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Assessment Of Soybean Production Skills Needed By Agricultural Science Teachers For Teaching Secondary School Students In Benue State, Nigeria

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ABSTRACT
The purpose of this study was to assess the soybean production skills needed by agricultural science teachers for teaching secondary school students in Benue state. The study was carried out in Benue state. The researcher developed seven (7) objectives for the study and based on these objectives, seven research questions were asked to guide the study. Seven hypotheses were formulated by the researcher and tested at 0.05 level of significance. The study made use of survey research design. The population for the study was 230 respondents comprising of 187 Agricultural Science Teachers and 43 Agricultural Extension Agents. There was no for sampling as the entire population of 230 respondents was effectively managed by the researcher. The instrument used for data collection was a seventy-one (71) items self-structured questionnaire titled: Soybean Production Skills Questionnaire (SPSQ). The instrument was validated by five experts. Cronbach alpha was used to determine the reliability of the instrument which yielded a coefficient of 0.95. The data was analyzed using mean and standard deviation to answer the research questions, while t-test statistics were used in testing the hypothesis. The result showed that there were no significant difference in the mean ratings of the two groups of respondents on soybean pre-planting skills, soybean planting operation skills, weed, diseases and pest control skills in soybean, soybean fertilizer application skills, soybean harvesting skills, soybean processing skills and soybean and it's product marketing skills and were needed by secondary school agricultural science teachers for teaching soybean production. It was recommended that curriculum planners should incorporate the soybean production skills into the curriculum of crop production in secondary schools for teachers to teach secondary school students, the findings of the study should be made available to agricultural science teachers so that they will avail themselves of the skills needed in soybean production for effective teaching at secondary school level, through the state ministry of education Government should ensure strict supervision of agricultural science teachers so that the curriculum and the national policy on educations skill based subject for self-reliance are handled with all seriousness, school administrations should establish demonstration farms for farm practical's to arouse and sustain the interest of students to enable them acquire the necessary skills and knowledge needed for soybean production among others.

Keywords: Assessment, Soybean, Production, Skills, Agricultural Science Teachers Secondary School Students.

INTRODUCTION

In Nigeria, unemployment has continued to grow in a geometric progression especially with the global economic meltdown. It is disheartening to note that the trend of unemployment is aggravated as more and more graduates continue to join the queue of unemployed educated. This scenario is highly worrisome and suggests that Nigerians should look inward and think about what they can do for themselves in the face of the current economic down turn. In Nigeria, the National Directorate of Employment (NDE) rates graduates employment at 25% and graduate under employment at 24%. This implies that only half of every set of fresh graduates have access to gainful employment.

The government has tried to reverse this trend through intervention agencies such as National Poverty Eradication Programmes (NAPEP), National Directorate of Employment (NDE), N-Power and others. The impact of these agencies are yet to be felt since unemployment rate continue to increase and every year thousands of fresh graduates swell the unemployment number. Indeed, the major thrust of the United Nation Millennium Development Goals (MDG and the National Poverty Alleviation Programme (NAPEP) is on how to create wealth, create employment for youths and reduce poverty. It is becoming increasingly imperative that individuals be equipped with self-sustaining skills especially now that the Nigeria economy is moving towards a direction where only individuals who are self-reliant can really survive.

The Federal Republic of Nigeria emphasized a united strong and self reliant nation. It further stressed the need for acquisition of appropriate knowledge and skills necessary for securing paid employment in an establishment or be self-employed FRN (2014). In the same vein, the Nigerian Universal Basic Education system contains a comprehensive program designed to inculcate in the young all the necessary attributes that enhance acquisition of appropriate skills, ethical, moral and civic values needed for laying a solid foundation for lifelong learning. In order to achieve this, skill based courses were introduced in the curriculum of every programme including vocational education.

Skill is the ability to do something well, Wever and Obiyai (2019), skills are very important in any vocation. They are the basic elements in a vocation that must be followed to achieve success. The skills involved in soybean production begin from farm site selection to storage and marketing of processed product. So the ability of secondary school students to participate well in soybean production depends on the level at which soybean production skill are impacted on to them by their agricultural science teachers. Agada (2014) identified skills that are needed for soybean production to include; pre-planting operations, which includes site selection, land clearing, stumping, plotting, tilling. Planting operations, which includes seed selection, treatment, spacing and planting. Post planting operations, which includes thinning/supplying, weeding, manure/fertilizer application, control of pests and diseases, harvesting. Post-harvest operations, which include threshing/winnowing/cleaning, preparation for storage, storage and processing operation, which include soymilk production, soy floor, soy oil, soy cake and other industrial process depending on what is needed from the soybean.

In the opinion of the United Nations Educational Scientific and Cultural Organization (UNESCO, 2013), emphasis is now placed on making education more responsive to the needs of the people by equipping learners with skills that would make them productive citizens. Equipping the learners with productive skills especially with soybean production skills will reduce the tide of such challenges facing the youth as global financial economic crisis, unemployment, job deskilling and poverty. The same UNESCO document emphasizes that young people need entrepreneurial skill oriented anchors that will enable them to cope with the global tensions, pressures, unemployment and contradictions in their daily lives. Such skills are better acquired through vocational education programmes.

The present rate of unemployment in the society calls for the type of education which equips individuals with knowledge and skills required to establish them and become enterprising. It is only when people can effectively apply their knowledge and skills into profit making ventures thereby solving the needs of the society that they are said to be self-reliance (UNESCO, 2013).

One cannot be self-employed without formal or informal training, which thus brings in the concept of vocational education, which in the views of Ogwe & Ndem, (2016) is any form of education whose main

purpose is geared towards preparing an individual for employment in any recognized occupation in the society or world of work. Vocational education thus provides the needed skills, competencies, knowledge, characteristics necessary for effective employment in the society. Agricultural science teachers therefore, need to be retrained through short term programs, conferences and workshops to enable them acquire better skill and managerial capabilities for effective teaching of crop production at the secondary school level.

Teachers of agricultural science in this study refer to those people who had completed three years in College of Education or four years in the university with specialization in agricultural education. According to Agbulu and Wever (2011), the philosophy of agricultural education programme is tied to national philosophy on Agriculture for self-reliance based on the provision of teachers endowed with a balanced approach between principles and practice of Agriculture for academic and vocational needs.

It is quite unfortunate that the agricultural science teacher's training institution do not have enough space for farm practical's, so the practical aspect of their training is completely neglected. A verbal interaction with twenty-three (23) agricultural science teachers of secondary schools in Makurdi and part of Gwer-east Local Government Areas of Benue State revealed that most Agricultural Science Teachers know little about the various soybean production skills. One would therefore, wonder if it will be possible for one to give out what one doesn't have, hence the need for this assessment study.

Assessment in these regard is the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what someone knows, understand, and can do or cannot do with some ones knowledge as a result of some ones experience, Adjebeng and Osho (2012). Harlen (2016) view assessment as the process of collecting data and organizing or analyzing the data to interpretable form on a number of variables to constructing a profile on ones abilities or skills in a given task. Hornby (2020) defined assessment as an opinion or judgment about something or somebody that has been through about very carefully. In the researcher's opinion, assessment is the process of gathering information about a person or group of persons on an identified subject matter for the purpose of making careful judgment or forming opinion about the person or group. Assessment provides information about someone's ability or competency in performing a given task. The ability of agricultural science teachers in the teaching of soybean production depends highly on the teachers' acquisition of soybean production skills. In this study, assessment was done on agriculture science teacher's skills in Soybean production along the skills of Agriculture extension workers. A comparison of the responses of the two groups, indicated whether teachers need or do not need such skills. The effectiveness of agricultural science teachers in the teaching of soybean production skills to secondary school students is to complement the self-reliance target of the nation's policy on education which depends largely on the Agricultural Science Teachers, in terms of their acquired skills in soybean production and the application of such in teaching learning process at the secondary school level. Benue state is endowed with all it takes to emerge number one producer of Soybean in the country. The state need more people into soybean production, because the available number is not enough and are mostly subsistence farmers. Teachers are therefore, saddled with the responsibility of raising young energetic and skilled oriented farmers to complement the efforts of the peasant farmers in soybean production. Teachers guide and direct the future of the next generation and so must be custodians of these skills to ensure passage/impartation to younger learners. So the researcher need to assess the teachers to find out how equipped they are in passage/impartation to younger learners.

Soybean is a farm crop that belongs to the family of legumes, it is scientifically called (*Glycine Max (L) Merrill).* It is an annual herbaceous plant which is bushy, erect and with leafy plant structure. Its height is 40-100cm. It has been reported that soybean has been part of the history of China for about 5, 000 years, but now the production of soybean is circulating to different part of the world (International Institute of Tropical Agriculture, IITA, 2013). According to Agada, (2014) soybeans were first introduced into Nigeria in 1908, but the first successful cultivation was in 1973 with the Malayan variety, which was found suitable for commercial production in Benue state, Central Nigeria. Apart from the earliest Malayan variety other varieties were identified and cultivated in Nigeria. These include TG x 1904-6f, TGX 1910-11f, TGX 1905-5f, TGX 1910-6f, TGX 1910-8f, TGX 1910-1f, TGX 1905-2f, TGX 1908-8f,

TGX 1910-10f and TGX 1910-15f. but the TGX 1910-8f and TGX 1905-2f are the varieties widely cultivated in Benue State now, because of their high number of flower production, which also give rise to high pod formation with sizeable seeds that are resistant to high moisture and can be grown at every time of the wet season (Benue Agricultural and Rural Development Agency (BNARDA, 2016).

The importance of soybean to the state and the national economy cannot be over emphasized. It ranges from production of food for human consumption, employment, income to farmers and nation and raw materials for industries. Soybean has been a major source of foreign exchange to segment of the rural population in Benue state. Ernest (2014) revealed that soybeans have been used as food for centuries, it is exceptionally good and the nutritional value is well known. He noted that soybean contains 40% high quality protein, 20% edible vegetable oil and a good balance of amino-acid and has therefore tremendous potential to improve nutritional status and welfare of the families of resource-poor farmers, youths or intending farmers who could be secondary school students. Teachers are also not left out in the benefiting category.

According to Fabiyi (2016), benefits of soybean over other grain legumes commonly grown by small-holders, such as groundnut (*Arachis hypogea*), cowpea (*Vigna unguiculata*) and common bean (*Phaseolus vulgaris*) include lower susceptibility to pests and diseases, better grains storage quality, a large leaf biomass, which gives a soil fertility benefit to subsequent crops and a secure commercial market for the crop. Nigeria is the largest producer of soybeans for food in West and Central Africa Fabiyi (2016). Though still largely regarded as a relatively new crop, soybean has made a successful incursion into the diet of many Nigerians, particularly children and nursing mothers. Soybean derivatives such as soy-gari, soy-milk, soy-ogi, soy-ebiripo and soy-lafun have been developed and found to be good substitutes for more conventional food ingredient like melon, cow- milk and cowpea. Therefore, the value of soybean both for satisfying human dietary needs and for compounding livestock feeds cannot be overlooked. There is need to stimulate and encourage the production of soybeans. Also, Adebayo, Coker and Tsavhemba (2018) said that numerous efforts have been undertaken by research institutes, NGO and industries to promote the production of the crop in Nigeria to bridge the gap of limited adoption and production in Non-traditional areas.

Efforts made by research institute and other organizations clamoring for the production of soybean cannot be effectively achieved without the intervention by the extension agents in agriculture. Agricultural extension agents are people employed to mediate between farmers and research institute as well as agricultural production based NGO's in the dissemination of information on new farm innovation and feedback. Extension agents play vital role in information dissemination to farmers about the techniques and practices involved in soybean production. Ekele (2015) lists some of the functions of extension agents to include, assist people to develop and analyze their problems, needs and wants, develop leadership among the people and help them in organizing groups capable of solving problems. They also disseminate information based on research or practical experience. Furthermore, extension agents keep research workers informed of the people's problem from time to time, finally, they persuade the farmers to appreciate the value of change and the need to adopt new agricultural methods and as change agents they teach in the non-formal rather than the formal way. They are therefore, equipped in terms of competencies, skills, attitude and knowledge in soybean production and so are mediators between researchers and farmers. In this study, extension agents provided useful information on skills needed in soybean production which were used by the researcher to assess secondary school teachers skills needed in teaching soybean production to students.

Statement of the problem

One of the cardinal objectives of the National Policy on Education is to build a self –reliance nation where every citizen of the country shall be equipped with vocational skills to be productive. Hence the introduction of vocational agricultural skilled based subjects in the secondary school curriculum, which soybean production is one of the crops to be taught. Skills are very important in any vocation. They are the basic elements in a vocation that must be followed to achieve success. The ability of secondary school students to participate well in crop production depends largely on the level at which crop production skill

are impacted by Agricultural Science Teachers, but the teachers themselves do not have the requisite crop production skills and their applications in practical teaching-learning process. A verbal interaction with agricultural science teachers in selected secondary schools in Makurdi and Gwer-east revealed that most of them have little or no knowledge about soybean production skills, so the researcher wants to assess if it will be possible for one to give out what one doesn't have. Hence the need for the assessment of such skills and their application to teaching-learning process at the secondary school levels.

Purpose of the Study

The purpose of the study was to assess the soybean production skills needed by agricultural science teachers of secondary schools in Benue state. Specifically, the study identified soybean production skills needed to be taught by agricultural science teachers to secondary school students prior to graduation in:

1. Skills in soybean pre-planting operations
2. Skills in soybean planting operations
3. Skills in soybean weed, pest and disease control operation

Research Questions

The following research questions guided the study

1. What are the pre-planting skills needed by secondary school Agricultural Science Teachers' for teaching soybeans production?
2. What are the planting skills needed by secondary school Agricultural Science Teachers for teaching soybean production?
3. What are the weed, pest and disease control skills needed by secondary school Agricultural Science Teachers for teaching soybean production?

Research Hypothesis

The following Null hypothesis were tested at 0.05 level of significance.

1. There is no significant difference in the mean response of Agricultural Science Teachers and Agricultural Extension Agents on skills needed in soybean pre-planting operation.

2. There is no significant difference in the mean response of Agricultural Science Teachers and Agricultural Extension Agents on skills needed in soybean planting operation.

3. There is no significant difference in the mean response of Agricultural Science Teachers and Agricultural Extension Agents on skills needed in soybean weed, pest and disease control operation.

Methodology

Three research objectives, questions and hypotheses guided this study. Survey research design was adopted for this study. Emaikwu (2022) stated that descriptive survey research design is a plan, structure and strategy than an investigator adopts in order to obtain solution to research problems using questionnaire in collecting, analyzing and interpreting the data. This design is suitable because the study made use of questionnaire developed literature and functions of industry to collect data from the respondents. The area of the study was Benue state, Nigeria: the population for the study was 230 comprising of 187 Agricultural Science Teachers in Benue state and 43 Agricultural Extension Agents from Benue Agricultural and Rural Development Authority (BNARDA). There was no sampling hence the population was small and manageable to be handled by the researchers. The instrument for data collection was 23-item questionnaire titled: Soybean Production Skill Questionnaire (SPSQ). The questionnaire was developed from related literature by the researchers' with response scale of Highly Needed (HN), Needed (N), Slightly Needed (SN), and Not Needed (NN) with corresponding value of 4, 3, 2 and 1. The instrument was face validated by five university lecturers: three from Department of Agricultural Education, one from Department of Crop Production and two from the Department of Science Education all from the Joseph Sarwuan Tarka University Makurdi, Benue state. Their corrections and suggestions were utilized to improve the initial copy of the questionnaire to produce the final copies. Cronbach-alpha reliability method was adopted to determine the internal consistency of the questionnaire items. A coefficient of 0.95 was obtained. Two hundred and thirty copies of the questionnaire were administered to the respondents and same number returned were returned and analyzed. Weighted mean

and standard deviation were used to answer the research questions while t-test statistic was used to test the hypothesis at 0.05 level of significance and at 228 degree of freedom. The average mean of 2.50 was used for decision-making. Any item with a mean rating of 2.50 or above was regarded as a competency item that is required while any competency item with a mean rating less than 2.50 was regarded as not required. Any item with standard deviation between 0.00 and 1.98 indicated that the respondents were not far from the mean and the opinion of one another. The hypotheses of no significant difference was upheld for any item whose t-calculated value was less than the t-table value of 1.96 level of significance and at 228 degree of freedom.

Table 1: Mean Rating Scores and Standard Deviation of the Responses of Agricultural Science Teachers and Agricultural Extension Agents on Pre-Planting Skills Needed by Secondary School Agricultural Science Teachers for Teaching Soybean Production (N = 230)

S/N	Items on Soya Beans Pre-planting Skills	$\overline{X1}$	SD_1	$\overline{X}_2$	SD_2	Remarks
1.	Selection of suitable site	3.86	0.35	3.88	0.32	HN
2.	Remove the stumps with hoe and axe	3.16	0.81	3.02	0.64	N
3.	Clear the land of vegetation	3.34	0.79	3.88	0.32	HN
4.	Pack and burn the thrash	2.67	1.08	2.77	0.75	SN
5.	Mark the layout of the site using lines and pegs	2.37	1.08	2.77	0.75	SN
6.	Make ridges or flat bed using hoes	3.90	0.30	3.81	0.39	HN
7.	Select suitable and viable seeds	3.91	0.29	3.02	0.71	N
8.	Treat seeds with chemicals	2.55	1.22	3.02	0.71	N
	Grand mean & Std. Deviation	**3.22**	**0.72**	**3.38**	**0.53**	**N**

Key: *X_1= Mean of Agricultural Science Teachers, X_2= Mean of Agricultural Extension Agents, SD_1=Standard Deviation of Agricultural Science Teachers, SD_2= Standard Deviation of Agricultural Extension Agents, HN-Highly Needed, and N-Needed*

The results presented in Table 1 reveals that the mean value of all the 8-items ranged from 2.37 to 3.91 and grand mean of 3.22 on the responses of Agricultural Science Teachers and the mean values of Agricultural Extension Agents responses ranged from 2.72 to 3.91 with a grand mean of 3.38. This showed that the mean value of each of the items in both responses exceeded 2.50 (the cutoff point). This indicates that all the items were needed by Agricultural Science Teachers for teaching soybean pre-planting skills to secondary school students. The table also shows that the standard deviation of the items in agricultural science teacher's response ranged from 0.30 to 0.79. This is an indication that the respondents were not too far from one another in their responses.

Table 2: The t-test Analysis of the Mean Rating Scores of the Responses of Agricultural Science Teachers and Extension Agents on Soybean Pre-Planting Skills Needed by Agricultural Science Teachers for Teaching Soybean Production to Secondary School Students (N = 230).

Status	N	Mean	Std.	Df	Sig.	t-cal	Alpha Value	Remark
Agric. Sci. Teachers	187	3.22	0.99					
Agric. Extension Agents	43	3.38	0.75	228	.49	1.05	.05	NR

N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P <.05, S = Significant, NR = Not Rejected.

Data on Table 2 shows that the p-value of 0.49 was greater than 0.05 level of probability, which shows that there was no statistical significant difference in the mean rating scores of responses of Agricultural Extension Agents and Agricultural Science Teachers on soybean pre-planting skills needed by Agricultural Science Teachers for teaching secondary schools students. Therefore, the null hypothesis of no significant on skills needed in soybean pre-planting operation was not rejected.

Table 3: Mean Rating Scores and Standard Deviation of the Responses of Agricultural Science Teachers and Agricultural Extension Agents on Planting Skills Needed by Secondary School Agricultural Science Teachers for Teaching Soybean Production (N = 230)

S/N	Items on Soybeans Planting Skills	$\bar{X}1$	SD_1	$\bar{X}_2$	SD_2	Remarks
1.	Planting by broadcasting	2.53	0.75	3.00	0.61	N
2.	Planting by drilling	2.42	1.03	3.00	0.61	N
3.	Planting date June - July	2.67	0.72	3.86	0.51	HN
4.	Planting depth of 4cm	2.59	0.79	3.81	0.58	HN
5.	Planting spacing of 60 - 70cm	2.70	0.82	3.81	0.58	HN
6.	Planting 1 - 2 seeds per hole	2.82	0.74	2.72	0.62	SN
	Grand mean & Std. Deviation	**2.62**	**0.82**	**3.36**	**0.75**	**HN**

Key: *X_1= Mean of Agricultural Science Teachers, X_2= Mean of Agricultural Extension Agents, SD_1=Standard Deviation of Agricultural Science Teachers, SD_2= Standard Deviation of Agricultural Extension Agents, HN-Highly Needed, and N-Needed*

The result presented in Table 3 shows that all the 6 items on soybean planting skills had their mean value ranged from 2.53 to 2.82 and 2.72 to 3.86 with grand mean of 2.63 and 3.37 in Agricultural Science Teachers and Agricultural Extension Agents respectively. The mean were above the cut-off point of 2.50, hence all the skills items were needed by Agricultural Science Teachers for teaching soybean production. The standard deviation of the items as shown from the table ranges from 0.72 to 1.03 and 0.51 to 0.75 from Agricultural Science Teachers and Agricultural Extension Agents respectively. This indicates that the respondents were not very far from the mean of one another in their responses and this; also means that the respondents tended to be close in agreement.

Table 4: t-test Analysis of the Mean Rating Scores of the Responses of Agricultural Science Teachers and Agricultural Extension Agents on Soybean Planting Skills Needed by Agricultural Science Teachers for Teaching Soybean Production to Secondary Schools Students (N = 230)

Status	N	Mean	Std. Dev.	Df	Sig.	t-cal	Alpha Value	Remark
Agric. Sci. Teachers	187	2.62	0.829					
Agric. Extension Agents	43	3.36	0.753	228	1.96	4.99	.05	NR

N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P <.05, S = Significant, NR = Not Rejected.

Data on Table 4 shows that the p-value of 1.96 was greater than 0.05 level of probability which means that there was no statistical significant different in the mean rating scores of responses of Agricultural Extension Agents and Agricultural Science Teachers on planting skills needed by secondary school Agricultural Science Teachers for teaching soybean production. Therefore, the null hypothesis of no significant difference in the two groups of respondents on skills needed in soybean planting operation was not rejected.

Table 5: Mean Rating Scores and Standard Deviation of the Responses of Agricultural Science Teachers and Agricultural Extension Agents on Weed Control Skills Needed by Secondary School Agricultural Science Teachers for Teaching Soybean Production (N = 230)

S/N	Items on Soybeans Weed, Pest and Diseases Control Skills	$\bar{X}1$	SD_1	$\bar{X}_2$	SD_2	Remarks
1.	Weed control manually with hoe	3.43	6.80	3.97	1.52	HN
2.	Weed control with chemicals	3.43	0.63	3.58	0.54	HN
3.	Apply weed control chemicals	3.53	0.63	3.27	0.69	N
4.	Inspect the farm for disease infection	2.77	1.13	3.16	0.75	N
5.	Identify chemicals for disease control	2.77	1.13	3.16	0.75	N
6.	Spray chemicals to control disease	2.77	1.13	3.16	0.75	N
7.	Inspect the farm for pest infestation	2.77	1.13	3.16	0.75	N
8.	Identify pesticides for pest control	2.77	1.13	3.16	0.75	N
9.	Spray pesticides to control pest	2.77	1.13	1.62	0.75	NN
	Grand mean & Std. Deviation	**2.99**	**0.97**	**3.35**	**3.65**	**HN**

Key: *X_1= Mean of Agricultural Science Teachers, X_2= Mean of Agricultural Extension Agents, SD_1=Standard Deviation of Agricultural Science Teachers, SD_2= Standard Deviation of Agricultural Extension Agents, HN-Highly Needed, and N-Needed*

The data presented in Table 5 reveals that all the 9 skill items had their mean values ranges from 2.77 to 3.43 from Agricultural Science Teachers responses and 3.16 to 3.97 from Agricultural Extension Agents with grand means of 2.99 and 3.35 respectively. This indicate that the mean value of each item was above the cutoff point of 2.50, showing that all the 9 skill items were needed by secondary school Agricultural Science Teachers for teaching soybean production. The table also shows that the standard deviation of the items in the two groups ranged from 0.65 to 0.97. This indicates that the respondents were not very far from the mean of one another in their responses.

Table 6: t-test Analysis of the Mean Rating Scores of the Responses of Agricultural Science Teachers and Extension Agents on Weed Control Skills Needed by Agricultural Science Teachers for Teaching Soybean Production to Secondary School Students

Status	N	Mean	Std. Dev.	df	Sig.	t-cal	Alpha Value	Remark
Agric. Sci. Teachers	187	2.99	0.97					
Agric. Extension Agents	43	0.65	0.75	228	1.9	2.5	.05	NR

N= Number of respondents, Std = Standard deviation, df = degree of freedom, Sig. = P-value; t-cal = t-calculated value; P <.05 S = Significant, NR = Not Rejected.

Data on table 6 also shows that the p. value of 1.96 was greater than 0.05 level of probability, which means that there was no statistical significant difference in the mean rating scores of responses of Agricultural Extension Agents and Agricultural Science Teachers on weed control skills needed by secondary school Agricultural Science Teachers for teaching soybean production. Therefore, the null hypothesis of no significance difference in the two groups of respondents on weed control skills needed was not rejected.

DISCUSSION OF FINDINGS

The findings on pre-planting skills agreed with the work of Are, Igbokwe, Asadu and Bawa (2020) who affirms that, when someone wants to start a farm, the first step is to acquire a suitable land with well-drained fertile soils then, prepare the land for farming with the following pre-planting operations; land clearing, stumping, plotting and tilling. The finding also agreed with the work of Okoro (2018) who advised that only improved, live, healthy, disease free seeds are to be elected for planting. He adds that if

for instance one is buying seeds including hybrid seeds, the percentage germination which should be 95-99 percent is recommended, selected seeds should be treated with chemicals before they are sown.

Finding on planting skills also agreed with the work of Are, Igbokwe, Asadu and Bawa (2020) who affirms that the recommended spacing for soybean is 60 cm x 70cm for the late maturing variety and 45cm – 60cm for the early maturing variety, planting of soybean is mostly done on flat-beds, while the main planting method is by broad casting and drill.

Finding on weed, pests and disease control skills is in line with the assertion made by Iwena (2012). According to him, it is advisable to remove weeds before they produce seeds, this is because weeds produce very many seeds, which when matured, drop to the ground, germinate and produce very many more seeds. In agreement with the findings of Iwena (2012) who affirm that crop plants are subject to attack by many pests and disease. Losses due to pests and diseases attack range from a low of 10 percent crop loss to a total loss of money to the farmer where for instance, soybean production formation stage is completely affected. So, in soybean production pests and disease attack are controlled and prevented by spraying appropriate chemicals e.g. pesticides for pests control and fungicide for the control of diseases cause by fungus Iwena (2012) goes ahead to affirms that unless pests and disease control measures are put in place, a planted crop will not achieve its potential yields.

CONCLUSION

Based on the findings of this study it was concluded that, all the skills in soybean pre-planting, planting, weed, pest and diseases control were all needed by Agricultural Science Teachers for teaching secondary school students in Benue state, Nigeria. Because, the two groups of respondents significantly differ in their responses.

RECOMMENDATIONS

The following recommendations were made based on the findings of this study

1. Curriculum planners should incorporate the soybean production skills into the curriculum of crop production in secondary schools for teachers to teach secondary school students.
2. The findings of the study should be made available to agricultural science teachers so that they will avail themselves of the skills needed in soybean production for effective teaching at secondary school level.
3. Through the state ministry of education Government should ensure strict supervision of agricultural science teachers so that the curriculum and the national policy on educations skill based subject for self-reliance are handled with all seriousness.

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