



ASSESSMENT OF THE KNOWLEDGE LEVEL OF CITRUS AND PINEAPPLE FARMERS ABOUT OCCUPATIONAL HEALTH HAZARDS IN SELECTED STATES OF SOUTHWESTERN NIGERIA

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ABSTRACT

Farmers are generally exposed to different types of health hazards and illness conditions in the course of carrying out their farming activities. This study assessed the knowledge level of citrus and pineapple farmers about occupational health hazards in Southwestern Nigeria. Multistage random sampling technique was used to select four states representing 50% of the states in southwest agro ecological zone. The lists of citrus and pineapple farmers were generated through the assistance of Agricultural Development Programmes staff and recognized farmers' associations in the selected states. A total of 426 farmers representing fifty percent of the farmers from the list were randomly sampled. Data were collected using pre-tested structured interview schedule and focus group discussion and analyzed using frequency counts and percentages. The mean age of the respondents was 50 years, 80.5% were females, 90.1% were married, 70.4% had one form of education or the other while 29.6% had no formal education. Respondents from Osun (82.0%) and Oyo states (54.4%) had low knowledge about health hazards and occupational-related illness while Edo state (61.3%) and Ondo state (75.5%) had high knowledge. Edo (57.0%), Oyo (56.7%) and Ondo (74.5%) states had low health and safety utilization measures. Concerted effort should be put in place to improve their knowledge in order to empower them and enhance their potentials in contributing to the value chain development in horticultural industry in Nigeria.

Keywords: citrus, pineapple, occupational hazards, illness, safety measures.

INTRODUCTION

Human capital is an indispensable production input in the agricultural and economic development of a nation. Good health and productive agriculture are important especially in the fight against hunger and poverty because there is a positive relationship between health and productivity (Ajani and Ugwu, 2008). Out of the world's 1.2 billion extremely poor people, 75% live in rural areas and they mostly depend on agricultural related activities (Gustavo and Kostas, 2007). Agricultural sector is one of the most hazardous to health worldwide as affirmed by International Labour Organization (ILO) (Donald, 2006). The labour process in agriculture generally exposes farmers to various occupational health hazards that are risky to health such as exposure to harsh weather, close contacts with plants and animals, extensive use of chemical and biological products, difficult working postures, lengthy hours and use of hazardous agricultural tools and machinery (ILO and FAO, 2010).

In addition to these, fruit farmers particularly may be exposed to various occupational health hazards which may make them vulnerable and predispose them to risk. This may include exposure to insect bite or sting especially during the flowering and fruiting stages when insects are naturally attracted to fruits, thus pre-disposing farmers to health risks through stings or bite from these vectors. Farmers may also sustain injury from plant, falls, trips, slips, farm tools and equipment.

Fruits are very important components of a balanced diet and they contain vitamins and minerals necessary for proper functioning of the body system. In

order to encourage fruit consumption, enhance the standard of living of fruit farmers and move juice industry forward to the point of sustainable development, the Federal Government of Nigeria (FGN) set up the Presidential Initiative on Tropical Fruits in 2005 with a major task of finding ways of achieving 10% of the world tropical fruit production in four years (Presidential Initiative on Tropical Fruits Production, 2006). Accompanying this also is the ban on importation of fruit juice, a major challenge to fruit farmers in the country.

For the attainment of the above goals and also unlock the different inherent potentials of horticultural industry through value chain approach, issues that relate to the health and safety of the farmers who are the major suppliers and stakeholders in fruit production cannot be overlooked.

The general objective of the study was to assess the knowledge level of citrus and pineapple farmers about occupational health hazards and related illnesses in selected states of Southwest Nigeria. The specific objectives were to:

- determine the personal characteristics of the fruit farmers
- assess the knowledge level of fruit farmers about occupational health hazards and related illnesses.
3. identify the health and safety measures utilized among the farmers



METHODOLOGY

The study was carried out in Southwestern Nigeria. The study area was southwest agro ecological zone of Nigeria comprising eight states (Edo, Ekiti, Delta, Lagos, Ogun, Osun, Ondo and Oyo). The population of the study comprised fruit farmers who are involved in the production of either citrus or pineapple or a combination of the two crops in southwestern Nigeria.

Multistage random sampling technique was used to select four states (Edo, Ondo, Osun and Oyo) representing 50% of the states in southwest agro ecological zone. The list of farmers who had at least 50 stands each of citrus and pineapple or a combination of both crops on their farm were generated through the assistance of Agricultural Development Programmes (ADPs) staff and recognized farmers' associations in the selected states. A total of 426 farmers were randomly selected. Structured interview schedule was used to collect primary data while Focus Group Discussion (FGD) was used to elicit information on indigenous health hazards preventive and curative measures utilized.

RESULTS AND DISCUSSIONS

Personal characteristics of the fruit farmers

The mean age of the respondents was 50 years, 80.6% were male, 19.5% were female and (70.2%) had one form of education or the other. Among the respondents 19.5% and 12.0% had less than one hectare of citrus and pineapple, respectively while 13.1% had a combination of citrus and pineapple on 1-2ha of farmland. This indicates that they were small scale farmers with small holdings of land. Radio (71.4%) was the highest source of information and 46.2% of the respondents had contact with the extension agents of the ADP fortnightly. High educational attainment among the respondents could enhance effective dissemination of health information through the print and electronic media in the study area. Contact with the extension agents could be a good ground for appropriate take-off of health intervention programmes (Table-1).

Table-1. Personal characteristics of the farmers (n = 426).

Characteristics	Categories	Frequency	%
Age			
	19- 30	22	5.2
	31-40	82	19.2
	41-50	132	31.0
	51-60	118	28.0
	> 60		
	Mean age=50years	70	16.4
Sex			
	Male	343	80.5
	Female	83	19.5

	Widow	15	3.5
Education			
	No formal education	126	29.6
	Primary	96	23.0
	Secondary	107	25.1
	Adult	16	3.8
	Quranic	16	3.8
	Tertiary	43	10.1
Sources of health information			
	Radio	304	71.4
	TV	153	36.3
	Internet	12	2.8
	Print	34	8.0
	Family	159	37.3
	Mobile phone	32	7.5
	Hospital	77	18.0
	Community health worker	8	18.3
Contact with extension agent			
	No contact	64	15.0
	Weekly	52	12.2
	Fortnightly	197	46.2
	Monthly	54	12.7
	Quarterly	54	12.7
Size of citrus farm (ha)			
	<1	83	19.5
	1-2	49	11.5
	3-4	27	5.3
	>4	13	2.6
Size of pineapple farm (ha)			
	<1	51	12.0
	1-2	28	6.5
	3-4	28	6.5
	>4	17	3.9
Size of pineapple and citrus farm (ha)			
	<1	35	8.2
	1-2	56	13.1
	3-4	44	10.3
	>4	46	10.8

Source: Field survey 2012

**Knowledge level of fruit farmers about occupational health hazards and related illnesses**

Table-2 shows that majority of the respondents had knowledge about the implication of untreated wound (93.4%), carrying heavy load (90.4%), use of protective clothing during spraying (80.3%) while (47.2%) and 36.6% were knowledgeable about colour coding on chemical containers and likelihood of developing cancer due to exposure to intense heat from the sun respectively. To avoid tetanus, utilization of herbs in treating cuts, bleeding and wounds was a common act among the respondents as affirmed during the FGD. Hot pepper (*Capsicum annum*) and juices from Siam weed (*Chromola odorata*) and bananas were specifically mentioned with the potency to stop bleeding.

Some of them confirmed that whenever chemicals poured on their bodies, they always feel the negative effect through itching of the body and irritation on the eyes. United States Department of Labour stressed that most chemicals are readily absorbed through the skin;

this can cause other health effects and contribute to the dose absorbed by inhalation of the chemical from the air. It was also stressed that absorption of chemical through the skin can occur without being noticed by workers in many cases, skin is a more significant route of exposure than the lung and a relatively small percentage caused by skin exposure would represent a significant health risk (Sosan and Akingbounge, 2009). Different colour coding in chemicals represent different level of toxicity, however, less than half of the farmers had this knowledge. The World Health Organization (2000) colour classification of agrochemicals depicts red as belonging to hazard class 1a and 1b which is extremely hazardous to hazardous with hazard statements as very toxic and toxic respectively. Yellow means moderately hazardous with class II and hazard statement harmful while blue with hazard statement caution in class III. Green colour is non-classified with no hazard statement. Many of the respondents believed that exposure to intense heat from the sun could lead to yellowish urine and fever rather than cancer of the skin.

Table-2. Knowledge of respondents about occupational health hazards that may lead to illnesses (n = 426).

Technical knowledge	Correct response
1. Inhalation of dust is dangerous to health	264(62.0)*
2. Carrying of heavy load can cause muscular pain	385(90.4)
3. Wearing of protective clothing is necessary while spraying	342(80.3)
4. First aid box is essential on the farm	331(77.7)
5. It is necessary to read manuals and labels of chemical and equipment before use?	215(50.5)
6. Exposure to intense heat can lead to skin cancer	156(36.6)
7. Routine medical attention is not necessary for farmers	255(59.9)
8. Prolonged exposure to noise can cause permanent deafness	186(43.6)
9. Regardless of the direction of the wind, you can face any direction while spraying?	229(53.5)
10. Health insurance scheme is not relevant when it comes to farming.	199(46.7)
11. Inhalation of moulds from plants be dangerous to health	296(69.4)
12. Inhalation of pesticides can cause dizziness	287(67.4)
13. Frequent exposure to cold can cause respiratory disease	223(52.3)
14. Working long hours on the farm can constitute risk to life	328(77.0)
15. Falls and trips are common and not serious issues on the farm	193(45.3)
16. Wearing of boots on the farm is necessary	251(58.9)
17. Chemical containers can be reused for domestic purposes after washing.	267(62.7)
18. Inhalation of chemicals has any serious effect on female of productive age.	257(60.3)
19. Untreated wound/ cuts from cutlass and other farm tools can cause tetanus	398(93.4)
20. Can emotional disturbance affect farmer's productivity	323(75.8)
21. Colour coding in pesticides labels represent different level of toxicity	201(47.2)

*() Figures in parentheses are percentages

Source: Field survey 2012

Table-3 shows that respondents from Osun (82.0%) and Oyo states (54.4%) had low knowledge about

health hazards and occupational-related illness while Edo (61.3%) and Ondo (75.5%) states had high knowledge.



The similarity between the knowledge categories of fruit farmers from Osun and Oyo states on one hand and Edo and Ondo states on the other hand could be due to the

closeness with each other in terms of geographical location.

Table-3. Knowledge categorization of respondents about occupational health hazards and occupational-related illnesses.

	Osun n=133		Edo n=93		Oyo n=90		Ondo n=110	
Knowledge level	High	Low	High	Low	High	Low	High	Low
%	18.0	82.0	61.3	38.7	45.6	54.4	75.5	24.5

Source: Field survey 2012

Health and safety measures utilized among the farmers

Under routine measures, bathing immediately after farm work, wearing of rubber boots, wearing of overall and wearing of rubber gloves were very frequently utilized by 33.8%, 14.3%, 8.7% and 9.9% and of the respondents, respectively (Table-3). During the FGD, farmers affirmed that wearing of overall/PPC encourages heat and subsequent sweating and discomfort while rubber boots were said to be too heavy. Instead of wearing rubber boots, sandals, shoes and rubber slippers were worn as improvised protective means by the respondents. These may expose them to wounds and injury from thorns, stumps of trees and attack from snakes. This was closely related to the findings of Ibrahim (1999) where he discovered that rubber gloves, chemical aprons and rubber boots were used by 14.5%, 12.1% and 10.1% of sampled respondents, respectively.

Agro-chemical handling measures include thorough washing of hands after spraying, thorough washing of equipment after use, proper storage and disposal of agrochemical containers after use, reading of manuals, wearing of nose masks and goggles which were very frequently utilized by 31.9%, 31.2%, 29.3%, 18.5%, 10.6% and 5.2% of the respondents, respectively. It could be deduced from this result that farmers take care of their production inputs more and pay less attention to issues that may affect their health in a gradual and dangerous manner. Ibrahim (1999) also observed that 6.8% of farm owners and workers always used goggles and most of the farmers stored their chemicals in the house, garage and metal boxes while 44.1% usually wear respirators when applying pesticides which can increase the chance of being

poisoned and the long run effects. Possible implication is spending money on illness, unhealthy farmer and risk to life that may accompany prolonged exposure. United States Environmental Agency (2012) confirmed that when pesticides are used, they have some toxicity and exposure which could result in potential risk and thus encouraged farmers to use personal protective measure in order to prevent risk.

Preventive measures frequently utilized by few of the respondents include routine medical check-up (5.4%) and insecticide treated mosquito nets (8.0%). About (27.0%) (29.8%) (30.5%) of the respondents were not involved in proper storage of hand tools after use, listening to health talk and discussion of hazard with farm families and friends (30.5%). Insecticide treated mosquito net was recommended for use as one of the packages that are friendly to man in order to prevent attack from malaria. Despite the campaign and free distribution of these nets in some areas, the frequency of usage was still low. According to the Occupational Health and Safety Administration (OSHA) (2012) injury and illness prevention programme is a proactive process to help find and fix workplace hazard before workers are hurt while its adoption will result in workers suffering fewer injuries, illnesses and fatalities.

Curative measures such as local herbs, seeking medical attention when ill and prompt report of health hazards in the hospital were frequently used by 15.3%, 14.8% and 6.5% of the respondents, respectively. The proportion of the respondents frequently utilizing curative measures was very low suggesting that there is a great risk to their health and general wellbeing.

**Table-4.** Health and safety measures utilized by the respondents (n=426).

Farm Health and safety measures	Yes, very frequent	Yes, frequent	Yes, not frequent	No
A. Routine measures				
1. Wearing of overall	37(8.7)*	60(14.1)	63(14.8)	266(62.4)
2. Wearing of rubber boots on the farm	61(14.3)	68(16.0)	91(21.4)	206(48.4)
3. Wearing of rubber gloves during production activities	42(9.9)	59(13.8)	78(18.3)	247(58.0)
4. Bathing immediately after farm work	144(33.8)	102(23.9)	73(17.9)	107(25.1)
5. Use of safety belt in vehicles during transportation for marketing	33(7.7)	52(12.2)	6(15.7)	274(64.3)
B. Handling of agrochemicals				
6. Readings of manuals/ labels of equipment and agro-chemicals	79(18.5)	90(21.1)	95(22.3)	162(38)
7. Wearing of goggles while spraying agrochemicals	22(5.2)	47(11.0)	55(2.9)	302(70.9)
8. Wearing of nose mask or respirator during spraying	45(10.6)	48(11.3)	57(13.4)	276(64.8)
9. Thorough washing of equipment used for mixing agro-chemicals after use	133(31.2)	122(28.6)	87(20.4)	84(19.7)
10. Proper storage and disposal of agro-chemical containers after use	125(29.3)	116(27.2)	83(19.5)	102(23.9)
11. Washing of hands after spraying	136(31.9)	127(29.8)	76(17.8)	87(20.4)
C. Preventive measures				
12. Regular/routine medical check-up	23(5.4)	59(13.8)	87(20.4)	257(60.3)
13. Listening to health talk	82(19.2)	108(25.4)	109(25.6)	127(29.8)
14. Use of insecticide treated mosquito net	34(8.0)	58(13.6)	76(17.8)	258(60.6)
15. Use of insect repellent/cream	20(4.7)	44(10.3)	65(15.3)	297(69.7)
16. Routine inspection of equipment for problems that may be hazardous	70(16.4)	88(20.7)	79(18.5)	189(44.4)
17. Discussion of hazards with farmers, family and worker	81(19.0)	102(23.9)	113(27.0)	130(31.0)
18. Proper storage of hand tools after use to prevent accident	110(27.0)	125(29.3)	76(17.8)	115(27.0)
D. Curative				
19. Use of First Aid Box/improvised first aid box	27(6.0)	44(10.0)	93(22.0)	262(62.0)
20. Prompt report of health hazard in the hospital	28(6.5)	79(18.5)	128(3.0)	191(44.8)
21. Seek medical attention when ill	63(14.8)	130(30.5)	122(28.6)	111(26.1)
22. Traditional/Local means	65(15.3)	78(18.3)	100(23.5)	183(43.0)

*() Figures in parentheses are percentages

Source: Field survey 2012

Table-4 reflects that Edo (57.0%), Oyo (56.7%) and Ondo (74.5%) states had low health and safety utilization measures. In order to improve farmers' health and safety, FAO Farmer Field School (FSS) extension approach is increasingly addressing issues of occupational health and safety as part of their curriculum for farmers' advancement and linkages to ILO's Work Improvement

for Neighbourhood Development (WIND). WIND has been described as a powerful methodology for improving conditions of work and life of families in rural and agricultural undertakings and also a tool for sharing local protection, poverty reduction and community development (IFPRI, 2008). There is the need to tap into this opportunity to create a healthy farm environment.

**Table-5.** Categorization of Health and safety measures utilized by the respondents.

	Osun n=133		Edo n=93		Oyo n=90		Ondo n=110	
Health and safety measures	High	Low	High	Low	High	Low	High	Low
%	50.4	49.6	43.0	57.0	43.3	56.7	24.5	74.5

Source: Field survey 2012

CONCLUSION AND RECOMMENDATION

Majority of the sampled fruit farmers were male and had one form of formal education or the other. Knowledge about health hazards and occupational-related illnesses was low among the respondents from Osun and Oyo states while Edo, Oyo, and Ondo states had low health and safety utilization measures.

Concerted effort should be put in place by relevant stakeholders in health and agriculture to improve farmers' knowledge in order to empower them physically. Health and safety kits should be made available by the government through partnership with producers and be made available at subsidized rate within the reach of farmers.

It is essential to tap into the readily available sources of information within the reach of the farmers for effective sensitization of the farmers about the need to protect themselves against risk and the long run irreversible negative effects. This will enhance an effective coverage, positive impacts of health intervention programmes and consequently enhance their work capability and maintain a balance between their work and health.

To fully unlock the potential of horticultural industry in Nigeria through value chain development, there is the need to improve the health conditions of farmers and the rural populace at large by incorporating specific health and safety packages into horticultural technologies; this can be channeled through the FAO Farmer Field School (FSS) extension approach.

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