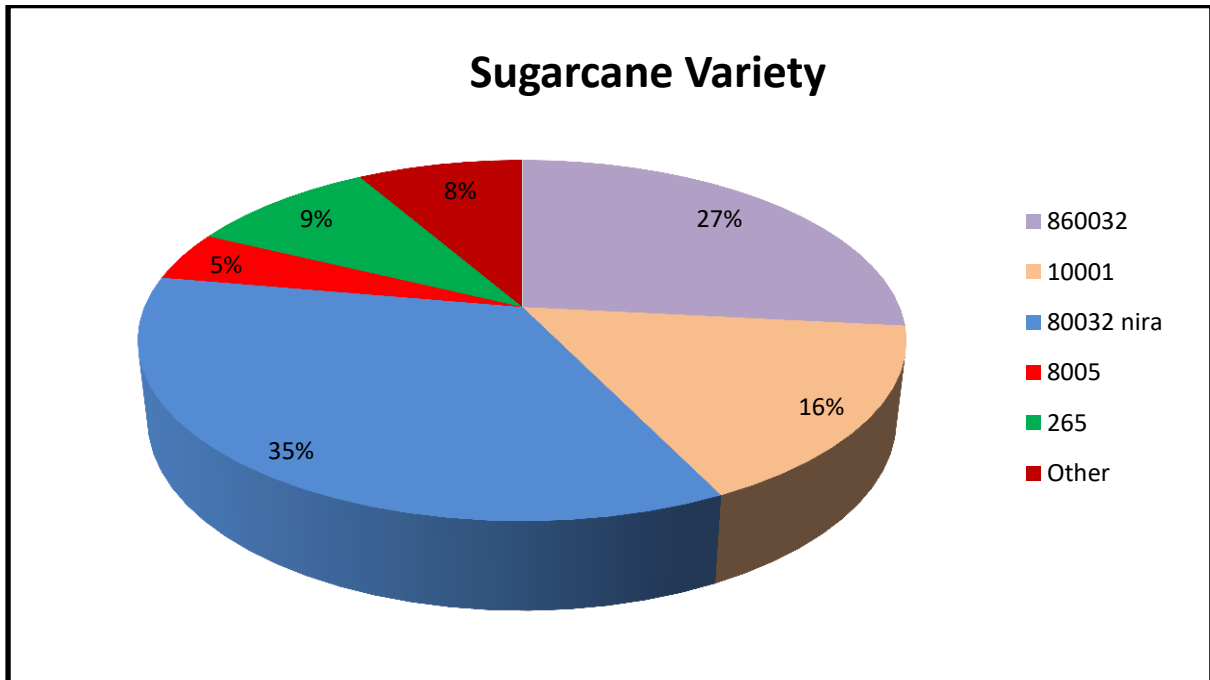
5. Intercropping

Water system-

1. Type of water supply
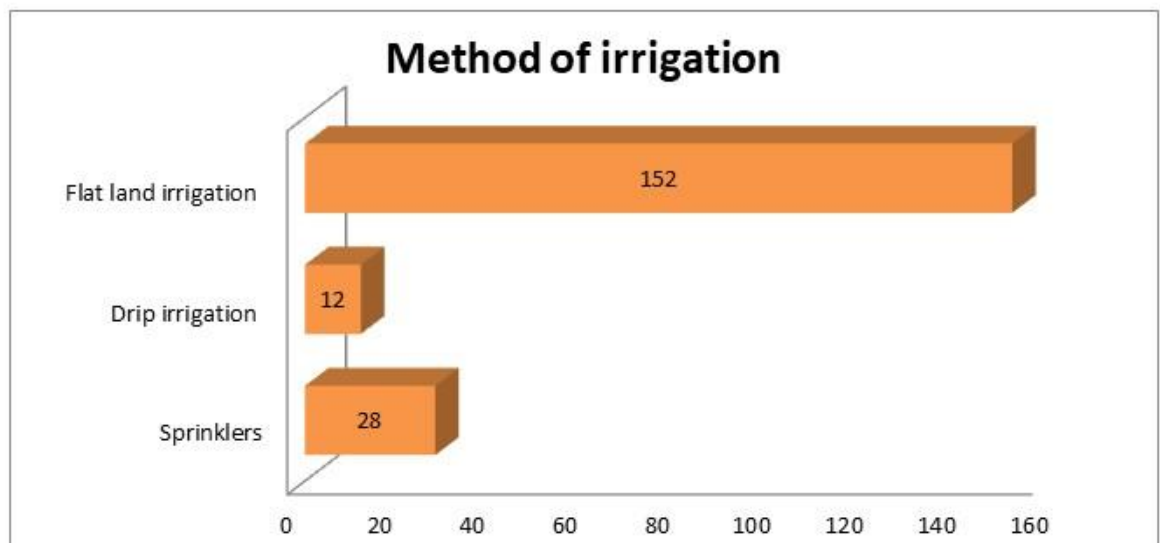
2. Duration between two successive water

Fertilizers-

1. Types of fertilizers

2. Spreading the chemicals and its reason

GRAPHICAL REPRESENTATION

➢ **SUGARCANE VARIETY IN AGRICUILTURE FIELD -**

Sugarcane Variety

(Pie chart of Sugarcane Variety)

- 860032 — 27%
- 10001 — 16%
- 80032 nira — 35%
- 8005 — 5%
- 265 — 9%
- Other — 8%

➢ **Method of irrigation for Sugarcane Production:**

Method of irrigation

(Bar chart)

- Flat land irrigation — 152
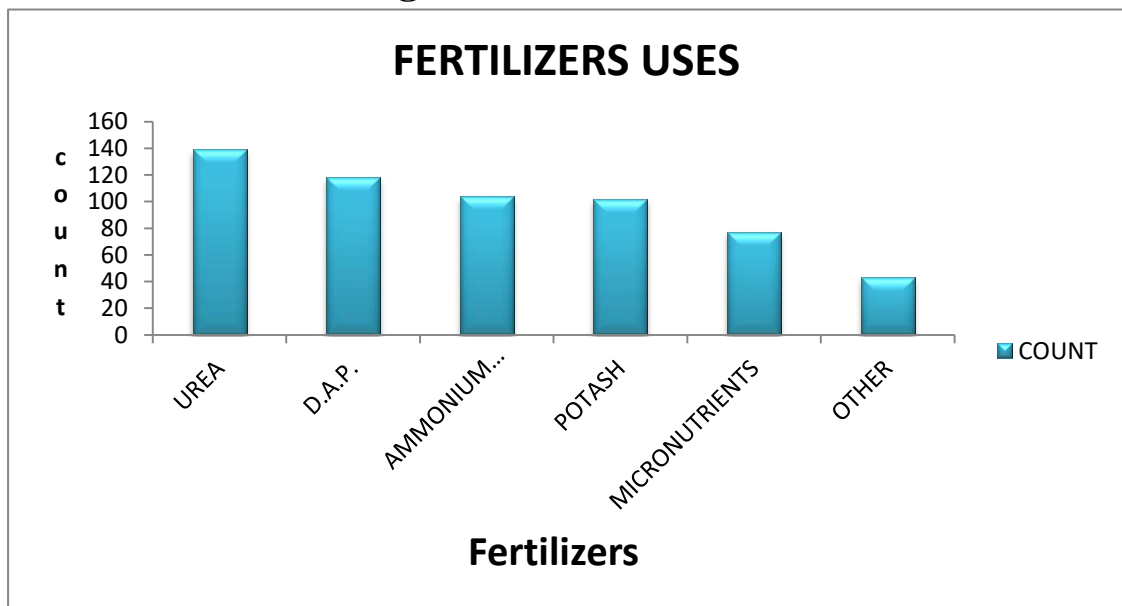- Drip irrigation — 12
- Sprinklers — 28

Interpretation:

About 84.4 % farmers prefer free and flat land irrigation method. Some farmers use drip irrigation and hardly use of sprinklers is done.

➢ **Method of weeding:**
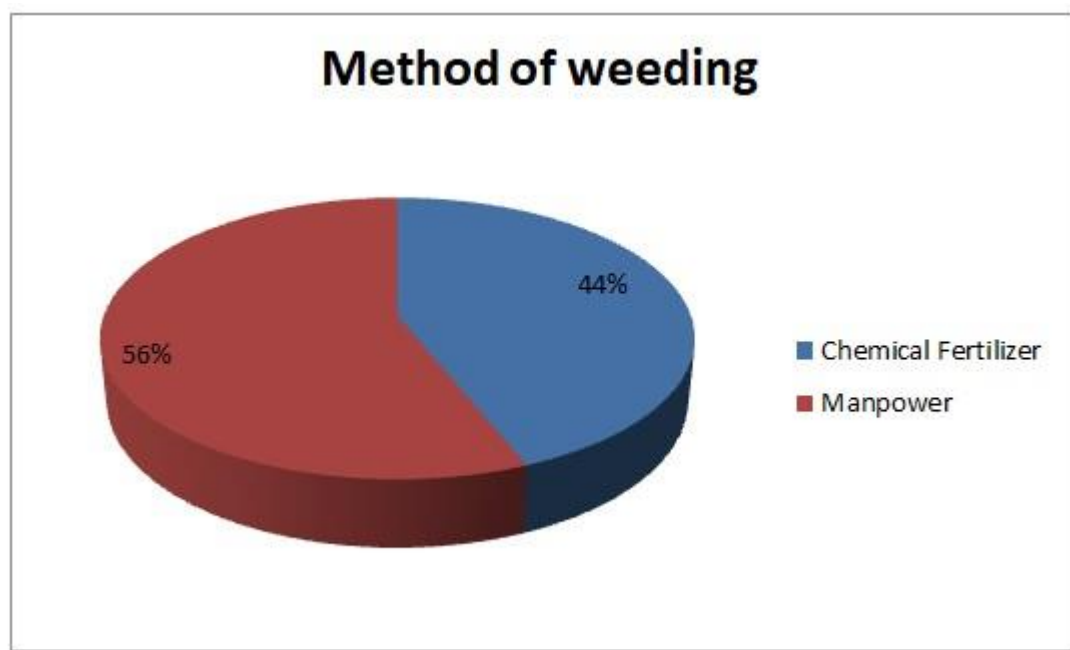
Interpretation: About 56% farmer use chemical fertilizers for weeding and others by manpower (laborers)
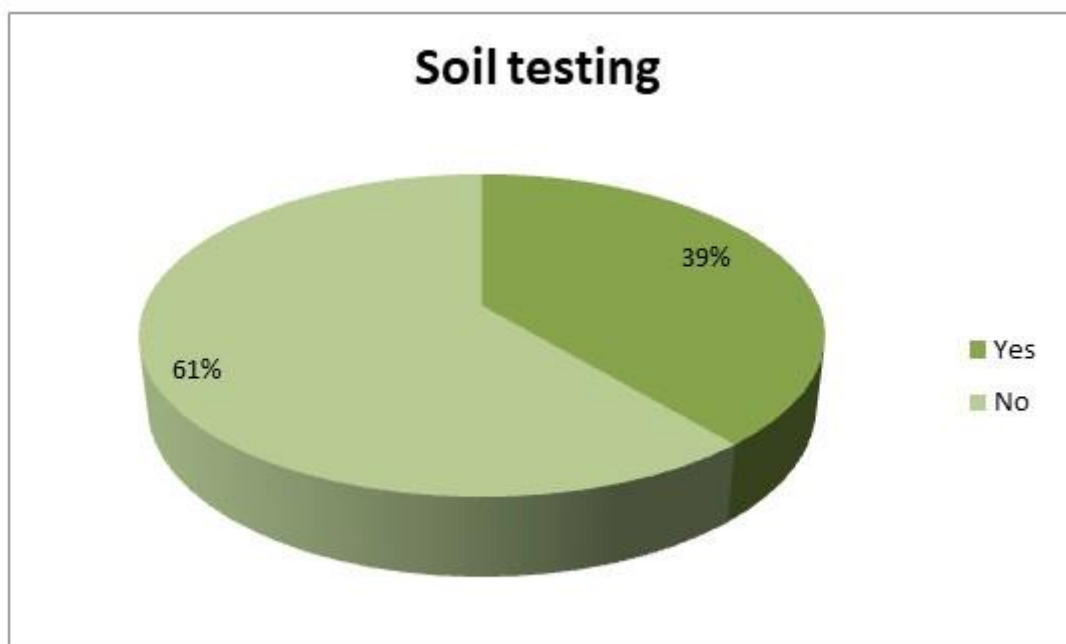
➤ Fertilizers Uses In Sugarcane-

FERTILIZERS USES

Interpretation:

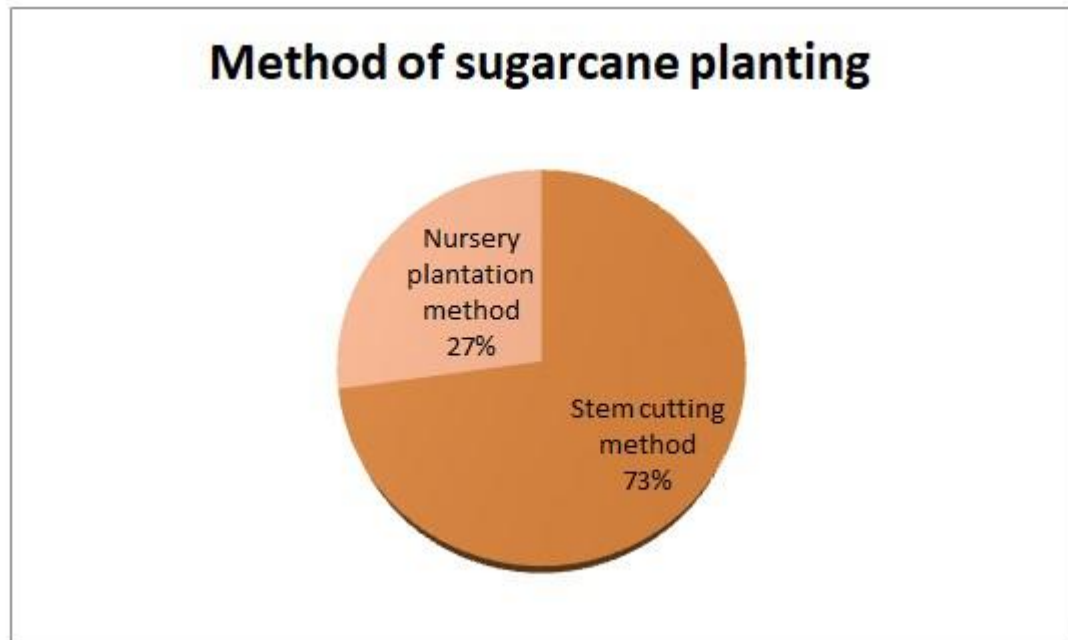Most of the farmers prefer urea as fertilizers. Because cost of the urea is very low.

➤ Soil testing :

Interpretation: About 61% farmers did not test the soil.

Method of sugarcane planting:

A) Stem cutting method

B) Nursery plantation method

Method of sugarcane planting

Nursery plantation method 27%

Stem cutting method 73%

Interpretation:

Most of the farmers prefer stem cutting method than nursery plantation method. About 73 % farmers practice stem cutting method.
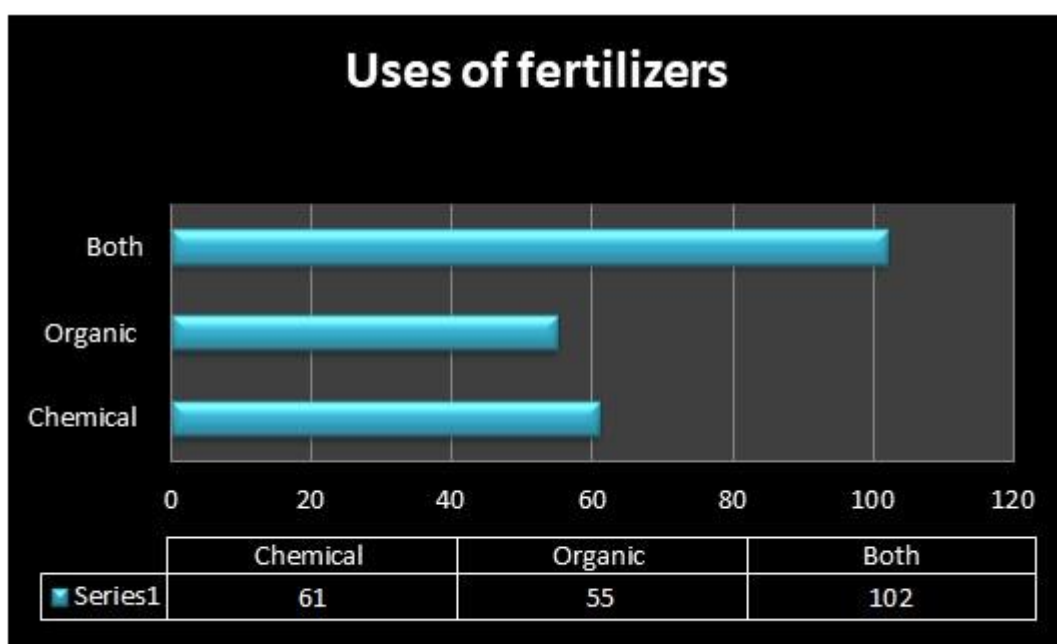
➢ **Distance between two successive rows:**

Distance between two successive rows

2 feet	42
3 feet	98
4 feet	51
5 feet	3
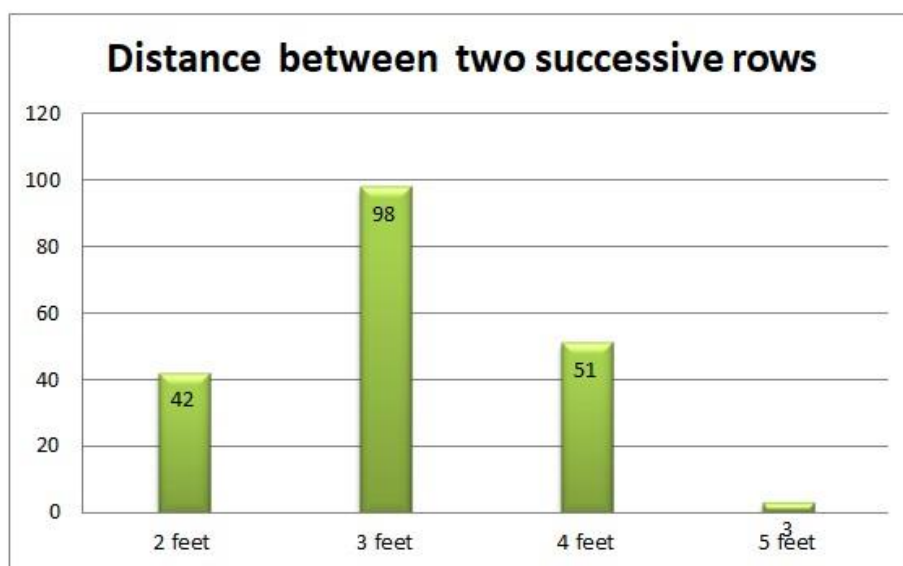
Interpretation:

From the above graph, we conclude that most of the farmers keep 3 feet row distance and some farmers hardly 2, 4 and 5 feet row distance.

➢ **Uses of fertilizers:**

Interpretation:

About 56.7% farmer used both chemical and organic fertilizers, only 30% farmers use organic fertilizers use of chemical fertilizers is more as compared to organic fertilizes,

STATISTICAL ANALYSIS

❖ To check whether dependency of ration card and soil testing

We have to test

H_0 **:** Ration card and soil testing are independent.

H_1 : Ration card and soil testing are not independent .

3*2 Contingency Table,

Ration card\Soil testing	Yes	No
Yellow	15	22
Saffron	38	82
White	10	13

Test statistic under H_0 is,

$$\chi^2 = \sum_i^m \sum_j^n \frac{(Oij - Eij)^2}{Eij} \sim \chi^2_{(m-1)\,(n-1)}$$

Where,   m = number of rows and

n = number of columns.

Here,

$\chi^2_{cal} = 1.8119$

$\chi^2_{tab} = \chi^2_{(m-1)\,(n-1),0.05} = \chi^2_{(3-1)(2-1),0.05} = 5.991$

Hence,

$$\chi^2_{cal} < \chi^2_{tab}$$

We accept H_0 at 5% L.O.S.

Conclusion:

Ration card and soil testing are independent.

❖ To check whether row distances affect the sugarcane production or not. Following data is analyzed by using paired t test.

x_i = Production of sugarcane with 3 feet row distance.

y_i = Production of sugarcane with 4 feet row distance.

We have to test,

H_0 : Row distance is not affect the sugarcane production.

H_1 : Row distance is affect the sugarcane production.

Test statistic under H_0 is,

$$t = \frac{\bar{d}}{s/\sqrt{n}} \sim t_{n-1}$$

Where,

n= number of observations.=11

$$\bar{d} = \frac{\sum di}{n}$$

$$S = \sqrt{\frac{\sum (di-d)^2}{n-1}} = \sqrt{\frac{\sum di^2 - n\bar{d}^2}{n-1}}$$

For 3&4 feet distances

$$\bar{d} = \frac{5.05}{11} = 0.4591$$

$$S = \sqrt{\frac{\sum di^2 - n\bar{d}^2}{n-1}} = \sqrt{\frac{1.7941}{11-1}} = 0.4235$$

Now,   Paired t-test is given by,

$$t = \frac{\bar{d}}{s/\sqrt{n}} = \frac{0.4591}{\frac{0.4235}{\sqrt{11}}} = 3.5954$$

Therefore,

$$|t\ cal| = 3.5954$$

Now,

$$|t\ tab| = 2.6337$$

Since,

$$|t\ cal| > |t\ tab|$$

We reject H_0 at 5% L.O.S.

Hence, Row distance is affect the sugarcane production.

Conclusion:

Change in row distance affects the sugarcane production.

❖ To check covariance between yield with intercropping and without yield intercropping.

x= yield with intercropping in tones per plot.

y= yield without intercropping in tones per plot.

$$\bar{x} = \frac{\sum_1^n xi}{n} = \frac{12.7649}{10} = 1.27649$$

$$\bar{y} = \frac{\sum_1^n yi}{n} = \frac{13.8584}{10} = 1.38584$$

Covariance is given by,

$$Cov(X, Y) = \frac{\sum_1^n (xi-\bar{x})(yi-\bar{y})}{n-1}$$

$$= \frac{1.3726}{9} = 0.1525$$

Conclusion:

1) Intercropping has no effect on sugarcane production.
2) There is no change in sugarcane production with and without intercropping.

CONCLUSIONS

❖ Ration card and soil testing are independent.

❖ Sugarcane production is affected by the change in row distance.

❖ Intercropping has no effect on sugarcane production.

❖ There is no change in sugarcane production with and without intercropping.

SUGGESTIONS

1. Farmers should test the soil and on the basis of soil report they should use prescribed fertilizers.
2. Farmers should practice nursery plantation method because it is cost effective and simple method of planting,
3. Production of sugarcane is maximum when successive row distance is as wide as possible and sufficient.
4. The best method of weeding is by laborers than by chemicals. Use of Chemicals cause soil degradation, nitrogen leaching, soil compaction, reduction in soil organic matter and loss of soil carbon. It also affects total production of sugarcane.
5. Crop counting of sugarcane is necessary. It should be done 3-4 months after sugarcane planting. There must be about 1000 plants per plot.
6. Farmers should practice intercropping in sugarcane production because it has no affect on total production. Intercropping can increase farmer's income by some amount. It also keeps the soil fertile.
7. Drip irrigation is the most efficient and appropriate irrigation system instead of wetting the whole field surface, water is applied only to the plant root zone. Wastage of water is less by drip irrigation method.
8. Farmers should use organic fertilizers rather than chemical fertilizer. Organic fertilizers improve soil structure, help to retain nutrients, allow carbon fixation and enhance the ability of the crop to absorb water. High quality organic fertilizers are the products of natural decomposition and are easy for plants to digest.

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