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Capacity Building Needs Of Lecturers of Agricultural Education in Soil Testing (NPK) For Effective Teaching of Students In Colleges Of Education In South-Easth, Nigeria

Asogwa, V. C[1]; Isiwu E.C[2]. and Jumbo, D. D[3].
1. Department of Agricultural Education, University of Agriculture, Makurdi, Benue State.
2. Department of Agricultural Education, Michael Okpara University of Agriculture, Umudike; Abia State
3. Ignatius Ajuru University of Education, Port Harcourt, River State.
asovinchidi@yahoo.com

Abstract
The main purpose of this study was to determine capacity building needs of lecturers of agricultural education in soil testing (NPK) for effective teaching of students in Colleges of Education in South-easth, Nigeria. Four research questions guided the study. The study adopted descriptive survey research design. The study was conducted in 8 Colleges of Education in South-east, Nigerian offering Agricultural Education programme. The population of the study was 107 lecturers. The entire population was involved in the study. An instrument titled Soil Testing Capacity Building Needs Questionnaire (STCBNQ) was used for data collection. Three experts face validated the questionnaire. Cronbach alpha reliability method was used to determine the internal consistency of the questionnaire items. A reliability coefficient of 0.90 was obtained. Data collected for the study were analyzed using weighted mean, standard deviation and Improvement Need-Performance Index (INPI) to answer the research questions. It was found out from the study that lecturers of Agricultural Education in Colleges of needed capacity building on 12 items in soil sampling, 6 items in testing for soil Nitrogen, 9 items in testing for soil Phosphorus and 9 items in testing for soil Potassium for effective teaching of students in Colleges of Education in South-east, Nigeria. It was recommended that lecturers of Agricultural Education in Colleges of Education should utilize the findings of this study on their capacity building needs to seek for sponsorship from their administrators in order to attend re-training programme for their capacity building in soil testing and analysis among others.
Keywords: capacity building, lecturers of agricultural education, soil testing, soil sampling, Nitrogen Phosphorus-Potassium.

1. Introduction

Soil testing is a vital aspect of soil fertility management in crop production. Soil testing is an excellent measure of soil fertility. It is acting determining the nutrient content, composition and other characteristic including contamination in the soil. Frederick and Thompson (1993) explained that soil testing is the analysis of a soil sample to determine nutrient and contaminant content, composition and other characteristics such as acidity or P^H level. It measures fertility, indicates deficiencies that need to be remedied and determines potential toxicities from excessive fertility and inhibitions from the presence of non-essential trace minerals. Laboski (2013) posited that the objectives of soil tests are to:

1. Provide an index of nutrient availability (or supply) in a given soil.
2. Predict the probability of obtaining a profitable response to lime and fertilizer.
3. Provide a basis for recommendations on the amount of lime and fertilizer to apply.
4. To obtain a value that will help to predict the amount of nutrients (fertilizer) needed to supplement the nutrient supplying capacity of the soil such that maximum economic yield is achieved. Jone and Jacobson (2001) stated that soil testing is a powerful tool for deciding how best to specifically manage nutrients. It is used as a tool for diagnosis and prescription system and if properly carried out, forms the bases for successful long term soil and crop nutrient management plant. Greenland (2008) posited that soil testing helps to determine what one's native soil contains to select crop that will do well on it, make recommendations for amendment that can be added to alter the characteristics of the soil for optimal plant growth and allows to determine the best plant for one's farm or garden. The author stated further that soil testing on a regular basis allows one to monitor the available nutrient, nitrogen, phosphorus and potassium and add what is needed for optimal plant growth and vigour. Soil testing, according to

Stewart, Dib, Johnstem and Smyth (2005) is the chemical method for estimating the nutrient supplying capacity of a soil. It measures a portion of a nutrient from a "pool" that is used by plants. It does not measure the total amount of a nutrient in the soil. According to the author, soil testing is important because it provides an index of nutrient availability (or supply) in a given soil, predicts the probability of obtaining a profitable response to lime and fertilizer, provides a basis for recommendations on the amount of lime and fertilizer to apply and gives a value that predicts the amount of nutrients (fertilizer) needed to supplement the nutrient supplying capacity of the soil such that maximum economic yield is achieved. In the observation of Brady and Weil (2010), soil testing consists of three major phases which are: sampling, chemical analysis and interpreting phases. Olaitan and Lombin (1985) buttressed that laboratory test of soil often checks for plants nutrients in 3 categories:

i. Major nutrients: nitrogen, phosphorus and potassium
ii. Secondary nutrients: sulphur, calcium, magnesium
iii. Minor nutrient: iron, manganese, copper, zinc, boron, molybdenum, chlorine.

In the context of this study, soil testing is the determination of the major nutrients (NPK) content of the soil to predict the amount of fertilizer needed to supplement the nutrient supplying capacity of the soil for maximum crop yield.

The (NPK) nitrogen (N), phosphorus (P), and potassium (K) are major or primary nutrients; that is, they are required in large quantities by plants. Nitrogen, according to Allen, Barker and Pilbeam (2007) is one of the most important nutrients for crop growth, second only to water, and is the major nutrient the producer can control. The authors stressed that Nitrogen is beneficial to crop because it is directly involved with chlorophyll production; key building block for proteins and enzymes; acts as a catalyst for absorption of other nutrients; promotes cell division; causes darker green plants and rapid growth and boosts plant protein and protoplasm levels.

Phosphorus (P), in the opinion of Hobbs and Haas (2013) is one of the most important elements for plant growth and metabolism. It plays key roles in many plant processes such as energy metabolism, the synthesis of nucleic acids and membranes, photosynthesis, respiration, nitrogen fixation and enzyme regulation. Vance (2001) mentioned that phosphorus is important to crop production in that it is involved in photosynthesis, respiration, energy storage and transfer, cell division, and enlargement; promotes early root formation and growth; improves quality of fruits, vegetables, and grains, helps in seed formation; helps plants to survive harsh winter conditions; increases water-use efficiency and hastens maturity of crops.

Potassium, in the submission of Sadanandan (1993), is absorbed by plants in larger amounts than any other mineral element except nitrogen and calcium, in some cases. The author observed that potassium plays vital roles in carbohydrate metabolism and the break down and translocation of starches; increasing photosynthesis in green plants; increasing water-use efficiency; essential protein synthesis; fruit formation; activation of enzymes and controls their reaction rates; improving quality of seeds and fruit; enhancing winter hardiness and increasing disease resistance of plants.

These major nutrients (NPK), in the observation of Gilroy and Jones (2000), are usually lacking from the soil first before other minor nutrients because plants use large amounts of them for their growth, survival, development and yield. The authors noted that deficient or excess supply of any of the nutrients in the soil has its own serious side effects on plants, results in economic loss to the producer and have environmental repercussions. This might be why Mills and Jones (1996) advised that soil testing should be carried ones in every two years on each plot of land to monitor and avert the effect of deficient or excess supply of NPK to plants in the soil. In the same vein, The Federal Government of Nigeria, through her agency- National Commission for Colleges of Education, included soil testing as aspect of soil science courses taught to students of Agricultural Education in Colleges of Education in Nigeria.

A student is described by Mirriam (2012) as someone who is admitted into an institution such as college or university. A student is a learner, or someone who attends an educational institution to study a subject or course. Collins (2013) viewed a student as a learner or scholar who attends a school to seek knowledge from professional teachers or books. In this study, students are learners who were admitted into Colleges of Education to study Agricultural Education programme.

A college is an institution offering instruction in a professional, vocational or technical field. According National Policy on Education (2004), a College of Education is a tertiary institution that prepares individuals as teachers within a-three year duration for teaching in primary and junior secondary school in various subjects including agriculture. Ukonze and Olaitan (2010) explained Agricultural Education as a programme designed for

preparing or equipping learners with knowledge, skills and attitude in teaching and technical areas of agriculture to enable them impart the same to students in schools and colleges. The objectives of Agricultural Education program in Colleges of Education, according to National Commission for Colleges of Education include to:

a. prepare graduates with the right attitude to, and knowledge/professional competence, in vocational agriculture;
b. produce teachers who will be capable of motivating students to acquire interest in and aptitude for agriculture;
c. develop in the student-teachers the appropriate communicative skills for effective transmission of agricultural information and skills to the students in the context of their environment;
d. equip the student-teachers with adequate knowledge and ability to establish and manage a model school farm effectively;
e. provide a sound background to enhance further academic and professional progression of the student-teachers.

The aforementioned objectives of Agricultural Education are achieved with the help of lecturers in Colleges of Education.

A lecturer, as contained in the National Policy on Education (2004) is a person who had undergone approved professional training in education at appropriate levels and is capable of imparting knowledge, skills and attitudes to the learners in a relevant programme. Isiwu and Okonkwo (2013) explained that a lecturer of agricultural education is an individual who had undergone a teacher preparatory programme in the university and charged with the responsibility of imparting knowledge, skills and attitudes in agriculture to students in a subject. In the context of this study, a lecturer is an individual who had undergone training in pedagogical and technical aspects of a programme in a university and is teaching relevant course(s) to student-teachers in the College of Education. The lecturers in Agricultural Education deliver instruction to students in areas of Agriculture such as soil testing and evaluate them for competence and mastery before they are awarded Nigerian Certificate in Education (NCE) on graduation. This certificate qualifies the graduates into teaching profession / job in junior secondary schools.

However, one of the researchers taught Agriculture in secondary schools in Enugu State for more than 6 years, during which he observed that teachers of agriculture in junior secondary schools apply NPK artificial fertilizer to school farms for crop production every year without soil testing. The knowledge of what could be the adverse and long time effects of excess soil nutrients to crops in the school farms gave the researcher concern to conduct a pilot study on the situation. The study adopted a focused group discussion in 2-Junior Secondary School Examination Marking Centres involving 10 NCE teachers of Agriculture in each centre. The discussion was centered on why teachers of Agriculture do not carry out soil testing before fertilizer application in junior secondary school farms. The pilot study revealed that they lack the requisite competence in soil testing which they attributed to the way it was handled by their lecturers in Colleges of Education. To confirm or disapprove the claims of the teachers of Agriculture about their poor competence in soil testing, it becomes necessary to determine capacity building of the lecturers of Agricultural Education in soil testing since a Latin adage says: nemo dat quod non habet, meaning that none gives what one has not.

Capacity building, in the report of United Nations Development Programme (UNDP, 2002) means building abilities, relationships and values that will enable organisations, groups and individuals to improve their performance and achieve their development objectives. It includes strengthening the processes, systems and rules that influence collective and individual behaviour and performance in all development endeavours. The UNDP stressed that capacity building refers to enhancing people's technical ability and willingness to play new developmental roles and adapt to new demands and situations. Capacity building, therefore, refers to the set of activities directed towards improving competencies and capacities of lecturers of Agricultural education in soil testing (NPK) for effective teaching of students of Agricultural Education in Colleges of Education. The capacity building needs of the lecturers in soil testing could be ascertained through assessment.

Assessment, in the opinion of Palomba and Benta (1999) is the systematic collection, review and use of information about educational programmes undertaken for the purpose of improving learning and development. Okoro (2000) defined assessment as a form of evaluation that uses collected data for estimating the work quality or effectiveness of a programme or project. In this study, assessment is the process of evaluating lecturers of agricultural education in colleges of Education through collection of data from them to determine the level of competencies they possess in soil sampling, chemical analysis and interpretation of NPK content of a soil sample.

The level of competencies they posses in the aforementioned stages of soil sampling could be identified through need gap. Need gap, as explained by Chuta (1992) is what one requires in order to meet up with the target standard. Rosett and Sheldon (2001) explained need gap as the difference between the perceived need and actual need. In this study, the difference between the perceived level of competencies possessed by lecturers and what they required to meet standard of acceptable performance constitute the need gap which is meant be to filled.

Therefore, the purpose of this study was to determine the capacity building needs of lecturers of Agricultural education in soil testing for effective teaching of students in Colleges of Education. Specifically, the study sought to identify capacity building needs of lecturers in:

1. soil sampling;
2. testing for soil Nitrogen;
3. testing for soil Phosphorus and
4. testing for soil Potassium.

2. Research Questions

1. What are the capacity building needs of lecturers of Agricultural Education in soil sampling?
2. What are the capacity building needs of lecturers of Agricultural Education in testing for soil Nitrogen?
3. What are the capacity building needs of lecturers of Agricultural Education in testing for soil Phosphorus?
4. What are the capacity building needs of lecturers of Agricultural Education in testing for soil Potassium

3. Methodology

Four research questions guided the study. The study adopted descriptive survey research design. Chohen, Manion and Morrison in Lan, Asogwa and Okoye (2013) viewed descriptive survey research design as the use self completion questionnaire and attitude scales to gather large scale data from a representative sample of the population. This design was suitable for the study because questionnaire was used to collect data from lecturers of Agricultural Education.

The study was conducted in 8 Colleges of Education in South-east, Nigerian offering Agricultural Education programme. The population of the study was 107 made up of 20 lecturers of Agricultural Education in Universities and 87 lecturers of Agricultural Education in Colleges of Education. The entire population was involved in the study due to its manageable size, hence there was no sampling.

An instrument titled: Soil Testing Capacity Building Needs Questionnaire (STCBNQ) was developed from literature reviewed and used for data collection. The STCBNQ had two response categories of needed and performance. The needed category had a four-point response option of highly needed (4), averagely needed (3), slightly needed (2) and not needed (1) while the performance category had a four-point response option of high performance, average performance, low performance and no performance with a corresponding value of 4, 3, 2 and 1 respectively.

Three experts face validated the STCBNQ; one from department of soil science, University of Nigeria, Nsukka and two from the department of Agricultural Education, University of Agriculture, Makurdi. Their corrections and suggestions were used to refine the questionnaire. Cronbach alpha reliability method was used to determine the internal consistency of the STCBNQ. A reliability coefficient of 0.90 was obtained. Five research assistants, one from each state were hired and educated on how to administer and retrieve the questionnaire. One hundred and seven copies of the questionnaire were administered to the respondents through mail and e-mail. After two weeks, a follow-up letter was sent to remind those who delayed responding to the questionnaire that their cooperation was essential. At last, a total of 103 copies of the questionnaire were returned representing 96.26 percent return rate. Data collected for the study were analyzed using weighted mean, standard deviation and Improvement Need-Performance Index (INPI) to answer the research questions.

The real limit of numbers and mean of 2.50 was used for decision making. Any item with mean of 2.50 or above was regarded as needed while any item with a mean less than 2.50 was regarded as not needed. Also, any item with a standard deviation of 1.96 or below revealed that the respondents were close to the mean and not too far from one another in their responses. To determine the need-performance gap of lecturers of Agricultural Education, the following steps were adopted.

(1) The weighted mean of each item under the needed category $\left(\bar{x}_n \right)$ was calculated.

(2) The weighted mean of each item under the performance category $\left(\bar{x}_p\right)$ was calculated

(3) The difference between the two weighted mean i.e $\bar{X}_n - \bar{X}_p$ = NPG (Need-Performance Gap) was calculated.

The value of NPG of each item indicated the capacity level of the lecturers on that item.

Where NPG is zero (O), it means that capacity building is not needed for the item because the level at which the lecturers performed that item is equal to the level at which the item is needed. Where NPG is negative (-), it means capacity building is not needed for that item because the level at which the lecturers performed the item is higher than the level at which the item is needed. Where the NPG is positive (+), it means capacity building is needed because the level at which the lecturers performed the item is lower than the level at which it is needed (Olaitan and Ndomi, 2000, adapted).

4. Results

The results of the study were obtained from the research questions answered through data collected and analyzed.

The results of the study are presented in the tables below.

4.1. Table 1: Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where Lecturers of Agricultural Education needed capacity building on soil sampling (N=103).

S/N	Soil sampling	Xn	Xp	NPG Xn-Xp	CBN
1	Obtain soil sampling instruments from the laboratory such as soil probe or auger well	3.75	2.56	1.19	CBN
2	Divide the farm into well marked portions	3.76	2.58	1.18	CBN
3	Dig a number of holes 6-8 inches deep in the portions marked out	3.74	2.65	1.09	CBN
4	Take a tin slides of the wall of the hole and place it in a bucket	3.77	2.71	1.06	CBN
5	Repeat step 4 for each of the holes	3.79	2.73	1.07	CBN
6	Put the collected samples in a bag	3.78	2.76	1.01	CBN
7	Mix the soil samples thoroughly to blend them	3.69	2.84	0.85	CBN
8	Spread the mixed sample on a newspaper in a shed to air dry it	3.77	2.89	0.89	CBN
9	Pulverize the dried sample if in lumps	3.72	2.81	0.92	CBN
10	Sieve the dried soil sample using a 2 mm brass, stainless or plastic sieve to obtain fine sample	3.74	2.87	0.87	CBN
11	Package the sieved sample into a container send the packaged sample to the laboratory for testing	3.76	2.74	1.02	CBN
12	Store in a clean closed container	3.76	2.64	1.12	CBN
	Grand Total	**3.76**	**2.73**	**1.02**	**CBN**

$\overline{X}$ = mean of needed, $\overline{X}$ = mean of performance, NPG= Need-Performance Gap, CBN= Capacity building needed, CBNN= Capacity Building Not Needed.

Data in table 1 showed that need-performance gap values of all the 12 items and grand mean ranged from 0.85 to 1.19 and were positive. This indicated that the lecturers needed capacity building in all the 12 items on soil sampling. Generally, the overall mean of needed minus performance responses is 1.02 and was positive. This indicated that the lecturers needed capacity building on soil sampling for effective teaching of students in Colleges of Education in South-east, Nigeria.

4.2. Table 2: Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where Lecturers of Agricultural Education needed capacity building on testing for soil Nitrogen (N=103).

S/N	Testing for soil Nitrogen	Xn	Xp	NPG Xn-Xp	CBN
1	Measure out 1-2 gram of the oil sampling	3.74	2.64	1.11	CBN
2	Place one drop of the soil extract into a test tube	3.75	2.75	0.99	CBN
3	Add four drops of disphenyl amine solution to the test tube	3.74	2.93	0.81	CBN
4	Stir the mixture after two minutes	3.75	2.88	0.87	CBN
5	Compare the colour with standard colour chart or use computer	3.74	2.87	0.86	CBN
6	Record the observation.	3.72	2.73	0.99	CBN
	Grand total	**3.74**	**2.79**	**0.94**	**CBN**

$\overline{X}$ = mean of needed, $\overline{X}$ = mean of performance, NPG= Need-Performance Gap, CBN= Capacity building needed, CBNN= Capacity Building Not Needed.

Data in table 2 showed that need-performance gap values of all the 6 items and grand mean ranged from 0.81 to 1.11 and were positive. This indicated that the lecturers needed capacity building in the 6 items on testing for soil Nitrogen. Generally, the overall mean of needed minus performance responses is 0.94 and was positive. This indicated that the lecturers needed capacity building on testing for soil Nitrogen for effective teaching of students in Colleges of Education in South-east, Nigeria.

4.3. Table 3: Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where Lecturers of Agricultural Education needed capacity building on testing for soil Phosphorus (N=103).

S/N	Testing for soil phosphorus	Xn	Xp	NPG Xn-Xp	CBN
1	Measure/put 10cm^3 of ammonium molybdate solution into a glass vial	3.67	2.60	1.07	CBN
2	Add 1g of the soil sample into the glass vial	3.73	2.71	1.02	CBN
3	Shake the vial vigorously for one minute	3.72	2.78	0.94	CBN
4	Filter the solution into another glass vial	3.74	3.01	0.72	CBN
5	Add a grain of dry power tin	3.70	2.98	0.71	CBN
6	Measure out 5cm^3 of the filtrate into another glass vial	3.69	2.98	0.72	CBN
7	Add Chloride solution to the 5cm^3 of the filtrate.	3.67	3.02	0.64	CBN
8	Observe the intensity of the colour of molybdenum	3.68	2.87	0.81	CBN
9	Record the observation	3.65	2.71	0.93	CBN
	Grand total	**3.69**	**2.86**	**0.83**	**CBN**

$\overline{X}$ = mean of needed, $\overline{X}$ = mean of performance, NPG= Need-Performance Gap, CBN= Capacity building needed, CBNN= Capacity Building Not Needed.

Data in table 3 showed that need-performance gap values of all the 12 items and grand mean ranged from 0.64 to 1.07 and were positive. This indicated that the lecturers needed capacity building in the 9 items on testing for soil Phosphorus. Generally, the overall mean of needed minus performance responses is 0.83 and was positive. This indicated that the lecturers needed capacity building on testing for soil Phosphorus for effective teaching of students in Colleges of Education in South-east, Nigeria.

4.4. Table 4: Need-Performance Gap Analysis of Mean Ratings of the Reponses of Respondents where Lecturers of Agricultural Education needed capacity building on testing for soil Potassium (N=103).

S/N	Testing for soil potassium.	Xn	Xp	NPG Xn-Xp	CBN
1	Measure 10cm^3 of sodium cobalt nitrate solution into a glass vial	3.72	2.73	0.99	CBN
2	Add one level tea spoon of the soil sample into the glass vial	3.76	2.71	1.04	CBN
3	Shake the vial vigorously for one minute.	3.72	2.79	0.92	CBN
4	Filter the solution into another glass vial	3.76	2.83	0.92	CBN
5	Measure out 5cm^3 of the filtrate to another glass via	3.74	2.85	0.88	CBN
6	Pipette 2.5cm^3 of an hydrous proply 20l into the glass via	3.74	2.76	0.97	CBN
7	Mix the two solutions together thoroughly	3.73	2.71	1.02	CBN
8	Compare the turbidity of the solution with a standard chart computer after three minutes	3.76	2.82	0.94	CBN
9	Record the observation of the result	3.72	2.70	1.05	CBN
	Grand total	**3.80**	**2.79**	**1.02**	**CBN**

$\overline{X}$ = mean of needed, $\overline{X}$ = mean of performance, NPG= Need-Performance Gap, CBN= Capacity building needed, CBNN= Capacity Building Not Needed.

Data in table 4 showed that need-performance gap values of all the 12 items and grand mean ranged from 0.88 to 1.05 and were positive. This indicated that the lecturers needed capacity building in the 12 items on testing for soil Potassium. Generally, the overall mean of needed minus performance responses is 1.02 and was positive. This indicated that the lecturers needed capacity building on testing for soil Potassium for effective teaching of students in Colleges of Education in South-east, Nigeria.

5. Discussion of Findings

The findings of the study in Table 1 revealed that the lecturers of Agricultural Education needed capacity building in all the 12 items in soil sampling for effective teaching of students in Colleges of Education in South-east, Nigeria. The items in soil sampling include: obtain soil sampling instruments from the laboratory such as soil probe or auger well, dig a number of holes 6-8 inches deep in the portions marked out, repeat step 4 for each of the holes, mix the soil samples thoroughly to blend them among others.

The findings of the study in Table 2 showed that the lecturers of Agricultural Education needed capacity building in all the 6 items in testing for soil Nitrogen for effective teaching of students in Colleges of Education in South-east, Nigeria. The items in testing for soil Nitrogen include: measure out 1-2 gram of the oil sampling, place one drop of the soil extract into a test tube, add four drops of disphenyl amine solution to the test tube and so on.

The findings of the study in Table 3 indicated that the lecturers of Agricultural Education needed capacity building in all the 9 items in testing for soil Phosphorus for effective teaching of students in Colleges of Education in South-east, Nigeria. The items in testing for soil Phosphorus include: measure/put 10cm^3 of ammonium molybdate solution into a glass vial, add 1g of the soil sample into the glass vial, measure out 5cm^3 of the filtrate into another glass vial, and observe the intensity of the colour of molybdenum.

The findings of the study in Table 4 showed that the lecturers of Agricultural Education needed capacity building in all the 9 items in testing for soil Potassium for effective teaching of students in Colleges of Education in

South-east, Nigeria. The items in testing for soil Potassium include: measure 10cm^3 of sodium cobalt nitrate solution into a glass vial, add one level tea spoon of the soil sample into the glass vial, filter the solution into another glass vial, pipette 2.5cm^3 of anhydrous proply 20l into the glass via among others.

The findings were in agreement with the findings of Olaitan, Alawa and Ekong (2009) in a study on capacity building needs of farmers in improving soil nutrients for enhancing crop production in Cross River State of Nigeria, where it was found out that farmers required capacity building on 10 competencies in soil testing and analysis, 30 in manure and manuring and 31 in fertilizer application for enhancing crop production in Cross River State of Nigeria. The findings were in conformity with the findings of Ifeanyieze (2011) in a study carried out on capacity building of instructors for effective teaching of soil conservation practices to students of College of Education in South-east, Nigeria, where it was found out that the instructors required capacity building in 20 skill items in tillage practices, 29 skill items in soil testing and analysis; 13 skill items in irrigation and drainage and 11 skill items in crop rotation.

6. Conclusion and Recommendation

It was learnt that teachers of Agriculture in junior secondary school apply fertilizer in their school farms yearly without soil testing. A bid to find out why so indicated that the teachers have low competence in soil testing and analysis. The teachers, in a pilot study, associated their low competence in soil testing and analysis with the way it was handled by their lecturers while they were in Colleges of Education. To this effect, this study was conducted to determine capacity building needs of lecturers of Agricultural Education in soil testing (NPK) for effective teaching to students in colleges of education in South-easth, Nigeria. It was found out that the lecturers needed capacity building in 12 items in soil sampling, 6 items in testing for soil Nitrogen, 9 items in testing for soil Phosphorus and 9 items in testing for soil Potassium for effective teaching of students in Colleges of Education in South-east, Nigeria. Therefore, it was recommended that:

1. lecturers of Agricultural Education in Colleges of Education should utilize the findings of this study on their capacity building needs to seek for sponsorship from their administrators in order to attend re-training programme for their capacity building in soil testing and analysis.
2. the administrators of Colleges of Education should utilize the findings of this study to approve requests from the lecturers for sponsorship to participate in re-training programme to equip them effectively for teaching soil testing and analysis to students in their Colleges of Education.
3. the National Commission for Colleges of Education should integrate the findings of this into the content of soil testing and analysis to improve the quality of the curriculum of Agricultural Education in the areas of soil science.

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