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A survey of soil fertility status of cashew nut gardens of South Konkan, Maharashtra

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Abstract

Characterization of surface soil for fertility was studied by taking thirteen representative samples of traditional cashew nut gardens in South Konkan. Study revealed that soils are acidic (slight to moderate) in nature with saline soil. The available nitrogen content varied from 116.03 (low) to 357.50 kg/ha (high). The data on available phosphorus (P_2O_5) indicate very low 5.7 to high 22.62 kg/ha indicating low nutrient indices. Potassium status was from 180.35 to 698.0 kg/ha. With high fertility rating.

Keywords: Cashew nut, fertility status, nutrients

Introduction

Cashew (*Anacardium occidentale* L.) which was introduced by the Portuguese in the Sixteenth century, mainly to control soil erosion and to use in a forestation programmes has now become an important cash crop of Konkan region. At present area under cashew in Maharashtra is 1.91 lakh ha with production of 2.48 lakh MT and productivity is 1367 kg/ha. (Anonymous, 2016). Although there has been significant increase in the area under cashew nut since liberation (40000 ha in 1990) as there has been no significant increase in the productivity. The agro climatic situation in South Konkan offers good scope to raise successful cashew nut plantation in varied soils ranging from coastal sandy to sandy loam and laterite in the hill slopes up to elevation of about 700 meter. Although cashew can adapt itself to wide range of soil conditions, it suffers in the soils with prolonged water logging. Extreme low temperature and frost are also not conducive to raise plantations. There is a scope to extend cashew nut cultivation in the wastelands. These factors play a dominant role in determining the soil fertility and productivity constraints. The status of soil fertility determines the level of crop productivity. In the present study an effort is made to determine the physico chemical properties and their fertility status of South Konkan that would focus on adopting appropriate cultural and nutritional management practices to keep the cashew nut plants healthy and productive.

Materials and Methods

To evaluate the soil fertility status of South Konkan a systematic survey was carried out. Surface (0-60cm depth) soil samples were collected from 13 sites following the standard procedures of soil sample collection. The soil samples were analyzed for various attributes. The soil P^H and electrical conductivity were determined in 1:2.5 soil water suspension using P^H meter respectively. Electrical conductivity, organic carbon, was analyzed according to standard methods. The available nitrogen was determined by the method described by Subbaih and Asija, where as available phosphorus and potassium by Jackson method. Analytical data showing the physicochemical properties are shown in Table 1 management practices to keep the cashew nut plants healthy and productive.

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Table 1: Analytical data of Soil fertility status of South Konkan

Sr. No	Location	pH	EC (dSm-1)	OC %	N Kg/ha	P Kg/ha	K Kg/ha
1	Vengurle	5.32	0.117	2.61	116.03	20.05	566.93
2	Kudal	5.70	0.040	1.24	254.01	9.08	203.11
3	Malvan	4.82	0.042	0.97	134.84	11.54	279.80
4	Sawantwadi	5.41	0.085	3.8	225.79	16.92	698.0
5	Kankavali	4.77	0.085	1.98	304.1	22.62	286.8
6	Phonda	5.70	0.087	2.3	191.2	8.12	666.3
7	Vaibhavwadi	5.20	0.161	2.73	190.2	17.74	579.8
8	Lanja	5.85	0.065	2.7	206.9	11.52	500.1
9	Rajapur	5.13	0.068	3.93	263.42	5.8	254.33
10	Ratnagiri	5.42	0.065	4.17	285.37	5.7	420.05
11	Chiplun	5.34	0.081	2.61	357.50	12.7	503.11
12	Sangmeshwar	5.40	0.070	2.49	291.64	7.3	296.4
13	Guhaghar	4.46	0.083	3.19	216.38	18.8	180.35

Results and Discussions

The P^H of the soil ranged from 4.46 to 5.85 the soils were acidic and saline due to acidic parent material. High rain fall in this area induces leaching of soluble salts. The EC values of South Konkan command area studied were in normal range i.e. 0.01 to 0.08 dSm^{-1} (lowest). Dasog and Hadimani reported EC ranging from 0.39 to 0.53 dSm^{-1} at surface in BLBC soils. The organic carbon content of the soils was in the study area ranged from 0.97 to 4.17% and fall under high category. Dudal has reported that organic carbon in Indian soils range sub humid soils. The organic matter build up in soils is related to natural vegetation, cropping history and temperature. The available nitrogen content varied from 116.03 to 357.50 kg/ha. Shukla *et al* also observed wide variations of nitrogen in their studies. The data on available phosphorus indicate low to high range from 5.7 to 22.62 kg/ha, since the soils are rich in hydrated as well as amorphous oxides of Fe and Al, the potent source of 'P' immobilization, P content was very low in these soils. Near neutral P^H have a significant role in enhancing the P availability. Available P increases with P^H and decreases with organic carbon. The data pertaining to available potassium content under cashew nut soils ranged from 180.35 to 698.0 kg/ha. Ranganathan and satyanarayana observed low content of potassium in coastal soils due to low P^H .

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