GROUP 1:

CONTROL STRATEGIES INCLUDING SURVEILLANCE SYSTEM







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INTRODUCTION

- GAS infestation has spread to almost all of the rice bowls of many countries.
- Prevention & management of GAS in most Asian countries are still in the infancy stage due to the lack of qualified staff; financial constraint; paucity of appropriate information; lack of legal work, notably concerning implementation & low level of societal awareness concerning the negative impacts of the pest on the population & the economy.

INTRODUCTION

- There are several options on control measures for GAS. However, the effectiveness of each control measure varies due to several factors such as improper planning, cooperation among farmers and lack in knowledge and exposure to control technologies.
- Efforts need to be emphasized on integrated strategies as there is no single method that can prevent the spread of GAS
- The implementation of the appropriate measures can be strengthen by synergizing R&D, extension services and through regional cooperation and collaboration.

OBJECTIVE

- To identify the effectiveness of the control measures on GAS
- To improve and strengthen current strategies in controlling GAS which are more environmentally safe and cost effective
- To develop new control methods through R&D, extension services and through regional cooperation and collaboration
- To manage the golden apple snail through integrated control measures from spreading in order to sustain the yield



OPTIONS OF CONTROL MEASURES

Control Measures	Methods	Strength	Strategy
CULTURAL	• Transplanting	• Promote transplanting using machines, water must be controlled and using older seedlings (more than 15 days) for manual transplanting	• Costly - farmer cooperatives to help farmers rent/purchase machines • Government provide incentives
	• Broken rice (rejected rice) as bait and eventually kill the GAS	• Cheaper than chemical (Lao PDR experience)	• More research should be done



Mechanical transplanting

Manual transplanting

Control Measures	Methods	Strength	Strategy
CULTURAL	Soil levelling	• use of proper tools (Laser)	• costly - government subsidise / incentives
	Control Water level : 2- 3cm	• good irrigation and drainage system	• government must build the infrastructures • Strengthen extension services

Control Measures	Methods	Strength	Strategy
CULTURAL	Lime application plus rice husk before transplanting/ sowing at high population area (500kg/ha)	• effective in high population area (3-5 snails/m sq) • time of lime application immediately before transplanting	• availability of rice husk • needs mechanical dispenser

Control Measures	Methods	Strength	Strategy
CULTURAL	• In-field drain about 5 cm depth	• Ease collection of snails	• Integrate with baiting
	• Controlled complete straw burning (if allowed)	• Eliminating /reduce GAS population	• Comply with DOEnvironment regulations (certain countries)
	• Handpicking of egg mass and snails at critical stage (1-30 days after transplanting)	• Easy to collect egg mass and snails	• Regularly and community involvement • Strengthen extension services

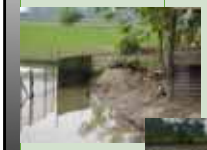


Control Measures	Methods	Strength	Strategy
PHYSICAL / MECHANICAL	• Mechanical ploughing	• Disturb the aestivating snails	• Strengthen extension services
	• Strainers at water inlet and outlet	• Collecting adult snails	• Must be monitored more often to prevent from blockage by the debris • Use the right mesh size • Strengthen extension services



Control Measures	Methods	Strength	Strategy
PHYSICAL / MECHANICAL	• Staking (bamboo, wood etc)	• Ease collection of egg mass	• Regular monitoring (every 3 days) • Strengthen extension services
	• Baiting using biological attractants - papaya leaves, jackfruits, taro leaves, tuber	• Collecting adult snails	• Regular monitoring (every 2 days within 65 days after sowing)

Control Measures	Methods	Strength	Strategy
BIOLOGICAL	• Ducks	• reducing all stages of snails • encourage farmers to rear 200-300 ducks per farmer for feasible side income (30-40 ducks/ha) • suitable for ponds/lakes	• herding ducks after harvesting until next land preparation • herding ducks can be done at stage of 45 days in transplanted rice fields • Introductory incentive by the government





Control Measures	Methods	Strength	Strategy
BIOLOGICAL	• Black carp, tilapia, catfish	• reducing adult snails in ponds and waterways (black carp, catfish, tilapia)	• black carp needs to be imported • Mass production of black carp • Introduction of black carp in water bodies



The black carp used as natural enemy for the control the golden apple snail

Control Measures	Methods	Strength	Strategy
CHEMICAL	• biopesticides : Tea seed cake, neem, furcraea, derris root • molluscicides	• Fast and effective measures • Available and applicable	• Strengthen extension services • Regulate through legislation











Control Measures	Methods	Strength	Strategy
LEGISLATION	• Quarantine regulation • local government regulations • Pesticide Act	• regulate import and export of apple snails as food or pets. regulate the movement of machineries and plants between provinces • regulate the premises and licenses • regulate the use of banned molluscicides	• collaboration amongst the Departments at entry point • Cross-border collaboration • legal permission for rearing apple snails for business • monitoring the usage and selling of illegal pesticides and penalty to be imposed (Inspectorate) • Strengthening extension services

Control Measures	Methods	Strength	Strategy
SANITATION	• Machineries, transportation	• regulate the movement of machineries between states/ provinces (Malaysia & Thailand)	• backed-up by legislation • Strengthen extension services



Control Measures	Methods	Strength	Strategy
R & D	• Taxonomy of snail species • Feeding interruption • Muscle relaxant • Effective biopesticides - Standardise procedures and analysis of biopesticides	• strengthen collaboration between higher institutions, private sector and research bodies • Information sharing	• Research funding must be available • Post-graduate programme • Collaboration and cooperation amongst regional countries and R&D institutions

Control Measures	Methods	Strength	Strategy
R & D	• Study on the snail pest and diseases • Managing GAS using carps - involving private sector • Sterile snail technique (SST) • Research on Bts biopesticides	• strengthen collaboration between higher institutions, private sector and research bodies • Information sharing	• Research funding must be available • Post-graduate programme • Collaboration and cooperation amongst regional countries and R&D institutions



IMPLEMENTATION

- Identification or Investigation on Area infestation – Surveillance
  - Degree of infestation (damage and coverage) regional / granary
- Setup GAS surveillance system
  - Using the farmers group under supervision of Department of Agriculture
  - Training in conducting surveillance
  - Establish standard of procedure for GAS surveillance
  - GIS technology (map, analysis, forecasting etc)

IMPLEMENTATION

- Government provide funding for containment programme.
- Collaboration amongst stakeholders and regional countries.

