



NATIONAL AGRICULTURAL EXTENSION AND RESEARCH LIAISON SERVICES

Federal Ministry of Agriculture and Rural Development

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AATF/NAERLS PBR COWPEA PROJECT

Farmers' Perceptions of SAMPEA 20T in Burkina Faso

A Survey Report Submitted to

AATF

BY

NAERLS

EXECUTIVE SUMMARY

The National Agricultural Extension and Research Liaison Services (NAERLS), ABU Zaria conducted the Pod Borer Resistant (PBR) perception studies in Burkina Faso through a consultant with funding from AATF. The goal of the Pod-borer Resistant Cowpea Project is to develop and disseminate farmer preferred and locally adapted Maruca-resistant cowpea varieties in Sub-Saharan Africa.

The Project is a public private partnership coordinated by AATF to promote technological interventions that will optimise cowpea productivity and utilisation in Sub-Saharan Africa. The partnership entails developing and testing cowpea varieties with a genetic trait that would make the plant resistant to the borer. The Pod-borer Resistant Cowpea (PBR-C) a BT seed product is a cowpea with characteristics that make it resistant to the pod-borer and provide farmers with an alternative to costly and hazardous insecticide spraying. In addition, the new varieties are expected to improve the nutrition and food security of millions of cowpea farmers and their families, reduce the chances of deteriorating health and environmental condition and increase the yield of smallholder farmers by 20%. The objective of the exercise was to get cowpea farmers perception with respect to the PBR Cowpea and to provide feedback on its use among cowpea farmers among cowpea producing regions in Burkina Faso.

Structured checklists were designed, digitized into ODK research instrument and distributed among 304 farmers that cut-across the Noumoudara, Peni, Taga, Darsalamy and Mes villages of Haut-Bassin (Wet Zone) of Burkina Faso. Majority (74.7%) of farmers reached were males as it has been for most developing countries. Cowpea farmers within the age bracket of 35-44 years formed the highest of 30.9% in Burkina Faso and about 91% of the entire farmers reached are married. A significant proportion (39.5%) of farmers had no formal education and the majority (92.8%) had crop production as their major source of livelihood while 34.1% had animal husbandry as secondary occupation. Major information sources used by farmers is through family which accounted for 60.5%.

Awareness level of PBRC is quite low as only 40% of farmers reported been aware of the seed with agricultural-related meeting (84.4%) as the source of the information. Most important challenge in cowpea production as identified are pest control (99.3%), good seeds (62.8%) and storage (58.6%). Ninety-six percent (96%) of cowpea farmers indicated willingness to accept an alternative over the seed variety used and 48.0% indicated PBRC discussion to be very important hence perceived the PBRC as a better alternative. Farmers further proved the importance of the PBRC by indicating their willingness to pay for its GAP while 45.4% indicated to pay between 500-1000 FCFA for a kg of the PBRC seed. All PBR Cowpea performance indicators as reported from the information gotten from cowpea farmers were in support of the positive attributes of the Pod-borer resistant cowpea hence expected to improve upon the control of major threats faced in cowpea production which are crop waste and/or loss due to pest infestation.

1.0 INTRODUCTION

Cowpea (*Vigna unguiculata*) is considered the most important food grain legume in the dry savannas of tropical Africa where it is grown on more than 12.5 million hectares. It is rich in quality protein and energy content, most importantly it has been the cheapest source of crop protein available to majority of resourced poor individuals in Africa. It is a good source of quality fodder for livestock and provides cash income. Nearly 200 million people in Africa consume the crop. Many biotic and abiotic factors greatly reduce cowpea productivity in the traditional African farming systems. Among these constraints is the pod borer, *Maruca vitrata*, which perennially damages cowpea pods in the fields.

The pod borer (*Maruca vitrata*) is a major Lepidopteran pest that inflicts severe damage to the cowpea plant. In severe infestations yield losses of between 70–80 percent have been reported. The conventional means of control which is spraying comes along with high risk of poisoning either the producer during spraying or the consumer after consumption of already sprayed output that still holds traces of active chemicals and in addition the method is costly. Poisoning through consumption of sprayed cowpea causes serious health hazards. The deployment of a cowpea product that is capable of protecting itself from attack by *Maruca* will make it easier and cheaper for farmers to produce the crop with confidence of expecting higher yield after limited resources have been committed.

The goal of the Pod-borer Resistant Cowpea Project is to develop and disseminate farmer preferred and locally adapted *Maruca*-resistant cowpea varieties in Sub-Saharan Africa. The Project is a public private partnership coordinated by AATF to promote technological interventions that will optimise cowpea productivity and utilisation in Sub-Saharan Africa. The partnership entails developing and testing cowpea varieties with a genetic trait that would make the plant resistant to the borer. The Pod-borer Resistant Cowpea (PBR-C) a BT seed product is a cowpea with characteristics that make it resistant to the pod-borer and provide farmers with an alternative to costly and hazardous insecticide spraying. In addition, the new varieties are expected to improve the nutrition and food security of millions of cowpea farmers and their families, reduce the chances of deteriorating health and environmental condition and increase the yield of smallholder farmers by 20%.

The project is being implemented in three countries in Sub-Saharan Africa – Nigeria, Burkina Faso and Ghana. As at 2014, confined field trials for testing the efficacy of the Bt gene in controlling the Maruca had been successfully conducted in the three countries. The purpose of the survey was to gather data to measure farmers' perceptions and level of interest in the PBR cowpea variety in Burkina Faso.

1.1 Study Area

The study was conducted in Burkina Faso, specifically the Haut Bassins region. The Hauts-Bassins (Upper Basins) is one of Burkina Faso's thirteen administrative regions and was is located on latitude 11° 29' 39.12" N and longitude 4° 14' 0.01" W. The region was created on 2 July 2001 with the region's capital in Bobo Dioulasso. The three provinces that make up the region are Houet, Kénédougou, and Tuy. As of 2019, the population of the region was 2,238,375 with 51.1% females. The population in the region was 10.92% of the total population of the country. The child mortality rate was 80, infant mortality rate was 67 and the mortality of children under five was 141. The coverage of cereal need compared to the total production of the region was 160%. As of 2007, the literacy rate in the region was 33.4%, compared to a national average of 28.3%.

Most of Burkino Faso is a wide plateau formed by riverine systems and is called falaise de Banfora. There are three major rivers, the Red Volta, Black Volta and White Volta, which cuts through different valleys. The climate is generally hot, with unreliable rains across different seasons. Gold and quartz are common minerals found across the country, while manganese deposits are also common. The dry season is usually from October to May and rains are common during the wet season from June to September. The average elevation is around 200 m (660 ft) to 300 m (980 ft) above mean sea level.

Among West African countries, Burkino Faso has the largest elephant population and the country is replete with game reserves. The southern regions are more tropical in nature and have Savannah and forests. The principal river is the Black Volta, that originates in the southern region and drains into Ghana. The areas near the rivers usually have flies like tsetse and similium,

which are carriers of sleep sickness and river blindness. The average rainfall in the region is around 100 cm (39 in) compared to northern regions that receive only 25 cm (9.8 in) rainfall.

2.0 METHODOLOGY

2.1 Sample Size and Sampling Procedure

A multi stage sampling technique was adopted for the study and the Haut-Bassin (Wet zone) of Burkina Faso was the study location. The first stage involves the purposive selection of the Peni Commune been the major cowpea producing site in the Haut-Bassin of Burkina Faso. Depending on cowpea production intensity, Noumoudara, Peni, Taga, Darsalamy and Mes villages were visited of which 135, 69, 85, 11 and 4 cowpea farmers were randomly selected and interviewed respectively. In total, five (5) villages and three hundred and four (304) small-scale cowpea farmers were interviewed in the course of the exercise (Table 1).

Table 1: Survey regions and sampling

Region	Village	No. of interviews
Haut-Bassin (Wet Zone)	Noumoudara	135
	Peni	69
	Taga	85
	Darsalamy	11
	Mes	4
Total		304

2.2 Research Instrument

Instrument for the exercise was designed by the National Agricultural Extension and Research Liaison Services (NAERLS), Nigeria and validated by consultants from Burkina Faso and other experts including the sponsors of the exercise. The instrument went through pretest in Ghana and was later refined based on the comments observed during the pre-test exercise. The final survey instrument was designed using kobo toolbox to ensure easiness in monitoring of field activities and accuracy with respect to coordinates capture.

2.3 Data Collection, Processing and Analysis

The data collection process started with training of field enumerators from diverse field of agriculture as well experienced. Data collected were cleaned (processed) and analyzed using Stata 15. Data collected were subjected to analysis using descriptive statistics (particularly mean, frequencies and percentages) which was achieved through a stata do-file.

3.0 RESULTS AND DISCUSSION

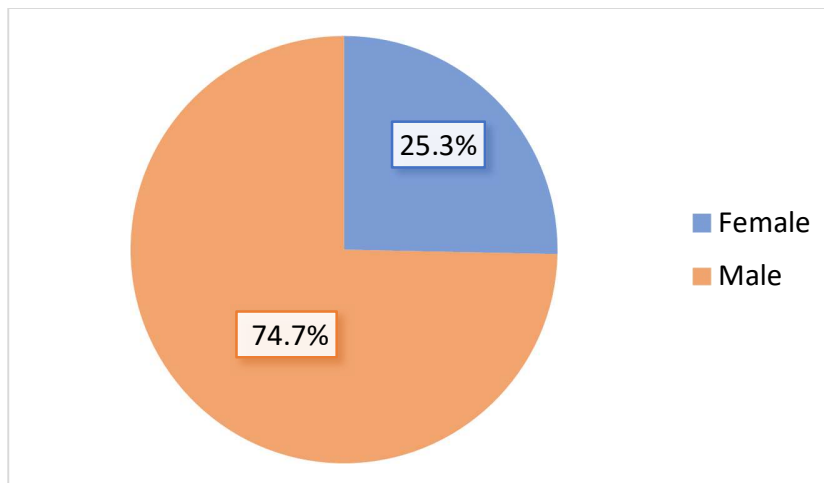


Fig 1: Gender distribution.

The above figure indicates the gender distribution of the respondents, and it shows that the majority (74.7%) of them are male, while 25.3% are female. This indicated that more of the male gender are into cowpea production than their female counterparts.

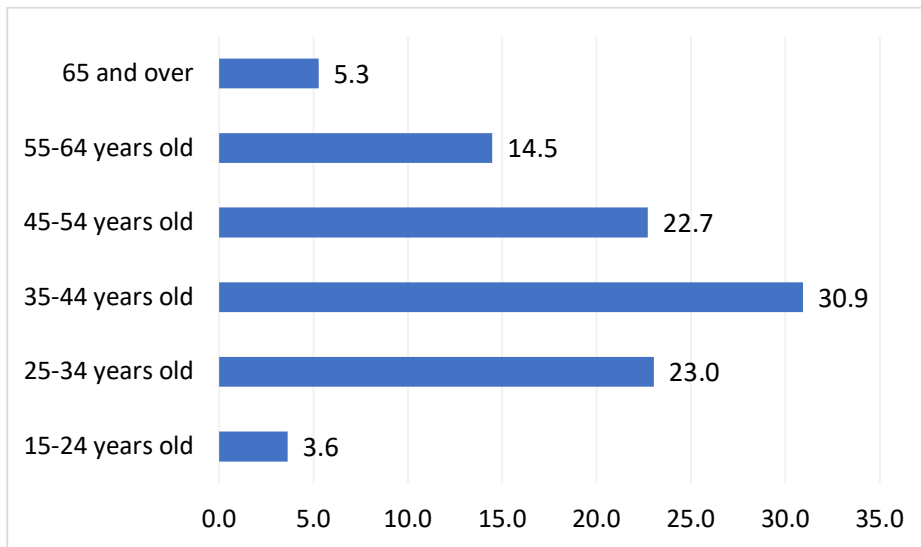


Fig 2: Age distribution.

Figure 2 above shows that about 14.5% of the respondents are between the age bracket of 55-64yrs, and that 30.9% are between the ages of 35-44yrs with only about 3.6% between the ages of 15-24yrs old. This implies that the cowpea farmers are in their productive age.

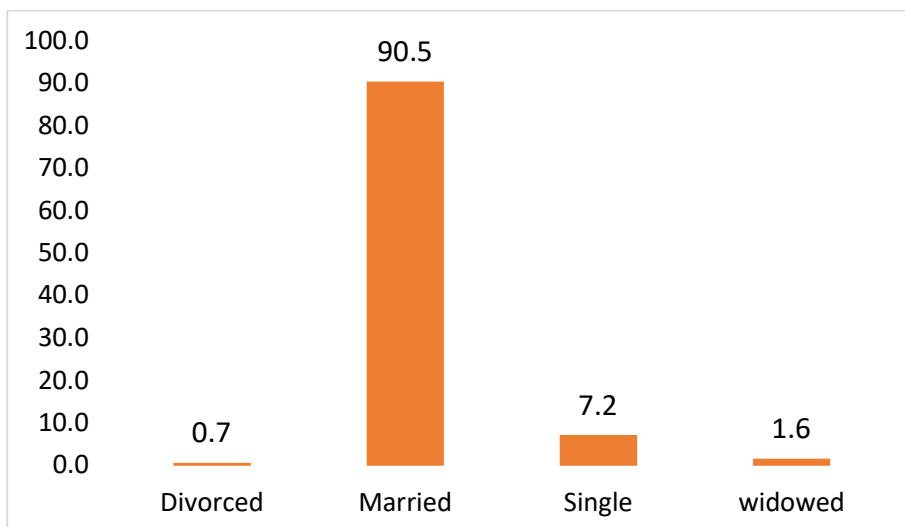


Fig 3: Marital status

Marriage often makes an individual more responsible and takes relatively technical decision more accurately. The result in Figure 3 shows that 90.5% of cowpea-producers surveyed were married

and 7.2%% were single with about 0.79% divorced. This implies that the high rate of marriage indicates a high degree of responsibility among the respondents, which is important in taking rational decisions.

Table 2: Educational background

Educational Background	Freq.	Percent
No formal education	120	39.5
Adult literacy	14	4.6
Some primary education	69	22.7
Completed primary education	49	16.1
Some secondary education	24	7.9
Completed secondary education	18	5.9
Koranic education	4	1.3
Some post-secondary education	6	2.0
Total	304	100

The level of educational attainment by plays a significant role in sharpening the mind and for effective rational decision-making. Results from Table 2 revealed that 5.9% of the respondents complete secondary education, 16.1% completed primary, and a significant proportion (39.5%) had no form of formal education, while others attained different levels of education.

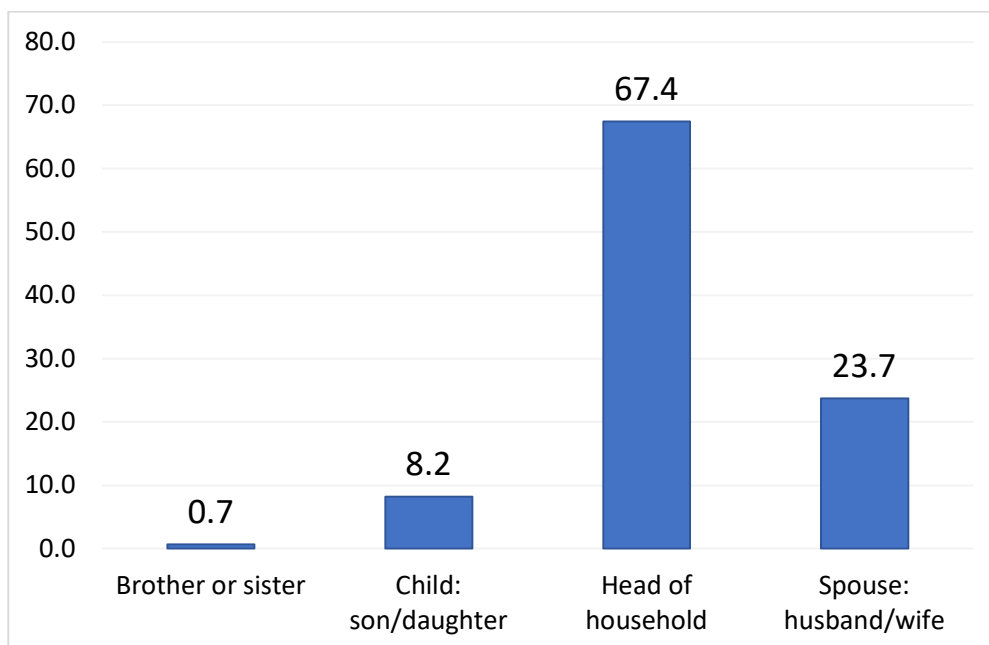


Fig 4: Relationship with HH head.

Figure 4 above shows the relationship with household size, and it indicates that majority (67.4%) of those interviewed are the household head, 8.2% have a relationship of a son/daughter with the HH head, while about 0.7% are brothers/sisters of the HH head.

Table 3: Primary activity.

Primary activity	Freq.	Percent
Animal husbandry	4	1.3
Craftsmen (including mechanics)	1	0.3
Crop production	282	92.8
Formal private employment	3	1.0
Non-agricultural trade	1	0.3
Other to be specified	5	1.6
Public sector employment	4	1.3
Retired	1	0.3
Transport	3	1.0
Total	304	100

Occupations of the population are largely influenced by the setting of their environment as well as their local economy, and also have a significant effect on the income generating ability and household wellbeing of individuals. The results in Table 3 indicated that cowpea producers were unanimous in confirming that crop production as their major occupation with about 92.8%, about 1% are into formal private employment, while others have different types of occupation.

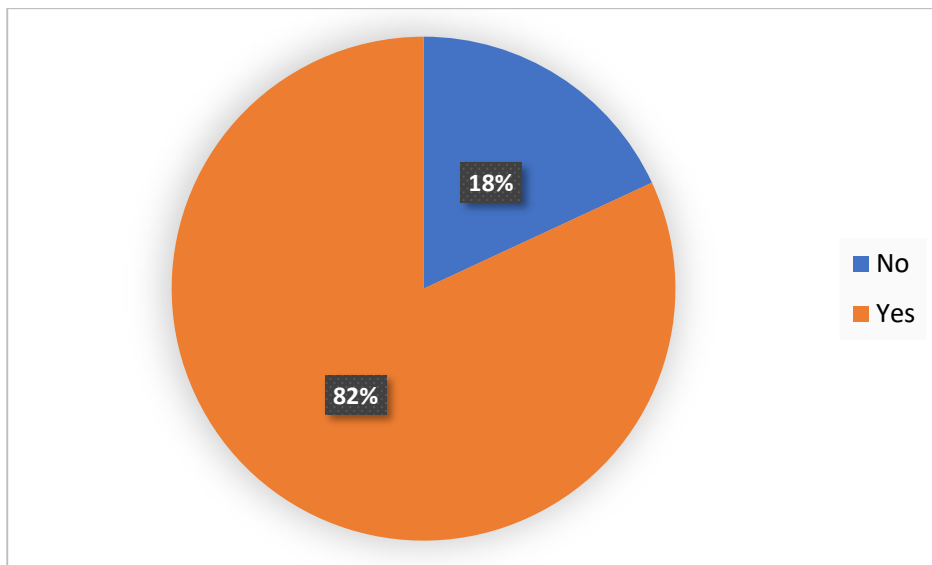


Fig 4: Engagement in secondary activity.

Even though most farmers have crop production as their main primary activity, some significant proportion of them do engage in other means of activity in other to diversify and increase their level of living. Fig 4 shows that about 82% of the respondents are in the affirmative that they engage in secondary activity besides cowpea production.

Table 4: Type of secondary activity.

Secondary Activities	Freq	Percent
Agricultural processing	19	7.6
Agricultural trade	25	10.0
Animal husbandry	85	34.1
Construction	23	9.2
Craft	3	1.2

Craftsmen (including mechanics)	6	2.4
Crop production	20	8.0
Fishing	1	0.4
Forestry production and/or harvesting	2	0.8
Formal private employment	9	3.6
Gold panning	1	0.4
Mechanical	2	0.8
Non-agricultural trade	45	18.1
Other to be specified	4	1.6
Transport	4	1.6
Total	249	100

Table 4 above shows the type of secondary activity engage by the various respondents, and from the table it indicated that about 18.1% are in to Non-agricultural trade, 34.1% are in to animal husbandry, 9.2% engaged in construction, while about 10% are in to agricultural trade. This implies that animal production is the most popular secondary activity among the interviewed cowpea producers in the study area.

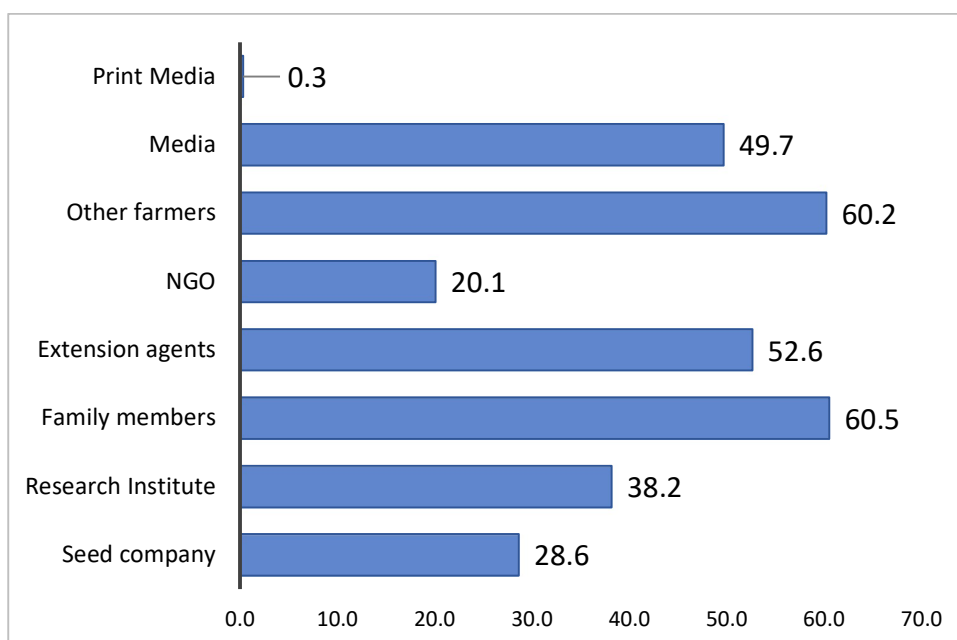


Fig 5: Source of Information.

In figure 5 above, the majority (60.5%) of the respondents said that their source of information on PBRC were family members, about 49.7% said it was from the media, 52.6% was extension agents, while about 38.2% was from research institute. This indicated that most of the source of information on PBRC for the respondents was from family members.

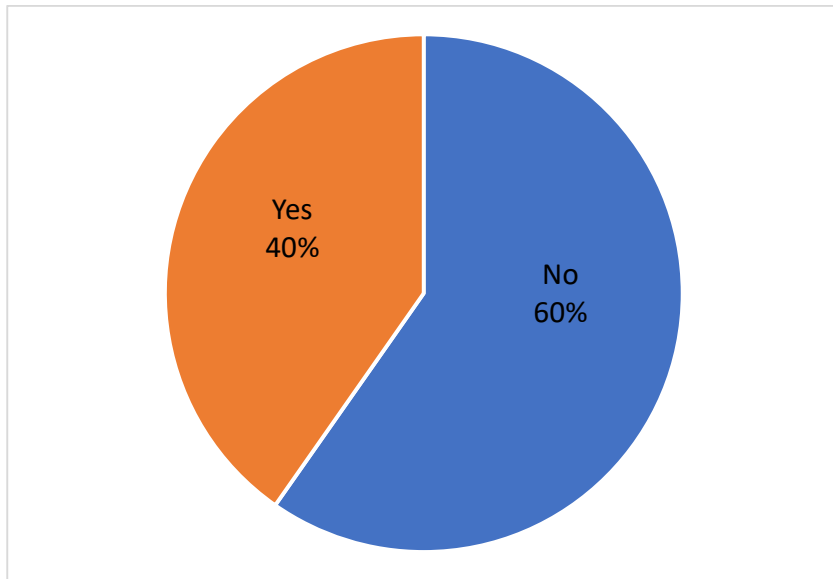


Fig 6: PBRC Awareness.

PBRC awareness among respondents was shown in Fig 6. About 60% of crop producers are not aware of PBRC, while 40% are aware. This implies poor awareness among producers as majority of them are unaware of PBRC.

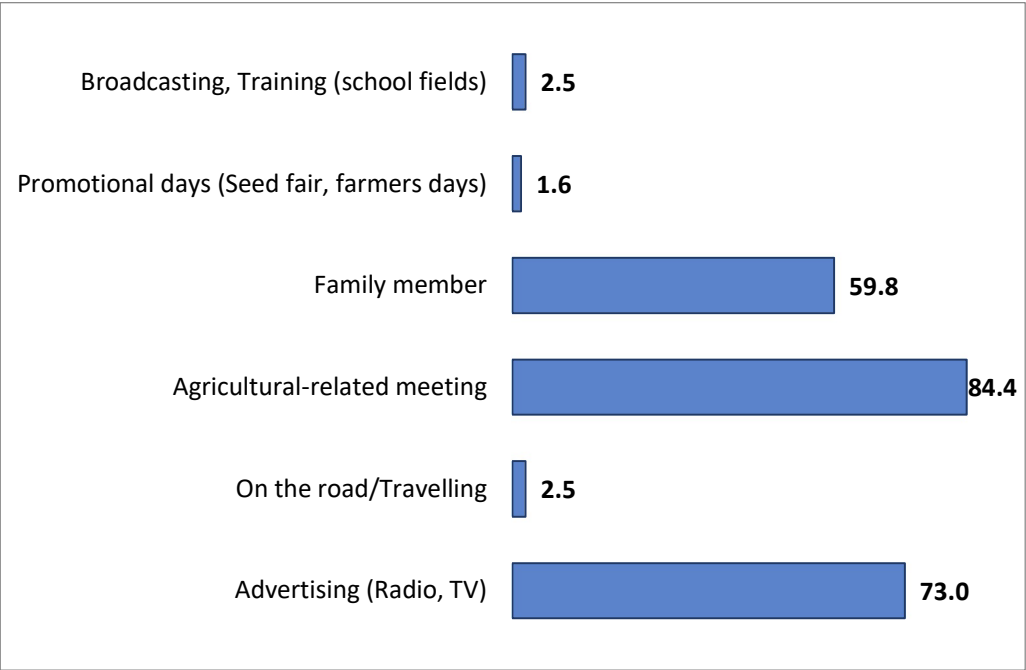


Fig 7: Source of PBRC Information.

Figure 7 shows the source of PBRC information, and it indicate that majority (84.4%) get their information from agricultural related meeting, about 73% got the information from advertising (radio, TV), with only about 1.6% of the respondents who got their information from promotional days (farmers days, seed fairs).

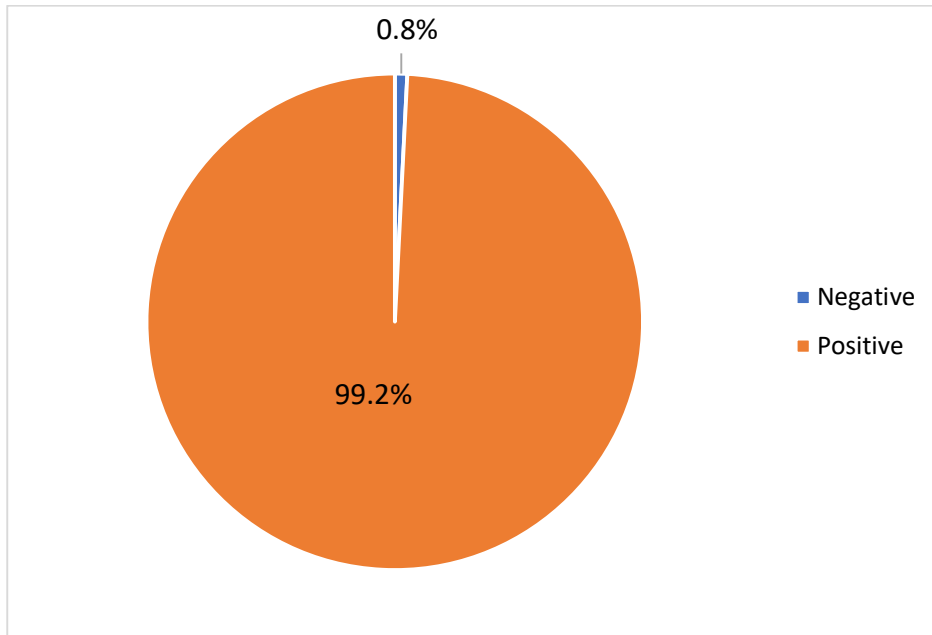


Fig 8: information provided +ve or -ve in terms of content.

On importance with respect to contents of information provided figure 8 indicated that 99.2% farmers reached reported the information as positive and only 0.8% had negative perception about the information. Positive information entails information that is regarded as important and helpful to farmers while negatively perceived information is those not seen as information that will benefit cowpea farmers.

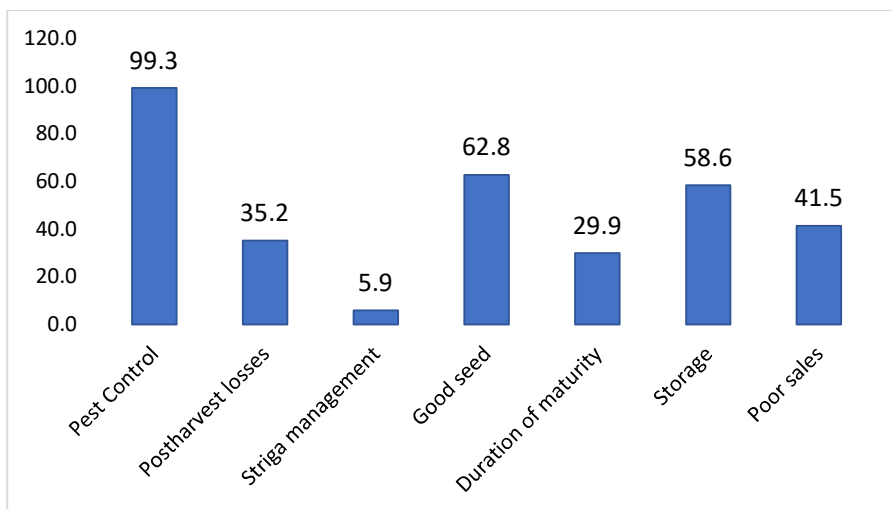


Fig 9: Challenges faced in cowpea production.

Cowpea is a crop that is susceptible to lots of challenges and at different stages ranging from input sourcing, production, and post-production stages. With respect to cowpea farmers interviewed in Burkina Faso, the most important challenge during production of cowpea as reported by over 99.3% of farmers interviewed was pest control. Quality seed is also a serious challenge within the study area and developing nations at large, it was reported by 62.8% of farmers reached. Other challenges were lack of storage facility (58.6%), Poor sales (41.5%), postharvest losses (35.2%), duration of maturity (29.9%) and striga management (5.9%).

All these pose serious challenges to cowpea farmers which has been a serious topic over the years and has resulted to serious setback in livelihood of small-scale cowpea farmers. There is therefore need for making available a seed variety that is resistant to these serious constraints.

Table 5: Alternative decision.

Will you accept an alternative?	Freq.	Percent
No	12	4.0
Yes	292	96.1
Total	304	100
If Yes or No, are you prepared to accept an alternative		
Yes	304	100
Total	304	100

Table 5 indicated and categorized small scale cowpea farmer’s opinion with respect to acceptance of an alternative to their existing cowpea variety. Majority and over 96.1% indicated interest to accept an alternative over farmers used or conventional variety while 3.9% indicated they won’t accept an alternative. The table further reported that 100% of the farmers reached are prepared to accept an alternative. The result from table 4 implies that a large proportion of cowpea farmers are in need of a substitute that could cope to the production challenge characterized with the available seed variety.

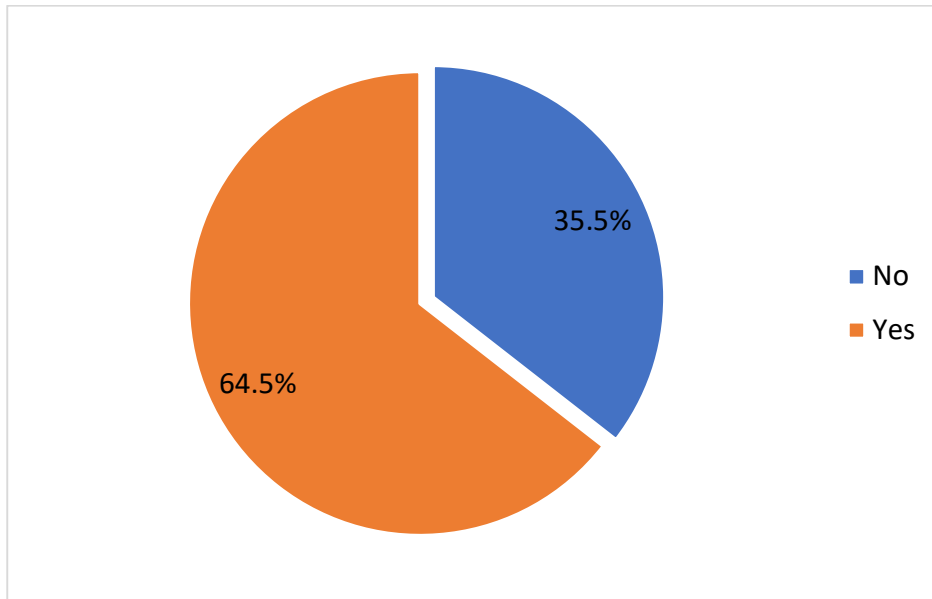


Fig 10: PBRC discussion.

Figure 10 indicated the proportion of cowpea farmers that do engage in discussion about PBR cowpea. The figure indicated that 64.5% of farmers reached engage in PBR cowpea related discussion while 35.5% do not engage in that discussion. The result could mean that farmers in the country and region in particular must have heard about the beneficial qualities of the PBR cowpea hence discussing on likely means of or advantages likely to be derived ones it is available.

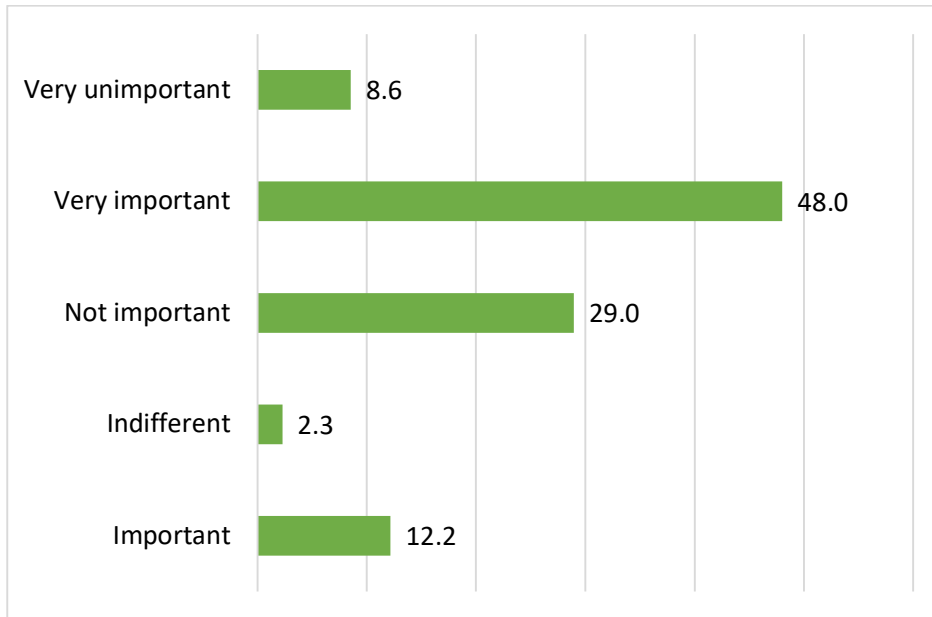


Fig 11: Importance of PBRC discussion.

The study further inquired from cowpea farmers the ratings to how they perceived their discussions with respect to PBR cowpea (Fig. 11). The figure indicated that 60.2% of farmers interviewed indicated PBRC discussion is important (12.2%) or very important (48%), while 29% regard it as unimportant and 2.3% are indifferent. The majority of farmers perceived PBRC as an important issue worthy of discussion that could improve their living standard.

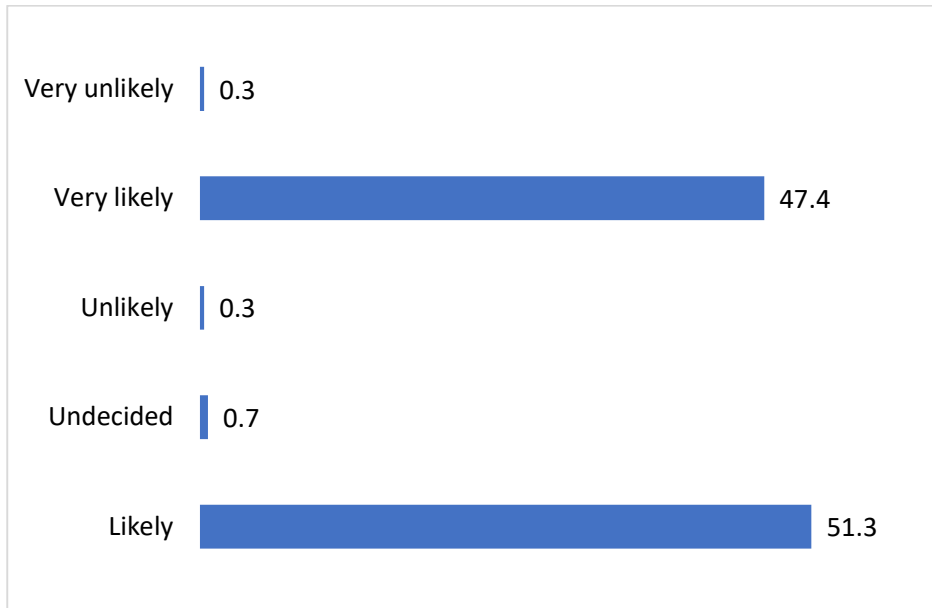


Fig 12: Likelihood of Accepting PBRC in the Future.

Fig 12 shows cowpea farmer's ratings with respect to likelihood of accepting PBR cowpea in the future. A significant proportion (51.3%) of farmers indicated they will likely accept PBRC in future and 47.4% are very likely to accept PBRC in the future. A few however indicated they haven't yet decided to accept or not.

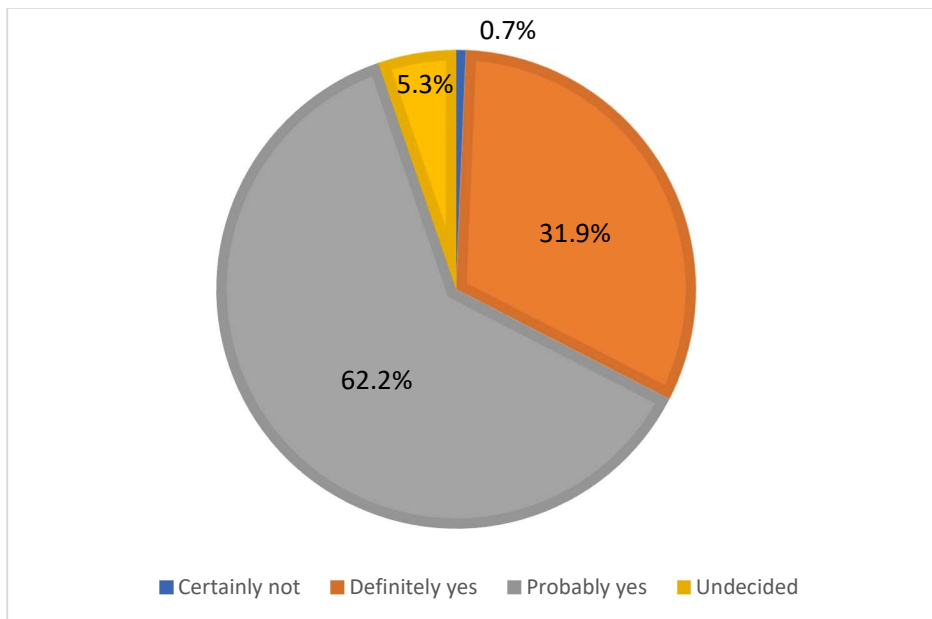


Fig 13: Production of PBRC in 5yrs.

The description displayed in fig 13 indicated that 62.2% and 31.9% of interviewed respondents reported they will probably produce and definitely produce the PBRC in the next five years respectively. About 5.3% remain indifferent (undecided) while 0.7% indicated they will certainly not engage in PBRC production in the next five years.

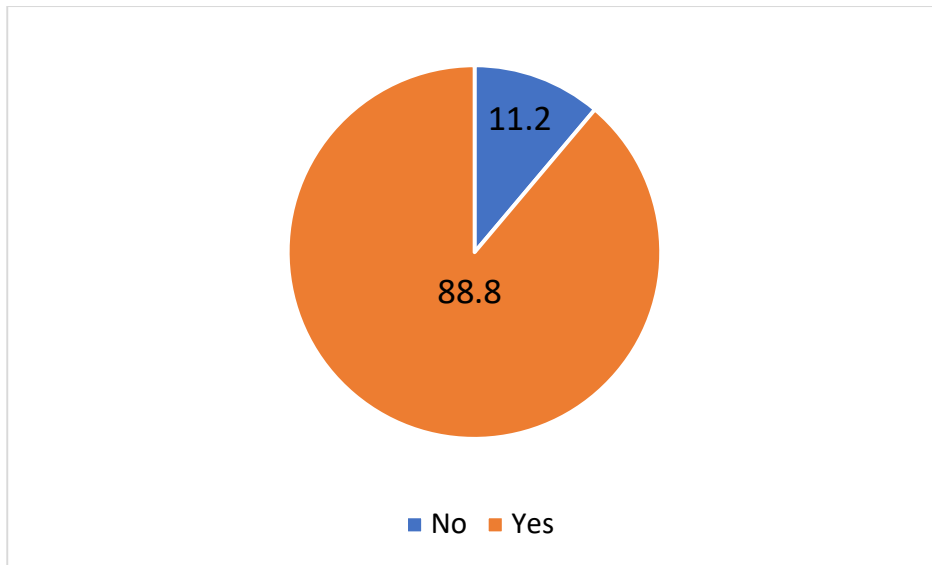


Fig 14: Payment for cowpea GAP.

Extension service delivery has become a major setback and challenge to crop producers in developing nations due to challenges of poor funding of the extension agencies hence making it difficult to discharge responsibilities of reaching out to farmers with innovations intended to improve output and eventually livelihood standards. Farmers are therefore left with the option of either going to extension agencies to sought for solutions to existing challenges and request for new techniques of production or rely on the services of private extension agents with some charges attached or in exchange for promoting inputs of organizations they are working for.

Report from figure 14 indicated that 88.8% of farmers interviewed are willing to pay for services of extension agents with respect to cowpea GAP while 11.2% are not willing to pay for cowpea GAP.

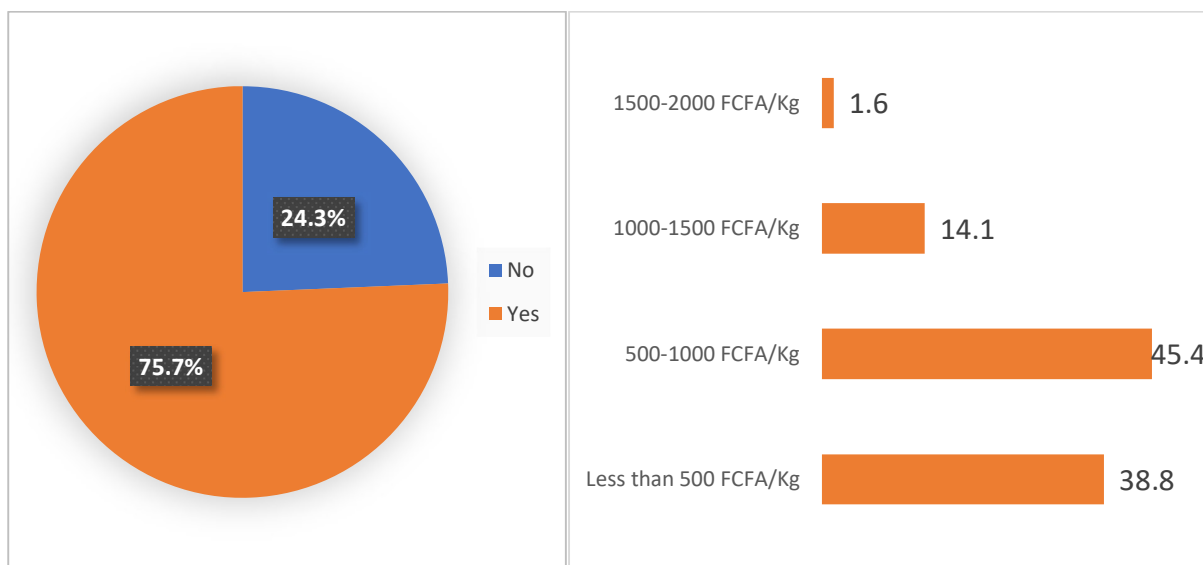


Fig 15: Payment for seed and amount intended to be paid.

Fig 15 indicates that 75.7% of farmers are willing to pay for PBRC seed ones available while 24.3% have no intent of paying for the seed. It further shows that 45.4% are the highest proportion of farmers reached and are willing to pay between 500-1000 FCFA/Kg for PBRC seed, followed by 38.8% whom are willing to pay less than 500 FCFA/kg for a PBRC seed. The least (1.6%) payment falls within the range of 1500-2000 FCFA/Kg.

Table 6: Performance indicators.

Performance Indicators (%)	Agree	Indifferent	Totally Agree
Cultivating PBR Cowpea will give a positive advantage to cowpea farm (Nonuse of Chemicals will aide soil microbes development thus improves soil fertility and structure)	48.4	0.3	51.3
PBR Cowpea will reduce the chances of having food poisoning and environmental pollution	55.3	0.3	44.4
PBR Cowpea will fetch more market price than conventional cowpea	57.9	3.6	38.5
Will Ensure sustainable crop cultivation over other cowpea seeds	63.2	2.6	34.2

PBR Cowpea is expected to save cost of applying chemicals thus brings about diversification	61.5	1.3	37.2
PBR Cowpea will generate higher yield, income which translate to enhanced living standard	60.2	3.6	36.2
Expected to improve farmers access to credit since the fear of pod borer infestation is been taken care of	58.2	3.0	38.8

PBR cowpea performance indicators in table 5 is intended to obtain farmers perception with respect to good attributes of the PBR Cowpea and from the table, it shows that about 63.2% of the respondents agreed that PBR Cowpea will ensure sustainable crop cultivation over other cowpea seeds, 61.5% also agreed that the PBRC is expected to save cost of applying chemicals thus brings about diversification. About sixty percent (60%) agreed that PBRC will generate higher yield, income which translate to enhanced living standard.

All PBR Cowpea performance indicators from information gotten from cowpea farmers support positive attributes listed in table 5. The PBRC is therefore expected to improve upon the major threats faced in cowpea production which are crop waste and/or loss due to pest infestation and the case of food poisoning that has caused lots of damage in recent times to consumers.

Conclusion

The general observation from interacting with farmers during the field survey was that only 40% of farmers reached are aware of the PBR cowpea. Many of the farmers who took part in the last field demonstrations requested that the project should release the PBRC seed. Been a Cowpea production hub, the Haut-Bassin farmers had positive perception about the PBRC and they believe it will serve as a means of improving cowpea farmers living standard. Major challenge encountered was on pest control, good seed, storage and poor sales.