ORIGINAL RESEARCH ARTICLE

Assessment of Staff of Federal College of Forestry, Jos, Plateau State on the Knowledge of Terms and Concepts used in Plant Nursery

Emmamoge Orewere[1] iD, Ogenyi Ruth Ajibola[2] iD, and Dogun Ojochogu[2] iD

[1]Department of Horticulture and Landscape Technology, Federal College of Forestry, Jos, Plateau State.
[2]Department of Science Laboratory Technology, Federal College of Forestry, Jos, Plateau State

ABSTRACT

This study is aimed at assessing the knowledge of staff of Federal College of Forestry, Jos towards plant nursery terms and concepts (Horticultural terms and services). The research design is descriptive and utilized structured questionnaires and observation techniques to obtain primary data from respondents. A total of 165 questionnaires were distributed and 140 were retrieved representing 84.84% used for final analysis. The retrieved questionnaires were analysed and presented using descriptive statistics, Kruskal-Wallis, Chi-square, and Mann-Whitney tests. The results indicated that respondents often visit the plant nursery for different purposes and are aware of the plant nursery terms and concepts. The study revealed that age, gender, education level and discipline of respondents have no significant influence on the level of awareness of plant nursery terms and concepts. Based on the findings of this survey, it is recommended that conducting more focused employee awareness and presentation programs, especially on newly introduced plant terminology and concepts, will help enhance staff knowledge.

INTRODUCTION

A plant nursery is a place where horticultural plants like fruit plants, ornamental plants, flowering plants and seedlings are raised, multiplied, propagated and supplied to growers. It is a managed site, designed to produce seedlings, grown under favorable conditions until they are ready for final planting (Acquaah, 2009; Larinde and Santus, 2014; Haase and Anthony 2017; Ishaya *et al.,* 2018; Mensah and Muhammed, 2020). They are used for the artificial regeneration of plants through the use of planting materials like seeds, stem cutting, budding, grafting and layering. Plant nurseries are key success factor in many forestry and agricultural development programs. A plant nursery can be an informal, small scaled arrangement or a large commercial enterprise.

Asiedu *et al.,* (2012) and Mensah *et al.,* (2020) opined that nurseries are a means to create opportunities for start-ups or beginners for either full-time or part-time employment. Nurseries vary in size, facilities (supplies, tools, equipment, etc.), types of seedlings produced and operations. They also differ significantly in quantity and quality of planting stocks produced. Nursery establishments can generally be grouped into private and public, depending on the ownership, size and ultimate goal of their establishments (Larinde and Santus, 2014).There are different types of nurseries according to the types of plants grown and sold. There are Fruit plant nursery, Vegetable plant nursery, Ornamental plant nursery, Forest plant nursery Medicinal and Aromatic plant nursery, Hi-Tech nursery, Plant library nursery, Tissue culture nursery, Landscape gardening consultancy, Retail nursery, Wholesale nursery, Flowering plant nursery (Odaudu, and Ekule, 2021).

Contextual to this paper, plant nursery terms and concepts is a technical language used by nursery landscape gardeners/horticulturist to describe horticultural terms and services (Ratha Krishnan *et al.,* 2014). Nearly all professionals have the terms they used in performing their duties. The terms may be a great problem for others who are not in that profession as it may create a communication gap for them. A reconnaissance survey carried out within the Federal College of Forestry, Jos reveals that not all staff are familiar with the common terms and concepts used in a plant nursery.

Correspondence: Emmamoge, O. Department of Horticulture and Landscape Technology, Federal College of Forestry, Jos, Plateau State ✉ emmamoge3603@gmail.com, Phone No.: +2348036164498

This can, however, be attributed to different areas of specialization and training which can cause a breakdown in communication or lack of understanding between staff and nursery workers. It is observed that little or no attention has been done to assess how well the staff are conversant with plant nursery terms and concepts within the college with a view to create awareness and bridge existing communication gaps. In other to achieve this aim, the research was employed to investigate the level of awareness on use of plant nursery terms and concepts by staff within the college of forestry, Jos for exploitation towards making recommendations on how to improve the understanding of plant nursery terms and concepts. These brought about the following hypotheses:

i. **H0$_1$** Age of respondents has no significant influence on the level of awareness of plant nursery terms and concepts

ii. **H0$_2$** Gender of respondents has no significant effect on plant nursery terms and concepts

iii. **H0$_3$** Visitation to plant nursery has no significant influences on the awareness of plant nursery terms and concepts

iv. **H0$_4$** Staff educational level and discipline has no significant influences on plant nursery terms and concepts

MATERIALS AND METHODS

Study Area
The study was conducted at Federal College of Forestry, Jos which is located between Latitudes 09° 48' and 09° 56'N, Longitudes 08° 38' and 08° 53'E. It is along Bauchi road and opposite Bauchi Motor Park (Archives of Library and Documentation Unit FCF, Jos, 2018).

The plant nursery consists of open and close nursery types. The land use of Federal College of Forestry, Jos can be classified into two broad types which are built up areas (developed) and the forest area (undeveloped). The forested area include all the vegetative areas of the College which include forestry and wood technology plantation/nursery site, teaching and research farms including livestock section, natural forest, pig/poultry farm, bee hive; and fish pond among others. The developed areas include academic, administrative, residential, commercial and communal facilities areas including religious area, parking and sporting areas among others (Archives of Library and Documentation Unit FCF, Jos, 2018).

Data Collection and Analysis
The data for this research was collected from both primary and secondary sources. The research design is descriptive survey design which sought to find opinions of the respondents from a given population and relies on data collection from respondents through the use of close-ended questionnaires. This is to enable the questionnaires to be easily subjected to quantitative analysis. Consulting extensively relevant textbooks, publications, official records, maps, and dictionaries were also done as sources of secondary literature.

Simple random sampling technique was adopted to reach the target respondents who were staff of the college. The sample size for the study is 165 staff. 140 questionnaires out of 165 were returned from the respondents which provide a return rate of 84.84%, used for the analysis. The analysis of the returned questionnaires was carried out using descriptive statistics.

RESULTS AND DISCUSSION

Demographic Information of Respondent
The socio-economic results obtained as presented in Table 1 revealed that out of the total respondents that participated in this exercise, majority (78.6%) were males while few (21.4%) were females. It also revealed that 45% of the respondent's falls between the ages of 26 - 35 years, 27.1% between ages of 36-45 years and 17.1% between the ages of 16 - 25 years while 10.7% are above 46 years.

Educational qualification results revealed that majority of the respondent (35%) had ND/HND and B.Sc. qualifications, 29.3% had M.Sc. while 0.7% had Ph.D. qualification. Results also showed that most of the respondents that participated in this exercise are staff from Science Laboratory Technology Department (18.6%). Other participants are from Forestry Technology (FOT) and Agricultural Technology (AGT) Dept. (13.6%) > Horticulture and Landscape Technology (HLT) Dept. (12.1%) > Agricultural Extension and Management (AEM) Dept (10.7%) > Statistics (9.3%) > Crop Production Technology (CPT) (8.6%) > Computer Science (7.9%) > Pest Management Technology (PMT) department (5.7%) respectively. The results on length of service revealed that, most (50.7%) of the respondents have been in service for between 6-10 years. Others are between 1-5 years (25%), 11-20 years (20%) and 21 years and above (1.4%).

Table 1: Demographic characteristics of the respondents (n = 140)

Characteristics	Variables	Frequency (F)	Percentage (%)
Sex	Male	110	78.6
	Female	30	21.4
	Total	**140**	**100**
Age Group (Year)	16-25	24	17.1
	26-35	63	45
	36-45	38	27.1
	>46	15	10.7
	Total	**140**	**100**

Table 1: Continued

Characteristics	Variables	Frequency (F)	Percentage (%)
Educational Qualification	ND/HND	49	35
	B.Sc.	49	35
	M.Sc.	41	29.3
	Ph.D.	1	0.7
	Total	**140**	**100**
Department	HLT	17	12.1
	FOT	19	13.6
	SLT	26	18.6
	AEM	15	10.7
	CPT	12	8.6
	AGT	19	13.6
	PMT	8	5.7
	COMPT. SCI	11	7.9
	STATISTICS	13	9.3
	Total	**140**	**100**
Length of Service (Years)	1-5	35	25.0
	6-10	71	50.7
	11-20	28	20.0
	21 years and above	2	1.4
	No Response	4	2.9
	Total	**140**	**100**

Source: Field Survey, 2022.
Key: HLT = Horticulture and Landscape Technology, FOT =Forestry Technology, Science Laboratory Technology, AEM =Agricultural Extension and Management, CPT = Crop Production Technology, AGT = Agricultural Technology, PMT = Pest Management Technology

Knowledge of terms and concepts of the respondents

Table 2 revealed the information gathered from the respondents on terms and concepts of plant nursery operations. On the respondents' ability to visit plant nursery, majority (87.8%) have visited the plant nursery while only 10% have not visited plant nursery while 2.1% have not responded to the enquiry. Among the respondents that have visited the college plant nursery, 49.6% agree to the fact that they often visit the plant nursery, 26% seldom visit the nursery while 24.4% visit the plant nursery very often.

The results also revealed that the type of plant nursery respondents are familiar with, have ranged from ornamental plant nursery (20.7%), forest plant nursery (17.2%), fruit plant nursery (16.7%), vegetable plant nursery (9.6%), landscape gardening consultancy (8.1%), plant library nursery and flowering plant nursery (6.6%), retail nursery (6.1%), Medicinal and aromatic plant nursery (2.5%), tissue culture nursery, wholesale nursery to Hi-tech nursery (2.0%).

The information gathered as regards to the sections of the plant nursery where respondent often seek information have indicated that respondent often seeks information from all the sections in the nursery (46.6%). Other respondent seek information only from nursery office (27%), shade net house (12.2%), green house (10.8%) and plant library (3.4%).

Results on the continuation of the respondents' knowledge on purpose of plant nursery visit, terms used, the available source of familiarizing the terms, importance of the terms and how the terms are used to improve the plant nursery operations are presented in Table 3. The purpose of visiting plant nurseries by the respondents has been to purchase seeds/seedlings (38.3%). Other purposes of visit to the nursery are for conducting research (27.7%), student supervision (13.5%), out of curiosity (10.6%) and for leisure (9.9%).

Results also showed that most (78.6%) of the respondents that participated in this exercise are aware of plant terms used in the nursery, 15.7% are not aware while there was no response from 5.7% respondents on the awareness of plant terms used in the nursery.

Respondents concur to the fact that they got to know the terms used in the nursery from lectures/seminars (42.4%), personal visit to a nursery (29.8%), colleagues/friends (15.2%) and through the use of internet (9.9%), while others (2.7%).

As regards to the importance of plant nursery terms and concepts in various discipline/field of study, majority of the respondents (53.6%), agree it is very important, 17.9% of the respondents agree it is important to their discipline/field of study. Others said plant nursery terms and concept are not important (15.0%) and least important (9.3%).

It was also revealed that most (85.7%) of the respondents that participated in the exercise agree to the fact that knowledge gained of plant nursery terms creates more awareness and bridge(s) existing communication

gaps, 5.7% are did not agree to such statement while there was no response from 8.6% of the respondents. Results of Table 4 revealed that the major plant nursery terms respondents are familiar with, ranges from seedlings (11.1%), forest trees (5.6%), weeding, manure (4.4%), condiment (4.1%), fumigation (3.8%), mycorrhiza soil, bulbs (3.5%), *Carica papaya* (2.9%), top soil (2.3%) and potting mixture, budding knife (2.0%) to budding, planting, dormancy, staking (1.8%).

Table 2: Knowledge of respondents on plant nursery terms and concepts

Attribute	Response	Frequency (f)	Percentage (%)
Visit to plant nursery	Yes	123	87.8
	No	14	10
	No Response	3	2.1
	Total	**140**	**100**
Visit frequency	Very often	30	24.4
	Often	61	49.6
	Seldom	32	26.0
	Never	0	0.0
	Total	**123**	**100**
Attribute	**Response**	**Frequency (*F)**	**Percentage**
Plant nursery visited according to plant grown	Fruit plant nursery	33	16.7
	Plant library nursery	13	6.6
	Vegetable plant nursery	19	9.6
	Tissue culture nursery	4	2.0
	Ornamental plant nursery	41	20.7
	Landscape gardening consultancy	16	8.1
	Forest plant nursery	34	17.2
	Retail nursery	12	6.1
	Flowering plant nursery	13	6.6
	Medicinal and aromatic plant nursery	5	2.5
	Wholesale nursery	4	2.0
	Hi-tech nursery	4	2.0
	Total	**198**	**100**
Respondents' information seeking avenue	Nursery office	40	27.0
	Shade net house	18	12.2
	Plant library	5	3.4
	Green house	16	10.8
	All of the above	69	46.6
	Total	**148**	**100**

F* = Multi-choice responses, Source: Field Survey, 2022.

Table 3: Continuation Knowledge of respondents on plant nursery terms and concepts

Attribute	Response	Frequency (F*)	Percentage (%)
Purpose of Plant nursery visit	Conducting research	39	27.7
	Out of curiosity	15	10.6
	Leisure purpose	14	9.9
	Student supervision	19	13.5
	Purchase of seeds/seedlings	54	38.3
	Total	**141**	**100**
Respondents' awareness of the terms and concepts	Yes	110	78.6
	No	22	15.7
	No Response	8	5.7
	Total	**140**	**100**

Table 3: Continued

Attribute	Response	Frequency (F*)	Percentage (%)
Respondents' sources of knowledge of terms	Lectures/Seminars	64	42.4
	Colleagues/Friends	23	15.2
	Personal visit to a nursery	45	29.8
	Use of Internet	15	9.9
	Others	4	2.7
	Total	**151**	**100**
Respondents' perception on the importance of plant nursery terms and concepts	Very important	75	53.6
	Important	25	17.9
	Least important	13	9.3
	Not important	21	15.0
	No Response	6	4.3
	Total	**140**	**100**
Respondents belief on importance of plant nursery terms and concepts as a solution	Yes	120	85.7
	No	8	5.7
	No Response	12	8.6
	Total	**140**	**100**

F* = Multi-choice responses. Source: Field Survey, 2022

Table 4: Plant Nursery Terms the Respondents are Familiar with

Response	Frequency (F*)	Percentage (%)
Seedling	38	11.0
Grafting	5	1.5
Budding	6	1.8
Green house	2	0.6
Species	4	1.2
Mycorrhiza soil	12	3.5
Seed	2	0.6
Condiment	14	4.1
Transplanting	5	1.5
Shrubs	2	0.6
Dormancy	1	0.3
Pruning	1	0.3
Weeding	15	4.4
Layering	4	1.2
Hardening off	2	0.6
Breaking dormancy	3	0.9
Stem cutting	4	1.2
Shed	3	0.9
Tools	5	1.5
Planting	6	1.8
Moringa oleifera	5	1.5
Khaya senegalensis	3	0.9
Gmelina arborea	5	1.5
Jatropha curcas	2	0.6
Eucalyptus	1	0.3
Sesame	4	1.2
Carica papaya	10	2.9
Germination box	3	0.9
Raised bed	4	1.2

Table 4: Continued

Response	Frequency (F*)	Percentage (%)
Sunken bed	6	1.7
Wildlings	3	0.9
Root pruning	2	0.6
Plant growth regulator	4	1.2
Manure	15	4.4
Insecticide	1	0.3
Forest trees	19	5.6
Watering	2	0.6
Improved varieties	4	1.2
Indigenous species	1	0.3
Nursery beds	5	1.5
Brown rot	2	0.6
Green house	5	1.5
Shrubs	1	0.3
Planting stock	1	0.3
Spraying	1	0.3
Fumigation	13	3.8
Mulching	2	0.6
Harvesting	1	0.3
Polythene pot	4	1.2
Flower pot	5	1.5
Potting mixture	7	2.0
Ornamental	3	0.9
Dormancy	6	1.8
Thinning	2	0.6
Top soil	8	2.3
Pruning knife	5	1.5
Budding knife	7	2.0
Tissue culture	3	0.9
Flower plant	2	0.6
Frequency (F*)	**Percentage (%)**	**Frequency (F*)**
Silviculture	2	0.6
Composting	3	0.9
Mowing	1	0.3
Straw/hay	2	0.6
Crop rotation	1	0.3
Alternate husbandry	1	0.3
Landscaping	1	0.3
Horticulture	1	0.3
Staking	6	1.8
Scion	1	0.3
Bulbs	12	3.5
Total	**342**	**100**

F* = Multi-choice responses. Source: Field Survey, 2022.

Hypothesis 1 Testing: Age of respondents does not have significant influence on the level of awareness of plant nursery terms and concepts.

The result on Table 5 shows Kruskal-Wallis test analysis on age of respondents to the level of awareness of plant nursery terms and concepts. The result thus revealed that age of respondents has no significant influence on the level of awareness of plant nursery terms and concepts. The result therefore, supports the null hypothesis. This implies that level of awareness of plant nursery terms and concepts does not necessarily focus on a particular age category.

Table 5: Kruskal-Wallis Test analysis on age of respondents to the level of awareness of plant nursery terms and concepts

Variables	N	Mean	Std. Deviation	Minimum	Maximum
Awareness of plant terms used in a nursery	133	1.18	0.405	1	3
Age	139	2.32	0.885	1	4

Variables	Age	N	Mean Rank
Aware of plant terms used in a nursery	16-25 years	24	68.65
	26-35 years	60	70.48
	36-45 years	35	60.61
	>46 years	13	60.04
	Total	132	

Source: Field Survey, 2022

Variables	K-value	df	P-value	Decision
Aware of plant terms used in a nursery	4.449	3	0.217	**NS**

Significant level = 0.05; NS: Not Significant; ** = Significant

Hypothesis 2 Testing: Gender of respondents does not have significant effect on plant nursery terms and concepts

The result on Table 6 reveals the Chi-square result on significant relationship of gender to plant nursery terms and concepts. Despite the different views amongst respondents, a non-significant difference was observed among responses from respondents in the study area thereby suggesting all respondents in the study area are having common view on plant nursery terms and concepts.

Table 6: Chi-Square analysis on gender to plant nursery terms and concept

		Chi-Square Tests	
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	109.313a	118	0.704 **NS**
Likelihood Ratio	115.976	118	0.535
N of Valid Cases	140		

NS = Not Significant

Hypothesis 3 Testing: Visit to plant nursery does not have significant influences on the awareness of plant nursery terms and concepts

Table 7 reveals the Chi-Square analysis for visit to plant nursery and awareness of plant nursery terms and concept. The results thus revealed that visiting plant nursery by the respondents have significant influence on the awareness of plant terms and concept used in a nursery. The result therefore, disagrees with the null hypothesis. This implies that respondents visit to the plant nursery will definitely bring about awareness of plant terms and concepts used in a nursery.

Table 7: Chi-Square analysis on visit to plant nursery to awareness of plant nursery terms and concept
Ever visited plant nursery * aware of plant terms used in a nursery Cross tabulation

		Awareness of plant terms used in a nursery			
Variables		1	2	3	Total
Ever visited plant nursery	Yes	103	11	1	**115**
	No	3	10	0	**13**
	No Response	1	1	0	**2**
Total		**107**	**22**	**1**	**130**
		Chi-Square Tests			

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39.288[a]	4	0.000**
Likelihood Ratio	28.923	4	0.000
Linear-by-Linear Association	25.012	1	0.000
N of Valid Cases	130		

** = Significant

Hypothesis 4 Testing: Staff educational level and discipline does not have significant influences in plant nursery terms and concepts

Mann-Whitney test analysis was performed to answer the question on staff educational level and discipline to its significant influences in plant nursery terms and concepts (Table 8). The result thus, supports the statement that staff educational level and discipline does not have significant influences in plant nursery terms and concepts. Implying that knowledge on plant nursery terms and concept cut across all educational level and discipline of staff in the study area.

Table 8: Mann-Whitney U Test analysis on staff educational level and discipline to the level of awareness of plant nursery terms and concepts

Variables	N	Mean	Std. Deviation	Minimum	Maximum
Educational Qualification	133	2.11	0.994	1	6
Aware of plant terms used in a nursery	133	1.18	0.405	1	3

Variables	Aware of plant terms used in a nursery	N	Mean Rank	Sum of Ranks
Educational Qualification	Yes	107	62.84	6724.00
	No	19	67.21	1277.00
	Total	**126**		

Source: Field Survey, 2020

Variables	U-value	P-value	Decision
Educational Qualification	946.0	0.613	**NS**

Significant level = 0.05; NS: Not Significant; ** = Significant

DISCUSSION OF RESULTS

The findings reveal the bulk of the surveyed population were civil servants and male, within the age range of 26-35 years and have obtained HND/B.Sc. qualifications. Most of the respondents that participated in the exercise are staff from different Departments and have been in service for a period of 6-10 years. The dominant age range recorded by Larinde and Santus (2014) was between 21 and 40 years and this age bracket is composed of youths implying that plant nursery enterprise can greatly empower and create jobs for the able body youths. This is corroborated by Fakayode et al. (2008) which reported the dominant age range of 21-50 years for a similar study in Kwara State, Nigeria.

Information gathered from the respondents revealed that they often visit the plant nursery. Ornamental plant nursery, forest plant nursery and fruit plant nursery are types of nurseries often visited. In addition, the respondents seeks information from the nursery office, shade net house, green house or plant library to either conduct a research or purchase seeds and seedlings or supervise students' project work.

Furthermore, through series of lectures/seminars, personal visit to a nursery, colleagues and the internet; respondents became aware of plant terms and concepts. Seedlings, forest trees, weeding, manure, top soil, potting mixture, budding knife, budding, planting, dormancy, staking are some terms they became aware of. Kruskal-Wallis test analysis revealed that age of respondents has no significant influence on the level of awareness of plant nursery terms and concepts. Chi-square result shows gender of respondents does not have significant effect on plant nursery terms and concepts. While the Mann-Whitney test analysis supports the statement that staff educational level and discipline does not have significant influences in plant nursery terms and concepts. The findings is in line with the studies of Asiedu et al. (2012) Ishaya et al. (2018) and Mensah and Muhammed (2020) revealed that knowledge obtained from plant nurseries

bridge existing communication gaps. Furthermore, previous studies reveal that knowledge on plant nursery terms and concept cut across all educational level and discipline of staff in the study area.

CONCLUSION

Major plant nursery terms respondents are familiar with ranges from seedlings, top soil , weeding, manure, *Moringa oleifera, Khaya senegalensis*, raised bed, sunken bed, nursery bed, bulbs, potting mixture, budding knife, budding, planting, dormancy, staking, etc. In view of the findings emanating from this study knowledge obtained from plant nurseries bridge existing communication gaps.

RECOMMENDATION

Based on the findings of this study, the following recommendations are put forward:

 i. More focused employee awareness and presentation programs, especially on newly introduced plant terminology and concepts, will help enhance staff knowledge

 ii. Staff should be encouraged to visit the plant library to get more familiar with recent discovery on the plant nursery.

 iii. There should be joint collaboration with other research institutions and similar colleges on horticultural aspects of the plant nursery which bridges communication gaps

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