



Assessment of contract sprayers in Borno State, Nigeria

Results of the Farmer and Contract Sprayers Interviews and Practical Tests



Prepared by CropLife Africa Middle East

December 2015

N2Africa

**Putting nitrogen fixation to work
for smallholder farmers in Africa**



N2Africa is a project funded by The Bill & Melinda Gates Foundation by a grant to Plant Production Systems, Wageningen University who lead the project together with IITA, ILRI, AGRA and many partners in Ghana, Nigeria, Tanzania, Uganda, Ethiopia, the Democratic Republic of Congo, Rwanda, Kenya, Malawi, Mozambique and Zimbabwe.

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CropLife Africa Middle East, 2015. Assessment of contract sprayers in Borno State, Nigeria, www.N2Africa.org, 54 pp.



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Keywords

Contract sprayer, Nigeria, Borno State, CropLife, age, gender, pesticides, knowledge, payment, interval, training, PPE, protective equipment



1 Background

The N2Africa project has started activities in Borno state where it is encouraging youth agri-entrepreneurs to start business activities along the value chain of groundnut, soyabean and cowpeas. The project is active in 40 communities in 4 Local Governance Areas (LGA): Bayo, Biu, Hawul, and Kwaya Kusar.

The government has a keen interest in setting up projects for youth in Borno state. ADP (extension services) in Borno state has trained youth to become contract sprayers. The spray gangs are selling their services to farmers but it is not clear how many were trained, who they service exactly, what type of products there are using, and if there is any follow up on activities in the field.

N2Africa is interested in supporting this group and therefore would like to collect information on their activities and their skills. Based on the information a plan of action can be developed to build their capacity.

Assessment

A total of 3 questionnaires were developed: one to interview farmer who made use of the services of the contract sprayers (see Annex 1), one to interview contract sprayers (see Annex 2), and one to test the contract sprayers on their application skills (see Annex 3).

From 24 to 27 November 2015, 50 farmers and 50 contract sprayers were interviewed, while 20 contract sprayers conducted the application test. The selection was an at random selection from lists provided by the N2Africa project. The interviews were done by 8 enumerators working for ADP Borno State, while the application test was done by the national coordinator of CropLife Nigeria.

This report provides a summary of the results of the interviews and the practical tests. For each question a graph has been created to depict the outcome of that particular question. Under each graphs or topic a short description of the outcome(s) on that particular question or topic is given. In the pie-charts the number indicates the actual number of respondents that gave that particular answer, while the number in brackets indicates the percentage of respondents that gave that particular answer. For example 3 (5.77%) means that 3 people gave that answer which is equal to 5.77% of all respondents.

The graphs and pies do not draw any conclusions but merely states facts or obvious relations. In the last chapter, conclusions are provided and recommendations on follow up activities.

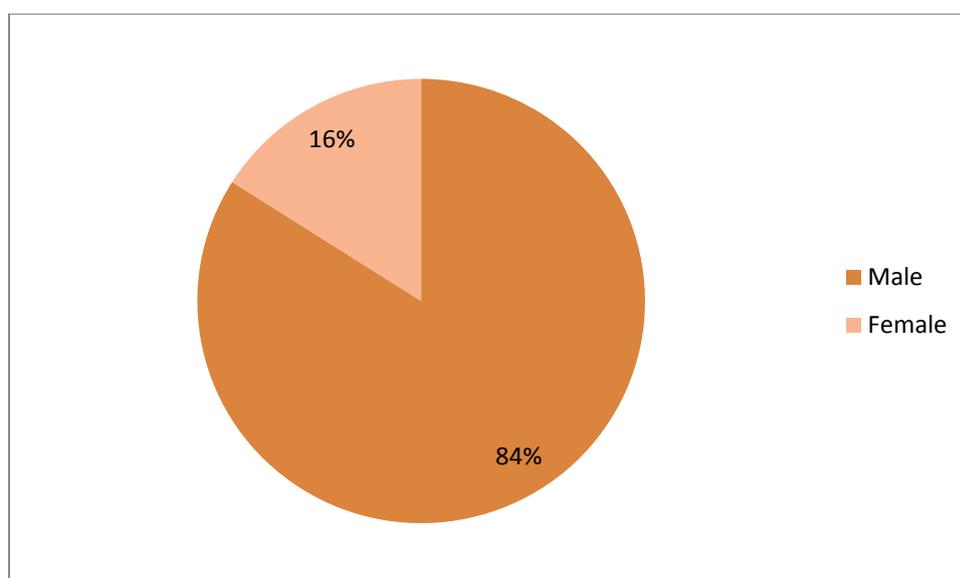


2 Results farmers Questionnaire

2.1 Location of Respondents

LGA	Community	Number of farmers
Bayo	Briyel	6
	<i>Total Bayo</i>	<i>6</i>
Biu	Maina Hari	5
Biu	Nzukuku	2
Biu	Yamarkumi	5
	<i>Total Biu</i>	<i>12</i>
Hawul	Kwaya Bura	5
Hawul	Marama	9
Hawul	Mbulatawiwi	6
	<i>Total Hawul</i>	<i>19</i>
Kwaya Kusar	Gashina	6
Kwaya Kusar	Gusi	2
Kwaya Kusar	Guwal	1
Kwaya Kusar	Mithla	1
Kwaya Kusar	Peta	1
Kwaya Kusar	Wandali	1
	<i>Total Kwaya Kusar</i>	<i>13</i>
	TOTAL	50

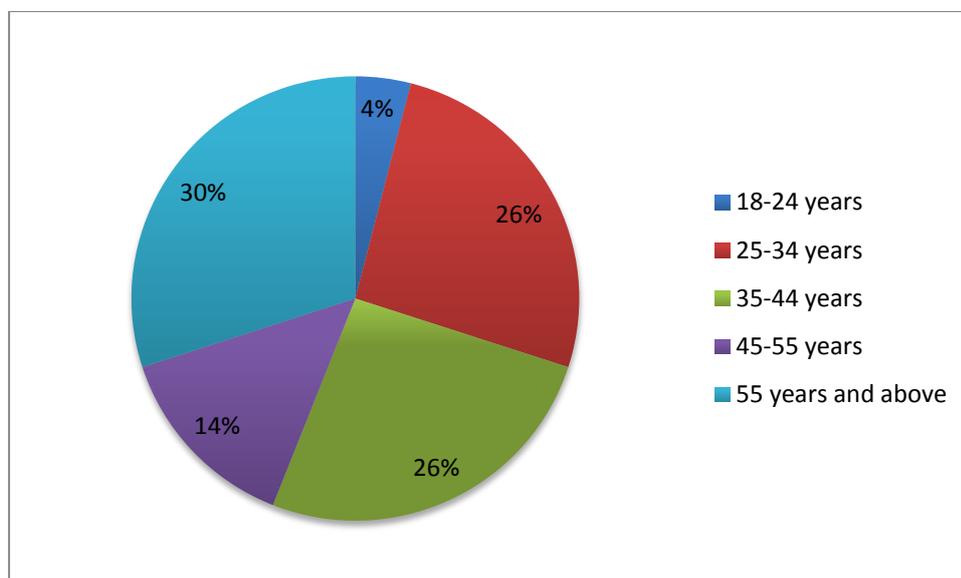
2.2 Gender of Respondents



- 84% of the farmers is male while 16% is female.

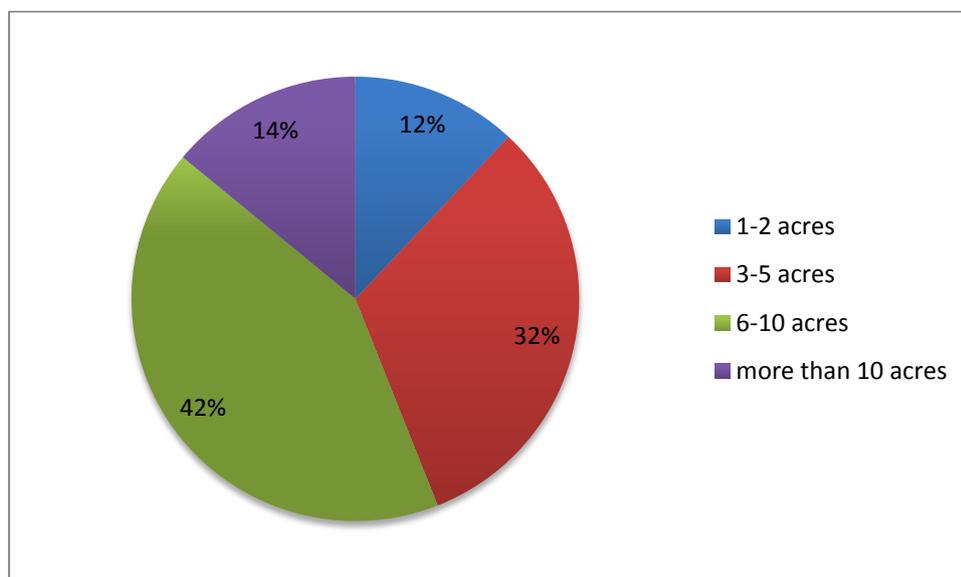


2.3 Age of respondents



- 4% of the respondents is between 18 and 24 years old.
- 26% is between 25 and 34 years, and the same percentage between 35 and 44 years.
- 14% is between 45 and 55 years, and 30% is 55 years and older.

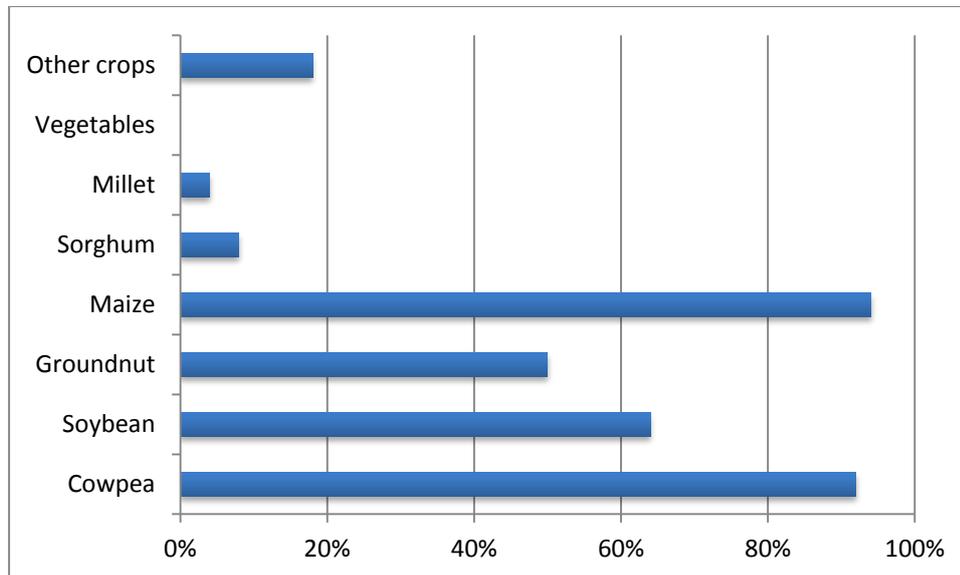
2.4 Farm size



- Most farmers (42%) have a farm of 6 to 10 acres, while 32% has 3-5 acres.
- 12% has less than 3 acres and 14% more than 10 acres.

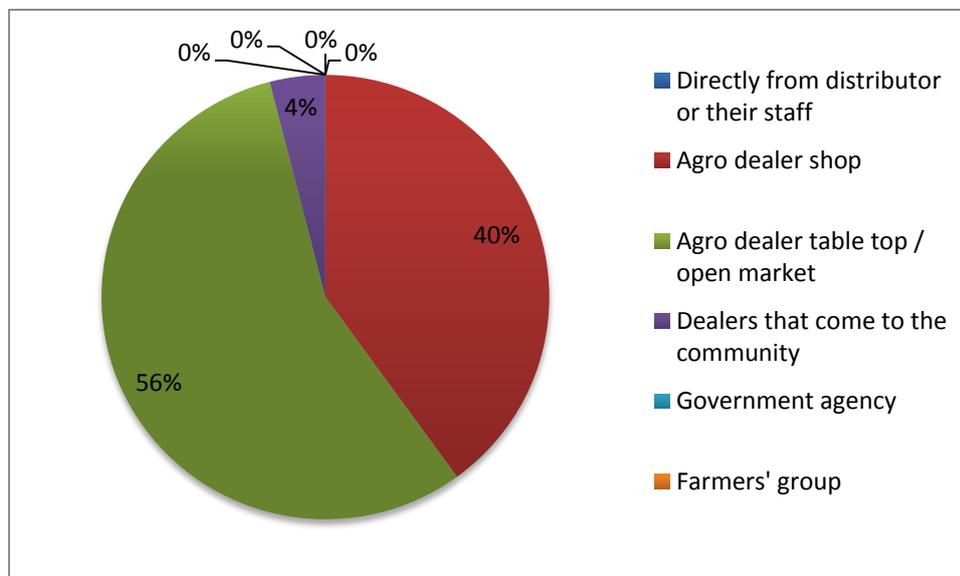


2.5 Crops pesticides applied to



- The most popular crops that are grown and pesticides are applied to are maize, cowpea, soyabean and groundnut.
- All of them apply herbicides (not shown in table). Only 1 person indicated to apply insecticides on cowpea.

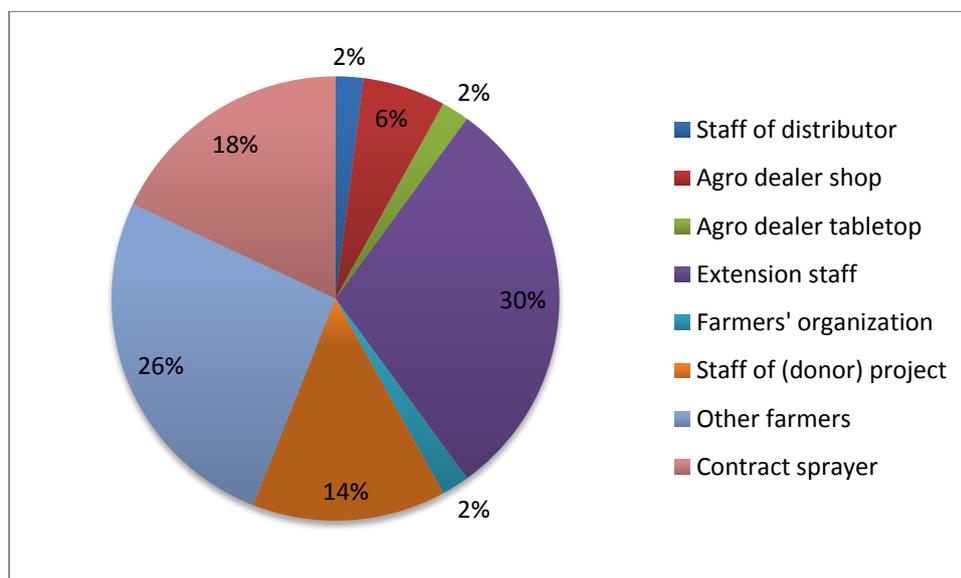
2.6 Source of pesticides



- More than half of the farmers (56%) buy their pesticides on the open market (from table top dealers), while 40% buys it in an agro dealer shop.

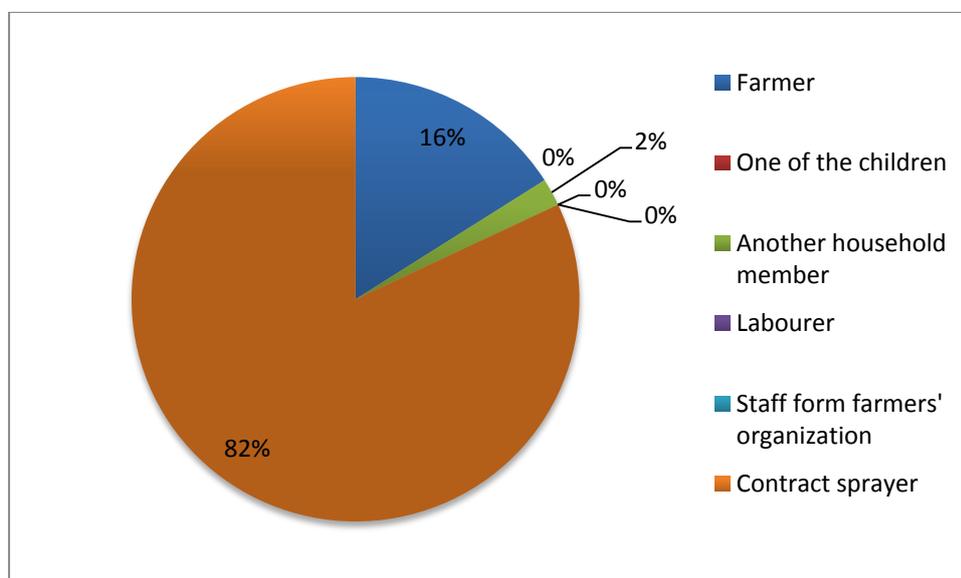


2.7 Advice on what pesticides to buy



- Farmers take from different persons advice on where to buy their pesticides.
- 30% relies on extension staff and 26% on other farmers.
- 18% follows the advice of contract sprayers and 6% from the agro dealer shop.

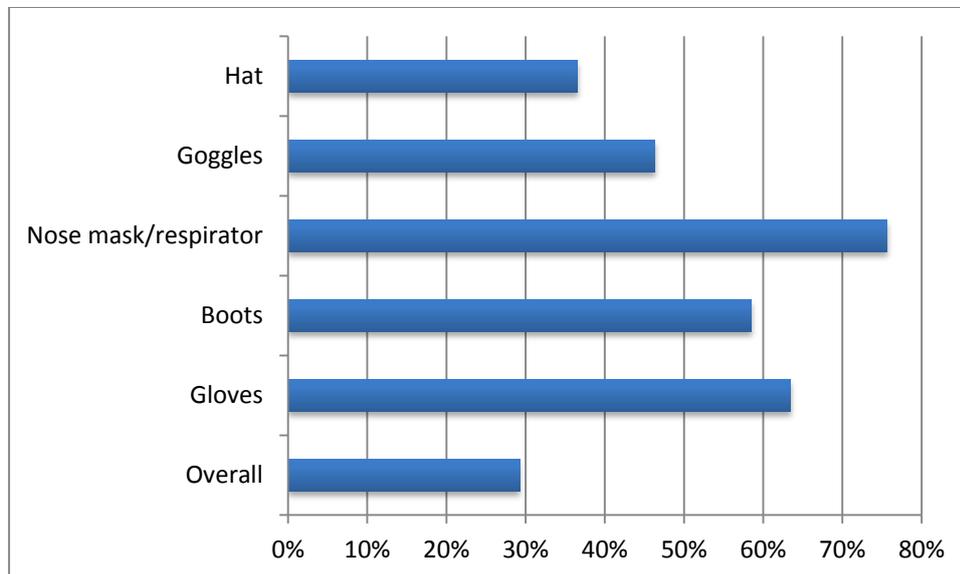
2.8 Application of pesticides



- In 82% of the cases pesticides are applied by a contract sprayer.

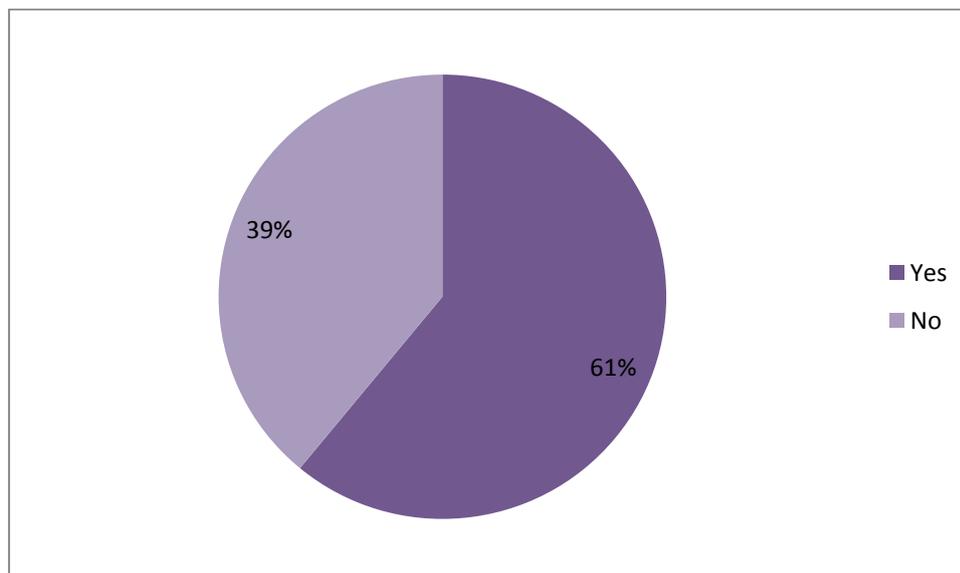


2.9 Wearing of personal protective equipment (PPE) by contract sprayer



- In case a contract sprayer applies the pesticides, the nose mask or respirator is most often worn (75%), followed by boots (59%) and gloves (63%).
- Less than half wears goggles (46%), a hat (37%) or overall (29%).
- None of the contract sprayers wears a full set of PPE.

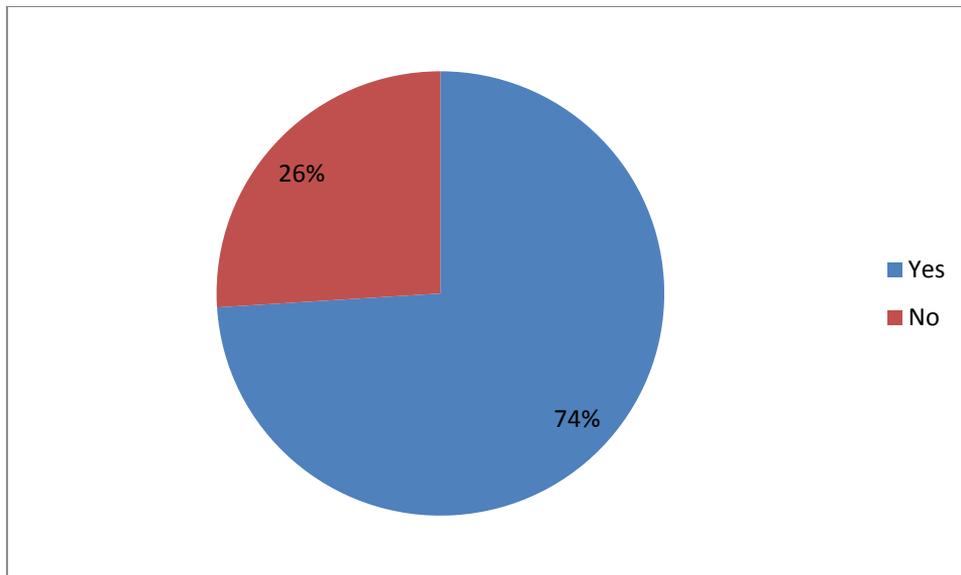
2.10 Placing of warning sign by contract sprayer



- In case a contract sprayer applies the pesticides, 61% places a warning sign after application.

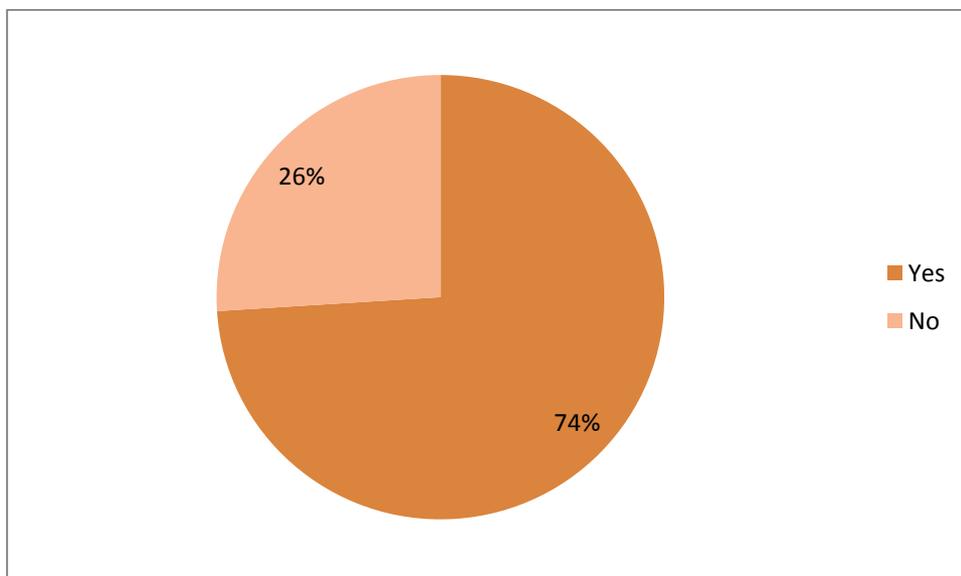


2.11 Knowledgeable about pre-harvest interval



- 74% of the farmers claim to know that the pre-harvest interval is.

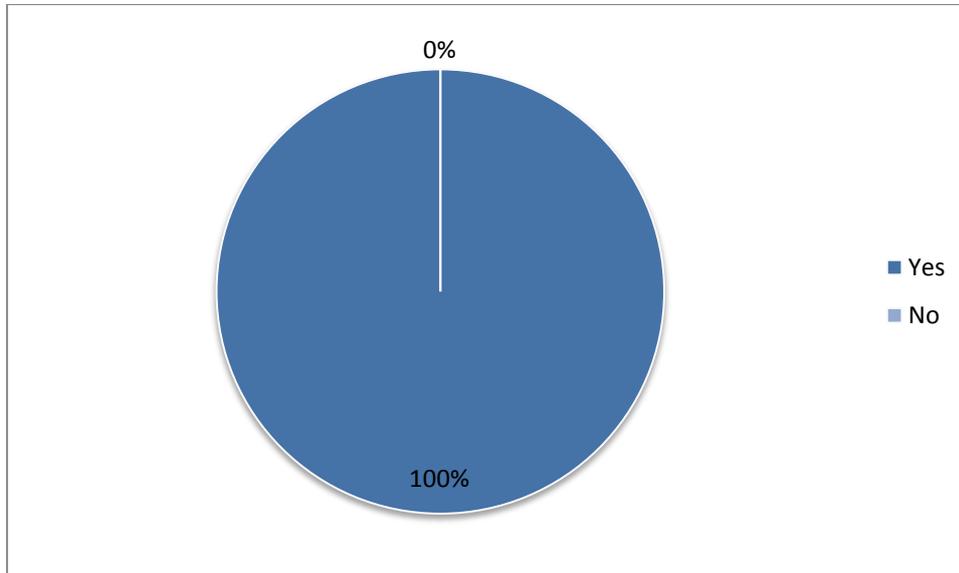
2.12 Knowledgeable about re-entry interval



- 74% of the farmers claim to know that the re-entry interval is.

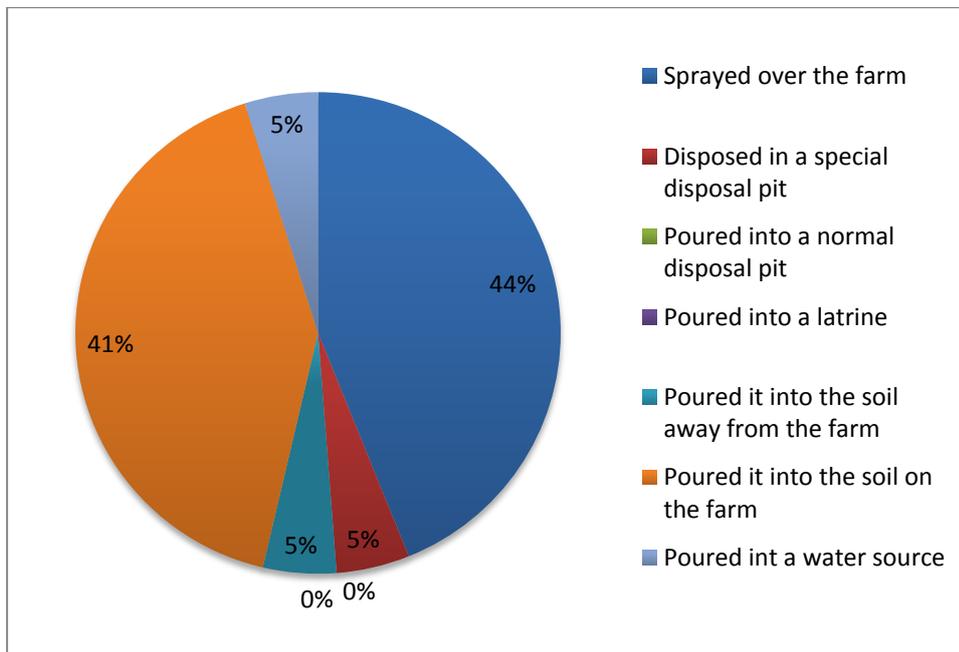


2.13 Triple rinsing of empty container by contract sprayer



- In case a contract sprayer applies the pesticides, all of them triple rinse the empty containers.

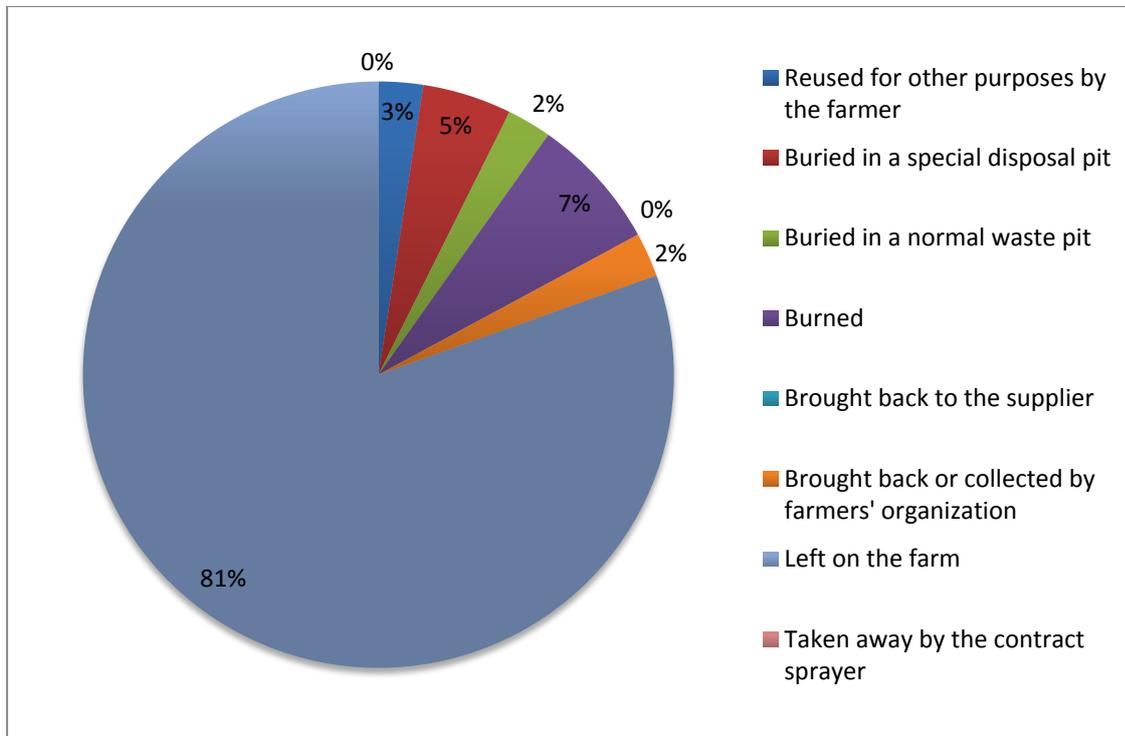
2.14 Disposal of wastewater after triple rinsing by contract sprayer



- In case a contract sprayer applies the pesticides, 44% spray the wastewater of rinsing the empty container over the farm (which is the official recommendation).
- 41% pours the wastewater into the soil on the farm and 5% away from the farm.

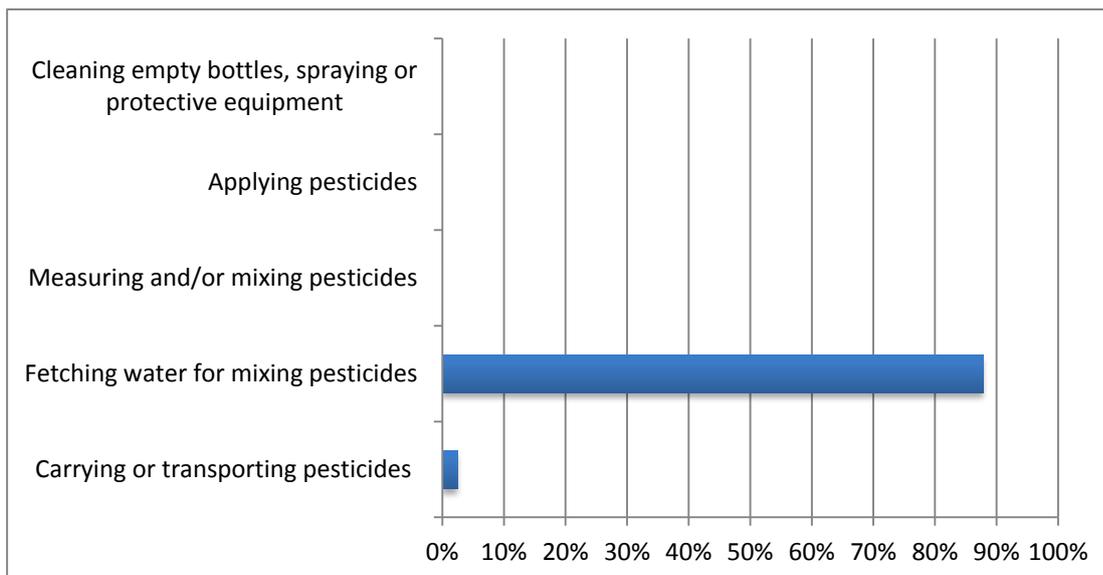


2.15 Disposal of empty container by contract sprayer



- In case a contract sprayer applies the pesticides, 81% of them leaves the empty containers on the farm.

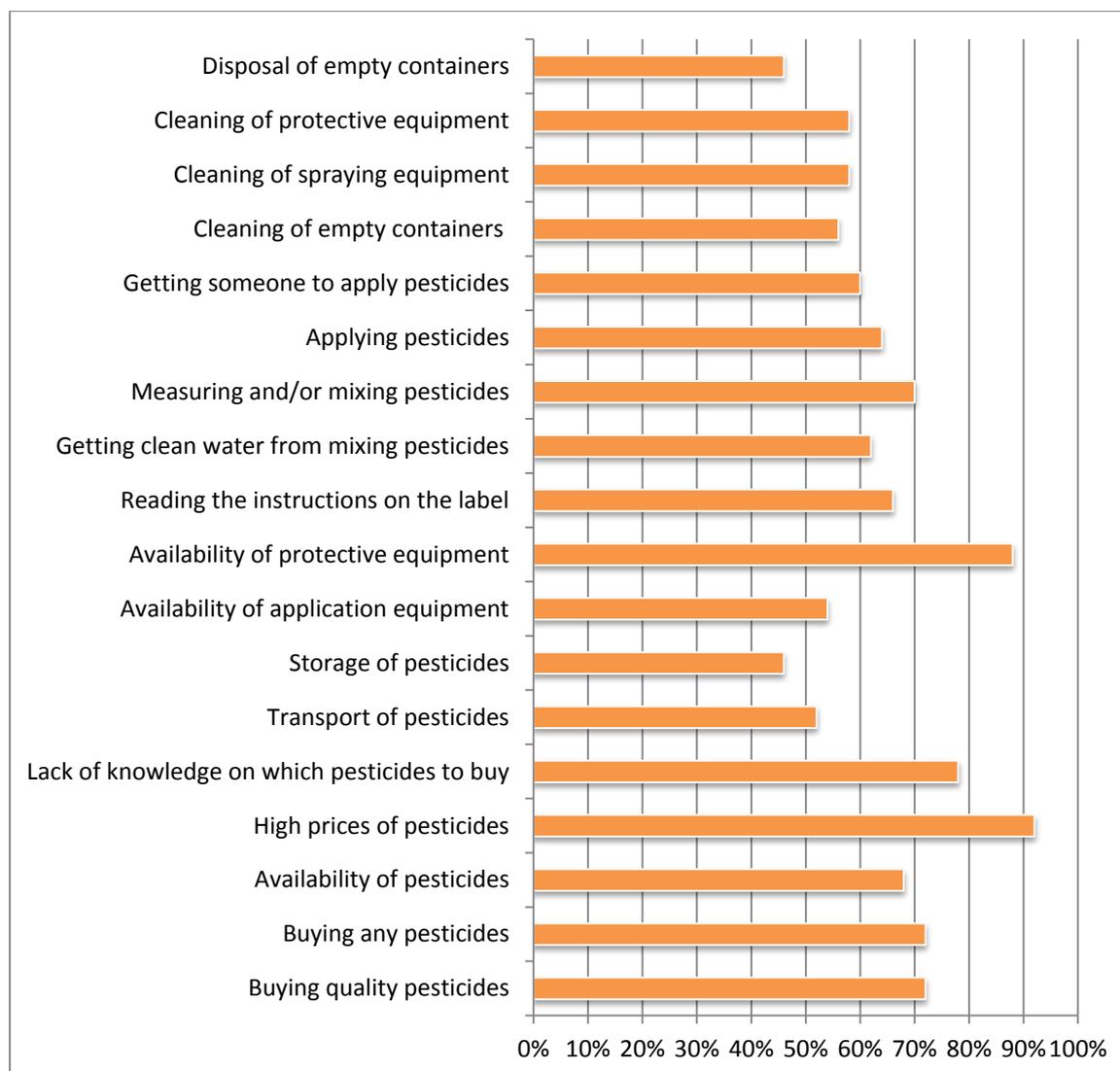
2.16 Involvement of children in pesticides activities when application is done by contract sprayer



- In case a contract sprayer applies the pesticides, in 88% children are used to fetch water.



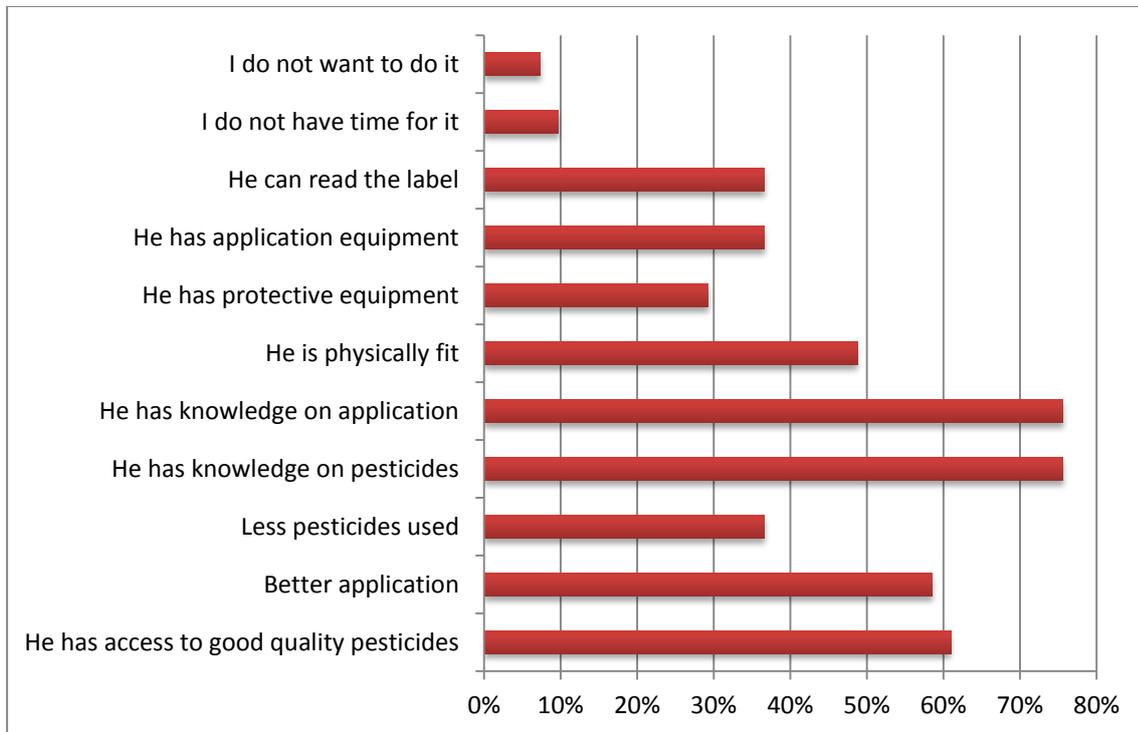
2.17 Challenges with pesticides



- The high price of pesticides is mentioned by 92% as a challenges, while 88% listed the availability of PPE.
- 78% lacks knowledge on what pesticide to buy, while 72% mentioned the buying of pesticides, and the buying of good quality pesticides.
- The storage of pesticides and the disposal of empty containers are the only two points that were listed by less than half of the farmers (46%).

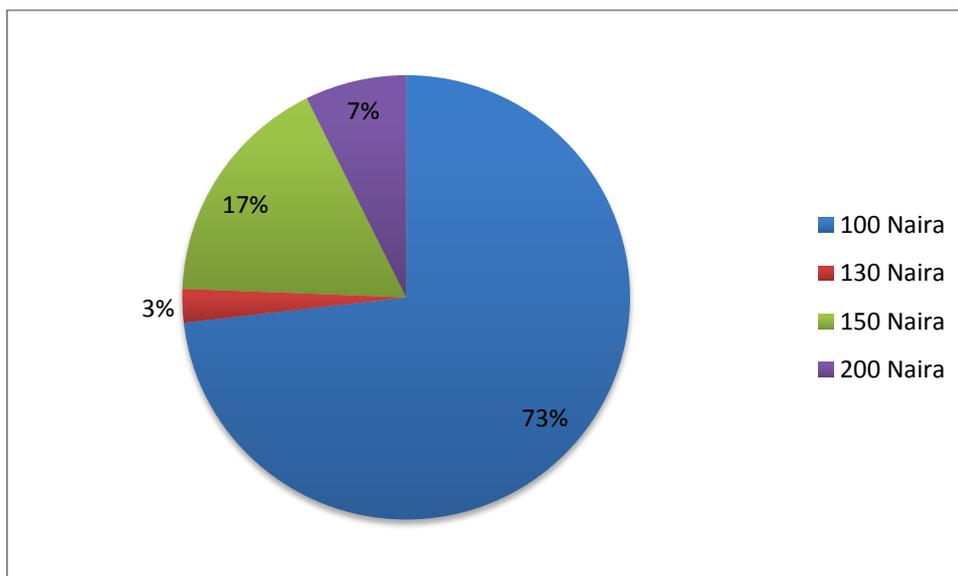


2.18 Reasons for using contract sprayers



- The knowledge of the contract sprayer on application and pesticides is mentioned as the main reasons for farmers to use their services (76%).
- Also the access to good quality pesticides (61%) and better application (59%) scored high.

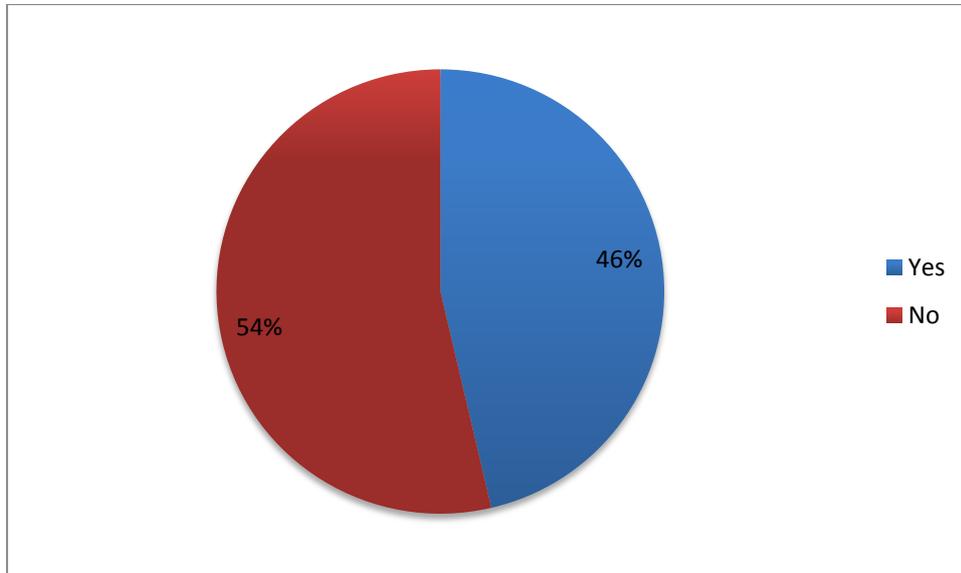
2.19 Payment to contract sprayer per spray tank



- All farmers pay a fee per spray tank.
- 73% pays 100 Naira, while 17% pays 150 Naira.

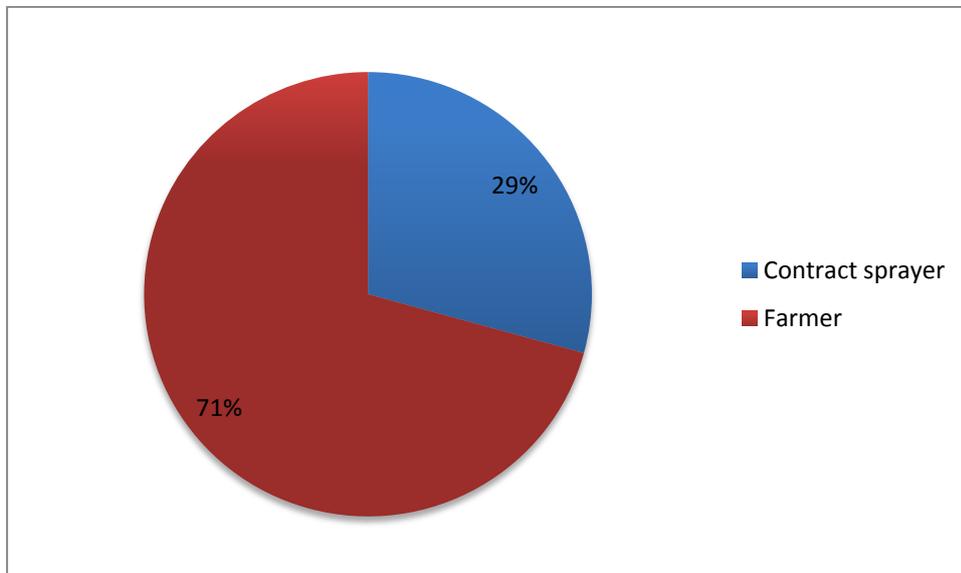


2.20 Payment of in-kind to contract sprayer



- 46% of the farmers pays also in-kind to the contract sprayer.

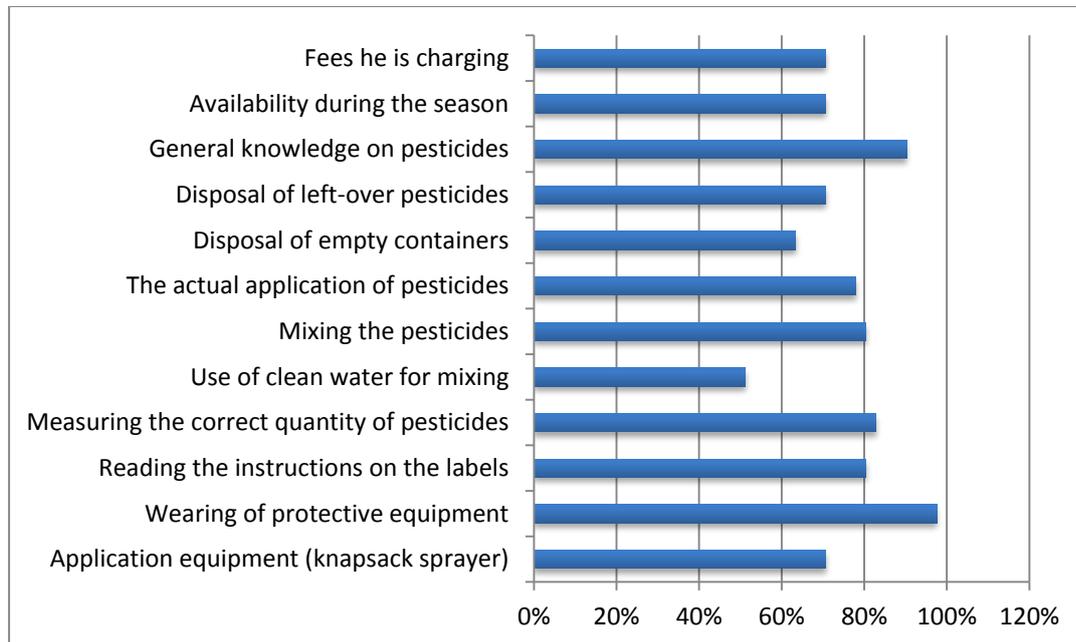
2.21 Payment of costs of transport



- In 71% of the cases, the farmer pays for the transport of the contract sprayer.

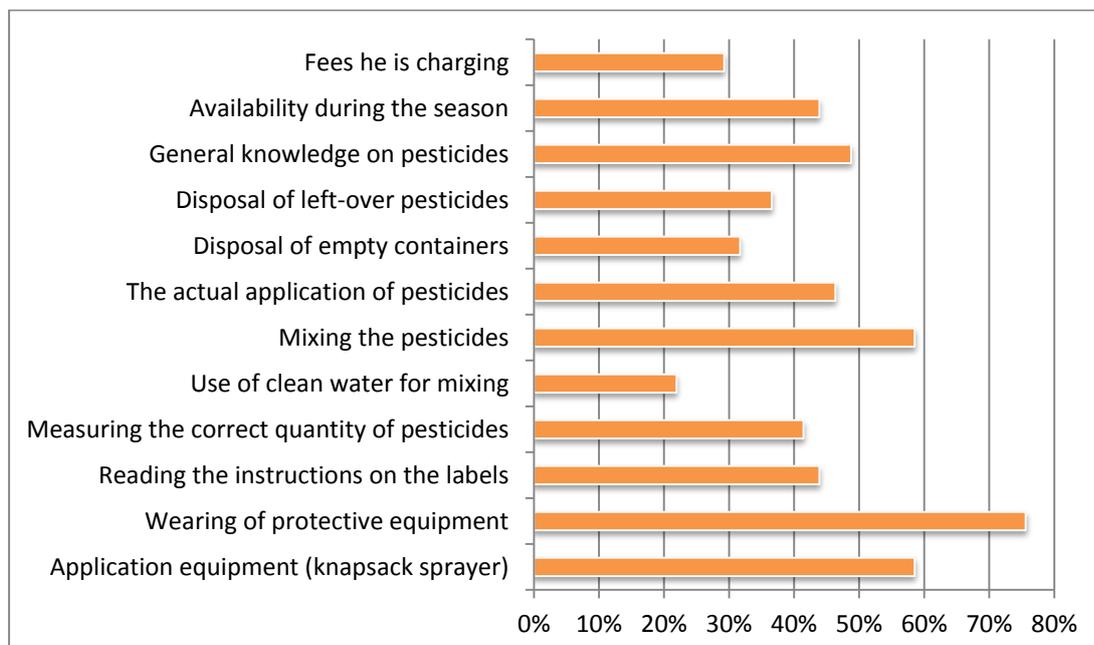


2.22 Activities of contract sprayer that need improvement



- The wearing of PPE was mentioned by almost all farmers (98%) as point for improvement.
- Also the general knowledge on pesticides (90%), reading instructions on the label (80%) and mixing of pesticides (80%) was mentioned by many farmers.

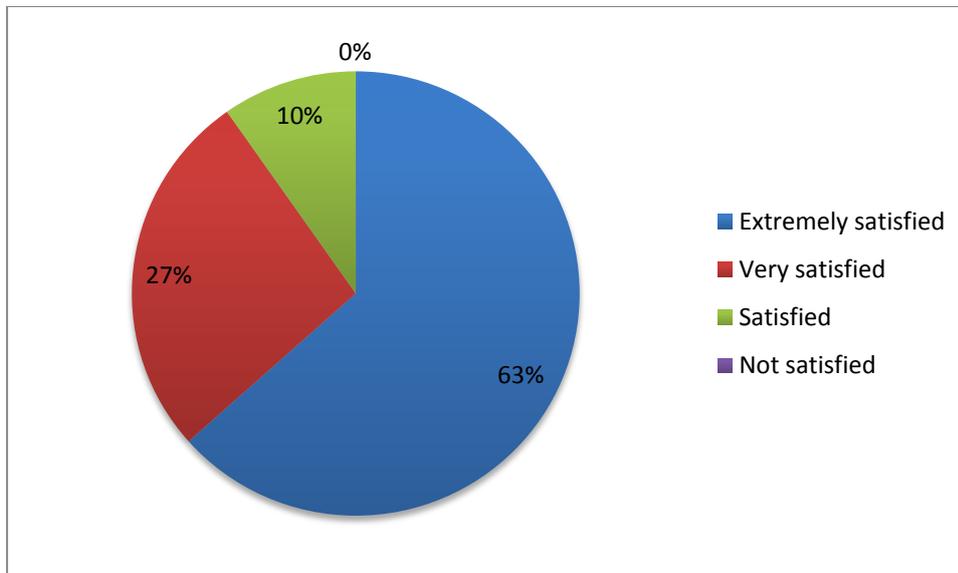
2.23 Activities of contract sprayer that definitely need improvement



- When asked what definitely needs to be improved, also the wearing of PPE scores highest (76%), followed by mixing (59%) and application equipment (59%).

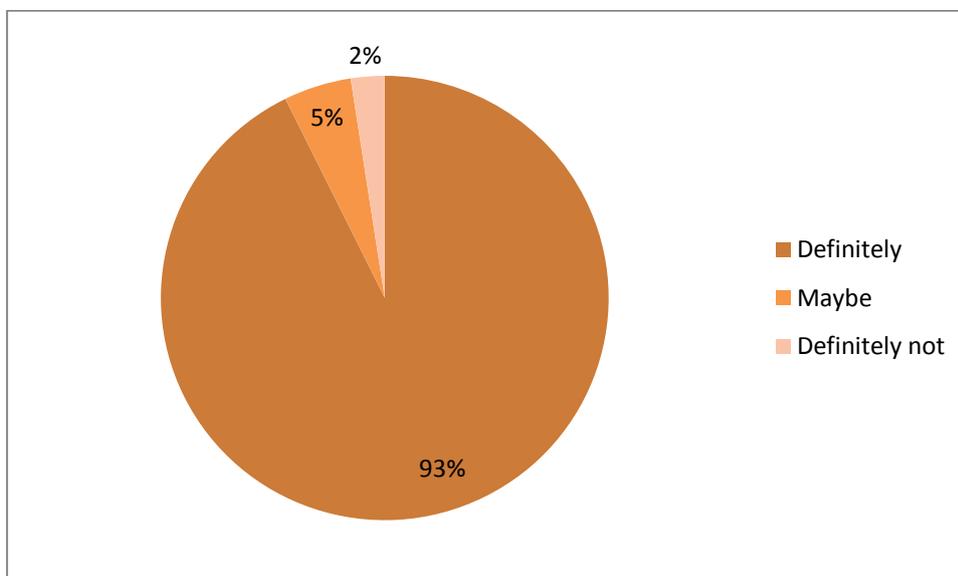


2.24 Level of satisfaction with services of contract sprayer



- 63% of the farmers who make use of contract sprayers is extremely satisfied with their services.
- None of the farmers mentioned that they are not satisfied with the work.

2.25 Making use of services of contract sprayer again



- 93% indicates to use the services of a contract sprayer again.

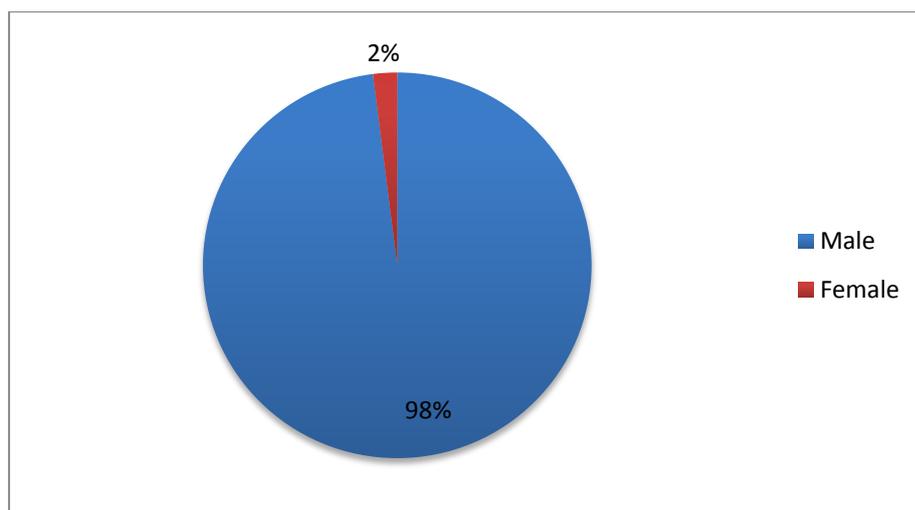


3 Results Contract Sprayers Questionnaire

3.1 Location of Respondents

LGA	Communities	Number of contract sprayers
Bayo	Briyel	6
	<i>Total Bayo</i>	<i>6</i>
Biu	Maina Hari	8
Biu	Nzukuku	3
Biu	Yamarkumi	1
	<i>Total Biu</i>	<i>12</i>
Hawul	Kwaya Bura	5
Hawul	Marama	6
Hawul	Mbulatawiwi	8
	<i>Total Hawul</i>	<i>19</i>
Kwaya Kusar	Gashina	4
Kwaya Kusar	Gusi	1
Kwaya Kusar	Guwal	2
Kwaya Kusar	Mithla	2
Kwaya Kusar	Peta	2
Kwaya Kusar	Wandali	2
	<i>Total Kwaya Kusar</i>	<i>13</i>
	TOTAL	50

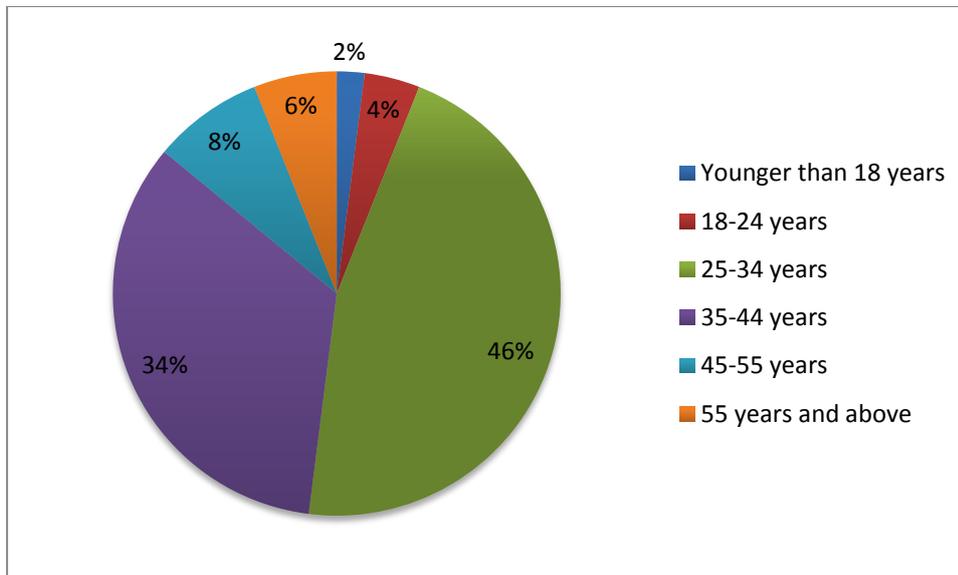
3.2 Gender of Respondents



- The majority of the respondents (98%) are males.
- Only 2% are females.

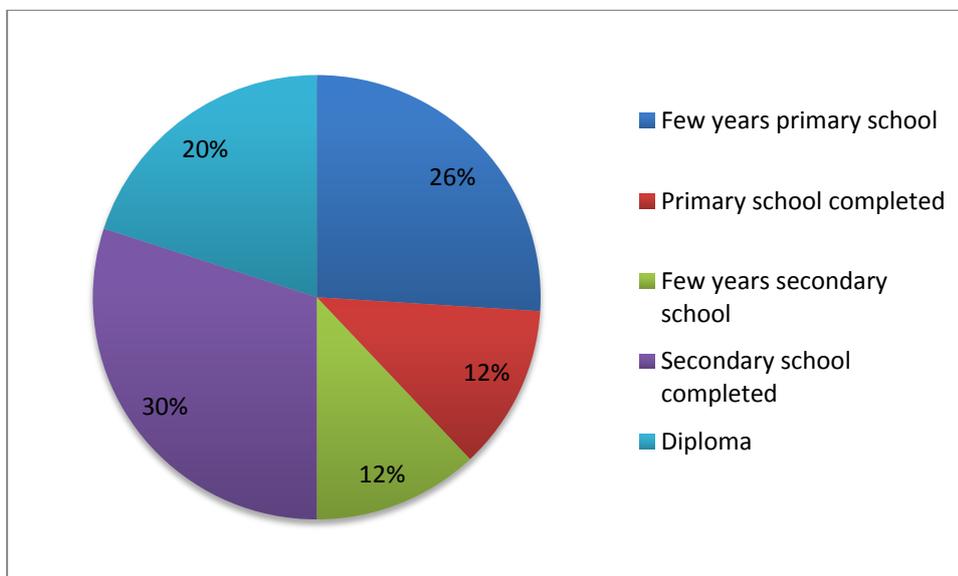


3.3 Age of Respondents



- The majority of the interviewed contract sprayers is between 25-34 years (46%) or 35-44 years (34%).
- 4% is between 18-24 years, 8% is between 45-54 years, and 4% is 55 years and older.
- 2% is younger than 18 years.

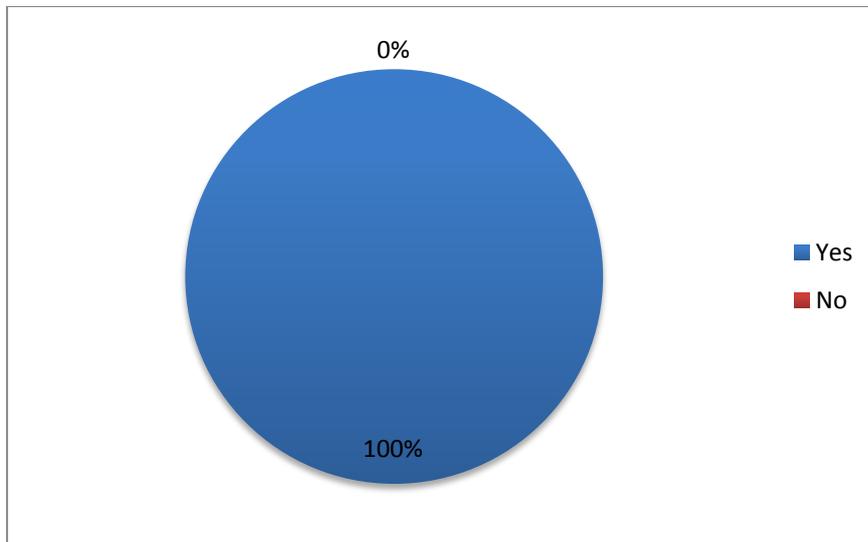
3.4 Highest educational level



- 26% of the contract sprayers have a few years of primary school and 12% completed primary school.
- 12% has a few years of secondary school and 30% completed secondary school.
- 20% has a diploma.
- Of the 10 respondents that have a diploma, in 3 cases it is in agriculture or related study (not depicted in the graph).

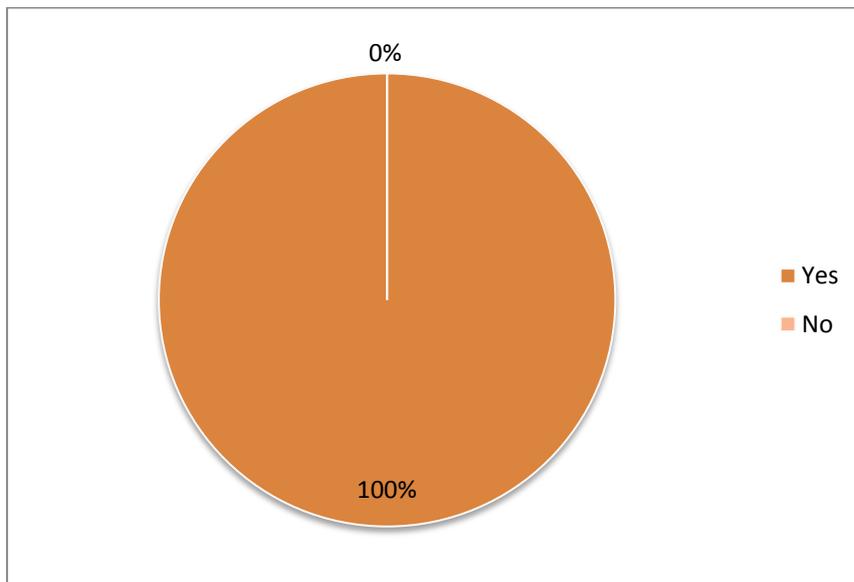


3.5 Growing up on a farm



- All of the respondents grew up on a farm.

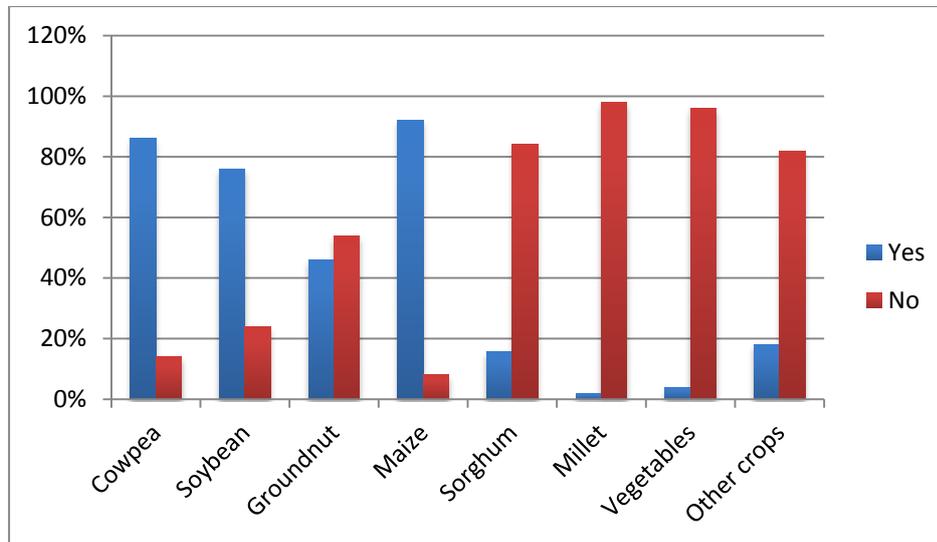
3.6 Farming at the moment



- All of the respondents farm at the moment.

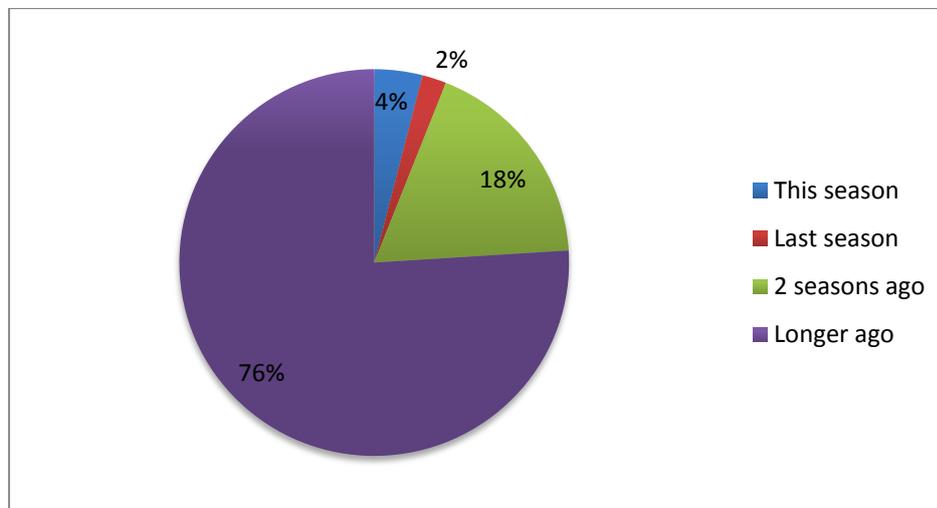


3.7 Crops farmed at the moment



- Most farm maize (92%), cowpea (86%), soyabean (76%) and/or groundnut (46%).
- Only 16% farms sorghum, 4% vegetables, 2% millet, and 18% other crops.

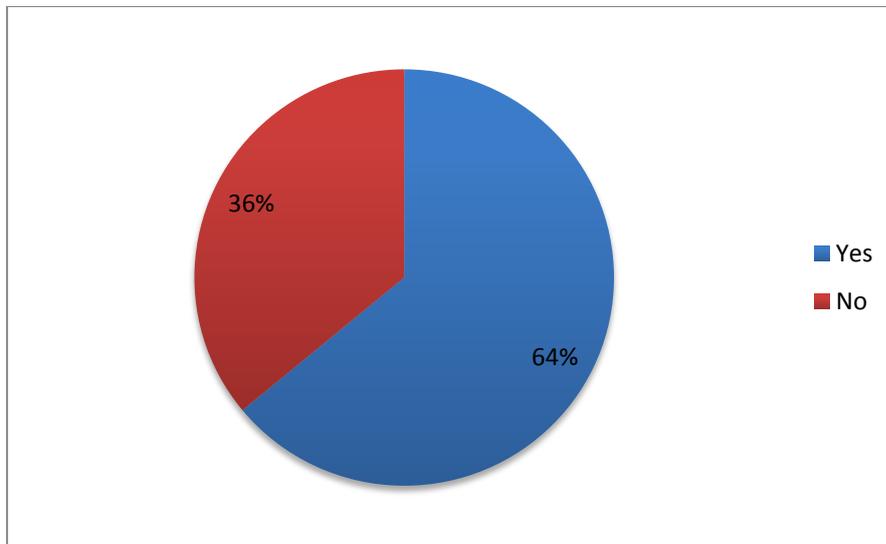
3.8 Starting period of working as contract sprayer



- The majority (76%) started longer than two seasons ago as contract sprayer.
- 18% started 2 seasons ago, while 2% started last season and 4% this season.

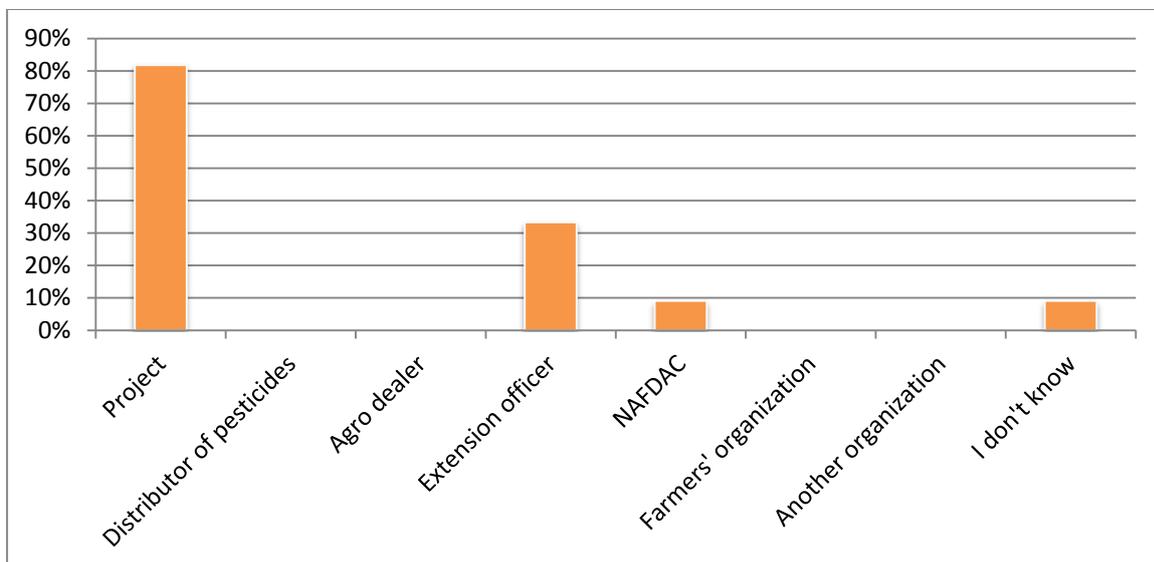


3.9 Followed a specific training on application of pesticides



- The majority (64%) indicated to have followed a special training on the application of pesticides, while 36% did not.

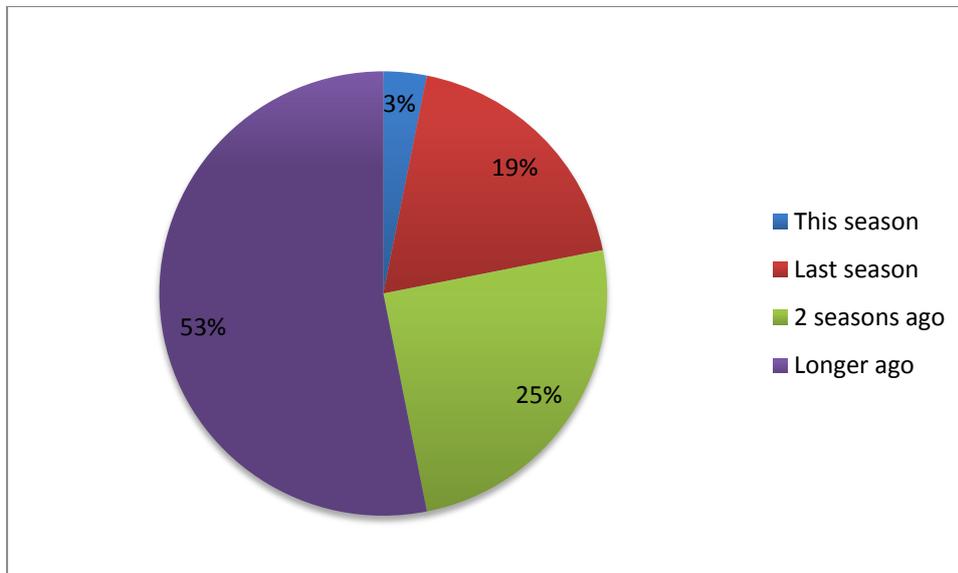
3.10 Organizing agency



- Of the 32 contract sprayers that did follow a training on the application of pesticides, in 82% the training was organized by a project, 33% were done by an extension officer, and 9% by NAFDAC.

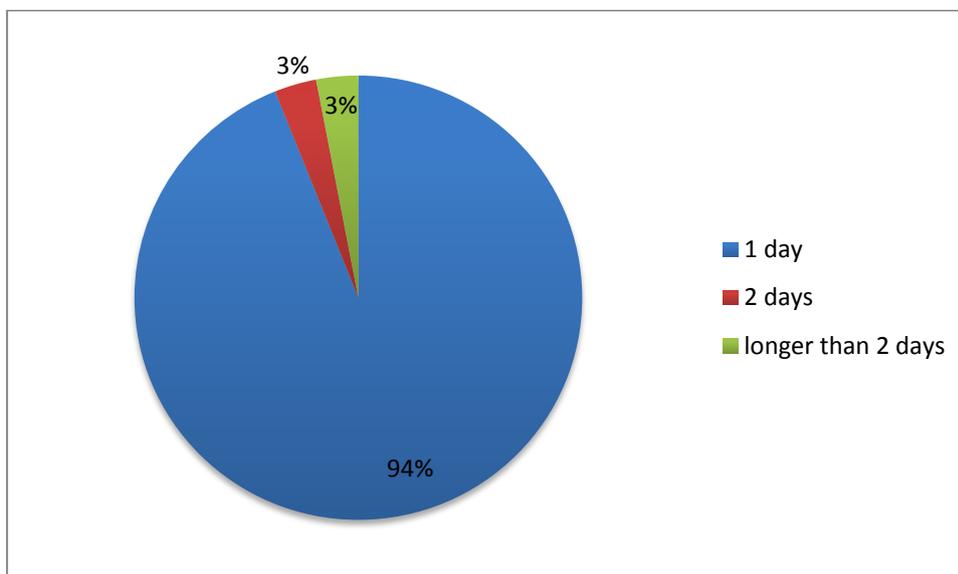


3.11 Time the training was followed



- Of the contract sprayers that did follow training on the application of pesticides, 53% followed it longer than 2 seasons ago.
- 25% followed it 2 seasons ago, 19% last season and 3% this season.

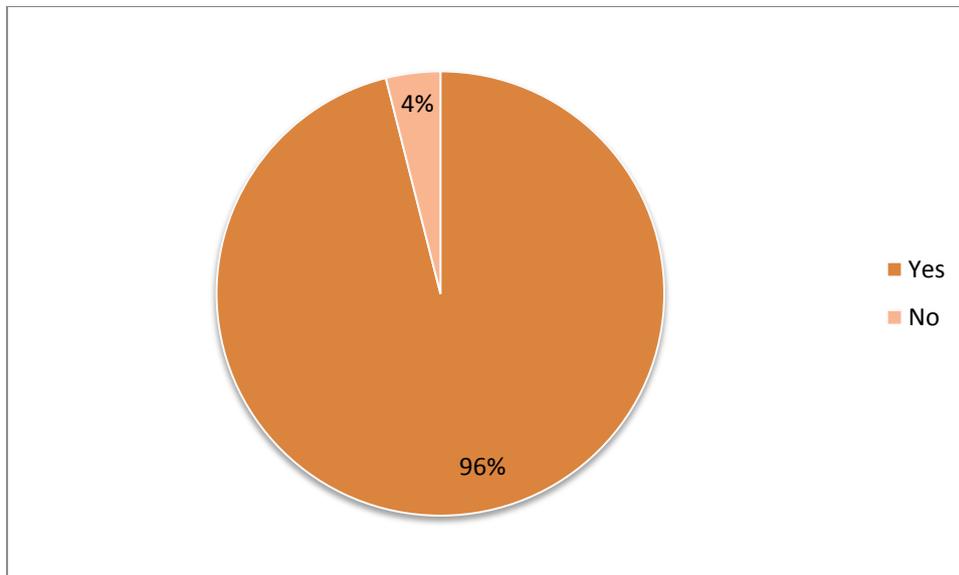
3.12 Length of training followed



- Of the contract sprayers that did follow training on the application of pesticides, in 94% of the cases it was a training program of 1 day.

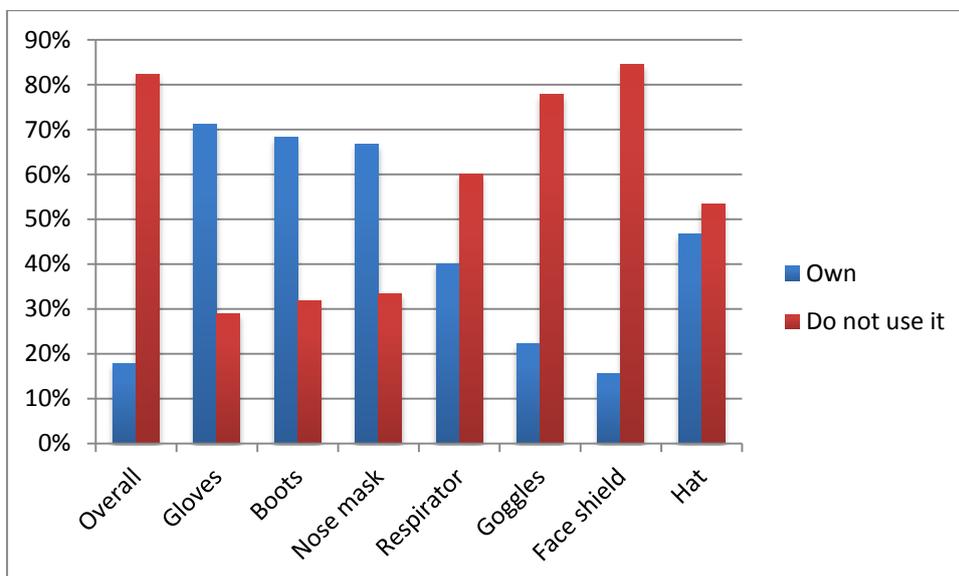


3.13 Owns a knapsack sprayer



- The majority (96%) owns a knapsack sprayer.

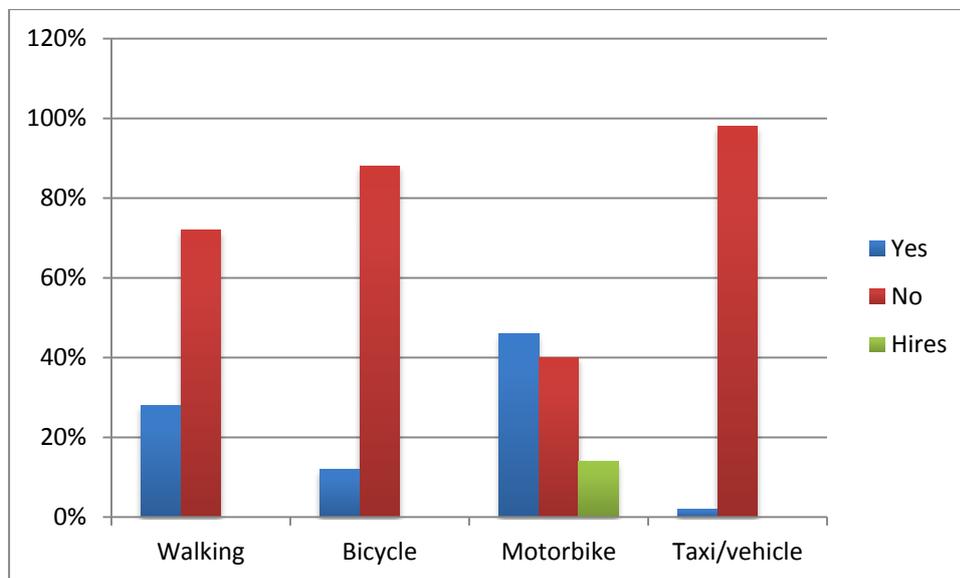
3.14 Owning or using PPE



- 10% of all contract sprayers do not use any Personal Protective Equipment, while only 4% owns a full set of PPE (not shown in the graph).
- Of those that use PPE, the majority owns gloves (71%), boots (68%) and/or a nose mask (67%).
- Less than half owns a hat (46%), respirator (40%), goggles (22%), overall (18%) and/or face shield (16%).

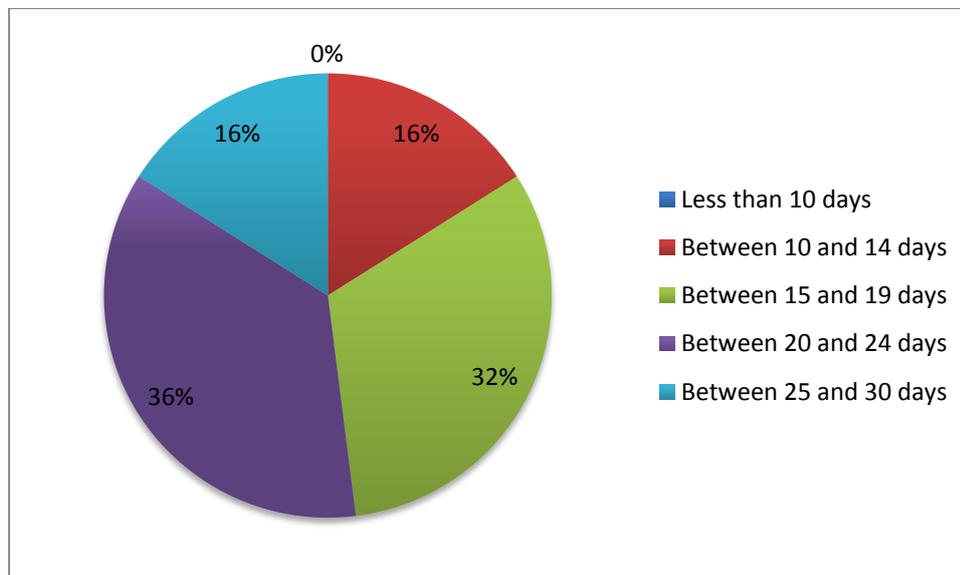


3.15 Mode of transport used



- Most respondents (54%) own or rent a motorbike, while 28% is walking and 12% uses a bicycle.

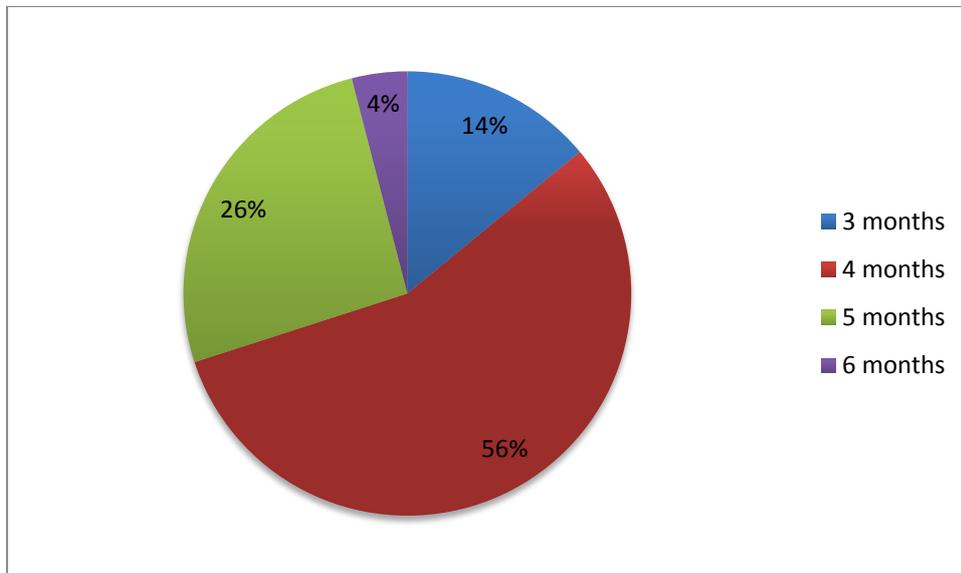
3.16 Number of days per month working as contract sprayer



- More than half works 20 days or more per month as contract sprayer: 36% between 20 and 24 days, and 16% between 25 and 30 days.
- 32% works between 15-19 days per month and 16% between 10-14 days.

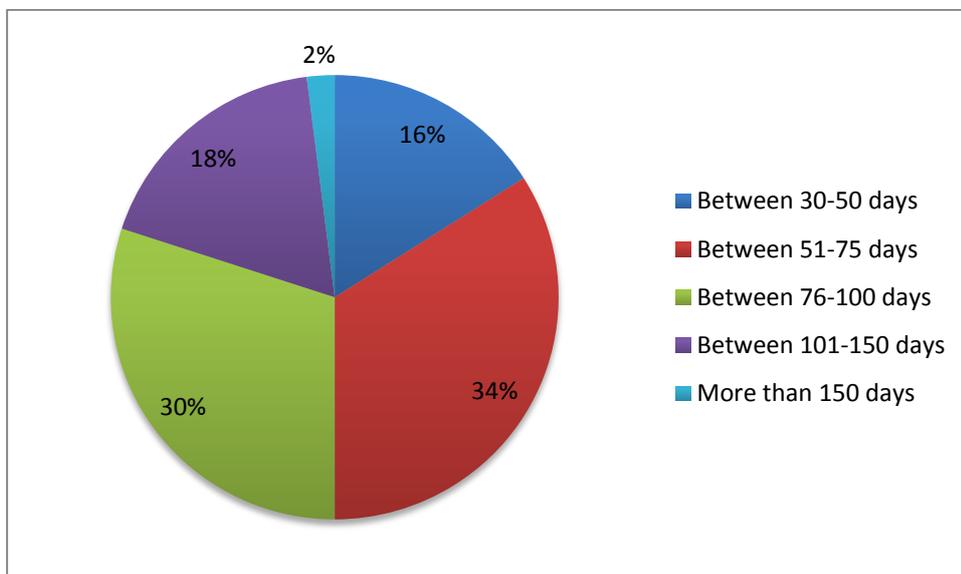


3.17 Number of months per season working as contract sprayer



- 56% works 4 months per season, 26% works 5 months, 14% for 3 months, and 4% 6 months.

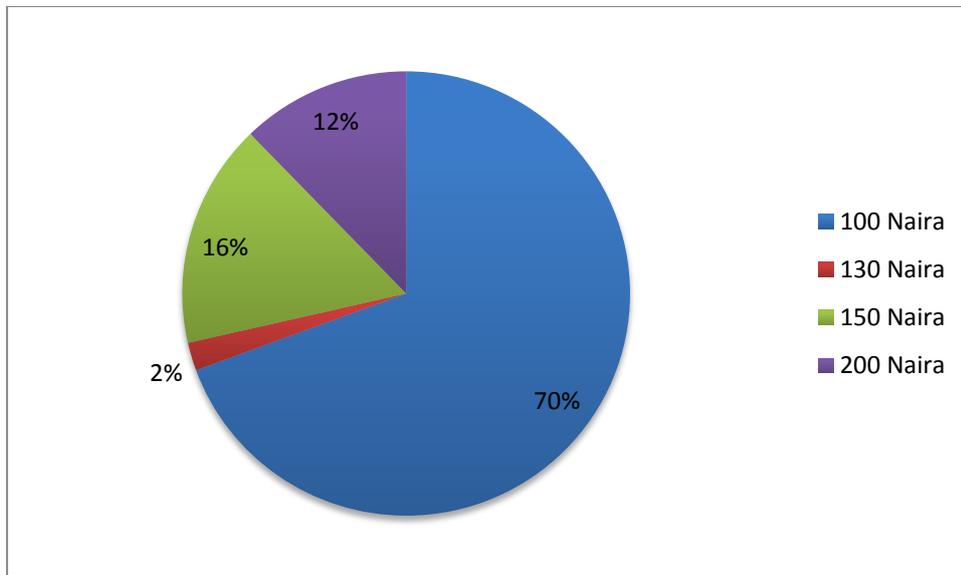
3.18 Total number of days worked per season



- The majority works between 51 and 100 days per season as contract sprayer: 34% works between 51 and 75 days, and 30% between 76 and 100 days.
- 20% works more than 100 days and 16% less than 51 days.

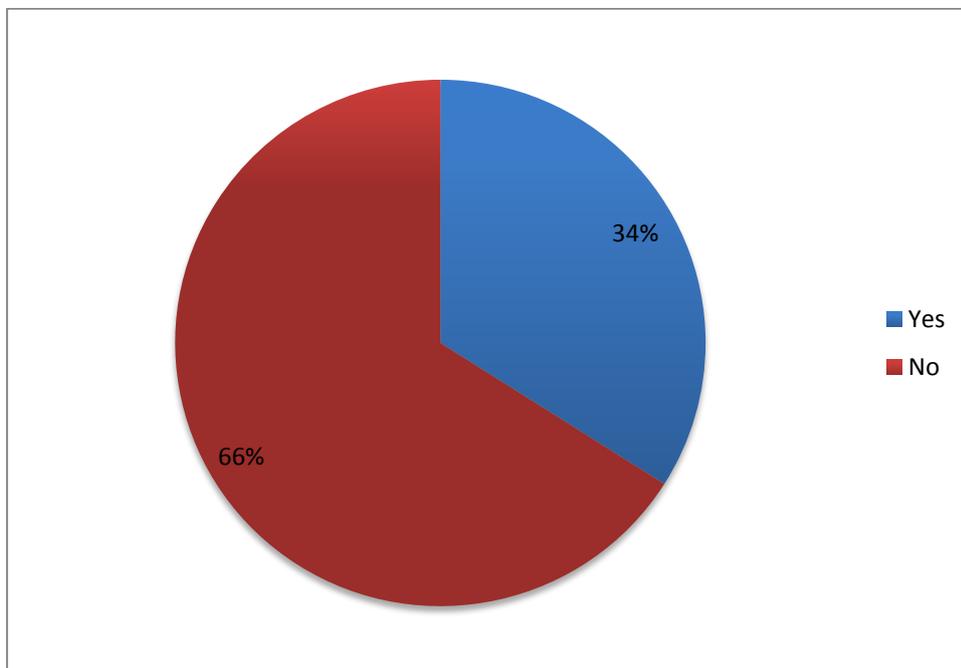


3.19 Payment per spray tank



- All contract sprayer charge per spray tank. The majority asks 100 Naira per spray tank.
- 2% asks 130 Naira, 16% 150 Naira and 12% 200 Naira.

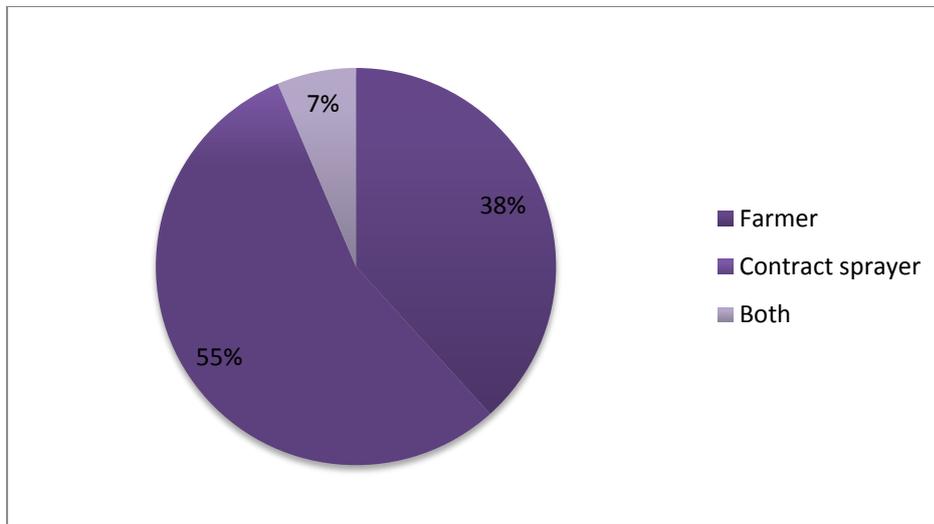
3.20 Payment in kind



- 34% receives, in addition to their fee per spray tank, also payment in-kind, including some who ask 200 Naira per spray tank.

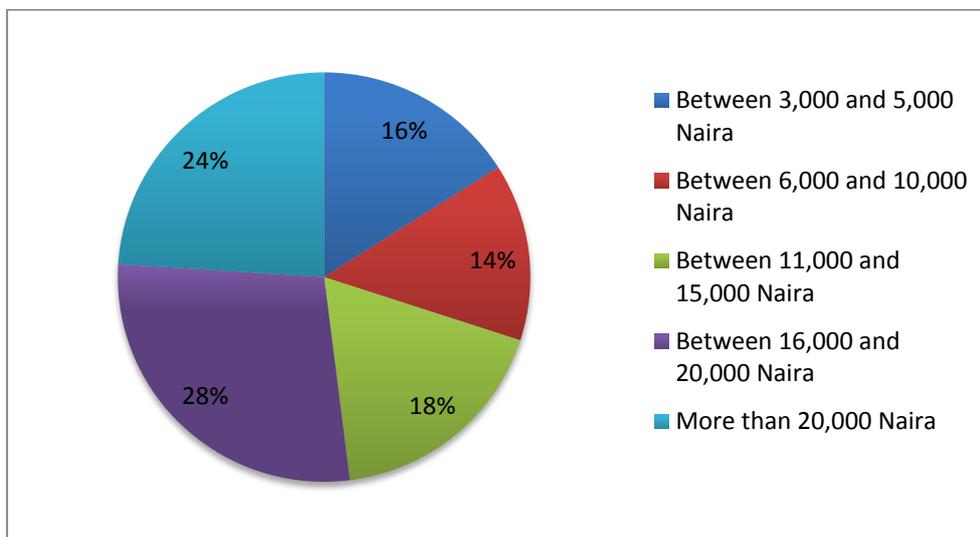


3.21 Payment of costs of transport



- In case costs are involved for transport, in 55% of the cases the contract sprayer pays for his own costs, while in 38% the farmer pays.

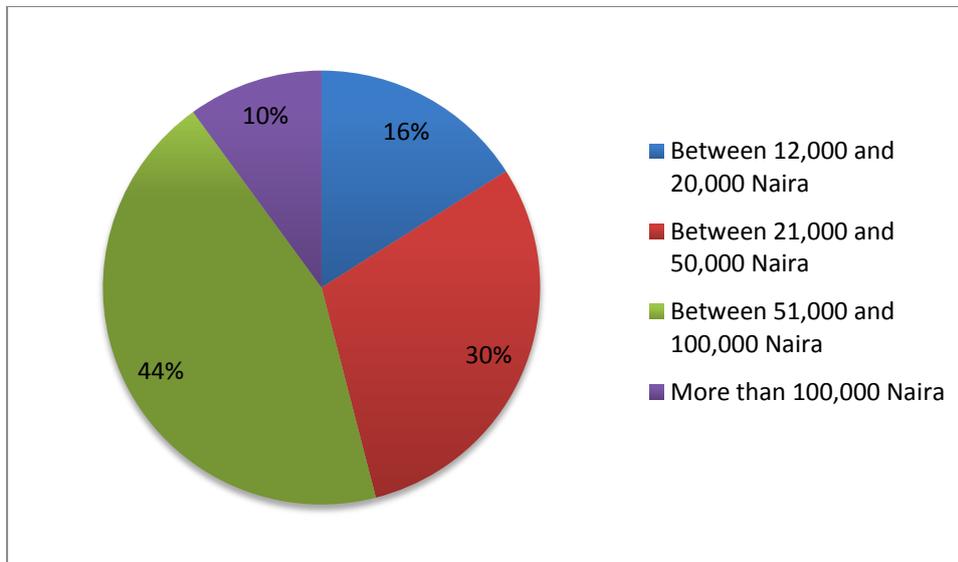
3.22 Average earnings per month from application services



- 30% claims to earn less than 11,000 Naira on average per month, while almost half (46%) makes between 11,000 and 20,000 Naira.
- 24% earns more than 20,000 Naira.

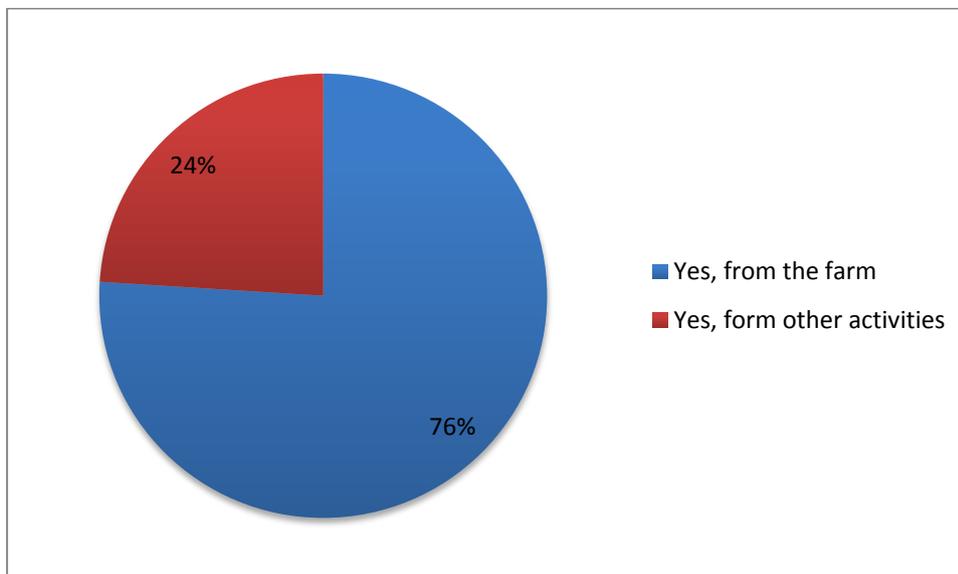


3.23 Average earnings per season from application services



- Almost half of the contract sprayers earns between 51,000 and 100,000 Naira per season from their application activities.
- 46% makes less than 51,000 Naira per season, while 10% earns more than 100,000 Naira.

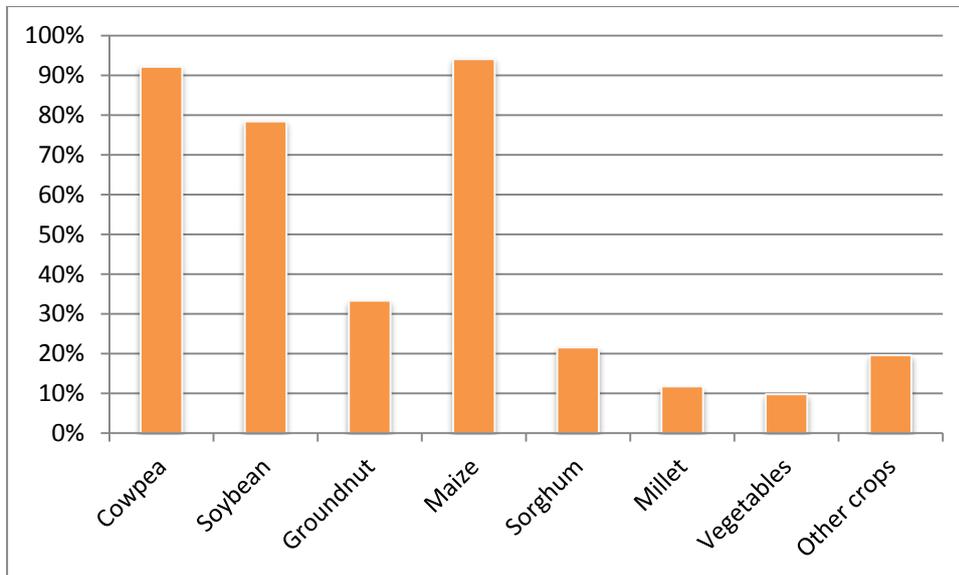
3.24 Payment of costs of transport



- All respondents earn in addition to their income from application activities, an income.
- 76% earns additional income from their farming activities, while 24% makes extra money from other activities or work.

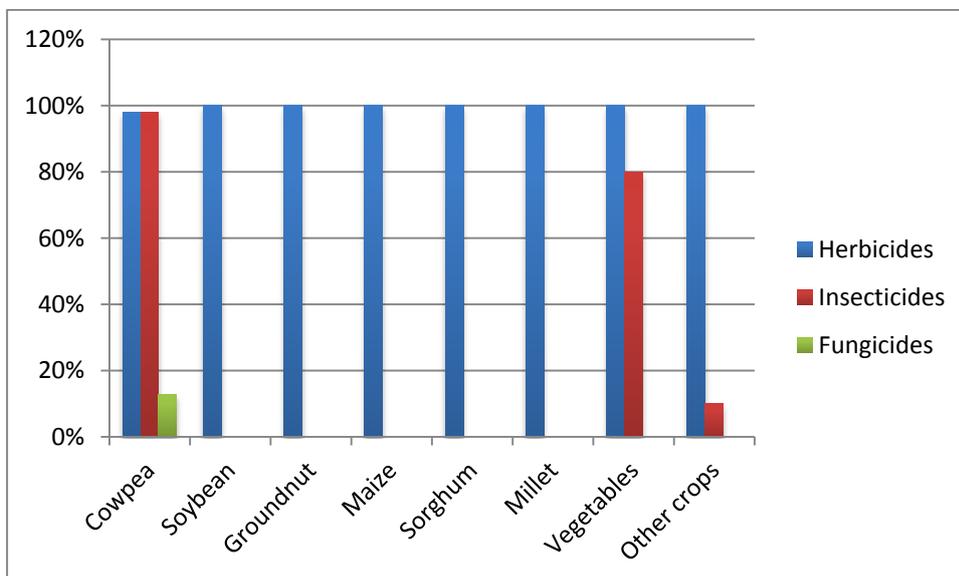


3.25 Crops applying pesticides to



- Most contract sprayers apply pesticides to maize (94%), cowpea (92%), and soyabean (78%).

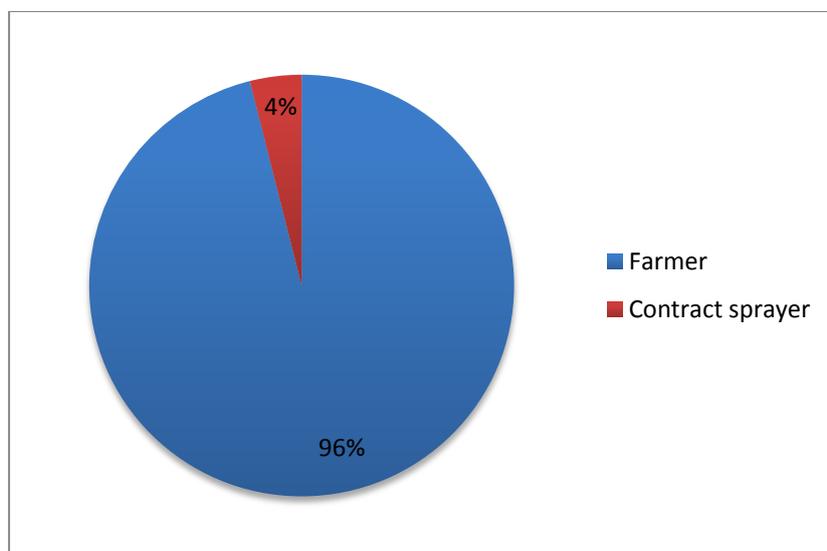
3.26 Type of pesticides used on crops



- In case contract sprayers apply pesticides to a certain crop, each of them applies herbicides.
- Insecticide is also used for cowpea and vegetables.

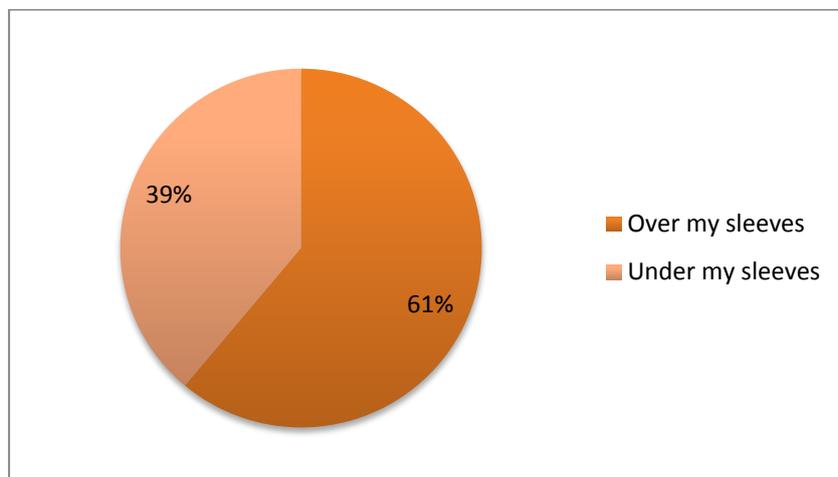


3.27 Person buying the pesticides



- In almost all case (96%) the farmer buys the pesticide and not the contract sprayer.

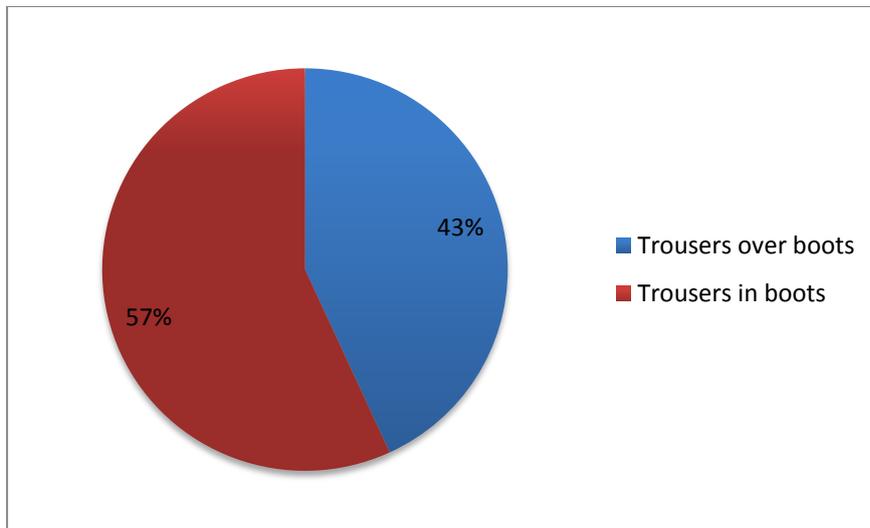
3.28 Way of wearing gloves



- 61% of the contract sprayers indicated to wear the gloves over the sleeves, while 39% wears them under the sleeves.
- The official recommendation on wearing gloves is during application of normal crops (so not tree crops) to wear the gloves over the sleeves.

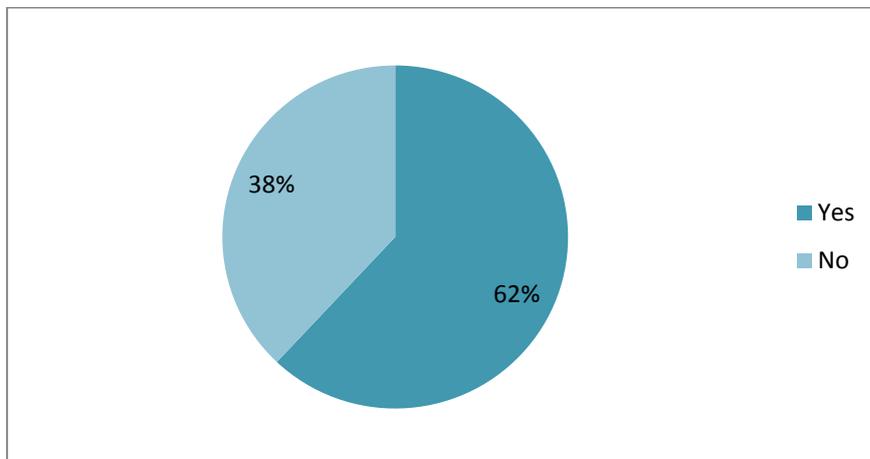


3.29 Way of wearing boots



- 57% of the applicators wear trousers in their boots, while 43% wears trousers over their boots.
- The official recommendation on wearing boots during application is to wear the trousers over the boots.

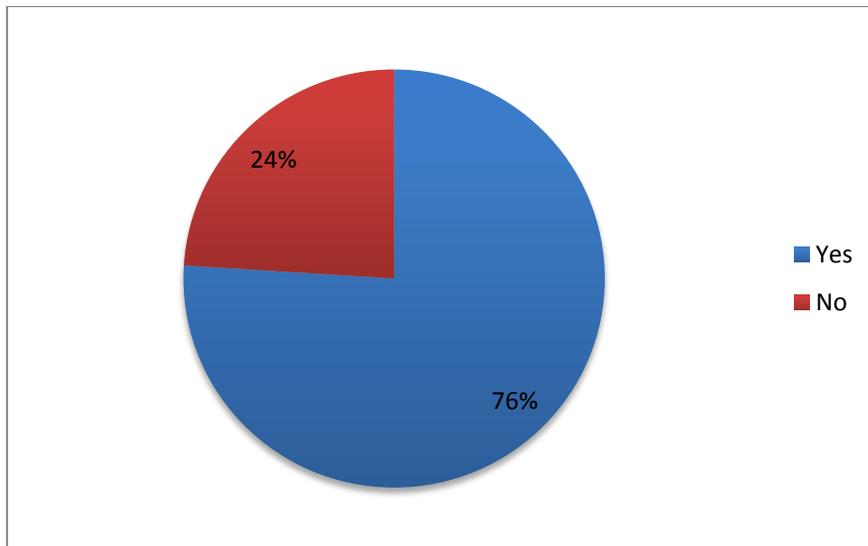
3.30 Reading the label



- 62% of the contract sprayers claim to read the label before application.

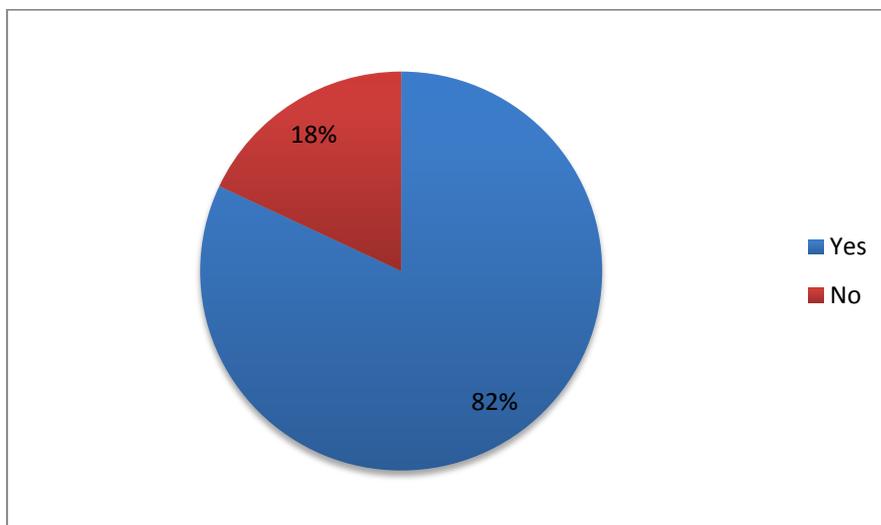


3.31 Placing a warning sign after application



- 3 out of 4 contract sprayers say to place a warning sign at the entrance of the farm after application.

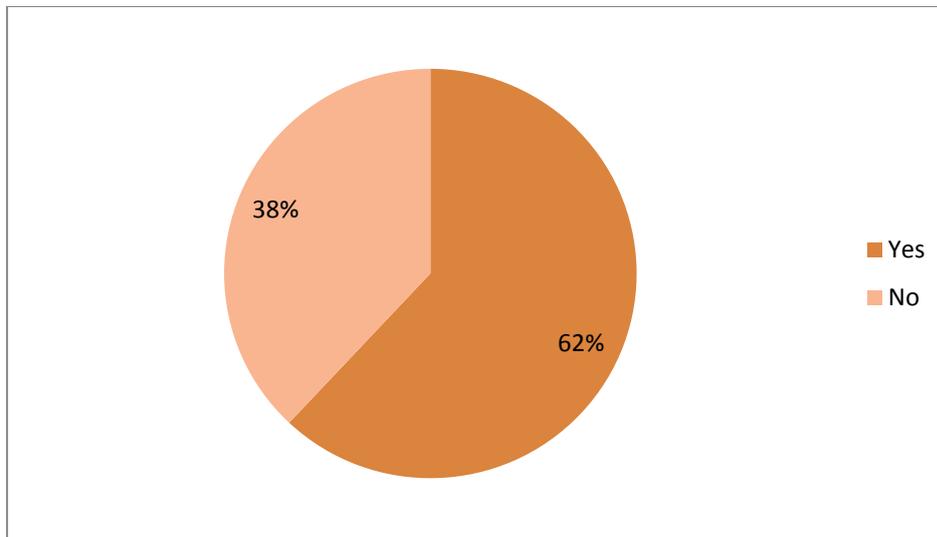
3.32 Knowledgeable about the pre-harvest interval



- 82% of the contract sprayers claim to know what the pre-harvest interval is.

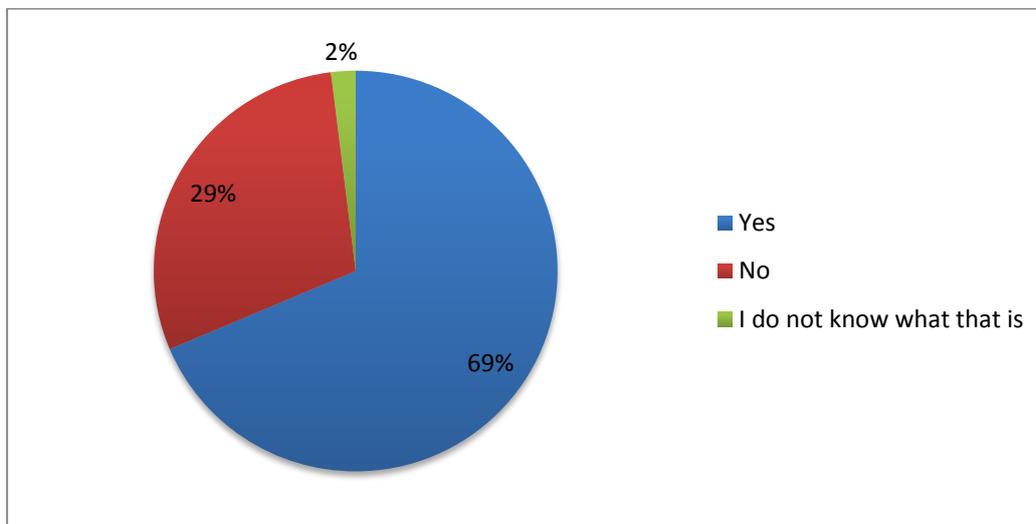


3.33 Knowledgeable about the re-entry interval



- 62% of the contract sprayers claim to know what the pre-harvest interval is.

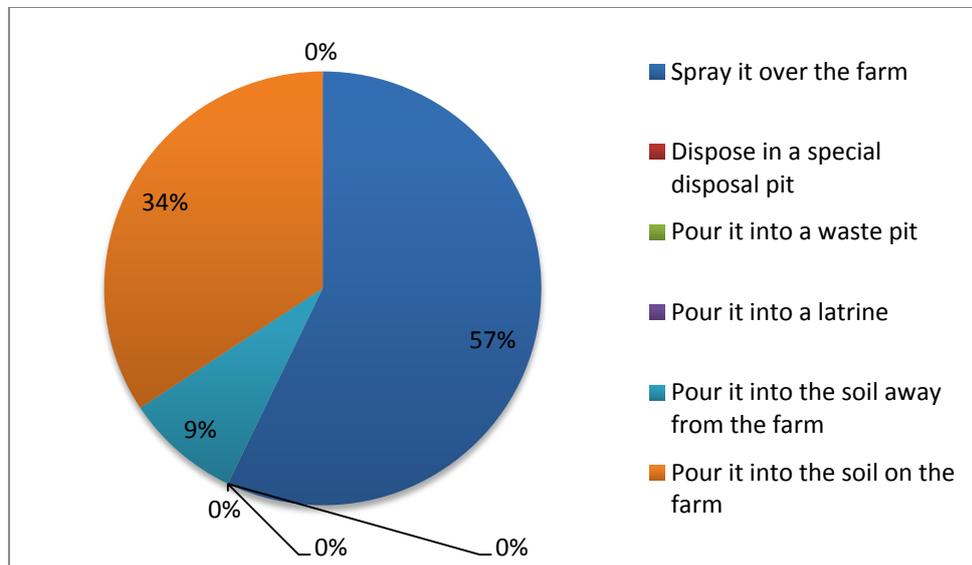
3.34 Triple rinsing the empty container after application



- The majority (69%) of the contract sprayers is triple rinsing the empty container after application.

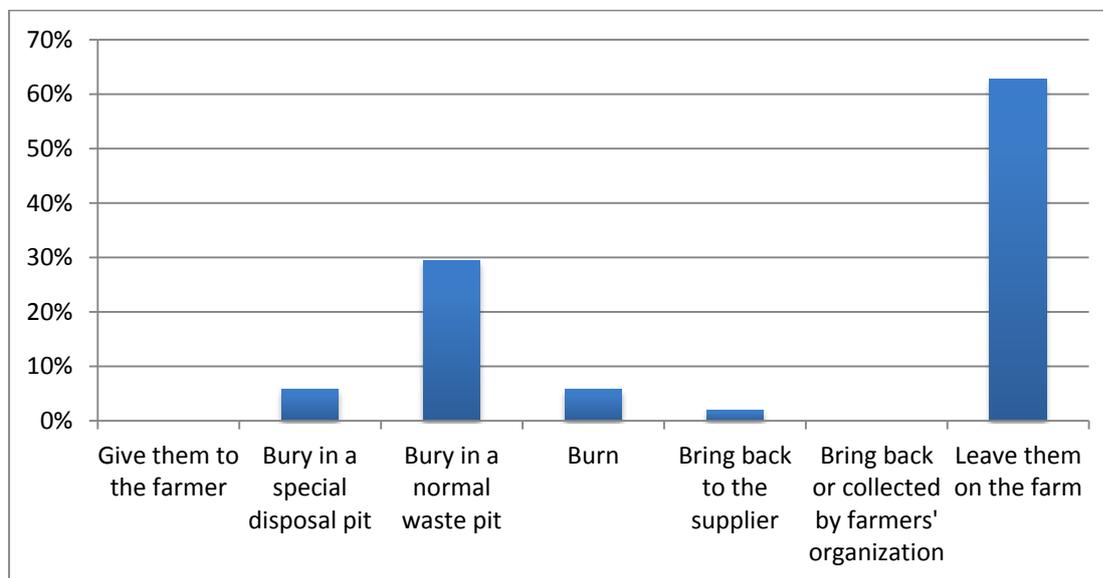


3.35 Disposal of wastewater after triple rinsing the empty container



- Of the contract sprayers who triple rinse their empty containers, 57% spray the wastewater over the farm, while 34% pour it into the soil on the farm, and 9% in the soil away from the farm.
- The official recommendation is to spray the wastewater of triple rinsing over the farm.

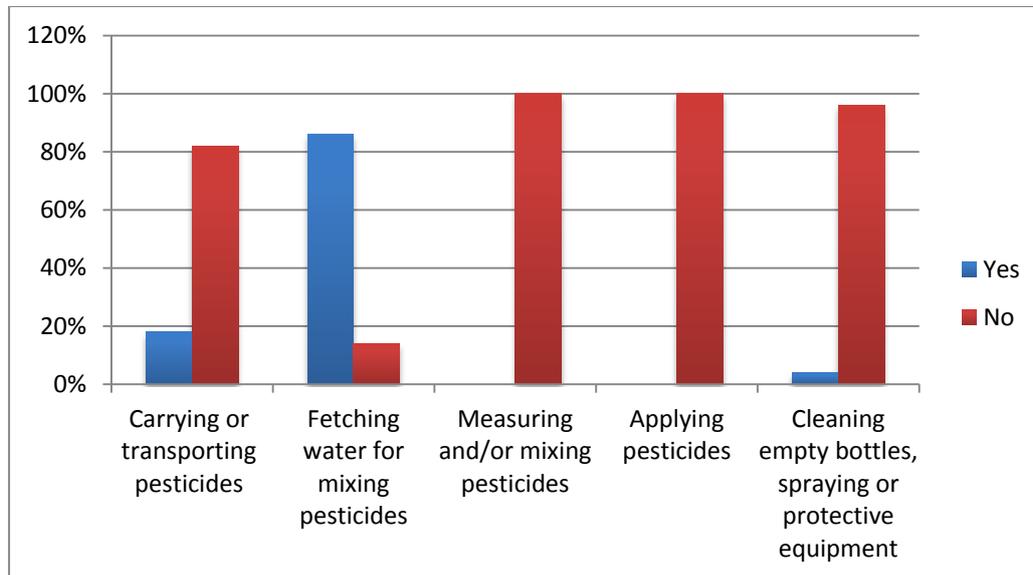
3.36 Disposal of empty containers



- Most contract sprayers (63%) leaves the empty containers on the farm after application, while 29% buries them in a normal waste pit.

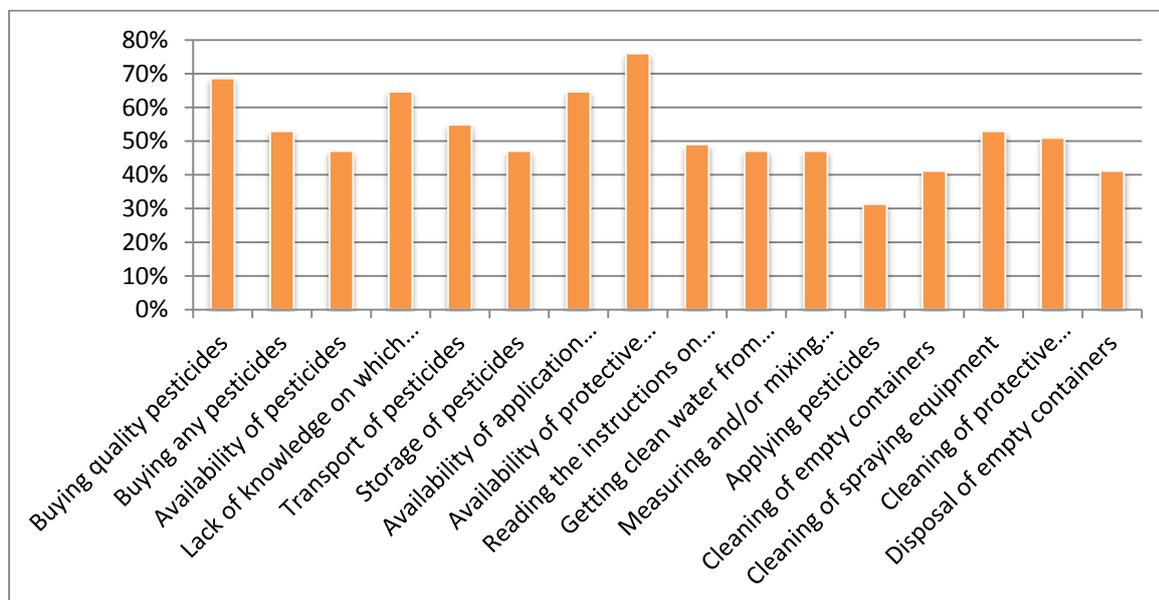


3.37 Involvement of children



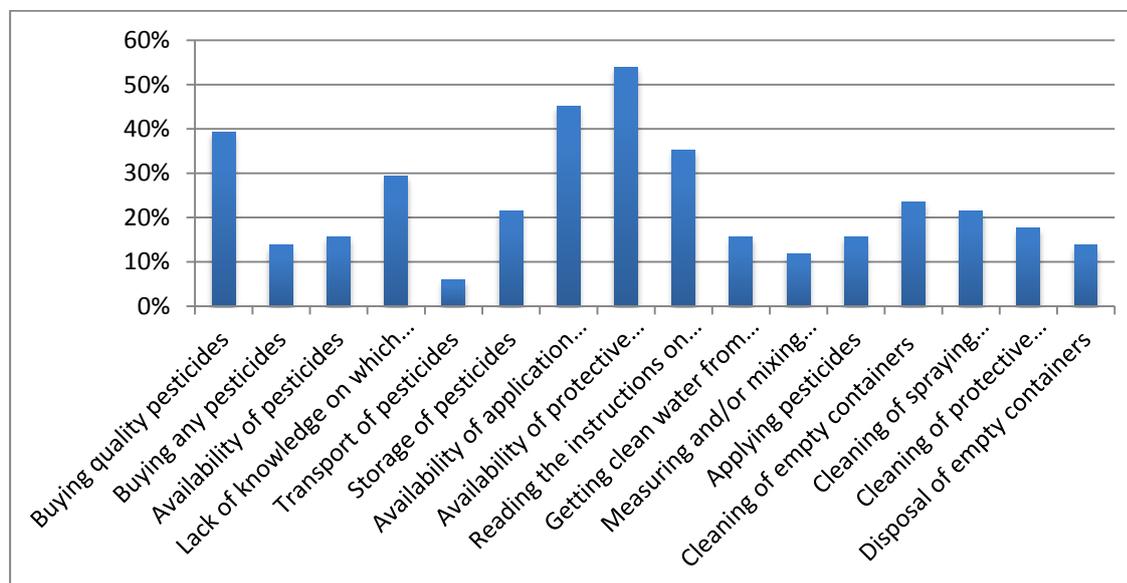
- Children are mainly used to fetch water for mixing pesticides (86% of the cases) and in 18% children carry or transport pesticides.

3.38 Challenges (a bit and very much)





3.39 Challenges (very much)



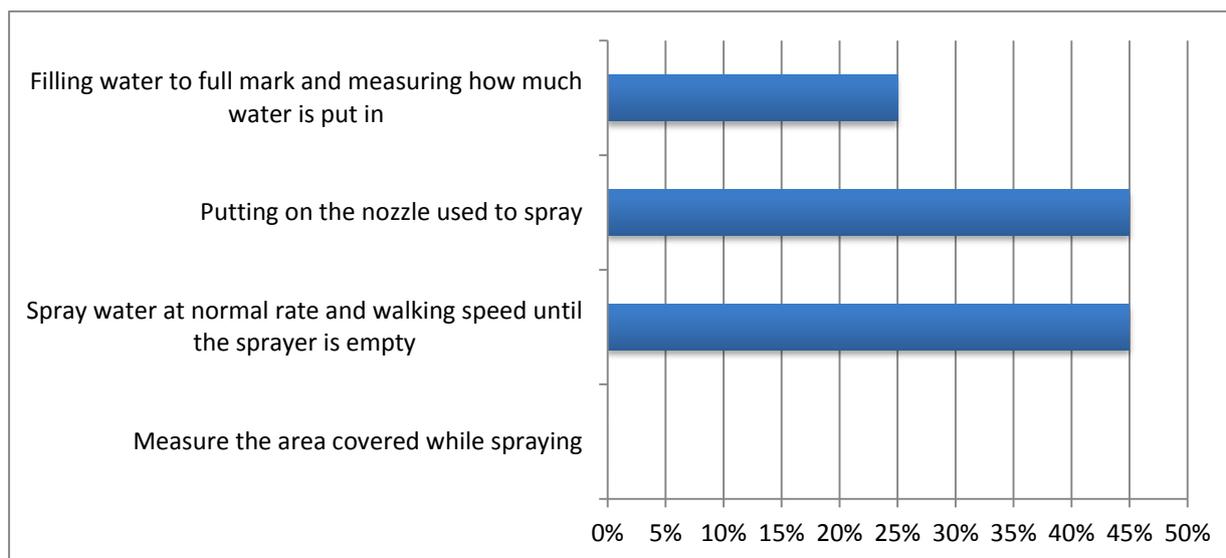
- Contract sprayers were asked for several activities related to pesticide handling and application if they have challenges, varying from very much, a bit to not at all.
- The availability of protective equipment is the biggest challenge: 54% indicates it as a challenge of the highest level (very much). Also the availability of application equipment scores very high (45% very much), just as buying quality pesticides (39%) and reading the label (35% very much).
- Lack of knowledge on which pesticide to buy is a challenge for many contract sprayers but not so severe: 29% indicates it as very much, but 65% mentions it as a challenge. Also the transport of pesticides and cleaning of both protective as application equipment is mentioned by more than half as a challenge.



4 Results Application Test Contract Sprayers

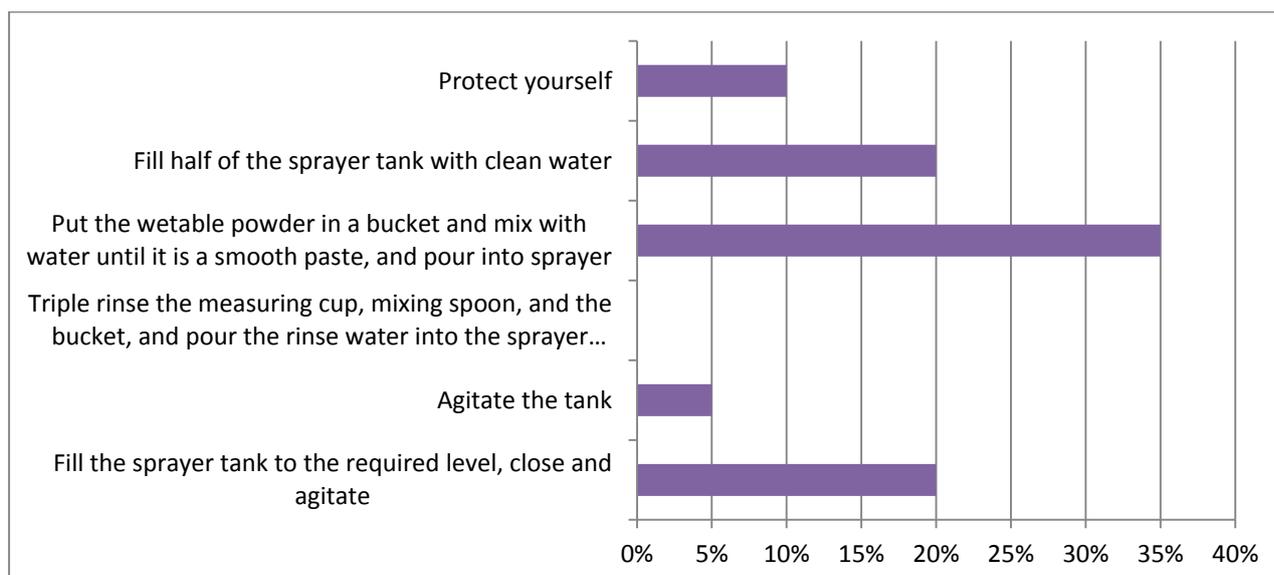
With questionnaires people who are interviewed might not always give an honest answer. Therefore 20 contract sprayers were selected and asked to calibrate, mix pesticide and apply them, while being observed. The graphs below show the results of the practical test.

4.1 Calibration of knapsack sprayer



- Although almost half made an attempt to calibration, none of them calibrated the knapsack sprayer because none of them did the last step (measuring the area that was covered).

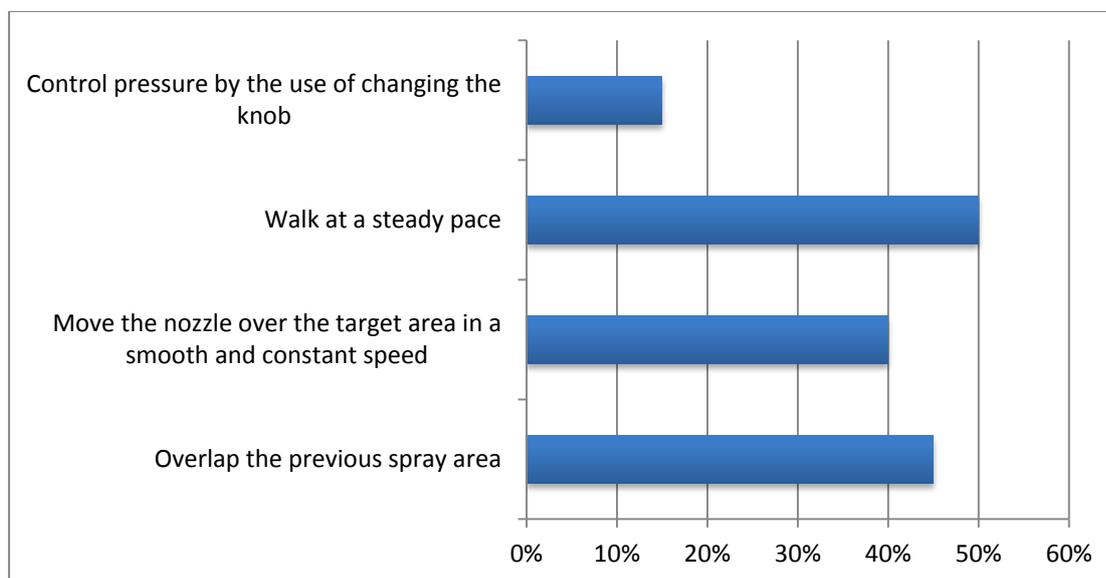
4.2 Mixing pesticides



- None of the contract sprayers succeeded in correctly mixing the pesticides.
- Only 10% protected himself and none of them rinsed the equipment used for mixing.



4.3 Application



- Not even half succeeded in applying the pesticides in the correct way.
- Half walked at a steady pace and 45% overlapped the previous spray area.
- Only 15% was able to control the pressure.

4.4 Total score

Total score	Number of contract sprayers
0%	8
9%	1
14%	2
23%	2
27%	1
32%	2
36%	2
41%	2

- For approval of admission to the Spray Service Providers (SSP) Network CropLife Nigeria as SSP, he needs to score at least 60% in the application test.
- 2 Contract sprayers managed to score 41%, while 8% did not score any point.
- The average score of the group of 20 was 16%.



5 Conclusions and Recommendations

5.1 Conclusions

The following conclusions are drawn.

5.1.1 Contract Sprayers

- **Age:** Most contract sprayers (80%) are between 25 and 44 years old, which is within the age bracket set by CropLife. The person who indicated to be younger than 18 years, should be contacted by the project to ensure that he will no longer work as contract sprayer.
- **Literacy rate:** The educational level is also acceptable: 75% has at least completed primary school, so they should be able to read and write. Special attention should be given to those with only a few years of primary school.
- **Experience:** All of them grew up on a farm and are farming at the moment, which indicates they have experience with crop production, which helps to be a SSP. Most of them (76%) work for more than 2 seasons as a contract sprayer, which shows they are experienced. However, still 1 out of 3 has challenges with the actual application of pesticides, and almost half with measuring and mixing.
- **Training:** 35% of them did not follow any training on the application of pesticides, and those that did follow training, for more than half it was longer than 2 seasons ago, and in 94% the program was only 1 day.
- **Use of PPE:** 1 out of 10 does not use any PPE, and 3 out of 4 mentions that the availability of PPE is a challenge. More than half owns gloves, boots and a nose mask, while most do not have an overall or any other equipment. Only 4% has a full set of PPE. More than half wears their boots wrongly and 2 out of 5 also wears their gloves wrongly. The project should ensure that everyone has an overall and other equipment to make the full set, and create awareness on the importance of wearing it and how to wear it.
- **Business:**
 - There seems to be enough work, because for most contract sprayers their activities are almost a fulltime job with more than half working for more than 20 days per month.
 - Contract sprayers make a decent income from their application activities with almost half earning between 51,000 and 100,000 Naira, on top of their income from farming activities or other activities.
- **Application:** Herbicides application on cowpea, soyabean and maize is most popular. During the SSP training emphasize should be on herbicide application for these 3 crops.
- **Buying of pesticides:** At the moment farmers buy the pesticides, although almost 70% of the contract sprayers indicate that buying quality pesticides is a problem. To ensure that the correct pesticides are used, it is advised that contract sprayers buy the pesticides. Therefore, the project should as much as possible link contract sprayers to member companies to ensure access to quality pesticides. In addition, the field officers of member companies can advise the contract sprayer which pesticide to buy.
- **Label reading:** 2 out of 5 does not read the label and half indicates to have challenges with reading the label, while knowledge on warning sign, re-entry and pre-harvest interval can be improved.
- **Handling empty containers:** 30% does not triple rinse the empty container and of those who do, more than 40% pours the wastewater into the soil. Most worrying is that more than 60% leaves empty containers on the farm and 30% buries them in normal disposal pits. Therefore, the topics on handling empty containers should be given a lot of attention.
- **Involvement of children:** In 86% of the cases children fetch water for pesticide application. It is strictly prohibited to use children for any activity related to pesticides. With fetching water, changes are high that children stay on the farm during application and are thereby exposed to the pesticides.



5.1.2 Practical test

The practical test was extremely bad made: 8 did not even score any point, meaning they did everything wrong. Only 2 succeeded to score higher than 40% which was still not enough to be approved by CropLife Nigeria as SSP.

5.1.3 Farmers

- Farmers use contract sprayers to apply herbicides on maize, cowpea, soyabean and groundnut.
- More than half buys their pesticides on the open market and follow advice from different sources on what type of pesticides to buy. 78% lacks knowledge on what pesticide to buy.
- A lot of farmers (82%) make use of contract sprayers and are extremely satisfied or very satisfied with the work (90%), and would definitely use their services again (93%).
- None of the contract sprayers wears a full set of PPE.
- Although containers are triple rinsed (100%), the wastewater is in more than half of the cases not disposed well. 81% of the contract sprayers leaves the empty containers on the farm.
- In case a contract sprayer applies the pesticides, in 88% children are used to fetch water.
- The knowledge of the contract sprayer on application and pesticides is mentioned as the main reasons for farmers to use their services (76%).

5.2 Recommendations

5.2.1 SSP training

Contract sprayers have a lot of working experience and the level of satisfaction among farmers is very high. However, because of the extremely low score of the practical test, it is advised to give every contract sprayer the full SSP course and pay special attention to the practical exercises.

5.2.2 Focus of training

- The main focus of the SSP training should be on herbicides.
- Other focus points are the importance of wearing PPE, handling wastewater after triple rinsing, disposal of empty containers, and involvement of children.

5.2.3 Linkages to member companies

Contract sprayers should be linked directly to (field staff of) member companies of CropLife Nigeria to guarantee access to good qualities.

5.2.4 Awareness creation among farmers where SSPs will be active

- It is common practice to leave empty containers on the farm after application, very likely to show to the farmer that the pesticides were applied. Therefore it is extremely important that awareness is raised among farmers about the correct disposal of empty container. It would be advised to set up collection schemes in the communities with active SSPs.
- Another common practice is that children fetch water for spraying activities. It should be communicated among farmers that children are never allowed to be involved in any activity related to pesticide handling or application, including fetching of water for application.
- Another point of awareness creation is the importance of buying and using good quality pesticides and informing farmers that contract sprayers that are trained as SSP will have access to good quality pesticides.



Annex 1: Farmer Questionnaire

Questionnaire for farmers

Date of enumeration: 2 0 1 5 Enumerator:

A. Demographics

Number:

Location/address LGA Bayo Hawul
 Biu Kwaya Kusar
 Community

-Farmer
 1. Name
 2. Sex Male Female
 3. Age Young than 18 years 35-44 years
 18-24 years 45-54 years
 25-34 years 55 years and above
 4. Mobile number

B. Farming

5. Total farm size Acres (That is, ALL crops)
 6. Farm size per crop
 a. Cowpea Acres e. Sorghum Acres
 b. Soybean Acres f. Millet Acres
 c. Groundnuts Acres g. Vegetables Acres
 d. Maize Acres h. Other crops Acres

C. Pesticide use

7. Did you use pesticides in the past season? If No for all, you can stop with the questionnaire
 a. Cowpea

Yes	No
Yes	No

 e. Sorghum

Yes	No
Yes	No

 b. Soybean

Yes	No
Yes	No

 f. Millet

Yes	No
Yes	No

 c. Groundnuts

Yes	No
Yes	No

 g. Vegetables

Yes	No
Yes	No

 d. Maize

Yes	No
Yes	No

 h. Other crops

Yes	No
Yes	No

8. What type of pesticides did you use?

a. Cowpea	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
b. Soybean	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
c. Groundnuts	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
d. Maize	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
e. Sorghum	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
f. Millet	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
g. Vegetables	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>
h. Other crops	Herbicides: <input type="text"/>	Insecticides: <input type="text"/>	Fungicides: <input type="text"/>	Any other type: <input type="text"/>

9. From where or who do you mainly buy your pesticides? (tick only one option)

a. Directly from distributor or via their staff	<input type="checkbox"/>	e. Government agency	<input type="checkbox"/>
b. Agro dealer shop	<input type="checkbox"/>	f. Farmers' group	<input type="checkbox"/>
c. Agro dealer tabletop/open market	<input type="checkbox"/>	g. Contract sprayer	<input type="checkbox"/>
d. Dealers that come to the community	<input type="checkbox"/>	h. Other	<input type="checkbox"/>



10. Who advises you most often on what type of pesticides to buy? 11. Who is most often applying the pesticides?

(ask the question and then tick only 1 option)

- a. Staff of distributor
- b. Agro dealer
- c. Agro dealer tabletop
- d. Extension staff
- e. Farmers' organization
- f. Staff of (donor) project
- g. Other farmers
- h. Contract sprayer
- i. Other

(ask the question and then tick only 1 option)

- closest to the answer)
- a. Farmer
 - b. One of the children
 - c. Another household member
 - d. Labourer
 - e. Staff from farmers' organization
 - f. Contract sprayer
 - g. Other

12. Did the person applying, wear any of the following protective equipment?

- | | | | | | | | |
|--------------|-----|----|-------------|----------------|-----|----|-------------|
| a. Overall | Yes | No | Do not know | e. Respirator | Yes | No | Do not know |
| b. Gloves | Yes | No | Do not know | f. Goggles | Yes | No | Do not know |
| c. Boots | Yes | No | Do not know | g. Face shield | Yes | No | Do not know |
| d. Nose mask | Yes | No | Do not know | h. Hat | Yes | No | Do not know |

13. Were warning signs placed after the application of pesticides?

Yes	No
-----	----

14. Do you know about the preharvest interval?

Yes	No
-----	----

15. Do you know about the re-entry interval?

Yes	No
-----	----

16. Were the empty containers triple rinsed?

Yes	No	Do not know
-----	----	-------------

17. If triple rinsed, what was done with the waste water?

(Ask the question and tick 1 answer that is applicable)

- a. Sprayed over the farm
- b. Disposed in a special disposal pit
- c. Poured into a normal waste pit
- d. Poured into a latrine
- e. Poured into the soil away from the farm
- f. Poured into the soil on the farm
- g. Poured into a water source (stream, pond)
- h. Do not know

18. What was mainly done with the empty containers?

(Ask the question and tick 1 answer that is applicable)

- a. Reused for other purposes by the farmer
- b. Buried in a special disposal pit
- c. Buried in a normal waste pit
- d. Burned
- e. Brought back to the supplier
- f. Brought back or collected by farmers' organization
- g. Left on the farm
- h. Taken away by the contract sprayer
- i. Do not know

19. Did children (younger than 18 years) help in any of the following activities linked to pesticide application?

- a. Carrying or transporting pesticides
- b. Fetching water for mixing pesticides
- c. Measuring and/or mixing pesticides
- d. Applying pesticides
- e. Cleaning empty bottles, spraying or protective equipment

Yes	No	Do not know
Yes	No	Do not know
Yes	No	Do not know
Yes	No	Do not know
Yes	No	Do not know

20. Do you have any of the following challenges with regards to pesticides?

- a. Buying quality pesticides
- b. Buying any pesticides
- c. Availability of pesticides during the season
- d. High prices of pesticides
- e. Lack of knowledge on which pesticides to buy
- f. Transport of pesticides

Very much	A bit	Not at all
Very much	A bit	Not at all
Very much	A bit	Not at all
Very much	A bit	Not at all
Very much	A bit	Not at all
Very much	A bit	Not at all



20. Do you have any of the following challenges with regards to pesticides?

g. Storage of pesticides	Very much	A bit	Not at all
h. Availability of knapsack sprayer (application equipment)	Very much	A bit	Not at all
i. Availability of protective equipment	Very much	A bit	Not at all
j. Reading the instructions on the label	Very much	A bit	Not at all
k. Getting clean water for mixing pesticides	Very much	A bit	Not at all
l. Measuring and/or mixing pesticides	Very much	A bit	Not at all
m. Applying pesticides	Very much	A bit	Not at all
n. Getting someone to apply the pesticides	Very much	A bit	Not at all
o. Cleaning of empty containers	Very much	A bit	Not at all
p. Cleaning of spraying equipment	Very much	A bit	Not at all
q. Cleaning of protective equipment	Very much	A bit	Not at all
r. Disposal of empty containers	Very much	A bit	Not at all

D. APPLICATION BY CONTRACT SPRAYER

21. What is the main reason you decided to use the services of a contract sprayer? (ask the question and tick answers)

- (more answers are possible)
- | | | | |
|---|--------------------------|---------------------------------|--------------------------|
| a. He has access to good quality pesticides | <input type="checkbox"/> | h. He has application equipment | <input type="checkbox"/> |
| b. Better application | <input type="checkbox"/> | i. He can read the label | <input type="checkbox"/> |
| c. Less pesticides used | <input type="checkbox"/> | j. I do not have time for it | <input type="checkbox"/> |
| d. He has knowledge on pesticides | <input type="checkbox"/> | k. I do not want to do it | <input type="checkbox"/> |
| e. He has knowledge on application | <input type="checkbox"/> | l. Other reasons | <input type="checkbox"/> |
| f. He is physically fit | <input type="checkbox"/> | | |
| g. He has protective equipment | <input type="checkbox"/> | | |

22. How much do you pay the contract sprayer?

Naira per Acre Spray tank Day

23. Do you pay anything in kind to the contract sprayer? Yes No

24. Who pays for the transport of the contract sprayer (tick only 1 option)

Farmer Contract sprayer Farmers' organization Someone else Other

25. On what can the contract sprayer improve?

a. Application equipment (knapsack sprayer)	definitely improve	somehow improve	no need to improve
b. Wearing of protective equipment	definitely improve	somehow improve	no need to improve
c. Reading the instructions on the label	definitely improve	somehow improve	no need to improve
d. Measuring the correct quantity of pesticides	definitely improve	somehow improve	no need to improve
e. Use of clean water for mixing	definitely improve	somehow improve	no need to improve
f. Mixing the pesticides	definitely improve	somehow improve	no need to improve
g. The actual application of pesticides	definitely improve	somehow improve	no need to improve
h. Disposal of empty containers	definitely improve	somehow improve	no need to improve
i. Disposal of left-over pesticides	definitely improve	somehow improve	no need to improve
j. General knowledge on pesticides	definitely improve	somehow improve	no need to improve
k. Availability during the season	definitely improve	somehow improve	no need to improve
l. Fees he is charging	definitely improve	somehow improve	no need to improve

26. Rate your level of satisfaction with the contract sprayer

- Extremely satisfied
 Very satisfied
 Satisfied
 Not satisfied

27. Would you use the services of the contract sprayer again?

- Definitely
 Maybe
 Maybe not
 Definitely not



Annex 2: Contract Sprayer Questionnaire

Questionnaire for contract sprayers

Date of enumeration: 2 0 1 5 Enumerator:

A. Demographics Number:

Location/address LGA Bayo Hawul
 Biu Kwaya Kusar
 Community

1. Name

2. Sex Male Female

3. Age Young than 18 years 35-44 years
 18-24 years 45-54 years
 25-34 years 55 years and above

4. Mobile number

5. What is your educational background?

Few years primary school (go to question 7) Secondary school completed (go to question 7)
 Primary school completed (go to question 7) Diploma (go to question 6)
 Few years secondary school (go to question 7) University degree (go to question 6)

6. In case you have a diploma or higher, is it in agriculture (or related study) Yes No

7. Did you grow up on a farm? Yes No 8. Do you farm at the moment? Yes No

9. If you farm, what crops do you farm?

a. Cowpea	<input type="checkbox"/> Yes <input type="checkbox"/> No	e. Sorghum	<input type="checkbox"/> Yes <input type="checkbox"/> No
b. Soybean	<input type="checkbox"/> Yes <input type="checkbox"/> No	f. Millet	<input type="checkbox"/> Yes <input type="checkbox"/> No
c. Groundnuts	<input type="checkbox"/> Yes <input type="checkbox"/> No	g. Vegetables	<input type="checkbox"/> Yes <input type="checkbox"/> No
d. Maize	<input type="checkbox"/> Yes <input type="checkbox"/> No	h. Other crops	<input type="checkbox"/> Yes <input type="checkbox"/> No

B. Training

10. When did you start working as a contract sprayer?
 This season 2 seasons ago
 Last season Longer ago

11. Did you follow any specific training on the application of pesticides? Yes No
 (If no, go to question 15. If yes, continue with question 12)

12. If you followed a training, who organized it? (you can circle more than 1 option)

<input type="checkbox"/> A project	<input type="checkbox"/> NAFDAC
<input type="checkbox"/> A distributor of pesticides	<input type="checkbox"/> Farmers' organization/association/cooperative
<input type="checkbox"/> An agro dealer	<input type="checkbox"/> Another organization
<input type="checkbox"/> An extension officer/ADP officer	<input type="checkbox"/> I do not know

13. If you followed a training, when did you follow it?
 This season 2 seasons ago
 Last season Longer ago

14. If you followed a training, how many days was the training?
 Half a day 2 days
 1 day longer than 2 days



C. Equipment

15. Do you own a knapsack sprayer?

Yes	No
-----	----

16. Do you own or hire any of the following protective equipment?

a. Overall	Own	Hire	Do not use it	e. Respirator	Own	Hire	Do not use it
b. Gloves	Own	Hire	Do not use it	f. Goggles	Own	Hire	Do not use it
c. Boots	Own	Hire	Do not use it	g. Face shield	Own	Hire	Do not use it
d. Nose mask	Own	Hire	Do not use it	h. Hat	Own	Hire	Do not use it

17. Do you own or make use of any of the following transport modes when going to farmers?

a. Bicycle	Own	Hire	Do not use it	c. Taxi/vehicle	Own	Use it	Do not use it
b. Motorbike	Own	Hire	Do not use it	d. Walking	Yes	No	

D. Business aspect

18. How many days per month do you work as contract sprayer? days

19. How many months per year do you work as contract sprayer? months

20. How many acres do you spray per day on average? acres

21. How much do you ask for your application activities?
 Naira per Acre Spray tank Day

22. Do you receive anything in kind?

Yes	No
-----	----

23. Who pays for your transport to the farm? (You can circle more than 1 option)

<input type="checkbox"/> You	<input type="checkbox"/> Farmer	<input type="checkbox"/> Farmers' organization	<input type="checkbox"/> Someone else	<input type="checkbox"/> No costs involved
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24. How much money do you earn on average per month with application? Naira

25. How much money do you earn on average per season with application? Naira

26. Do you have any other work or income?

No	Yes, from my farm	Yes, from other activities/work
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E. Pesticide use information

27. What type of pesticides do you apply?

a. Cowpea	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
b. Soybean	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
c. Groundnuts	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
d. Maize	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
e. Sorghum	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
f. Millet	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
g. Vegetables	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>
h. Other crops	Herbicides	<input type="text"/>	Insecticides	<input type="text"/>	Fungicides	<input type="text"/>	Any other type	<input type="text"/>

28. When you apply pesticides for someone else, who buys the pesticides?

<input type="checkbox"/> You	<input type="checkbox"/> The farmer	<input type="checkbox"/> Someone else
------------------------------	-------------------------------------	---------------------------------------

You can circle emore options. If the farmer buys, go to question 31. If you buy, continue with question 29)

29. In case you buy the pesticide, from where or who do you mainly buy your pesticides? (tick only one option)

a. Directly from distributor or via their staff	<input type="checkbox"/>	e. Government agency	<input type="checkbox"/>
b. Agro dealer shop	<input type="checkbox"/>	f. Farmers' group	<input type="checkbox"/>
c. Table-top dealer /open market	<input type="checkbox"/>	g. Other	<input type="checkbox"/>
d. Dealers that come to the community	<input type="checkbox"/>		



30. Who advises you on what type of pesticides to buy? (ask the question and then tick only 1 option)

- | | | | |
|-------------------------|--------------------------|-----------------------------|--------------------------|
| a. Staff of distributor | <input type="checkbox"/> | e. Farmers' organization | <input type="checkbox"/> |
| b. Agro dealer | <input type="checkbox"/> | f. Staff of (donor) project | <input type="checkbox"/> |
| c. Table-top dealer | <input type="checkbox"/> | g. Other farmers | <input type="checkbox"/> |
| d. Extension staff | <input type="checkbox"/> | h. Other | <input type="checkbox"/> |

31. How do you wear your gloves? Over my sleeves Under my sleeves I do not wear gloves

32. How do you wear your boots? Over my trousers Under my trousers I do not wear boots

33. Do you read the label on the pesticide container? Yes No

34. Do you or the farmer place any warning signs after the application of pesticides? Yes No

35. Do you know what the preharvest interval is? Yes No **36. And the re-entry interval?** Yes No

37. Do you triple rinse empty container? Yes No I do not know what that is

(If no or I don't know, to to question 39. If yes, continue with question 38)

38. In case you triple rinse containers, what do you most often do with the waste water?

(Ask the question and tick the options that are mentioned. More options are possible)

- | | | | |
|---|--------------------------|---|--------------------------|
| a. Spray it over the farm | <input type="checkbox"/> | e. Pour it into the soil away from the farm | <input type="checkbox"/> |
| b. Dispose it in a special disposal pit | <input type="checkbox"/> | f. Pour it into the soil on the farm | <input type="checkbox"/> |
| c. Pour it into a waste pit | <input type="checkbox"/> | g. Pour it into a water source (stream, pond) | <input type="checkbox"/> |
| d. Pour it into a latrine | <input type="checkbox"/> | h. Other | <input type="checkbox"/> |

39. What do you do with the empty containers?

(Ask the question and tick the options that are mentioned. More options are possible)

- | | | | |
|-----------------------------------|--------------------------|---|--------------------------|
| a. Give them to the farmer | <input type="checkbox"/> | e. Bring back to the supplier | <input type="checkbox"/> |
| b. Bury in a special disposal pit | <input type="checkbox"/> | f. Bring back or collected by farmers' organization | <input type="checkbox"/> |
| c. Bury in a normal waste pit | <input type="checkbox"/> | g. Leave them on the farm | <input type="checkbox"/> |
| d. Burn | <input type="checkbox"/> | h. Other | <input type="checkbox"/> |

40. Do children (younger than 18 years) help in any of the following activities linked to pesticide application?

- | | | | |
|---|--|----------------------------------|--|
| a. Carrying or transporting pesticides | <input type="checkbox"/> Yes <input type="checkbox"/> No | d. Applying pesticides | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| b. Fetching water for mixing pesticides | <input type="checkbox"/> Yes <input type="checkbox"/> No | e. Cleaning empty bottles, | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| c. Measuring and/or mixing pesticides | <input type="checkbox"/> Yes <input type="checkbox"/> No | spraying or protective equipment | |

41. Do you have any of the following challenges with regards to pesticides?

a. Buying quality pesticides	Very much	A bit	Not at all	Not applicable
b. Buying any pesticides	Very much	A bit	Not at all	Not applicable
c. Availability of pesticides during the season	Very much	A bit	Not at all	Not applicable
d. Lack of knowledge on which pesticides to buy	Very much	A bit	Not at all	Not applicable
e. Transport of pesticides	Very much	A bit	Not at all	Not applicable
f. Storage of pesticides	Very much	A bit	Not at all	Not applicable
g. Availability of application equipment	Very much	A bit	Not at all	Not applicable
h. Availability of protective equipment	Very much	A bit	Not at all	Not applicable
i. Reading the instructions on the label	Very much	A bit	Not at all	Not applicable
j. Getting clean water for mixing pesticides	Very much	A bit	Not at all	Not applicable
k. Measuring and/or mixing pesticides	Very much	A bit	Not at all	Not applicable
l. Applying pesticides	Very much	A bit	Not at all	Not applicable
m. Cleaning of empty containers	Very much	A bit	Not at all	Not applicable
n. Cleaning of spraying equipment	Very much	A bit	Not at all	Not applicable
o. Cleaning of protective equipment	Very much	A bit	Not at all	Not applicable
p. Disposal of empty containers	Very much	A bit	Not at all	Not applicable



Annex 3: Scoring Sheet Practical Test Contract Sprayer

Practical Test for Application Scoring Sheet

_____ %

NAME: _____

Activity	Maximum number of points	Number of points
Question 1: Calibration of knapsack sprayer		
1.1 Filling water to full mark and measuring how much water is put in	1	
1.2 Putting on the nozzle used to spray	1	
1.3 Spray water at normal pumping rate and walking speed until the sprayer is empty	2	
1.4 Measure the area covered while spraying	1	
Question 2: Mixing wettable powders		
2.1 Protect yourself	2	
2.2 Fill half of the sprayer tank with clean water	1	
2.3 Put the wettable powder in a bucket and mix with water until it is a smooth paste, and pour into sprayer	2	
2.4 Triple rinse the measuring cup, mixing spoon, and the bucket, and pour the rinse water into the sprayer tank	2	
2.5 Agitate the tank	1	
2.6 Fill the sprayer tank to the required level, close and agitate	1	
Question 3: Spraying		
3.1 Walk at a steady pace	2	
3.2 Pump at a steady pace	2	
3.3 Move the nozzle over the target area in a smooth and constant speed	2	
3.4 Overlap the previous spray area	2	
TOTAL	22	

TOTAL SCORE: _____ / 22 = _____ %



List of project reports

1. N2Africa Steering Committee Terms of Reference
2. Policy on advanced training grants
3. Rhizobia Strain Isolation and Characterisation Protocol
4. Detailed country-by-country access plan for P and other agro-minerals
5. Workshop Report: Training of Master Trainers on Legume and Inoculant Technologies (Kisumu Hotel, Kisumu, Kenya-24-28 May 2010)
6. Plans for interaction with the Tropical Legumes II project (TLII) and for seed increase on a country-by-country basis
7. Implementation Plan for collaboration between N2Africa and the Soil Health and Market Access Programs of the Alliance for a Green Revolution in Africa (AGRA) plan
8. General approaches and country specific dissemination plans
9. Selected soyabeans, common beans, cowpeas and groundnuts varieties with proven high BNF potential and sufficient seed availability in target impact zones of N2Africa Project
10. Project launch and workshop report
11. Advancing technical skills in rhizobiology: training report
12. Characterisation of the impact zones and mandate areas in the N2Africa project
13. Production and use of rhizobial inoculants in Africa
18. Adaptive research in N2Africa impact zones: Principles, guidelines and implemented research campaigns
19. Quality assurance (QA) protocols based on African capacities and international existing standards developed
20. Collection and maintenance of elite rhizobial strains
21. MSc and PhD status report
22. Production of seed for local distribution by farming communities engaged in the project
23. A report documenting the involvement of women in at least 50% of all farmer-related activities
24. Participatory development of indicators for monitoring and evaluating progress with project activities and their impact
25. Suitable multi-purpose forage and tree legumes for intensive smallholder meat and dairy industries in East and Central Africa N2Africa mandate areas
26. A revised manual for rhizobium methods and standard protocols available on the project website
27. Update on Inoculant production by cooperating laboratories
28. Legume Seed Acquired for Dissemination in the Project Impact Zones
29. Advanced technical skills in rhizobiology: East and Central African, West African and South African Hub
30. Memoranda of Understanding are formalized with key partners along the legume value chains in the impact zones
31. Existing rhizobiology laboratories upgraded
32. N2Africa Baseline report
33. N2Africa Annual country reports 2011
34. Facilitating large-scale dissemination of Biological Nitrogen Fixation



35. Dissemination tools produced
36. Linking legume farmers to markets
37. The role of AGRA and other partners in the project defined and co-funding/financing options for scale-up of inoculum (banks, AGRA, industry) identified
38. Progress Towards Achieving the Vision of Success of N2Africa
39. Quantifying the impact of the N2Africa project on Biological Nitrogen Fixation
40. Training agro-dealers in accessing, managing and distributing information on inoculant use
41. Opportunities for N2Africa in Ethiopia
42. N2Africa Project Progress Report Month 30
43. Review & Planning meeting Zimbabwe
44. Howard G. Buffett Foundation – N2Africa June 2012 Interim Report
45. Number of Extension Events Organized per Season per Country
46. N2Africa narrative reports Month 30
47. Background information on agronomy, farming systems and ongoing projects on grain legumes in Uganda
48. Opportunities for N2Africa in Tanzania
49. Background information on agronomy, farming systems and ongoing projects on grain legumes in Ethiopia
50. Special Events on the Role of Legumes in Household Nutrition and Value-Added Processing
51. Value chain analyses of grain legumes in N2Africa: Kenya, Rwanda, eastern DRC, Ghana, Nigeria, Mozambique, Malawi and Zimbabwe
52. Background information on agronomy, farming systems and ongoing projects on grain legumes in Tanzania
53. Nutritional benefits of legume consumption at household level in rural sub-Saharan Africa: Literature study
54. N2Africa Project Progress Report Month 42
55. Market Analysis of Inoculant Production and Use
56. Identified soyabean, common bean, cowpea and groundnut varieties with high Biological Nitrogen Fixation potential identified in N2Africa impact zones
57. A N2Africa universal logo representing inoculant quality assurance
58. M&E Workstream report
59. Improving legume inoculants and developing strategic alliances for their advancement
60. Rhizobium collection, testing and the identification of candidate elite strains
61. Evaluation of the progress made towards achieving the Vision of Success in N2Africa
62. Policy recommendation related to inoculant regulation and cross border trade
63. Satellite sites and activities in the impact zones of the N2Africa project
64. Linking communities to legume processing initiatives
65. Special events on the role of legumes in household nutrition and value-added processing
66. Media Events in the N2Africa project
67. Launch N2Africa Phase II – Report Uganda



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68. Review of conditioning factors and constraints to legume adoption and their management in Phase II of N2Africa
 69. Report on the milestones in the Supplementary N2Africa grant
 70. N2Africa Phase II Launch in Tanzania
 71. N2Africa Phase II 6 months report
 72. Involvement of women in at least 50% of all farmer related activities
 73. N2Africa Final Report of the First Phase: 2009-2013
 74. Managing factors that affect the adoption of grain legumes in Uganda in the N2Africa project
 75. Managing factors that affect the adoption of grain legumes in Ethiopia in the N2Africa project
 76. Managing factors that affect the adoption of grain legumes in Tanzania in the N2Africa project
 77. N2Africa Action Areas in Ethiopia, Ghana, Nigeria, Tanzania and Uganda in 2014
 78. N2Africa Annual report Phase II Year 1
 79. N2Africa: Taking Stock and Moving Forward. Workshop report
 80. N2Africa Kenya Country Report 2015
 81. N2Africa Annual Report 2015
 82. Value Chain Analysis of Grain Legumes in Borno State, Nigeria
 83. Baseline report Borno State
 84. N2Africa Annual Report 2015 DR Congo
 85. N2Africa Annual Report 2015 Rwanda
 86. N2Africa Annual Report 2015 Malawi
 87. Contract Sprayer in Borno State, Nigeria



Partners involved in the N2Africa project

