Overview

1. Challenges of global cocoa production
2. Our sustainability efforts – *Cocoa Life*
3. Mabang Megakarya Selection Programme (MMSP)
4. Development of forecasting methods for pest attack to inform pest management strategies
Challenges of global cocoa production
Cocoa thrives in narrow geographic area

Key cocoa origins % of global supply

WEST AFRICA 70%
- Cote d’Ivoire 35%
- Ghana 25%
- Nigeria 5%
- Cameroon 5%

LATIN AMERICA 10%
- Brazil 5%
- Ecuador <5%
- Peru <5%
- Dom Rep <5%

ASIA 20%
- Indonesia 10%
- Malaysia <5%
- Vietnam <5%
- India <1%
Issues facing cocoa production

- Cocoa production is confronted with a myriad of challenges
  - ageing trees
  - poor farming practices
  - Low use of fertilizer
  - Ageing farmers; youth not interested in cocoa/rural life

Key among these challenges is the pressure from pest and diseases

Cocoa pest and diseases accounts for about 40% of global loss of cocoa production annually
Damage caused by major Cocoa Pests/diseases

- Swollen shoot disease
- Black pod disease \( P. megakarya \)
- Mirids
Demand predicted to outstrip supply

Without intervention a 1MM tonnes deficit is forecast by 2020

Source: LMC
Our Sustainability efforts
<table>
<thead>
<tr>
<th>Category</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming</td>
<td>Low yields due to aging trees, poor farming practices and lack of access to inputs.</td>
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<tr>
<td>Community</td>
<td>Many cocoa communities lack basic infrastructure making them unattractive places to live. Limited access to education and health services. Challenges around gender equality and women’s empowerment.</td>
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<tr>
<td>Livelihoods</td>
<td>The limited cocoa season and poor returns means that poverty and food insecurity are real challenges for the many small-holders which make up cocoa farming communities.</td>
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<td>Youth</td>
<td>Cocoa is struggling to attract young people from farming communities resulting in an aging and declining workforce. Child labour continues to be a problem in cocoa communities.</td>
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<tr>
<td>Environment</td>
<td>Cocoa farming is conducted in a very narrow geographic area, vulnerable to the challenge of climate change.</td>
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Our sustainability efforts

“Cocoa life” has committed to invest $400 Million to improve the livelihoods of more than 200,000 cocoa farmers and about one million people in cocoa farming communities.

- Cocoa Agricultural Sci. Programme
  - Work with National research institutions to develop technologies needed to double productivity
- Recognize the need to intensify efforts in the fight against common cocoa diseases

Breeding for resistant cocoa varieties is one of the key elements for sustainable management of pests and diseases.
Example Projects
In collaboration with other stakeholders:

- Ghana Cocoa Board
- Cocoa Research Institute of Ghana (CRIG)
- The Dutch Government
- Cocoa Research (UK) Ltd
- Ghana Cocoa Growing Research Association
- Mars Incorporated
Mabang Megakarya Selection Programme (MMSP)

- *P. megakayra*
  - Devastating form of black pod disease

- Cannot be controlled economically with fungicide sprays or other cultural techniques
Objective of MMSP

Develop planting materials in Ghana, which would produce high yields of good quality cocoa, even under heavy pressure from Megakarya Black Pod disease, as well as other pests and diseases.
Project Site - Mabang

- Located 5km N of Tepa on the Ashanti-Brong Ahafo border
- Cocoa farming is a source of income for inhabitants
Project Site

- Green field site (219 Ha) located in an area with high incidence of *P. megakarya*
- Excellent facilities, including a world class nursery
Seedling and clonal trials
Benefits of MMSP

➢ Promising clones have been identified for a medium scale trial

➢ The short term benefit of MMSP will be improvement of the output of Ghana’s existing and planned seed gardens through use of superior pollen parents

➢ In the long term, trials underway will lead to the identification of clonal cultivars
Development of forecasting methods for pest attack to inform pest management strategies

- Mirids - major pest of cocoa in West Africa feed on new leaves and shoots

- Control methods mainly on the use of conventional insecticides – some of which have been banned due to high toxicity to mammals and the environment and also the development of insect resistance to these chemicals

There is therefore the need for timely and effective application of insecticides in a relatively environmentally friendly manner
Development of forecasting methods for pest attack to inform pest management strategies

- Since mirids feed on leaves and shoots, knowledge of factors influencing flushing and shoot development are important considerations in mirid control strategies.

- Furthermore, little is known about the effect of light and temperature on nutrients and plant defence compounds on mirid feeding sites on cocoa.
Objective of the study

To gain a better understanding of the interaction of light and temperature on cocoa leaf flushing, shoot growth, nutrients and phenolics in cocoa.

A better understanding of these parameters could help develop strategies to accurately forecast mirid incidence on farms.

Accurate forecasting of mirid numbers in cocoa farms will help develop an effective Integrated Pest Management program for mirid control.

Appropriate timing of application could keep mirid numbers below economic threshold levels.
Cocoa seedlings (var. Amelonado) from the Int. Cocoa Quarantine Center, (UoR) have been subjected to different degrees of temperatures and different intensities of photosynthetically active radiation (PAR).

Results have shown that different PAR and temperatures used resulted in significant differences in the vigour of leaf flushing and shoot growth and of concentrations of nutrients and defence compounds (phenolics).

The hypothesis is being tested in the field to provide further indications as to why mirids prefer unshaded cocoa.
Conclusion

- As the World’s largest chocolate company, Mondelēz International remain committed to the sustainability of the cocoa sector and will continue to support initiatives that are crucial to the long term sustainability of the crop.

- We are therefore committed to the fight against common cocoa diseases to reduce loss and increase cocoa yield.
Thank you