



Policy Brief

Innovative approach to minimizing loss of harvest and interest in farming Cowpea: The Biotechnology Case in Ghana.

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Executive summary:

Cowpea (*Vigna unguiculata*) is a herbaceous legumeous plant with the ability to fix atmospheric nitrogen. It is less dependent on chemical fertilizers hence the choice for resource-poor farmers. Given its proteinaceous nature (containing protein), insects often compete with man for its consumption.

Cowpea provides food, cash and serves as fodder for the feeding animals. Despite this, some insect pests such as the Maruca Vitrata, can rob farmers of about 80% of their expected harvest on the farm. Since conventional methods of breeding are unable to combat this major pest, scientists using a new and innovative biotechnology approach, have developed the Bt cowpea, the genetically modified version of the cowpea in Ghana, as a way of solving one of the farmer's challenges.

The newly developed Bt cowpea (PBR cowpea), regrettably is facing two major issues relating to environmental and public health safety. Unfortunately, this is happening at a time when demand for the crop is increasing and becoming more profitable. It is

recommended that the government should encourage the development, promotion, and adoption of new technology for the scientists to continue to employ more appropriate modern and emerging technologies to develop healthy and quality seeds for the farmer.



Fig 1 Cross section of farmers in Tamale examine the PBR Cowpea products

Recommendation on the acceptance and adoption of PBR Cowpea

- The government should retool the agricultural extension agency and support the education of farmers.
- The government should equip the research and higher educational institutions.
- The government should support the seed development sector to become vibrant in the multiplication of the seeds.

Introduction:



Fig 2 Cross section of farmers at a field trip in Tamale to see the PBR Cowpea innovation

Despite its potential benefits, biotechnology and its associated genetically modified crops have come under criticism, which has sometimes resulted in social conflicts. The (PBR cowpea) Bt cowpea is one of such new crop, developed through genetic modification and whose introduction has elicited debates among the public.

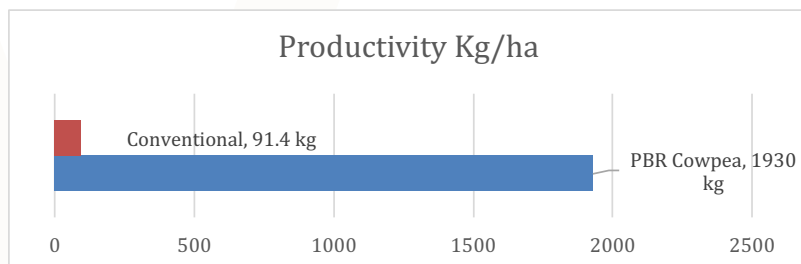
Cowpea is a rich source of protein and food energy for humans and its leaves are often used fodder for the feeding of livestock. In Ghana, the demand for cowpea outstrips the supply. There is a need to look for solutions to bridge the demand gap. In general, this yield gap has been attributed to the low average yield estimated to be under 1.0 t/ha on farmers' fields. In most cases, this low yield is attributed to a destructive insect pest cowpea borer (*Maruca Vitrata*), which alone can cause about 80 percent loss on the farm. Destruction of cowpeas by pests makes it difficult for resource-poor small-scale farmers to cultivate large acres of land and to make more money.

In recent years, scientists have used biotechnology tools to arrest the situation when it was realized that conventional systems of breeding could not address the problem. The use of GM technology has helped farmers to make money by giving them better seeds that resist the destructive insects from feeding on the crop in the field.

The government needs to focus attention on the acceptance and utilization of this innovative approach in agriculture and the food value chain in Ghana. This is because the adoption of this variety of cowpea will improve the success of agricultural policies such as the Food and Agriculture Sector Development Policy (FASDEP) and Planting for Food and Jobs which seek to create more jobs, particularly for the youth and food for the population ensuring that the country achieves food security. It will also increase the income of the farmers while reducing the use of agrochemicals and the pollution of the environment.

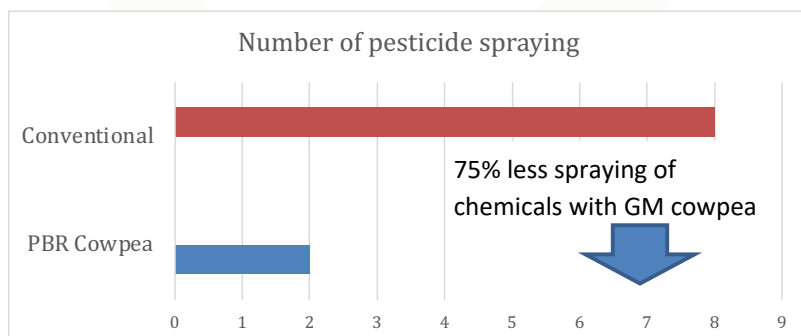
The Innovative Approach-PBR Cowpea

Ghana's annual demand for cowpea is estimated as 169,000 tons but the country produces only about 57,000 tons annually. This is because the average yield on farmers' fields is below 1.0 t/ha, attributed mainly to the destructive pests, that feed on the crop on the farm.



CSIR -SARI, Confined field trial data (2018)

To avoid losses, farmers are forced to spray 8 times to control the pest. This means spraying weekly for a crop that takes about 12 weeks to mature. The effect of high doses of pesticides has a devastating effect on farmers and the environment. It is harmful to the environment, harmful, and expensive to the farmer. Given this, various varieties of cowpea have been developed conventionally but none has the potency to protect the crop against the pest. Therefore, scientists have developed a new variety using genetic modification (GM) technology to protect the cowpea from damage by the Maruca pest. GM technology used in the development of PBR cowpea has the possibility to avert the challenges of the farmers that have to do with pest damage and ensure food security and income growth.



Policy Implication

In furtherance of the Food and Agriculture Sector Development Policy (FASDEP), the adoption of PBR Cowpea, which is a genetically modified crop, has the potential to stabilize the income of farmers through higher yield as a result of the ability of the crop to resist destruction by insects and less use of chemical pesticide. The goal of FASDEP to ensure food security in the Northern part of Ghana can be achieved by the adoption of PBR Cowpea. In furtherance of the Planting for Food and Jobs Policy, the application of this technology in the agriculture sector will boost production and productivity and create more jobs.

Recommendation:

- It is recommended that to enhance the acceptance, adoption, and use of the technology, the government needs to retool the agricultural extension agency and educate farmers.
- It is recommended that the government equips the research and higher educational institutions to enhance acceptance, adoption and use of the technology.
- It is recommended that the government should support the seed development sector to become vibrant in the multiplication of the seeds to enhance acceptance, adoption, and use of the technology.

Conclusion

The adoption and use of this technology in the agricultural sector will alleviate the challenges faced by cowpea farmers, ensure the stability of farm income as well as create more jobs for the youth.



