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SCOPE OF CHANGING CROPPING PATTERN THROUGH SOIL EXAMINATION OF SINNAR TEHSIL DIST. NASHIK MH

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Abstract:-

Cropping pattern and soil analysis are also reflects the performance of the farmer for various crops sown in an agricultural field. Hence, for better cropping pattern ,the preset research has been attempted to analyzing the soil facilities a scope of new cropping pattern .To change cropping pattern though soil analysis –Circle of sinnar Tehsi .Taking soil sample. Laboratory analysis of samples. Samples should be taken randomly throughout the entire area, travelling in a zigzag pattern to ensure uniform distribution. Dyer (1890) "After testing many samples dyer classified the soil according to its type." Significant area under food grains (45%) and oilseeds (16%). Increasing vegetable cultivation (from 13% of cultivable land in 20018-19 to 18% as of 2022). Kharif crops: bajra, soyabean, onions, vegetables, maize, peanuts (also tur, cotton sowing).Rabi crops: wheat, harbhara, onions, and vegetables. Only the 5% area wasoccupied by the truits plantation in is study area. The interpretation of the results by the issuance of fertilizer recommendation for the following scope of fruits plant and Citrus type of plants. NPK and other fruits .Garlic Benefits from phosphorus and potassium for good bulb and not development .Rose Boots of phosphorus could help with strongest and healthy blooms. Carrot With adequate phosphorus and potassium. Tomato Need N for strong vine growth , Poor good blooms and K and calcium for strong , healthy fruits . Citrus Plantation Nutrition 120 kg /ha – phosphorus 28 kg /ha –Potassium 120 kg /ha – calcium Require Soil Types Can be grown on a wide variety of soils , from sand to loam and clay . Both acidic and Alkaline soil acceptable .Principal citrus Orange, Lemon, Lime, Grapes fruits Require Climate Both Arid and Humid climate are acceptable. High and reflect to high citrus juice.

Introduction:-

Cropping pattern and soil analysis are also the part of behavioral approach in geography, because if reflects the performance of the farmer for various crops sown in an agricultural field. Hence, by considering the facts related to better cropping pattern, the preset research has been attempted to analyzing the soil facilities a scope of new cropping pattern. Soil organs have the property of providing nutrients to plants growing in soil. Like other living organisms, plants need some form of food (fertilizers) to survive and grow. If the crops are taken care of and cultivated to provide them with enough food (fertilizer) they start growing rapidly. In addition,power comes from them. Crops resist crop diseases and pests if they get the right nutrients from the soil. In addition (in the form of grains, fruits, and flowers), the crop gives abundance and quality. When it comes to soil fertility and texture from the point of view of agricultural production, the following are of special technique.

1. Applying other nutrients to crops only after studying the nutrients in the soil.
2. To see how and how much the soil supplies these nutrients to your plants.
3. To see what causes the loss and retention of nutrients in the soil.
4. What measures can be taken to maintain soil fertility or restore it if it is depleted?
5. If the crop is taken in agriculture only after checking the soil fertility, the financial loss of the farmer will be avoided.
6. It is necessary to give organic matter to maintain the fertility of the soil. Because it creates favorable conditions for the formation of vegetative fungi. It also promotes the growth of the crop. By improving the fertility of the soil, the production increases.

If the supply of food grains and orchards in Sinnartaluka is to be increased, some measures should be taken to improve soil fertility in the taluka. In order to avoid economic loss and economic upliftment of farmers, soil fertility should be checked. This means that per acre agricultural production of each farmer will increase.

It is necessary to convert farmers from traditional agriculture to modern agriculture. If proper planning is done, the farmer can grow citrus orchards and the farmer will also benefit financially. The land in Sinnartaluka is suitable for citrus orchards. In addition, the climate here is suitable for citrus orchards. According to the joint plan of India and America, laboratories for soil testing have been established at various places in the country. This helps farmers to improve soil fertility and use of chemical fertilizers. Geologists and agronomists have an effective and useful tool for scientific soil testing. So it has become possible for the farmers to know the fertility of the soil and the quantity of rice.

Nutrients absorbed by crops.

Types of crops	Emerging Crop	Nutrients to be ingested (kilogram/hector)		
		Nitrogen	phosphorus	Potassium
Wheat	2340	35	22	11
Millet	1200	17	10	8
Maize	3250	47	26	15
onions	20000	100	50	50
Groundnut	2160	37	21	13
Sugar cane	99850	85	60	190

Review:-

Liebig (1900) :-"while presenting the theory of crop growth Liebig proposed the theory scarcity which states that the growth of crop stander due to insufficient or very low supply of essential nutrients "

Soil quality is the capacity of soil to function, within ecosystem and land-use boundaries, to sustain biological productivity, maintain environmental quality and promote plant, animal and human health (Doran and Parking, 1994), while soil health is the continued capacity of soil to function as a vital living system within ecosystem and land-use boundaries, to sustain biological productivity, promote the quality of air and water environments, and maintain plant, animal and human health**" (Doran and Safley, 1997).**

Earth"s ecosystem depends on functional soil. Soil is irreplaceable; it governs plant productivity of terrestrial ecosystems and maintains biogeochemical cycles **(Nannipierei et al. 2003).** Humans exert a major influence on the world"s soil in particular through agricultural land use. These disturbances caused by natural or human activities have direct impact on ecosystem properties and functions such as nutrient cycles, physical and chemical complexity (Wright and Coleman, 2002; Upchurch et al. 2008) and these effects are long lasting and persist for decades **(Buckly and Schimdt 2003; Upchurch et al. 2008).**

To study the different aspects of soil health status we need to develop soil health indicators. Many indicators relate to the cycling of soil organic matter, a key component of soil quality

(Gregorich et al. 1997). Biological indicators represent different aspects of soil quality in different ecosystems **(Elliott, 1997).** These indicators strive to monitor or measure the basic functions or parameters as soil structure development, nutrient storage and biological activity **(Gregorich et al. 1994).**

Pandey and Singh (2006) have studied effect of Insecticide treatment on the activity of arginine deaminize, phosphomonoesterase and dehydrogenase activity. Boerner et al. (2005) studied seasonal variation on enzyme activity. Włodarczyk et al. (2005) studied the effects of sampling season, storage period, and three different methods of storage on dehydrogenase activities of the topsoil of four soil units.

Mishra Nityamanjari (2018) reported that potato is a heavy feeder crop and hence needs heavy doses of fertilizers for its growth and yield. Obviously, nutrient management shall be a primary characteristic in the management of potato crop. It is the art of managing the quantity, form and timing of application of nutrients to plants. However, integrated nutrient management is essential tools for balanced fertilization and sustainability of crop production on long-term basis. This review gives an account of nutrient management carried out on potato crop for optimization of potato growth and tuber yield.

Khan et al. (2002) reported that use of chemical fertilizers has become animportant issue due to the concerns for sustainable soil productivity and ecological stability. Traditional green manures (Sesbania aculeate), organic manures (FYM) and problematic weeds (Ipomoea Carnea&Gliricidiamaculatd) may serve as alternative source of nutrients to the plants and may supplement and chemical fertilizers. Most of the green manure plants contain from 0.3 to 0.8 percent nitrogen. Integrating fertilizer nitrogen with legume green manure as alternative source of nutrients can aid development of sustainable agricultural management system.

Singh et al. (2006) conducted the experiment to study effect of nutrient management practices on potato based cropping system and they reported that the nutrient management on cropping system basis is more efficient and judicious than sole crop basis, because the succeeding crops exploit the residual effects of fertilizer applied to one crop.

Objective:-

(1) To change cropping pattern though soil analysis –Circle of sinnar Tehsil.

(2) To develop sustainable agriculture planning though soil analysis.

Hypothesis:-

1) Soil examination is always good for increase the yielding capacity of the soil and its tends to help the changing cropping pattern.

Research Method:-

1. Collection of soil sample report by the Soil Health Card
2. Laboratory analysis of samples.
3. Samples should be taken randomly throughout the entire area, travelling in a zigzag pattern to ensure uniform distribution.
4. Take samples using your soil probe at a depth of 10-15 cm for sod crop and 3 to 20 cm foremost other crop.
5. Place samples in clean plastic bucket.Remove plant residue,rocks, break clumps and mix well.
6. If the samples is wet twill, need to air dry in a non-contaminated area before the sample can be mixed and a composite taken.
7. The composite sample should be about 2 cups in size.

Results and Discussion:-

Sinnar Tehsil Present Cropping Pattern

1. Significant area under food grains (52%) and oilseeds (21%)
2. Decreased vegetable cultivation (from 25 percentage of cultivable land in 2017-18 to 19% as of 2023).
3. DecreasedKharif crops: bajra, soyabean, onions, vegetables, maize, peanuts (also tur, cotton sowing).
4. Rabi crops: wheat, harbhara, onions, vegetables.
5. But only 2% of the study area has land under fruit tree cultivation.

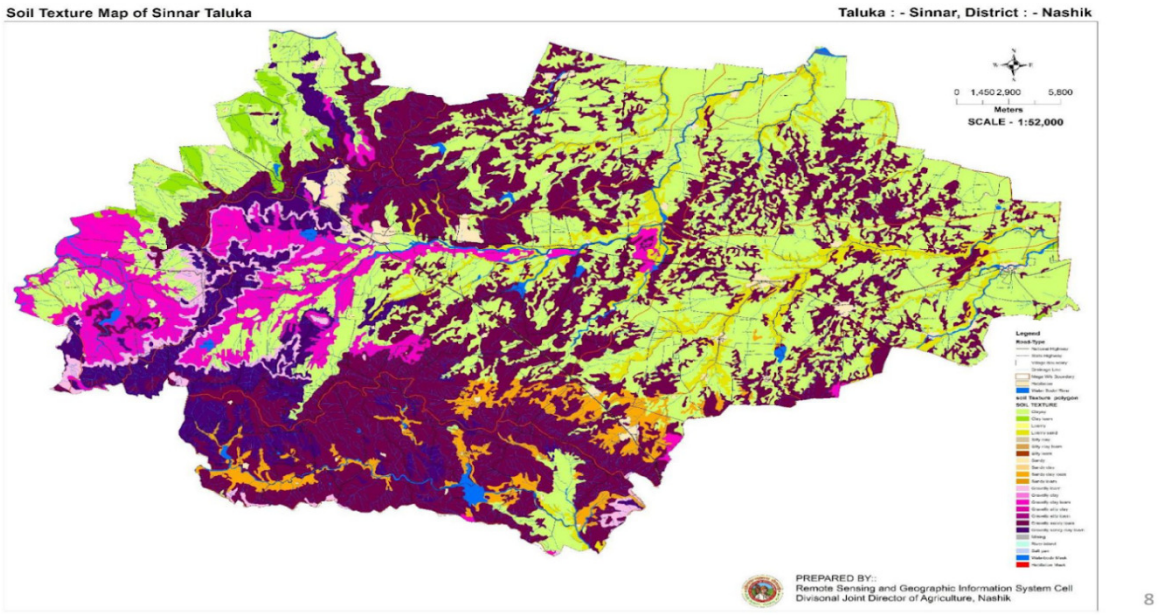
Present Nutrient Level in Soil in Study Area:-

Sinnar Circle	Gondhe	Dubere	Deupur	NandurShingote	Nayigaon	Pangari BK	Pndurli	Vanangi	Wavi	Shaha	Sinnar	Sonambe
Village	Gonde	Patole	Gulvanch	Nalwadi	BaragaonPimpri	Pangri BK	Agaskhind	mendhi	Marhal KH	ujjani	Musalgaon	atkavde
Farmer Name	BimaDattuTambe	RambhauDhanuKarad	SandipRamkrisanSanap	RambhauRaghujiSahane	Santosh BabanKurade	TukaramPagar	Anita RajaramGodase	ArunKulathi	EkathSangale	KeshavKhanderaoHandore	GirisghBabanShirsath	RajaramBaaravWagh
Sample no.	*MH551223/53899418*	*MH551222 1165860*	*MH551174 95047083*	*MH551241 96529886*	*MH551150 91692072*	*MH551253 52390694*	*MH551212 96817895*	*MH551170 90437947*	*MH551256 51355318*	*MH551179 91827138*	*MH551159 55135299*	*MH551220 90978943*
pH (5-7)(0-9)	8.31 MAL	7.350 MAL	8.30 MAL	8.420 MAL	8.210 MAL	8.410 MAL	8.170 MAL	8.300 MAL	8.50 MAL	8.04 MAL	8.100 MAL	8.11 MAL
EC <4ms/cm	0.455 N	0.315 N	0.177 N	0.335 N	0.817 N	0.641 N	0.427 N	0.829 N	0.481 N	0.513 N	1.9 N	0.396 N
OC <0.5-0.75%	0.54 M	0.64 M	1.111 VH	0.58 M	0.63 M	0.51 M	0.72 M	0.50 L	0.53 M	0.49 L	0.62 M	0.48 L
N <240-480kg/ha	216.0 L	312.4 M	316.5 M	234.0 L	236.0 L	204.0 L	270.0 L	200.0 L	212.0 L	224.0 L	151.7 L	216.0 L
P <11.0-22kg/ha	44.10 VH	43.17 VH	30.1 H	26.79 H	17.72 M	29.61 H	25.76 H	29.10 H	21.02 M	18.13 M	11.20 M	18.75 M
K <110-280kg/ha	168.0 M	1008.0 VH	351.20 H	196.0 M	252.0 M	112.0 L	280.0 M	168.0 M	168.0 M	168.0 M	342.7 H	196.0 M
S 15-25%	16.0 S	13.31 S	13.20 S	19.00 S	16.00 S	25.00 S	16.00 S	22.00 S	15.00 S	13.00 S	20.70 S	19.0 S

Zn <0.38-2.00mg/kg	2.31 S	0.72 S	0.31 D	1.38 S	1.38 S	1.83 S	1.39 S	1.29 S	1.99 S	1.02 S	0.68 S	1.12 S
Fe 1-5%	3.38 D	4.03 D	1.35 D	3.21 D	3.15 D	1.98 D	4.10 D	5.63 S	2.38 D	1.91 D	0.62 D	2.16 D
Cu 2-100ppm	2.21 S	1.81 S	1.25 S	1.91 S	2.14 S	0.93 S	1.64 S	1.14 S	1.63 S	1.05 S	1.24 S	1.56 S
Mn 0-50mg/kg	6.35 S	5.10 S	15.35 S	4.55 S	3.02 S	3.02 S	5.66 S	2.12 S	3.12 S	4.19 S	9.51 S	4.15 S
B <0.5-1.5ppm	0.65 S	0.67 S	0.25 D	0.25 D	0.35 D	0.35 D	0.30 D	0.20 D	0.30 D	0.30 D	0.63 S	0.30 D

(L-Low, VL-Very Low, M-Medium, H-High, VH-Very High, D-Deficient, S-Sufficient, HAC-Highly Acidic, MAC-Moderate Acidic, SIAc-Slightly Acidic, N-Neutral, MAl-Moderately Alkine, AS-Acid Sulphate,SrAc-Strongly Acidic)

Sinnar – Soil texture map



Source :- Divisional Joint Director of griculture Nashik

Conclusion:-

By the issuance of fertilizer recommendation for the following scope of fruits plant and Citrus type of plants.

(1) Garlic: -Benefits from phosphorus and potassium for good bulb and not development.

(2) Rose: - Boots of phosphorus could help with strongest and healthyblooms.

(3) Carrot: - With adequate phosphorus and potassium.

(4) Tomato: - Need N for strong vine growth,Poor good blooms and K and calcium for strong, healthy fruits.

Nutrion Demands for Citrus Plantation:-

	Grams per Ton of fresh fruit				
	N	P_2O_5	K_2O	MgO	CaO
Orange	1773	506	3194	367	1009
Tangerine	1532	376	2465	184	706
Lemon and Lime	1638	366	2086	209	658
Grapefruit	1058	298	2422	183	573

Micronutrients removal from soil, by fruit, of different citrus varieties

Variety	grams per ton of fresh fruit				
	Fe	Mn	Zn	Cu	B
Orange	3.0	0.8	1.4	0.6	2.8
Mandarin	2.6	0.4	0.8	0.6	1.3
Lemon and lime	2.1	0.4	0.7	0.3	0.5
Grapefruit	3.0	0.4	0.7	0.5	1.6

CitrusPlantationNutrition:- NPK and other new scope of Cropping Parttan

120 kg /ha – phosphorus

28 kg /ha –Potassium

120 kg /ha – calcium

Require Soil Types: - from sand to loam andclay. Both acidic and alkaline soil acceptable

Principal citrus: - (1) Orange, (2) Lemon, (3) Lime, (4) Grapes fruits

Require Climate: - Both Arid and Humid climate are acceptable. “High K reflects to high citrus juice."

Being a tropical and subtropical crop, citrus can be grown in a belt between 40 °N and 40 °S, except at high elevations. Minimum temperature and its duration time are the limiting growth factors sensitivity depends on variety, rootstock, dormancy of the trees and the absolute minimum temperature and its duration.

Intensive citrus cultivation requires the use of fertilizers, close monitoring and control of pests, diseases and weeds, effective irrigation and control of tree size. The trees begin their productive life on the third year, and peak productivity takes place when the trees are 10-30 years old, average yields under these conditions are 30-60 t/ha.

Extensive citrus cultivation requires with the use of fertilizers, but only moderate monitoring and control of pests, diseases and weeds. They are generally rain-fed only. Their productive life starts on the fourth year, and peak productivity takes place when the trees are 8-15 years old, average yields under these conditions are 15-25 t/ha.

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