

RESEARCH ARTICLE :

Knowledge of the farmers about soil testing techniques and its recommendations in saline sodic track of Vidarbha

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SUMMARY : The present study was under taken in Akola, Amravati and Buldana district in Vidarbha region of Maharashtra state. From each selected district one tahsil has been selected purposively where soil is saline or sodic. The selected tahsils are Akola, Daryapur and Shegaon from Akola, Amravati and Buldana districts, respectively. From each tahsil four villages were selected randomly and from each selected village ten farmers were interviewed. Thus, the total 120 respondents were the sample for this study. The objectives of the study were, to study the personal, socio-economic, situational and psychological characteristics of the farmers and to study the knowledge of the respondents about the soil testing techniques and its recommendations in saline sodic track of Vidarbha. The exploratory research design was used for present study. The findings revealed that majority of the respondents were in middle age group, educated upto high school level possessed small land holding (1.01-2.00 ha), having agriculture as main occupation, annual income upto Rs. 50,000, farming experience in between 11 to 20 years, medium level of extension contact, they have followed crop rotation on their field, have to travel above 45 km distance from their village to reach soil testing laboratory, followed seasonal cropping pattern, medium level of motivation and low level of innovativeness. Majority of the respondents having medium knowledge level about soil testing techniques and its recommendations. As regards the relational analysis, age, land holding, occupation, farming experience, crop rotation, distance from soil testing lab and cropping pattern was non-significantly correlated with knowledge. Annual income, extension contact and motivation were significantly correlated with knowledge. Whereas, education and innovation was highly significant with knowledge.

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BACKGROUND AND OBJECTIVES

Agriculture is the backbone of Indian economy. The increased agricultural production depends upon number of factors

of which soil fertility plays an important role. Soil fertility shows the nutrient status of the soil. Certain nutrients present in the soil are essential for plant growth. Soil testing has been used by soil scientists as an aid in determining

soil fertility level. Soil testing (ST) is known as a precise management method for determining and assessing soil fertility that enables farmers to assess the impact of management methods and identify what changes are needed each year. Soil testing is “a process by which elements are chemically removed from the soil and measured for their ‘plant available’ content within the sample.” The quantity of available nutrients in the sample determine the amount of fertilizer that is recommended. It helps in correct diagnosis of soil health and appropriate dose of nutrient can be added to get optimum crop yield.

The soil of Akola, Amravati and Buldana district of Vidarbha around Purna river belt is saline sodic. Under salinity 547 villages are present from 14 Tahsils of 3 districts viz., Amravati, Akola and Buldana. The area covered 136 villages of Amravati, 318 villages of Akola and 93 villages of Buldana districts. The saline belt is spread in north and south of river Purna and maximum part is on the north side. Nearly 1500 to 6000 mg. salt/lit of water is present. Due to this high salinity of Purna river belt, makes the soil infertile, low yield and water become non-potable. The track having the excess salt in soil and water is saline track. Saline soil is the soil with excess salt having EC less than 4 and pH is greater than 8.5. Sodic soil is the soil with sodium content sufficiently high to interfere with the growth of crop plants having EC greater than 4 and pH is less than 8.5. The salinisation/sodification is a chemical deterioration, mainly observed in arid and semiarid region due to unscientific use of irrigation water, inadequate drainage, seepage from irrigation channel and increase in level of ground water.

Soil is the most valuable natural resources, soil fertility plays a key role in increasing crop production in almost all soils of the world. Parvizi (2005) described soil management as an optimal use of farm soil resources for improving production management and achieving sustainable goals. Yadav *et al.* (2006) stated that soil testing has exposed some information about the accurate amount of nutrients of special kinds of plants and also other information such as acid and saline-alkali soil.

RESOURCES AND METHODS

The present study was undertaken in Akola, Amravati and Buldana district in Vidarbha region of Maharashtra state. From each selected district one tahsil has been selected purposively where soil is saline or sodic. The selected tahsils were Akola, Daryapur and Shegaon.

From each tahsil four villages were selected randomly and from each selected village ten farmers were interviewed. Thus, the total 120 respondents were the sample for this study. The exploratory research design was used for present study. Data were collected by the personally interviewing the respondents with the help of pre-tested and structured schedule.

OBSERVATIONS AND ANALYSIS

The findings revealed that majority of the respondents 40.84 per cent were in middle age group (36 to 50 yrs) (Table 1). The 39.16 per cent of the respondents were educated upto high school level, 38.33 per cent of respondents had small land holding (1.01-2.00 ha), 74.16 per cent of the respondents had agriculture as main occupation. Over half (60.84%) of respondents had annual income upto Rs. 50,000, followed by 29.16 per cent of the respondents had farming experience in between 11 to 20 years, 65.00 per cent of the respondents were having medium level of extension contact, It is observed that 73.33 per cent of the respondents were followed crop rotation on their field, 18.34 per cent of the respondents have to travel above 45 km distance from their village to reach soil testing laboratory, more than half (67.50%) of respondents were following seasonal cropping pattern, 51.67 per cent of respondents were having medium level of motivation and 46.66 per cent of respondents were having low level of innovativeness (Table 1). Similar finding were reported by Mankar *et al.* (2015).

Majority 63.33 per cent of the respondents were having medium knowledge level about soil testing techniques and its recommendations. Similar findings were reported by Ingle (2011) and Dohtare (2013). As regards the relational analysis, age, land holding, occupation, farming experience, crop rotation, distance from soil testing lab and cropping pattern was non-significantly co-related with knowledge. Annual income, extension contact and motivation was significantly correlated with knowledge at 0.05 level of significance. Education and innovation was highly significant with knowledge at 0.01 level of significance.

The data regarding practice wise knowledge of respondents about soil testing techniques and its recommendations in Table 2 revealed that, 96.67 per cent of the respondents were having knowledge about organic manures, followed by 95.84, 91.67 and 87.50 per cent of

Table 1 : Relationship between selected characteristics of the farmers with knowledge of soil testing techniques and its recommendations (n=120)

| Sr. No. | Different parameters | Categories | Respondents | | Pearson's co-efficient of correlation |
|---------|---------------------------------------|---|-------------|----------|---------------------------------------|
| | | | No. | Per cent | |
| 1. | Age | Young (Upto 35 years) | 29 | 24.16 | 0.0054 |
| | | Middle (36 to 50 years) | 49 | 40.84 | |
| | | Old (Above 50 years) | 42 | 35.00 | |
| 2. | Education | Illiterate | 2 | 1.67 | 0.2828** |
| | | Primary school (1 st - 4 th std.) | 9 | 7.50 | |
| | | Middle school (5 th - 7 th std) | 14 | 11.67 | |
| | | High school (8 th -10 th std) | 47 | 39.16 | |
| | | Higher secondary (11 th – 12 th) | 35 | 29.16 | |
| | | Collage (Above 12 th) | 13 | 10.84 | |
| | | | | | |
| 3. | Land holding | Marginal (Upto 1.00 ha.) | 26 | 21.67 | 0.1552 |
| | | Small (1.01 - 2.00 ha.) | 46 | 38.33 | |
| | | Semi-medium (2.01 - 4.00 ha.) | 36 | 30.00 | |
| | | Medium (4.01 - 10.00 ha.) | 11 | 9.16 | |
| | | Big (Above 10.00 ha.) | 1 | 0.84 | |
| 4. | Occupation | Agriculture+labour | 30 | 25.00 | 0.1493 |
| | | Agriculture | 89 | 74.16 | |
| | | Agriculture+Allied occupation | 0 | 0.00 | |
| | | Agriculture+Buisness | 1 | 0.84 | |
| | | Agriculture+Service | 0 | 0.00 | |
| 5. | Annual income (Rs.) | Upto 50,000/- | 73 | 60.84 | 0.2078* |
| | | 50,001 to 1,00,000/- | 34 | 28.34 | |
| | | 1,00,001 to 1,50,000 /- | 3 | 2.50 | |
| | | 1,50,001 to 2,00,000/- | 5 | 4.16 | |
| | | Above 2,00,001 | 5 | 4.16 | |
| 6. | Farming experience | Upto 10 years | 30 | 25.00 | 0.0079 |
| | | 11 to 20 years | 35 | 29.16 | |
| | | 21 to 30 years | 33 | 27.50 | |
| | | Above 30 | 22 | 18.34 | |
| 7. | Extension contact | Low (Upto 33.33) | 36 | 30.00 | 0.1901* |
| | | Medium (33.34 to 66.66) | 78 | 65.00 | |
| | | High (Above 66.66) | 6 | 5.00 | |
| 8. | Crop rotation | Yes | 88 | 73.33 | 0.0706 |
| | | No | 32 | 26.67 | |
| 9. | Distance from soil testing laboratory | Upto 15 km | 30 | 25.00 | 0.1768 |
| | | 16 to 30 km | 35 | 29.16 | |
| | | 31 to 45 km | 33 | 27.50 | |
| | | Above 45 km | 22 | 18.34 | |
| 10. | Cropping pattern | Seasonal cropping (1) | 81 | 67.50 | 0.0592 |
| | | Biseasonal cropping (2) | 31 | 25.84 | |
| | | Annual cropping (3) | 3 | 2.50 | |
| | | Biannual cropping (4) | 2 | 1.66 | |
| | | Perennial cropping (5) | 3 | 2.50 | |

Table 1 : Contd.....

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| | | | | | |
|-----|-----------------|-------------------------|----|-------|----------|
| 11. | Motivation | Low (Upto 33.33) | 46 | 38.33 | 0.2238* |
| | | Medium (33.34 to 66.66) | 62 | 51.67 | |
| | | High (Above 66.66) | 12 | 10.00 | |
| 12. | Innovativeness | Low (Upto 6) | 56 | 46.66 | 0.3478** |
| | | Medium (7 to 13) | 51 | 42.50 | |
| | | High (Above 13) | 13 | 10.84 | |
| 13. | Knowledge level | Low (Upto 33.33) | 32 | 26.67 | |
| | | Medium (33.34 to 66.66) | 76 | 63.33 | |
| | | High (Above 66.66) | 12 | 10.00 | |

*and **indicate significance of values at P=0.05 and 0.01, respectively

the respondents had knowledge about phosphate, potassium and nitrogenous fertilizers, 46.67 and 44.16 per cent of the respondents had knowledge about depth of soil sampling for agronomic crop and micro nutrient fertilizers, followed by 43.33 and 41.67 per cent of the respondents had knowledge about depth of soil sampling for fruit crop and concept of soil testing, 28.33 and 14.16 per cent of the farmers had knowledge about appropriate time for soil testing and ideal site for taking soil sample, whereas 12.50 and 10.84 per cent of the respondents had knowledge about procedure of soil sample collection and essential nutrients, while 7.50 per cent and 5.84 per cent of the respondents had knowledge about information to be attached with soil sample and secondary nutrients, respectively.

Majority of the respondents (94.16%) had no knowledge about secondary nutrients and information to

be attached with soil sample 92.50 per cent, followed by 89.16 per cent of the respondents had no knowledge about essential nutrients and procedure of soil sample collection 58.33 per cent. Whereas 85.84 per cent and 71.67 per cent had no knowledge about ideal site for taking soil sample and appropriate time for soil testing, respectively. While 58.33 and 56.67 per cent of the respondents had no knowledge about concept of soil testing and depth of soil sampling for fruit crops, respectively. It was followed by 55.84 and 53.33 per cent of the respondents had no knowledge about micro nutrients fertilizers and depth of soil sampling for agronomic crop, while 12.50 and 8.33 per cent of the respondents had no knowledge about nitrogenous and potassium fertilizers, 4.16 per cent and 3.33 per cent of the respondents had no knowledge about phosphate fertilizers and organic manures.

Table 2 : Distribution of the respondents according to practice wise knowledge about soil testing techniques and its recommendations (n=120)

| Sr. No. | Items | Yes (1) | No (0) | Total |
|---------|---|-------------|-------------|--------------|
| 1. | Do you know the concept of soil testing | 50 (41.67) | 70 (58.33) | 120 (100.00) |
| 2. | Do you know appropriate time for soil testing | 34 (28.33) | 86 (71.67) | 120 (100.00) |
| 3. | Do you know the ideal site for taking soil sample | 17 (14.16) | 103 (85.84) | 120 (100.00) |
| 4. | Do you know procedure of soil sample collection | 15 (12.50) | 105 (87.50) | 120 (100.00) |
| 5. | Do you know the information to be attached with soil sample | 9 (7.50) | 111(92.50) | 120 (100.00) |
| 6. | Do you know essential nutrients | 13 (10.84) | 107 (89.16) | 120 (100.00) |
| 7. | Do you know depth of soil sampling for agronomic crop | 56 (46.67) | 64 (53.33) | 120 (100.00) |
| 8. | Do you know depth of soil sampling for fruit crop | 52 (43.33) | 68 (56.67) | 120 (100.00) |
| 9. | Do you know nitrogenous fertilizers. | 105 (87.50) | 15. (12.50) | 120 (100.00) |
| 10. | Do you know phosphate fertilizers | 115 (95.84) | 5 (4.16) | 120 (100.00) |
| 11. | Do you know potassium fertilizers | 110 (91.67) | 10 (8.33) | 120 (100.00) |
| 12. | Do you know micro nutrients fertilizers | 53 (44.16) | 67 (55.84) | 120 (100.00) |
| 13. | Do you know secondary nutrients | 7 (5.84) | 113 (94.16) | 120 (100.00) |
| 14. | Do you know organic manures | 116 (96.67) | 4 (3.33) | 120 (100.00) |

Conclusion :

Thus, study concluded that more than half (63.33%) of the respondents had medium level of knowledge about soil testing techniques and its recommendations. Hence, this research study implied that there is a great scope to create the knowledge among the farming community regarding the soil testing techniques and its recommendations in study area. Among selected characteristics of the respondents *viz.*, age, land holding, occupation, farming experience, crop rotation, distance from soil testing lab and cropping pattern was non-significantly co related with knowledge. Annual income, extension contact and motivation was significantly co-related with knowledge, education and innovation with knowledge.

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