

Pod-borer Resistant Cowpea Project



Pod Borer Resistant
COWPEA



Kirkhouse
Trust





Background

Cowpea (*Vigna unguiculata L. Walp*) 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 its energy content almost equal to that of cereal grains; 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.

12.5 million... *hectares of land on which cowpea is grown in Africa*

200 million... *Average number of people in Africa who consume cowpea*

Developing a pod-borer resistant cowpea

The pod-borer *Maruca-vitrata* perennially damages cowpea pods in fields leading to upto 80 percent of crop yield losses

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. Control through spraying with insecticide has not been widely adopted by farmers due its prohibitive costs. On the other hand, farmers who have adopted control through spraying have been exposed to 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 cowpeas in areas where this pest is a problem.

Project goal

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.

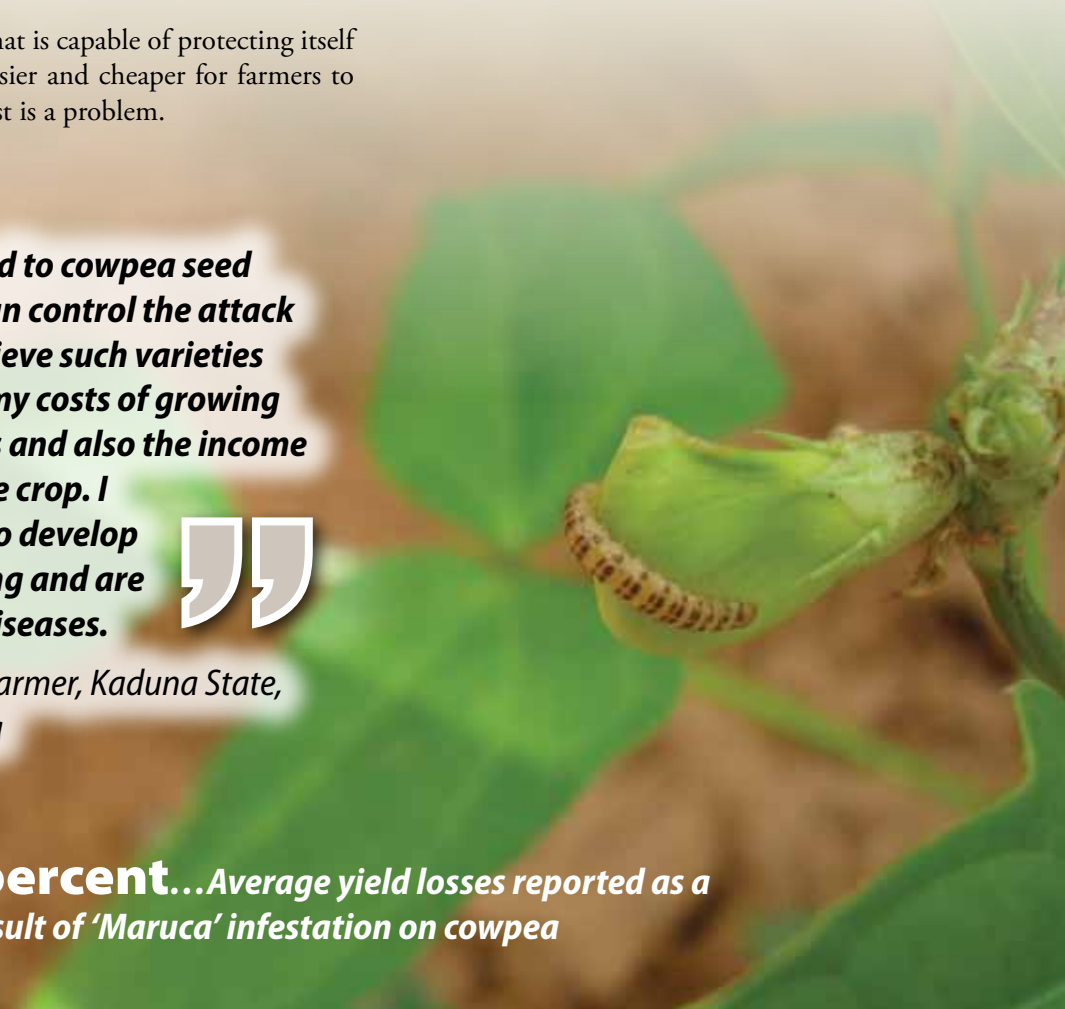


I look forward to cowpea seed varieties that can control the attack by pests. I believe such varieties would reduce my costs of growing cowpea, increase my yields and also the income I get from the sale of the crop. I would want researchers to develop seeds that are high yielding and are resistant to pests and diseases.



Momodu Ahiaba, cowpea farmer, Kaduna State, Nigeria

70-80 percent... Average yield losses reported as a result of 'Maruca' infestation on cowpea



Implementing the Pod-borer Resistant Cowpea Project



Cowpea facts and figures

- Cowpea is grown on more than 12.5 million hectares in Sub-Saharan Africa
- Nearly 200 million people in Africa consume cowpea
- In severe infestations, the pod-borer ruins 70–80 percent of harvests
- Africa accounts for 65 percent of the world's cowpea production

The Pod-borer Resistant Cowpea 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 and provide farmers with an alternative to costly and hazardous insecticide spraying.

The project entails transferring the *Bt* gene, which confers resistance to the pod, into improved cowpea varieties.

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 and Nigeria and Burkina Faso, have progressed into multi-locational trials.

The project is also conducting studies on safety for food, feed and environmental risks assessments for regulatory approvals in the target countries before seed release to farmers.



For a lab-based scientist, the cowpea project has been hugely satisfying. I can see how our work can help resource-poor farmers and make a contribution to food and ecological security for Africa.

Dr TJ Higgins, Commonwealth Scientific and Industrial Research Organisation



Expected benefits of using a Pod-borer resistant cowpea

- The new varieties are expected to improve nutrition and food security for about 8 million farmers and their families
- Use of improved varieties is expected to contribute to better health, environment and income for farmers
- The need for frequent spraying with insecticide to control the pod borer will be reduced
- Smallholder farmers are expected to increase their yields by over 20 percent

8 million ...*farmers and their families who are expected to benefit from improved cowpea varieties*



Pod-borer Resistant Cowpea Project Partnership



- AATF coordinates project activities, and negotiates access to proprietary technology and their sub-licenses.
- Commonwealth Scientific and Industrial Research Organisation (CSIRO) develops transformation and regeneration protocols and characterises the *Bt* expressing transgenic events.
- The national programmes – Council of Scientific and Industrial Research- Savannah Agriculture Research Institute (CSIR-SARI) Ghana; Institute of Agricultural Research (IAR), Nigeria; Institut de l'Environnement et de Recherches Agricoles (INERA), Burkina Faso; and National Biotechnology Development Agency (NABDA), Nigeria, support the conduct of agronomic and confined field trials to test the efficacy of the transgenic events in the countries.
- Monsanto donated the *Bt* gene royalty-free for use in the project.
- Network for the Genetic Improvement of Cowpea for Africa (NGICA) is an international research consortium that initiated the development of *Maruca*-resistant cowpea.
- Program for Biosafety Systems (PBS) provides technical backstopping and regulatory advice.
- Kirkhouse Trust provided the marker assisted selection technology.

Investor

United States Agency for International Development (USAID) provides financial support to the project.

“
When NGICA approached AATF to assist with accessing the rights to the 'Bt' gene (*cry1Ab*) from Monsanto Company to be used in developing a 'Maruca' resistant cowpea, I started to see hope for our farmers. Today, I see that hope coming closer to reality and I look forward to the day when I will actually be able to share the 'Maruca'-resistant cowpea seed with farmers.”

Professor Mohamed Ishiyaku, Pod-borer Resistant Cowpea Project Principal Investigator, IAR Nigeria

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