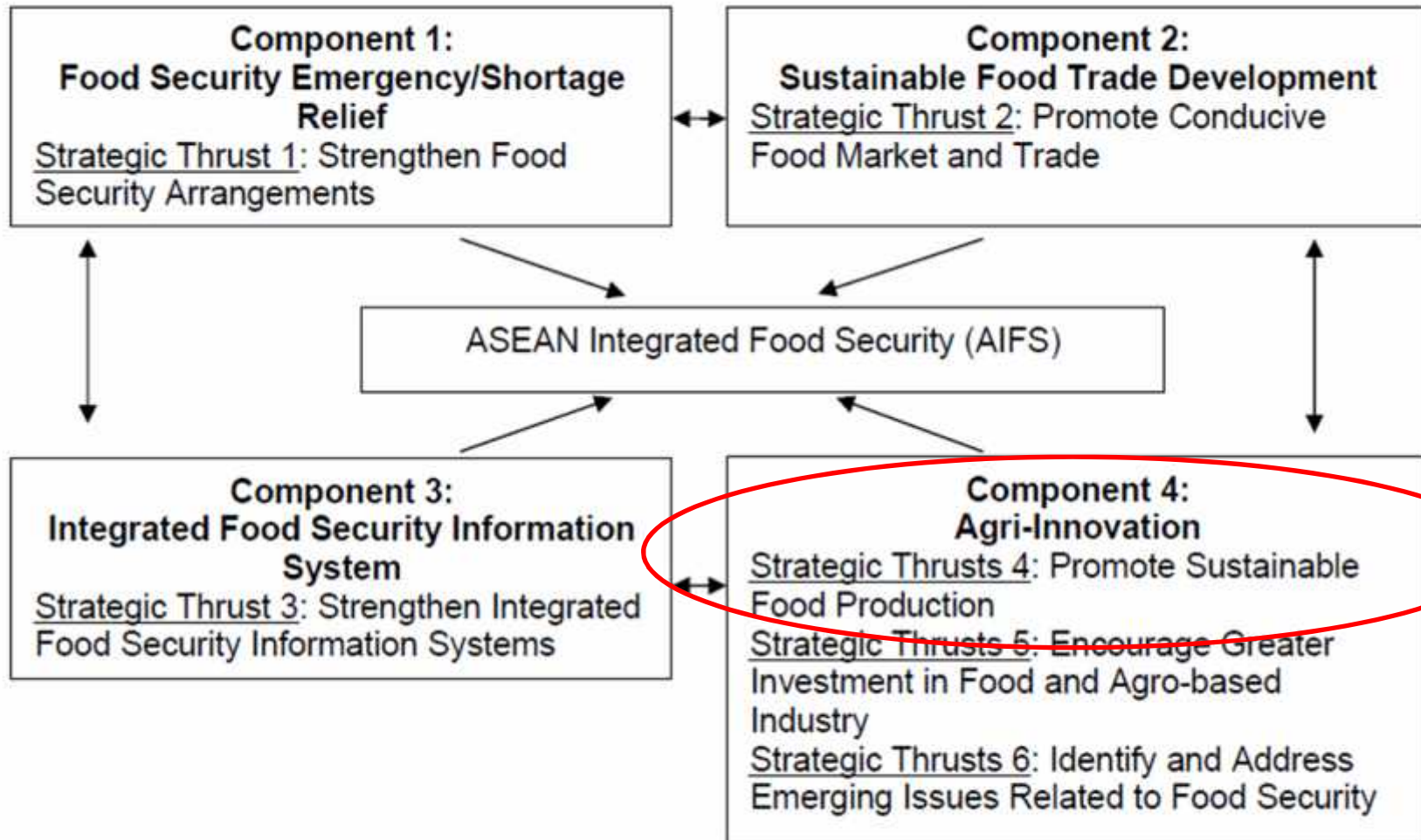


ASEAN Sustainable Agrifood Systems (ASEAN Biocontrol)

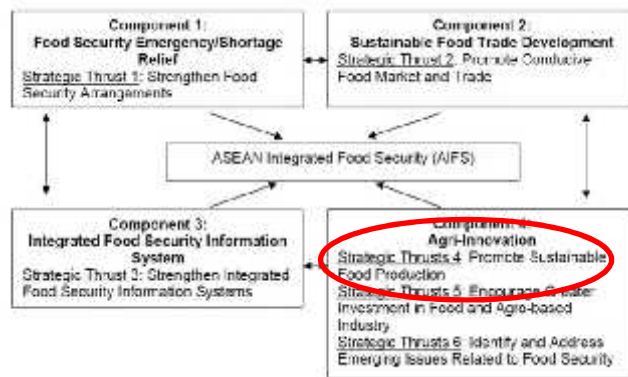


Overall Objective

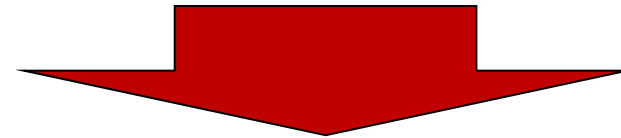
“To enable ASEAN Member States to implement the **ASEAN Integrated Food Security (AIFS) Framework and its Strategic Plan of Action (SPA-FS), Strategic Thrust 4: Promote Sustainable Food Production, at the national level”**



Source: Appendix 1 of the AIFS Framework



4 Action Programmes:



1. Improve **agricultural infrastructure development** to secure production system, minimize post-harvest losses, and reduce transaction cost. (supply chains, irrigation, inputs)
2. Efficient **utilization of resource potential** for agricultural development. (natural resources, PPPs, GAP)
3. Promote **agricultural innovation** including research and development on improving productivity and agricultural production.
4. Promote closer collaboration to accelerate **transfer and adoption** of new technologies.

➤ ASEAN Member States

- National authorities and consumer representatives are able to provide **more satisfactory services** to their customers
- **Environmental benefits** from less application of chemical inputs
- **Economic growth** in the BCA and organic fertilizer sector and through increased export volume of agricultural commodities

➤ Farmers in ASEAN

- **Income opportunities** in new “sustainable” agricultural market
- Comply with **quality standards**
- **Increased productivity and reduced costs** from applying appropriate production methods

- **Consumers in ASEAN**
 - **Healthy and safe food** with less pesticide residues

- **Private Sector**
 - **Harmonized production guidelines** of private sector amongst AMS
 - **Improving market opportunities** for private sector in both sustainable agricultural production and processing

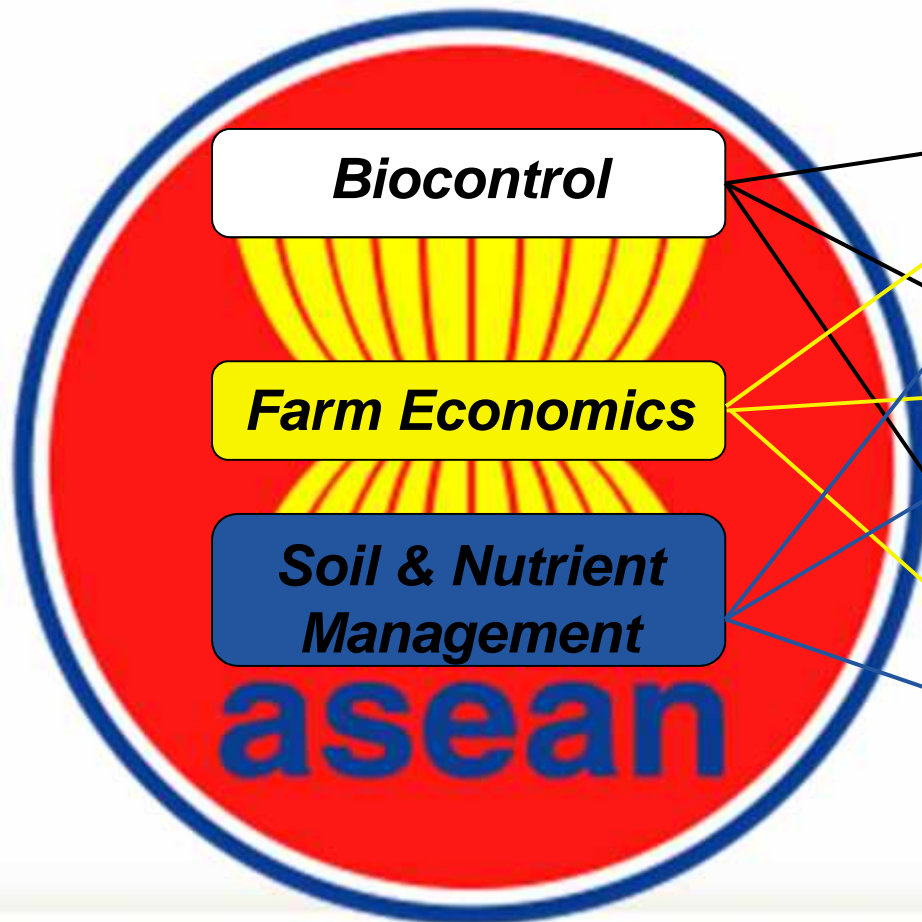
Team of “ASEAN Sustainable Agrifood Systems”



Areas of Interventions

Priority Topics

Priority Crops





CAM, LAO



Focus

Organic Standard
(Rice)

Partners



TA
7833



1

2

3

Challenge

- Farmers grow organic food traditionally but got no added value market channel
- National voluntary standards are not complying with international standards
- Consumer fraud due to missing regulation

Approach

- Drafting an Organic Standard based on existing standards in the region
- Multi stakeholder workshops
- Developing guidelines on organic production and certification processes

Outcome

- A first national organic standard in Cambodia and an extension on the Lao organic standard for rice
- National standards secure against Consumer fraud and enhance food safety
- Market diversification and added value



CAMBODIA



Focus

Organic Fairtrade Rice
SRI

Partners



Added market value:
100.000 €



Challenge

- Individual Rice Farmers depend on middlemen oligopol
- No market access for organic products

Approach

- Forming of cooperatives
- Training on System of Rice Intensification (SRI) and Organic Agriculture
- Certification
- Local and International Commerce

Impact

- Over 1,000 farmers get 25% above the average market price as organic top up
- Farmers handle an own Social Development Fund through Fair Trade
- Use of natural resources is increased
- Water consumption is decreased

- 1
- 2
- 3



CAMBODIA



Focus

Regulation and
promotion of Biocontrol
Agents (BCA)



Partners



+ Private sector
+ Local Producers

1

2

3

Challenge

- Pests show strong resistances against chemical inputs
- Farmers are unaware of bio control
- BCA are not available on the market

Approach

- Development of regionally coordinated policies and strategies and implement them in Cambodia
- Field research with local produced and imported BCA
- Market Linkages
- Capacity Development of Officials, Extensioners and Farmers
- National Fora on BCA

Funding

- Cofinancing: USAID
- Integrated PPP

What is Trichoderma ?

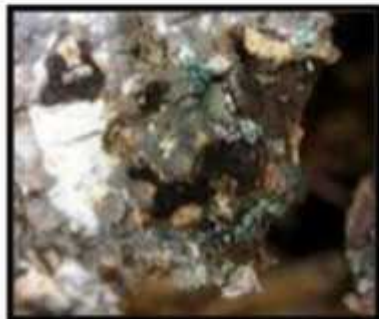


- *Trichoderma* spp. are free-living fungi that are common in soil and root ecosystems
- Trichoderma species have been investigated for over 80 years
- They are opportunistic, avirulent plant symbions, as well as being parasites of other fungi
- *Trichoderma* are used as biocontrol agents against several plant pathogenic fungi like *Rhizoctonia* spp., *Pythium* spp., *Botrytis cinerea* and *Fusarium* spp. which cause both soil-borne and leaf- or flower-borne diseases of agricultural plants



WHERE DO THEY COME FROM?

They can be easily isolated from soil, root, decaying wood and other forms of plant organic matter



SYMPTOMS



Wilt



Spot



Black Rot



Soft rot



canker



Damping off



Root Rot



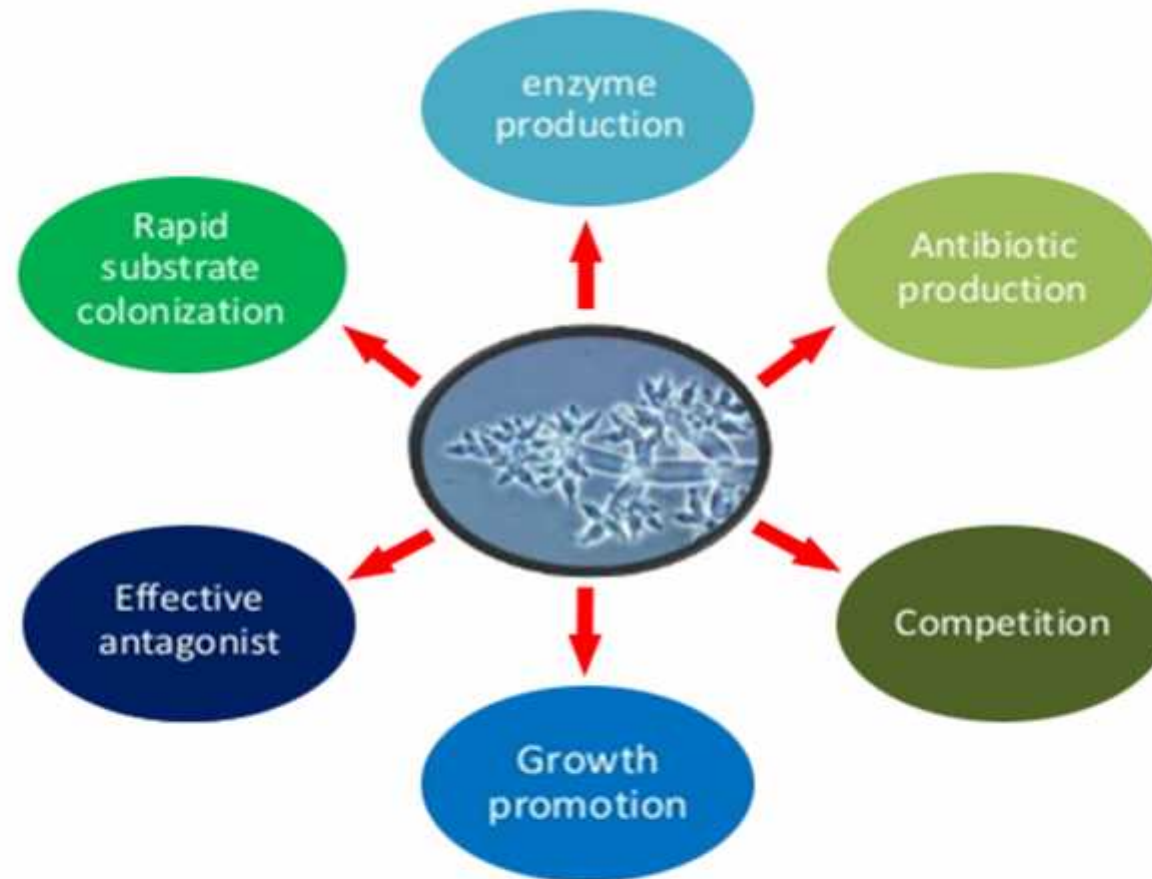
Advantages



- Enhance yield along with quality of produce
- Boost germination rate
- Increase in shoot and root length
- Augment nitrogen fixing
- Promote healthy growth in early stage of crop
- Increase dry matter production substantially
- Harmless to human and livestock
- Act against a wide range of pathogen fungi
- Grow rapidly and quickly colonize soil
- They can promote nutrient uptake and enhance plant growth
- Provide natural long term immunity to crops and soil



How Trichoderma works



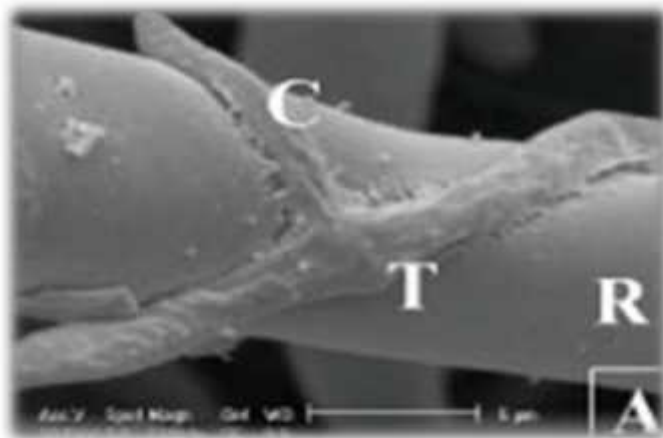
POTENTIAL BIO CONTROL ACTIVITIES EXHIBITED BY TRICHODERMA

Capability between T & R

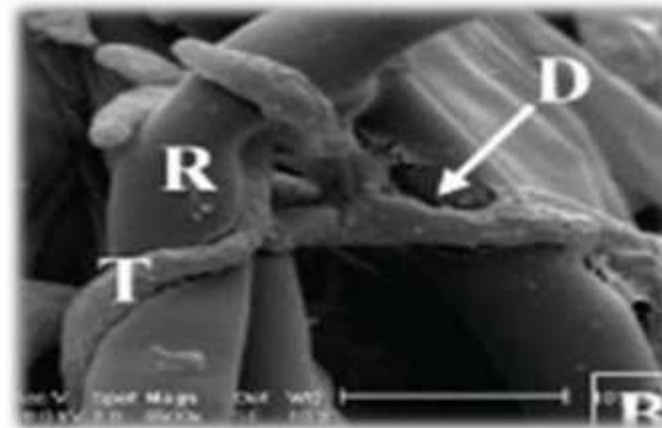


Trichoderma coils around, penetrates, and kills other fungi that are pathogenic (*i.e.* cause disease) to crops. It can digest their cell walls

A clear view with an electron microscope



Trichoderma spp. (T) fungal strands coil (C) around the *Rhizoctonia* (R)



Initial stages of degradation (D) as a result of *Trichoderma* generated enzymes.

T: *Trichoderma* R: *Rhizoctonia*

Asean Biocontrol Project - GIZ



Control



**Cow manure
+Trichoderma**

Results



Treatments	Yield (kg)
T1	2025
T2	3987
T3	5462
T4	6076



Treatments:

T1= Control (without compost)

T2= Compost without Trichoderma (20T/ha)

T3= Compost with Trichoderma (20 T/ha, 1 kg of Trichoderma powder mix with 1T of compost)

T4= Compost with Trichoderma and spray 4 times of Trichoderma (20T/ha, 20g of Trichoderma mix with 20L of water)

Trichoderma demo on egg plant



Trichoderma



Control

Direction to apply Trichoderma

- To be ready tools for mixing and treatment as like: spade, watering can, stick, plastic cover and completed compost with the rate 1kg Trichoderma per ton of compost
- Put Trichoderma into water in the watering can and stir till the powder is complete dissolved
- The Bio-compost need to have moderate moisture constantly (approx. 50% moisture)
- Within 4-5 days of treatment, Trichoderma will successfully develop showing a white foam on the compost. Treatment should be placed away from sunlight and rain



Direction to use Trichoderma (Cont)



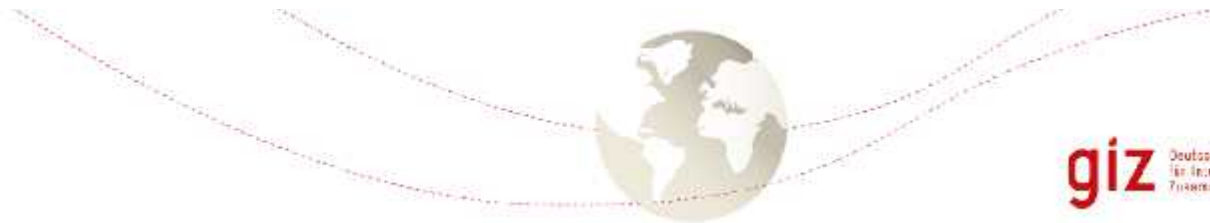
- For a good fertilization of your rice field it is recommended to use 20 tons of compost per hectare (2 kg/1square meter), depending on soil quality, the use of additional fertilizer and variety (short term, long term, yield expectation).
- Apply in evening time in humid condition. If conditions are dry, irrigate the land before application.
- For seed treatment, mixing 6-10g of Trichoderma power per kg of seed before sowing.



Caution



- Apply during evening in humid conditions. If conditions are dry, irrigate the land before application.
- Chemical fertilizers/insecticides should not be sprayed before or after 5 - 7 days for best results.
- Do not mix with chemical fertilizers or insecticides at the time of application.
- Store in cool place away from direct sun light and heat. Moisture is a essential factor for its growth and survivability
- High pressure rates with spray equipment can damage or destroy beneficial microorganisms.
- It doesn't grow in alkaline pH(above 8)



Thanks