

“SOIL REJUVENATION THROUGH NUTRIENT MANAGEMENT IN STRAWBERRY HORTICULTURE NURSERY”

Prabhakar Vilasrao Shinde M.A.L.L.B

Research Scholar, Shri J J T University, Jhunjhunu, Rajasthan, India

ABSTRACT:

Strawberry (Fragaria vesca) is a significant fruit crop in India and its commercial production is possible in temperate and sub-tropical areas of the country. As the soil health is degrading day by day due to more and more dependence on chemical fertilizers for plants production the need for alternative nutrients has been felt in Strawberry Horticulture Nursery. Long term fertilizer experiments have clarified that use of chemical fertilizers alone cannot sustain the soil health and productivity over a longer period of time. A number of organic sources are available, the proper management of which can solve the problem of nutrient imbalances and poor physical conditions, poor microbial population etc. in the soil. The observations revealed that there is production yield and profitability increase due the integrated nutrient management in Strawberry Horticulture Nursery which is also rejuvenated the soil. The essence of the integrated nutrient supply is the combined use of organic, inorganic and bio fertilizers in Strawberry Horticulture Nursery in order to sustain the productivity of the plants as well as for rejuvenation of soil.

KEYWORDS: Soil Degradation, Soil Rejuvenation, Integrated Nutrient Management, Strawberry Horticulture Nursery, etc.

INTRODUCTION

Strawberry (*Fragaria vesca*) is an important fruit crop in India and its commercial production is possible in temperate and sub-tropical areas of the country. Strawberry is cultivated in Himachal Pradesh, Uttar Pradesh, Maharashtra, West Bengal, Delhi, Haryana, Punjab and Rajasthan. Sub-tropical areas in Jammu have also the potential to grow the crop under irrigated condition. Mahabaleshwar and Panchgani region in Maharashtra is perfect and widely used region for Strawberry Cultivation. The climate of the area is suitable for cultivation of strawberries; *Mahabaleshwar Strawberry* contributes to about 85 percent of the total strawberry production in the country.

No two soils are alike in either the nature or the quantities of the plant nutrients it contains. The quantities of both organic and inorganic matter found in the soil vary greatly from soil to soil. Now a day, soil health is degrading due the excess use of chemical fertilizers. There is a need of innovative solution for rejuvenation of soil. The integrated nutrient management is one the significant solution that can be applied in strawberry horticulture nursery also. It includes organic manures, inorganic manures and bio fertilizers.

Research Scholar implemented integrated nutrient management in strawberry horticulture nursery by practical method. The observations recorded on regular basis which are presented in this study herewith. The study examined the observations and presented the conclusion in respect with strawberry horticulture nursery.

OBJECTIVES

- i. To study traditional manure pattern in Strawberry Horticulture Nursery.
- ii. To study causes of soil degradation in Strawberry Horticulture Nursery.
- iii. To study the integrated nutrient management pattern for soil rejuvenation in Strawberry Horticulture Nursery.
- iv. To study efficiency of integrated manure pattern in Strawberry Horticulture Nursery.

HYPOTHESIS

- i. H01 There is no impact of integrated nutrient management on soil rejuvenation and productivity in strawberry nursery.
- ii. H1 There is positive impact of integrated nutrient management on soil rejuvenation and productivity in strawberry nursery.

RESEARCH METHODOLOGY

The study was concluded in Mahabaleshwar strawberry growing area which is the hill station located in *Sahyadri Ranges* of **Western Ghat** in the Satara District of Maharashtra State. The Mahabaleshwar is located at 17.9237°N 73.6586°E. Mahabaleshwar has an average elevation of 1,353 metres (4,439 ft). Research Scholar implemented integrated nutrient management in strawberry horticulture nursery by practical method. The data obtained from primary sources through regular observations recorded strawberry horticulture nursery. The study examined the observations and presented the conclusion in respect with strawberry horticulture nursery. The required secondary data obtained from various reference books, magazines and research articles.

Integrated Nutrient Management

a. Farmyard Manures:

Farmyard manure is the most important of all fertilizers as it is supposed to contain all the ingredients required for the growth of all the crops and also because of it causes certain amount of disintegration of soil. Hence it is considered as the complete food for plants. It also increases the water-holding capacity of soil as well as restores humus in the soil, renders clayey soil more porous and usable, gives cohesion to sandy soils. It serves as buffer in the soil ensuring even distribution of inorganic plant nutrients to the roots of the crops.

On an average 50 tonnes of well rotted farmyard manure supplies about 250 kg Nitrogen, 100 kg phosphorous pent oxide, 250 kg potassium oxide. This composition may vary depending upon the feed fed to the animal and material used for bedding of the animals. In India farmyard manure contains 0.3 % of Nitrogen out of which 0.1% is dung and 0.2% is urine. It also contains 0.11 % of P₂O₅ out of which 0.1% is dung. The potash content in farmyard manure is 0.25% out of which 0.05% is urine and 0.20% K₂O.

Using the farmyard manure alone causes an imbalance in nutrition due to its relatively low content of phosphoric acid. Therefore, for keeping the soil well supplied with the all essential foods in a readily available form, and also to keep them in good 'heart' bulky manures must be used in conjunction with superphosphate and other artificial fertilizers as contain the particular plant food or foods in which soil may be deficient or which the crop to be grown may specifically require. The one will improve the physical condition of the soil and the other will supply the required quantities of plant food to produce a good crop.

b. Compost Manure

Compost manure is a local manure which made from refuse like leaf, wrings, sugarcane trash, maize and bajra stalks or any other plant waste. In villages and rural areas all types of cattle and human wastes made use of which known as rural manures. A large number of the soil micro organisms feed on them and convert them into well rotted manures. Conventionally prepared composts are also poor in nutrients. The addition of the superphosphate makes the manure more balanced and also conserves the nitrogen loss from the composts. The availability of the phosphorous, thus intimately mixed with organic manure is more than when this fertilizer is used as such and is of advantage to acidic and heavy soils.

It is necessary that adequate areas earmarked for sewage farming in our growing towns which should not be built upon. Effective utilization of city wastes, including sewage and sullage would mean not only increased agriculture production but also cleaner cities. Mechanical compost plants should be set up in selected cities to make organic manures from city wastes,

c. Animal Wastes: -

The minimum mortality of large animals has been estimated at 8%. The unconsumable portion can be used as manures: blood, bones, liver, offal, hooves, hair forms waste, etc.

- i. **Blood meal waste:** - The dried blood from slaughter houses may be used as fertilizer by reducing it to fine powder. This process consists in adding 1-3% of quicklime, which converts it into solid cake which may be used as dried in the air without purifying and finally gives a fine and inodorous powder. It contains 13% Nitrogen, 1% Phosphorous and 1% Potassium. It decomposes readily in the soil and can be applied any time during the crop growth to supply the nitrogen requirement i.e. Nitrogen is easily available from it. The care should be taken before use to check the presence of chlorides in the blood meal as chemically processed blood meal is to be used.
- ii. **Bone meal waste:** - Bone meal is a manure suitable for all types of soils particularly acidic soils where superphosphates cannot be used. It helps to increase the phosphorous content of grain and they enhance its nutritive value. Steamed bone meal contains 35% phosphate, 1% Nitrogen. Steamed bone meal contains more phosphorous than raw bone meal.

To increase its efficiency, it should be decomposed with organic materials for about one to two months before use in alkaline and calcareous soils. Chemically processed bone meal should not be used for Strawberry as it contains caustic soda and hydrochloric acid.

d. Agro Industrial wastes: -

There are certain agriculture animal wastes which could be usefully utilized for providing manure to the soil. Non edible oil cakes like neem, karanj, castor, etc. are effective manures. The decomposition of oil cakes is faster than cereals and legume residues another bulk manures. Nitrogen from oil cakes starts becoming available to plants after 8-10 days of application. For their easy decomposition soil cakes should be powdered before use.

Table 1
Approximate quantities of nutrient supplied by 1000kg of materials

Particular	N	P	K
Neem Cake	52	10	14
Karanj Cake	39	9	13
Groundnut Cake			
i. Decorticated	78	15-	14
ii. UnderCorticated	45	19	15
Mahua Cake	25	17	18
Rapessed and Mustard cake	51	8	10
Safflower Cake		18	
i. Decorticated	78		20
ii. Under Corticated	48	22	12
		14	

e. Green Manure:

Green manure is suitable form which supplies organic matter to the soil to keep up the supply to the humus. Green manuring can be practiced under irrigation and assured rainfall conditions where the moisture content in the soil is adequate and does not interfere with normal seasonal cropping. Legume crops are best suited. They add nitrogen to the soil about 80 lbs per acre.

In order to increase coverage under green manuring, it is necessary to take demonstration farms.

Table 2
Efficiency of green manures compared to others

Manure	Efficiency to that of Green Manure
No Manure	30.0
P Only	50.0
N Only	70.0
N and P Only	90.0
Green Manure	100.0
Green Manure P	120.0
Green Manure N	133.0
Green Manure N and P	166.0

f. Fish Manures:

Fish meal is quick acting organic manure and is suitable to all crops on all soils but powdered fish meal should be preferred for use. The fish manure is manufactured from byproducts of fishing. They contain about 3% Nitrogen, 1% Phosphorous. It is made on considerable scale on various kinds of fish refuse like dried fish unfit for human

consumption, fish guanos, the cake left after pressing the fish oil and often other refuse from fish curing yards.

Implication in Strawberry Horticulture Nursery:

Research Scholar implemented the integrated nutrient management for soil rejuvenation in strawberry horticulture nursery and has recorded some observations.

Table 3
Profitability Statement- Integrated Nutrient Management
(Rs. in Lakhs)

Sr. No.	Particulars	Production
1.	Annual Sales	5.50
2.	Recurring Expenses	2.63
4.	Net Profit	2.87

RESULTS AND DISCUSSION

The observations recorded revealed that total annual sales have increased due to integrated nutrient management.

While using integrated nutrient management as specified above, recurring expense almost remained constant but there is significant increase in net profit of Strawberry Horticulture Nursery.

Furthermore, the observations also rendered that integrated nutrient management maintained and enriched soil health. It minimized the incidences of pest and diseases in Strawberry Horticulture Nursery.

CONCLUSION

Land gives nourishment to crop and return call for nourishment. Now a day's soil health is degrading day by day. There is a requirement of strong efforts for rejuvenation of soil health. Neither the soil conservation programmes alone, fertilizer alone, improved tillage alone can each give a small uneconomic increase on good soil but combination of organic, inorganic and bio fertilizers commonly gives a three to six-fold increase in the harvest. So integrated nutrient management is must and best effort can be done for rejuvenation of soil in Strawberry Horticulture Nursery and other crops also.

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