

TECH NEED

Seeking Sustainable Methods For Reducing Usage And Environmental Impact Of Agrochemicals



KEY INFORMATION

TECHNOLOGY CATEGORY:

Chemicals - Agrochemicals

Life Sciences - Agriculture & Aquaculture

Life Sciences - Industrial Biotech Methods & Processes

Chemicals - Bio-based

TECHNOLOGY READINESS LEVEL (TRL): **TRL8 TO TRL9**

COUNTRY: **SINGAPORE**

ID NUMBER: **TN174403**

BACKGROUND/DESCRIPTION

Good agricultural practices form part of the armoury against pests and diseases which reduce yield losses by promoting healthy crop growth and improved tolerance of stress including attack from pest and diseases. For example, optimising the soil microbiome has been shown to increase the nitrogen fixing capability of microbes found in the root system of some crop species. There are also other natural approaches currently available that can successfully control diseases and pests. For example, endophytic *Trichoderma martiale* strain ALF 247 is used to control black-pod rot in cocoa, although in many cases further development is required to provide economically viable methods for biocontrol at scale.

Another example of a natural approach that has been successfully brought to market is the production of peanuts with a reduced level of aflatoxin through the application of a competitive strain of *A. flavus*. This strain is not capable of making the aflatoxin and out-competes the toxin-producing strains naturally present, thereby lowering levels to 3% of what it would otherwise be in

shelled, edible-grade peanuts. In many cases, it is thought that this natural pesticide has sufficient efficacy but with the added advantage of much lower levels of detrimental side effects compared to the standard synthetic chemicals.

Chemical fertilisers, particularly nitrogen, are a major source of greenhouse gas emissions both in the production phase and on-farm. To sustainably increase yield, there is a need to improve efficiencies of nutrient use, reduce losses and ideally identify low carbon nutrient sources.

The company is seeking sustainable methods that can reduce the amount of agrochemicals being used, and/or its environmental impact.

TECHNOLOGY SPECIFICATION

- Crops of interest: Wheat, Cocoa
- Effective control of pests and diseases
- Improve nitrogen fixation
- Easy to handle materials – low environmental sensitivity, i.e. product stability to sunlight, humidity, temperature, rain
- Microbiological solutions should have high survival rate of strains and maintain efficacy under field conditions typical for cocoa and wheat
- Environmentally friendly – biodegradable or do not persist in the local or downstream environment
- Should not require additional equipment or investment for farmers
- Reduced carbon emissions
- Must have at least proof-of-concept data

Possible approaches: Soil microbiome technology, other environmentally benign alternatives, solutions that reduce greenhouse emissions, etc.

WHAT WE ARE NOT INTERESTED IN

- Solutions with short shelf life or those that require a controlled supply chain
- Genetic control systems and methods
- Solutions that are based on / require continued usage of synthetic pesticides

PREFERRED BUSINESS MODEL

- Licensing
- Others
- R&D Collaboration