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**ASIA-PACIFIC FORUM ON
SUSTAINABLE DEVELOPMENT**

Promoting Food Security through Combating Soil Degradation in the Asia-Pacific

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Precision Agriculture for Efficient Use of Agrochemicals and Improved Soil Health

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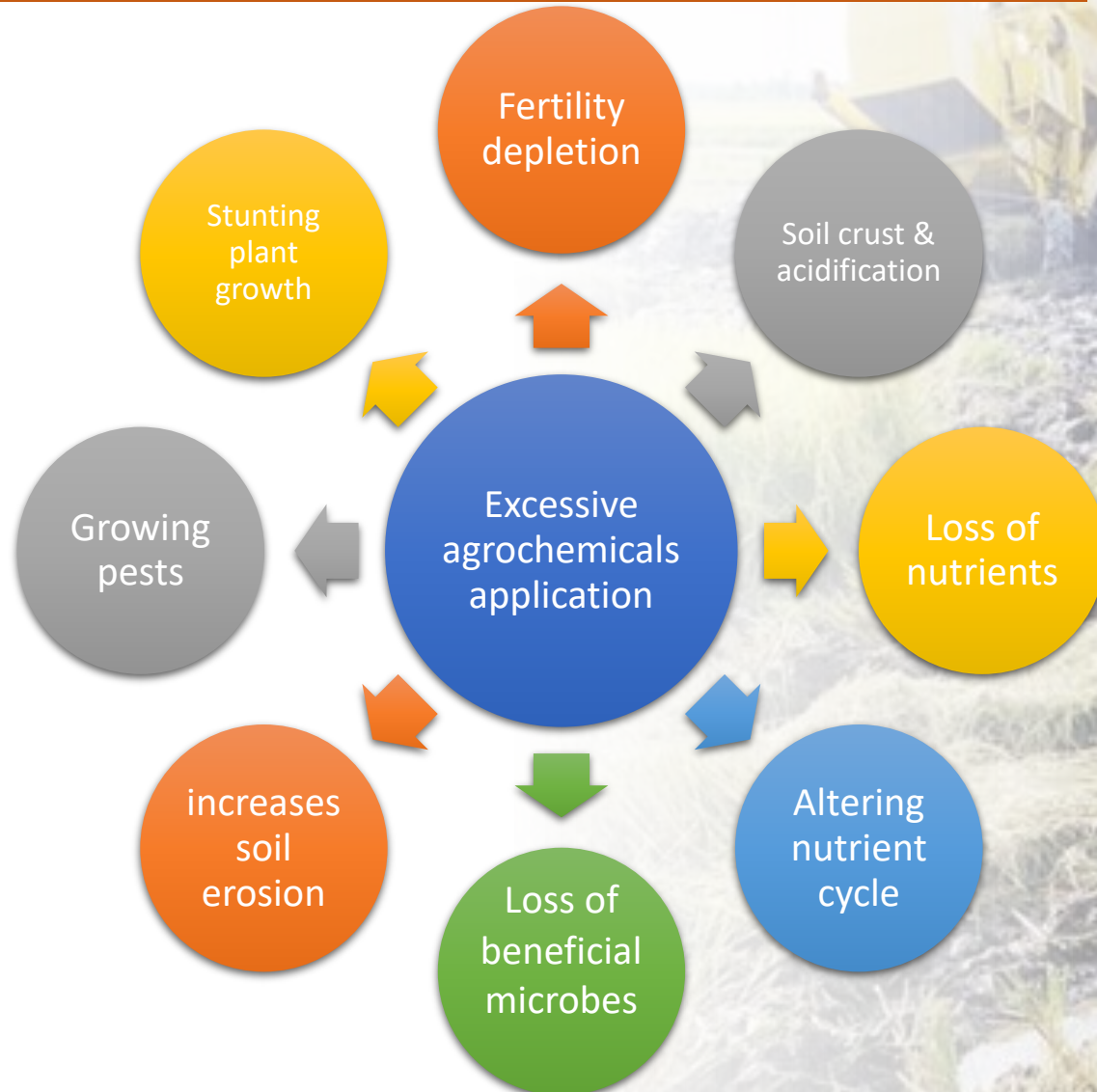
Malaysian Agricultural Research & Development Institute (MARDI)



General Introduction

ISSUES IN SOIL QUALITY AND HEALTH

“80% farmers practice unsustainable farming practices including excessive agrochemical application” (Mohamed et. al 2016)



Precision Agriculture Technology for Efficient Use of Agrochemical



Auto-Leveller System

- Detect uneven surface at specific location.
- Cut soil at high level spot and fill soil at low level spot.
- Produce even surface and uniform level land.
- Reduces waterlog due to uneven surface.
- Reduces weeds growth
- Minimize weedicide usage.

Reduce soil contamination due to excessive weedicide usage



Soil Sensor System

- Quantify amount of soil nutrient at specific locations.
- Information provided are used to determine fertilizer rates at specific location for variable-rate fertilizer application.
- Avoid over-application of fertilizer



Variable-Rate Fertilizer Application System

- Applies fertilizer at variable rate based on soil and crop nutrient status at specific locations.
- Avoid low- or over-application of fertilizer.
- Efficient use of agrochemicals, and thus minimized environmental pollution and soil degradation.

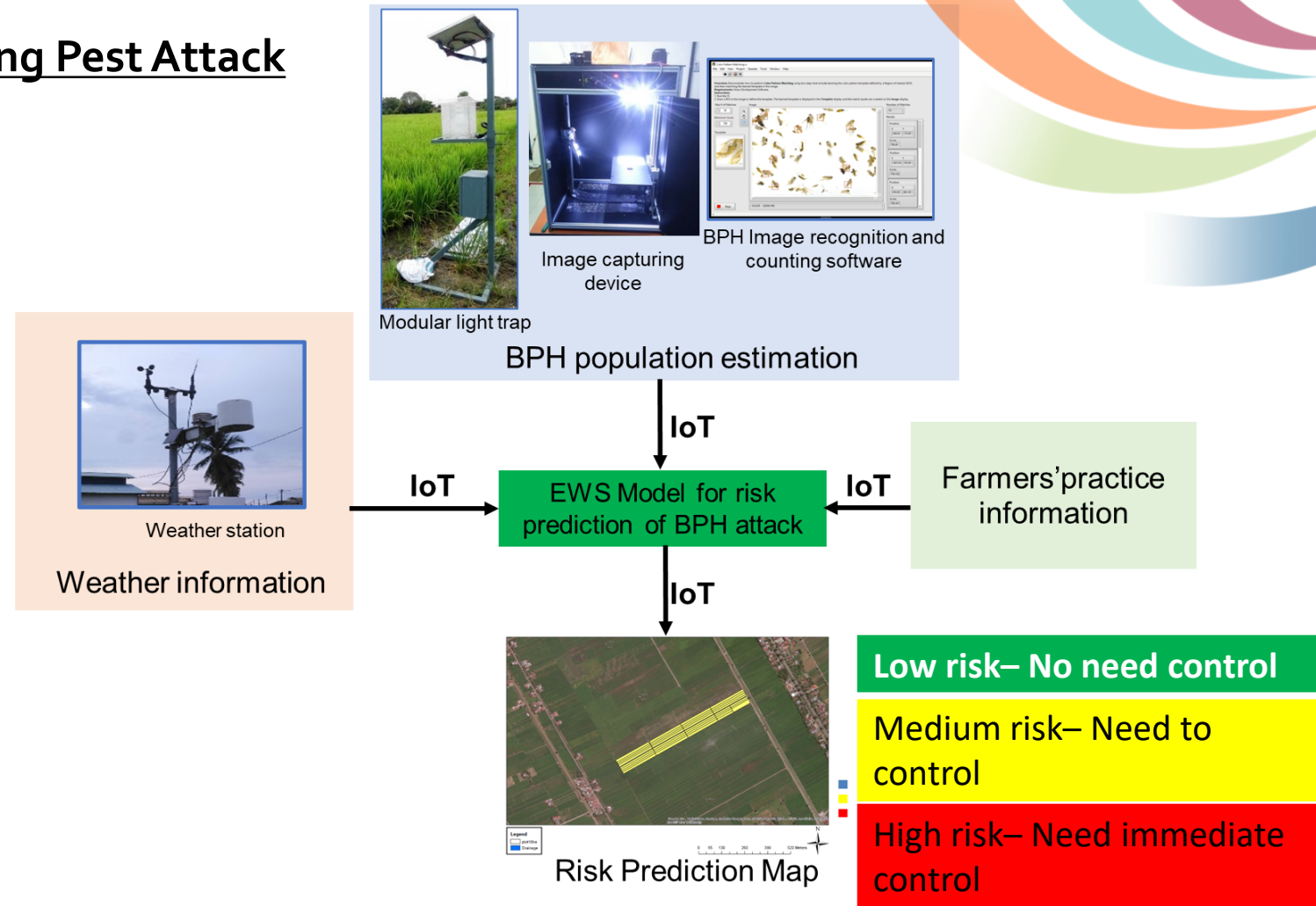
Variable rate fertilizer technology reduces soil contamination due to excessive fertilizer application

Precision Agriculture Technology for Efficient Use of Agrochemical

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Early Warning System (EWS) for Monitoring Pest Attack

- A system for monitoring pest population and provides decision support for pest control.
- Replace conventional pest control practice where pesticide is applied without information on the pest population occurrence at specific time.
- Prevent from unnecessary application of pesticide.
- Reduce the negative effect of pesticide on soil health in long run.



Main outcome and benefits

- Based on the trial implementation of precision agriculture technology at two Malaysian rice granaries in four cultivation seasons, the use of chemical fertilizer reduced by 12% to 17% per hectare through the variable rate application method compared to the conventional blanket fertilizer application. (Bujang & Abu Bakar, 2019; Mohamad Ghazali et. al. 2020)
- Precision Agriculture technology utilizes the '3R' concepts (right amount, right location, right time) contributes to efficient use of agrochemicals and thus, minimizing environmental pollution and soil degradation

Challenges and Recommendations

- Precision agriculture uptake by farmers has been slow
 - Technology adoption continues to be challenging not only because of the high cost that requires substantial capital.
 - Farmers reluctant to change or adapt to new technologies.
 - Farmers like the idea of VRT, but not convinced of its value.

- National policies can aid reducing or spreading burden of high cost.

- Land consolidation through regional farmers' could ease the adoption of precision agriculture on large scale farm area.

- Government policies that would promote the use of precision farming technologies in the future should be formed.

- Incentive is one form of financial assistance that the government can provide to promote the adoption of precision technology.

- Intensive technology transfer programme by extension agencies need to be carried out.

- Farmers keen to implement the technology as long as the technology benefit outweighed the cost.



THANK YOU

GRACIAS
ARIGATO
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