36th International Vegetable Training Course
"Vegetables: From Seed to Harvest" Module 1

Development Action Planning

Development of Appropriate Vegetable Production modules for Leisure & Educational Farms in North-East Taiwan

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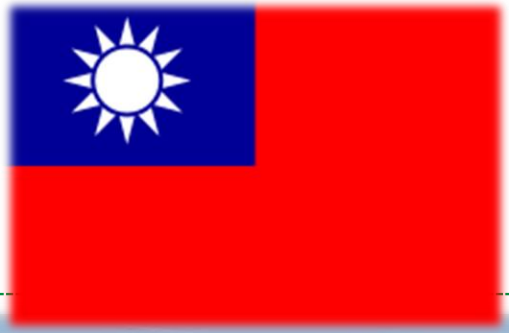
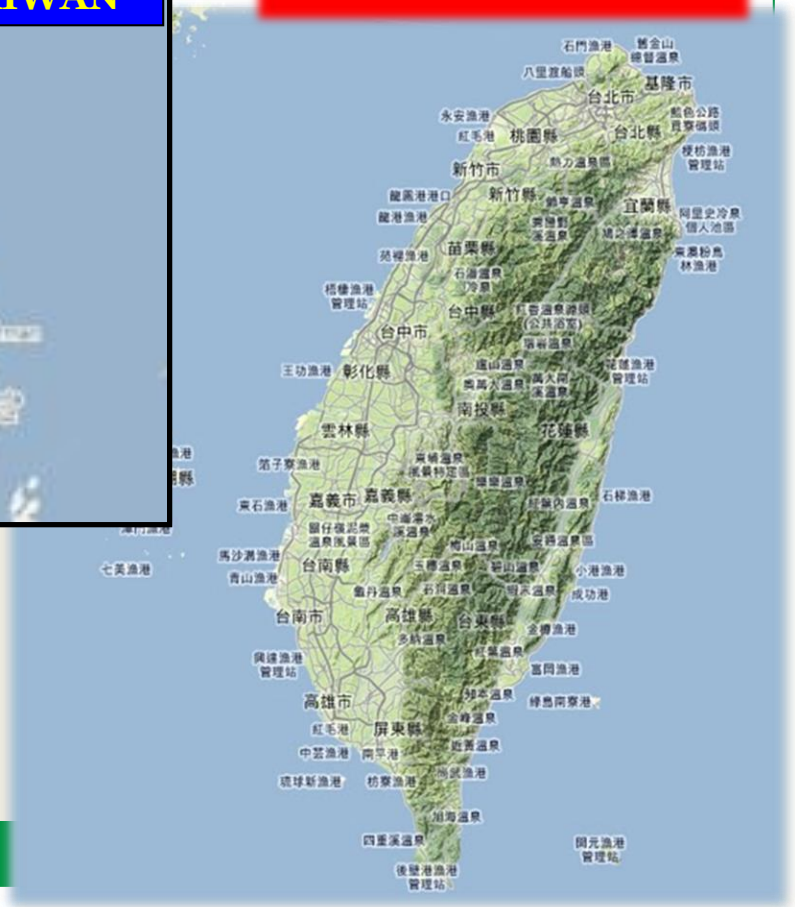
Where is Taiwan(R.O.C.)?





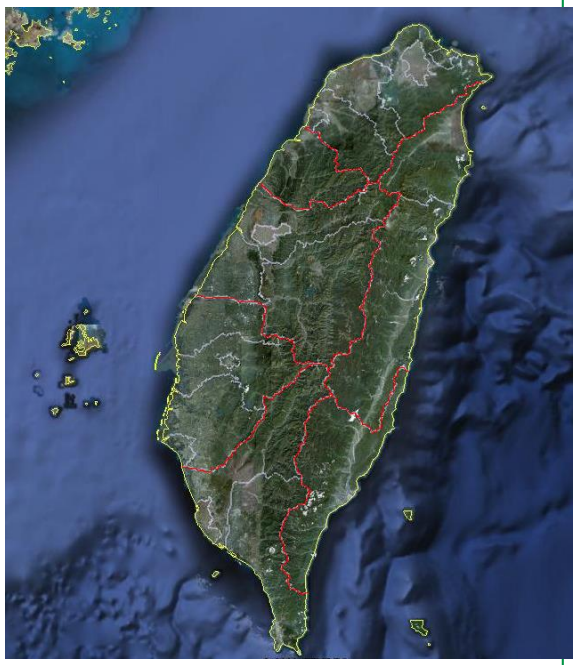
Area: 36,000 square kilometers
Population: 23 million

Agricultural products

Rice: the most important agricultural product both in total harvest (**1,457,175 ton)** and value(**31,868 million NTD**).

Pineapples, Cabbage, Sweet potatoes

Tea and **Orchids** are also important in Taiwan's agricultural production.



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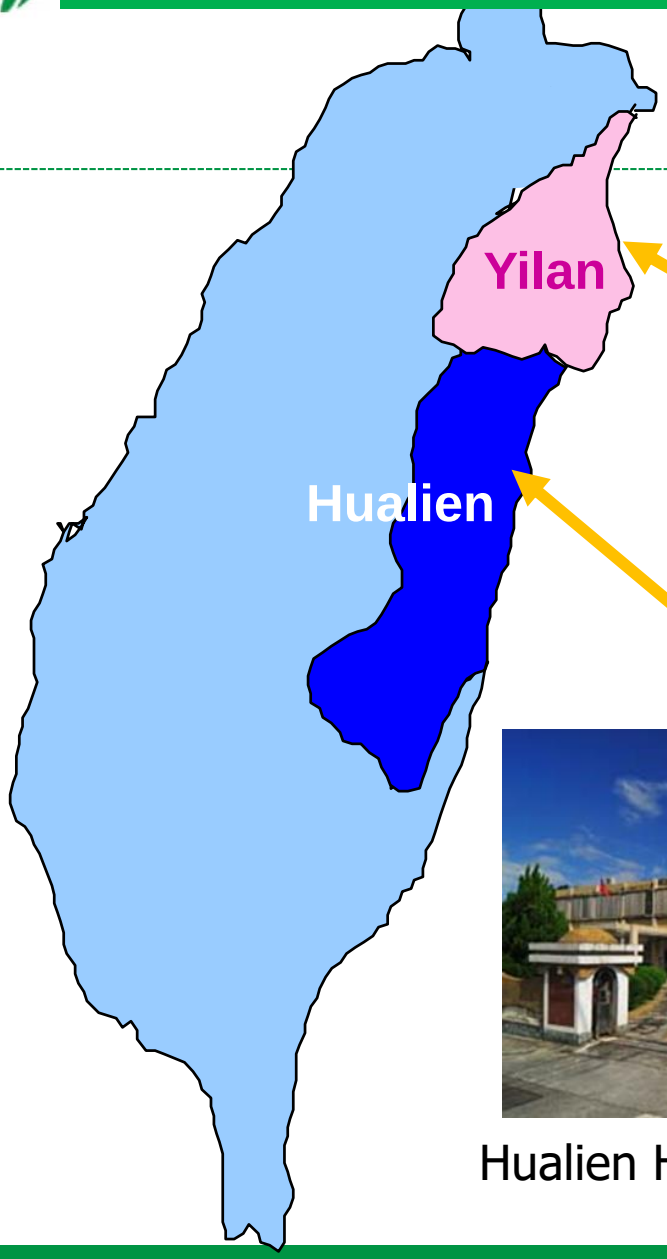
Hualien District Agricultural Research and Extension Station (Hualien DARES)




Aquatic crops


Kumquat


Green onion


Grafted pear


Wentan pomelo


Nest fern


Wild bitter gourd


Hualien HQ (Chi-an township)


Lanyang Branch Station (San-shing township)

Three main topics of Hualien DARES

- ✓ Organic & Safe agriculture
- ✓ Leisure agriculture
- ✓ Agriculture of aboriginal area

Steven Wen-Hwa Lin

Assistant Researcher
Lanyang Branch Station, Hualien DARES

- ✓ **Organic agriculture production**
- ✓ **Regional vegetable production**
- ✓ **Vegetables for aboriginal area**

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Diversity and Potential of Indigenous Vegetable






Integrated Pest Management (IPM)

Grafting

Visit to Local Agricultural Business

Development Action Planning

Development of Appropriate Vegetable Production modules for Leisure & Educational Farms in North-East Taiwan





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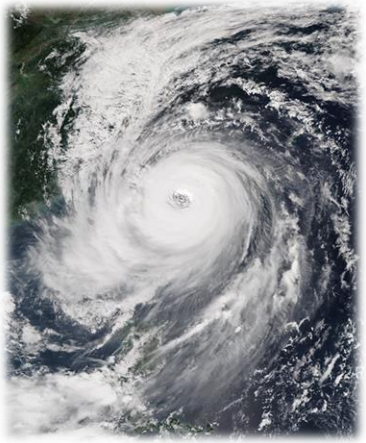
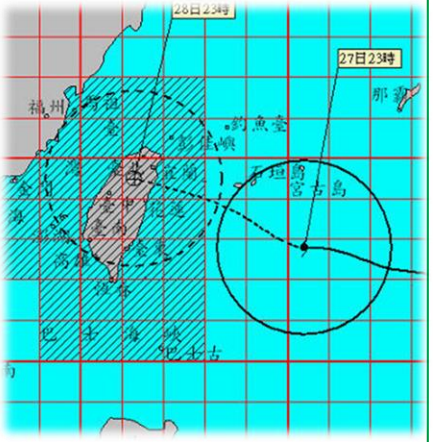
Problem to Solve in North-East Taiwan

- **Typhoons hit east Taiwan during July-Oct.**
- **Extremely high possibility of yield loss when cropping in summer**
- **Only one cropping in winter-spring all the year.**





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Problem to Solve in North-East Taiwan

- **Frequent rain and insufficient sunlight**
- **Lower yield and profit for vegetable crops.**

Hardest area for agricultural production!

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Problem to Solve in North-East Taiwan

- **Reinforced Greenhouse is needed to withstand typhoon.**
- **Higher cost causes lower acceptance.**

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Opportunities in North-East Taiwan

- close to capital Taipei
- famous for leisure activities
- education of food, agriculture and environment for students is in demand
- Rising of tomato production

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Concept：

- Combining vegetable production with leisure and educational activities in farm

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How to do：

- Screen for more than one (color) cultivar with higher adaptation.
- Screen and evaluate traditional veg. appropriate to grow in late summer to autumn for rotation.
- Create recipes for new crops
- IPM for main crop & traditional veg.
- Design creative horticultural activities

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How to do：

- Screen for more than one (color) cultivar with higher adaptation.

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How to do：

- **Screen and evaluate traditional veg. appropriate to grow in late summer to autumn for rotation.**









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Water spinach：

- **IPM for Nematoes & Pests**

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How to do：

- Create recipes for new crops




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How to do：

- IPM for main crop & traditional veg.

  - Pre-sowing
  - Seed Sowing/ Transplanting stage
  - Seed and Seedling
  - Vegetative stage
  - Reproductive stage

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How to do：

- IPM for main crop & traditional veg.
- Cultural practice
- Mechanical control
- Biological control
- Chemical control

Pre-sowing	
Nutrients	• Add well rotten farm yard manure (FYM) @ 8-10 t/acre or vermicompost @ 5 t/ acre. Incorporate at the time of field preparation at 1 week (vermicompost) or 2 to 3 weeks (FYM) before transplanting.
Weeds	• At the time of field preparation, adopt stale seed bed technique to minimize the weeds menace in field. • Keep the nursery weed free by hand pulling of the weeds.
Soil-borne fungus and nematodes, resting stages of insects	**Cultural control:** • Deep summer ploughing of fields to control nematodes and exposes dormant stages (pupa and larva) of Helicoverpa and Spodoptera and subsequently reduces their initial population build up • Soil solarization: Cover the beds with polythene sheet of 45 gauge (0.45 mm) thickness for three weeks before sowing for soil solarization which will help in reducing the soil-borne pests including weeds. • Ecological engineering of tomato with raising African marigold nursery 15 days prior to tomato nursery serves as a trap crop for ovipositing females of Helicoverpa. • Apply neem cake @ 100 kg/acre.
Damping off	**Cultural control:** • Excessive watering and poorly drained areas of field should be avoided • Use raised beds: 15 cm height is better for water drainage or use pro-trays for raising seedlings

	cultures @ 8-10 g each/kg seed • For seedling root dip treatment with Azotobacter and phosphorous solubilizing bacteria (PSB) cultures @ 250 g each/acre seedlings
Seed and Seedling*	
Weed management	• Keep the nursery beds weed free by hand weeding. • Avoid carrying of weed seedlings along with tomato seedlings • Cultural practices such as crop rotation, line transplanting, intercropping should be adopted to avoid weeds spread and to suppress the weed growth.
Early blight	**Cultural control:** • Use resistant or tolerant cultivars • Change the nursery beds location every season,h eradicate weeds and volunteer tomato plants, fertilize properly • Avoid planting overlapping crops in adjacent area. **Chemical control:** • Spray azoxystrobin 23% SC @ 200 ml in 200 l of water/acre or captan 50% WP @ 1000 g in 300-400 l of water/acre or captan 75% WP @ 666.8 g in 400 l of water/acre or copper oxy chloride 50% WP @ 1000 g in 300-400 l of water/acre or copper sulphate 2.62% SC @ 400 ml in 200 l of water/acre or iprodione 50% WP @ 600 g in 200 l of water/acre or kitazin 48% EC @ 80 ml in 80 l of water/acre or mancozeb 35% SC @ 200 g in 200 l

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Marigold:

- **IPM for nemato & Ornamental Use**

Survey for heat tolerate cultivars

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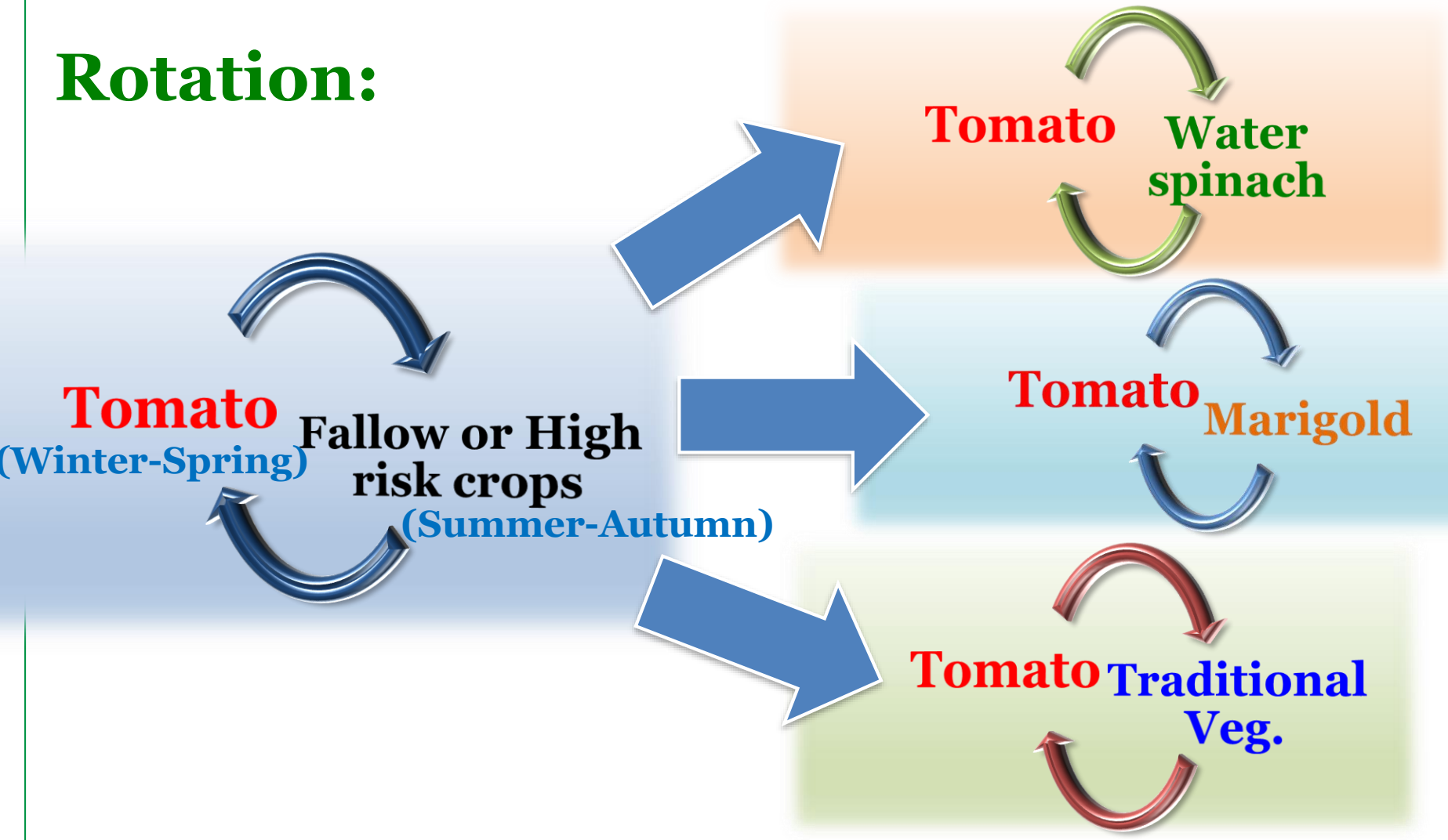
Rotation:



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How to do：

- **Design creative horticultural activities**

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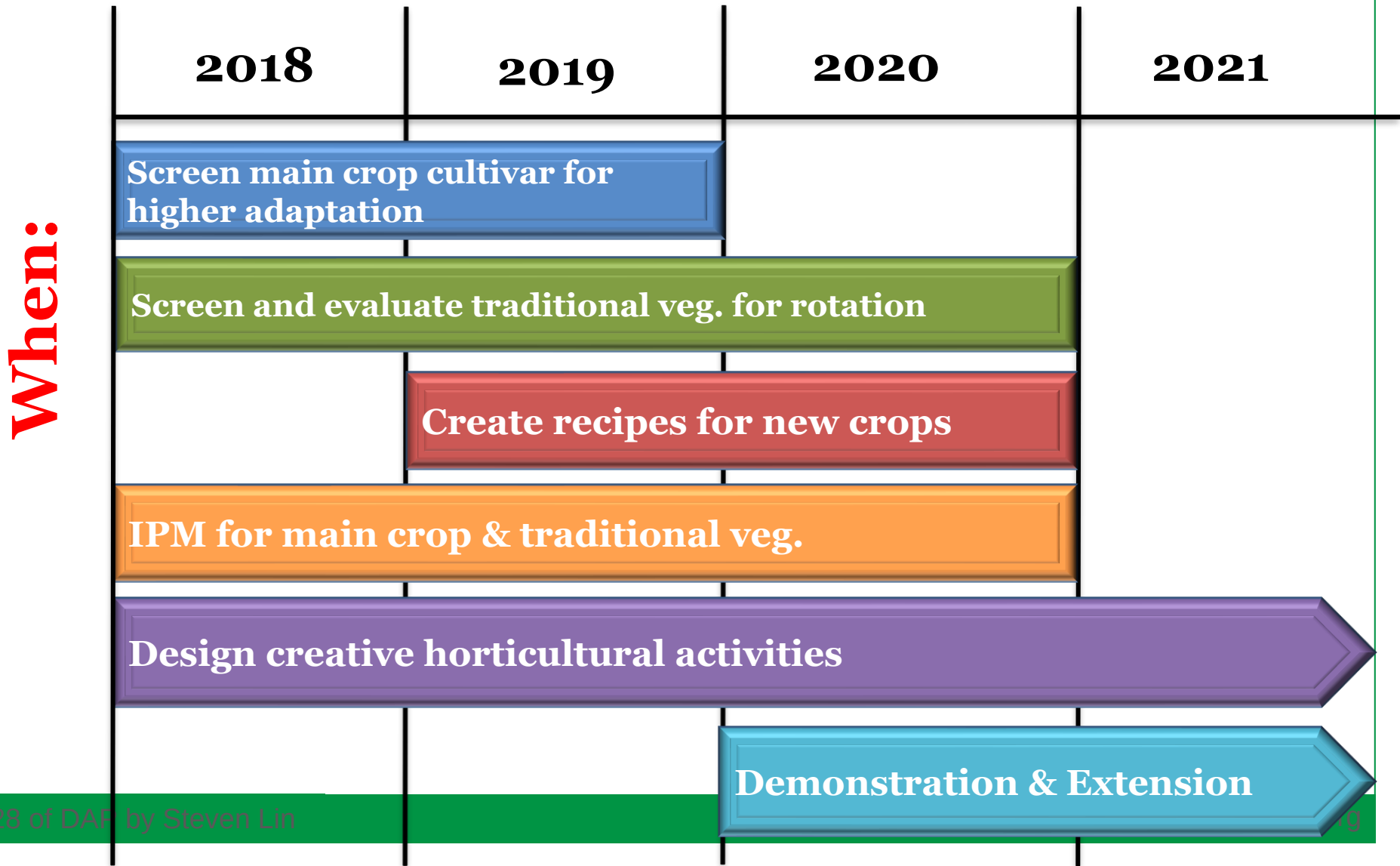

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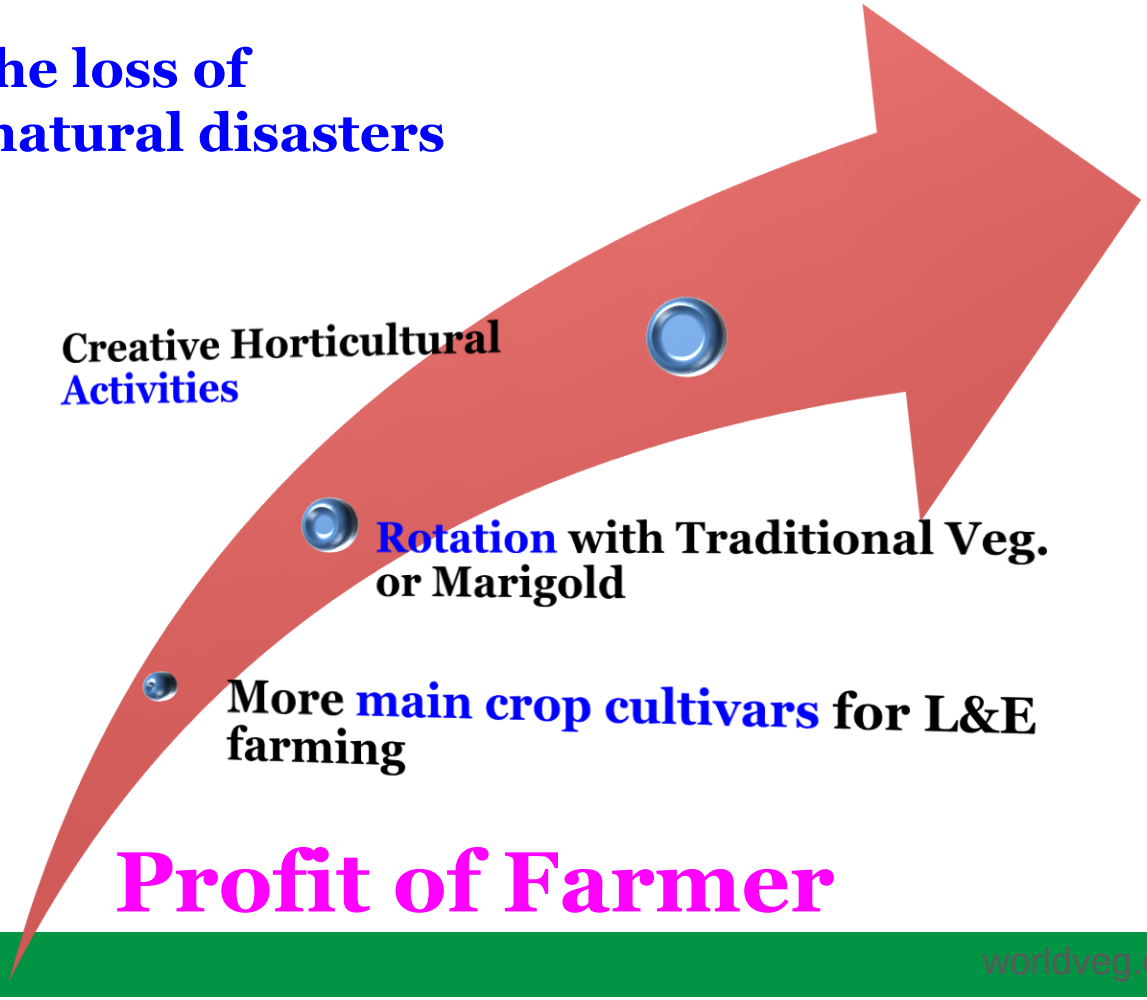
Outcome expected：

- **Effectively reduce the loss of farmers caused by natural disasters and local climate.**



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Outcome expected :

- **Create the value chain of regional vegetable production (satellite farms).**

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Outcome expected：

- **Maintain the sustainability of fields.**

Chemicals

Abundance of species for Eco-system

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Outcome expected：

- **Reduce the agricultural loss compensation budget of natural disasters from government.**

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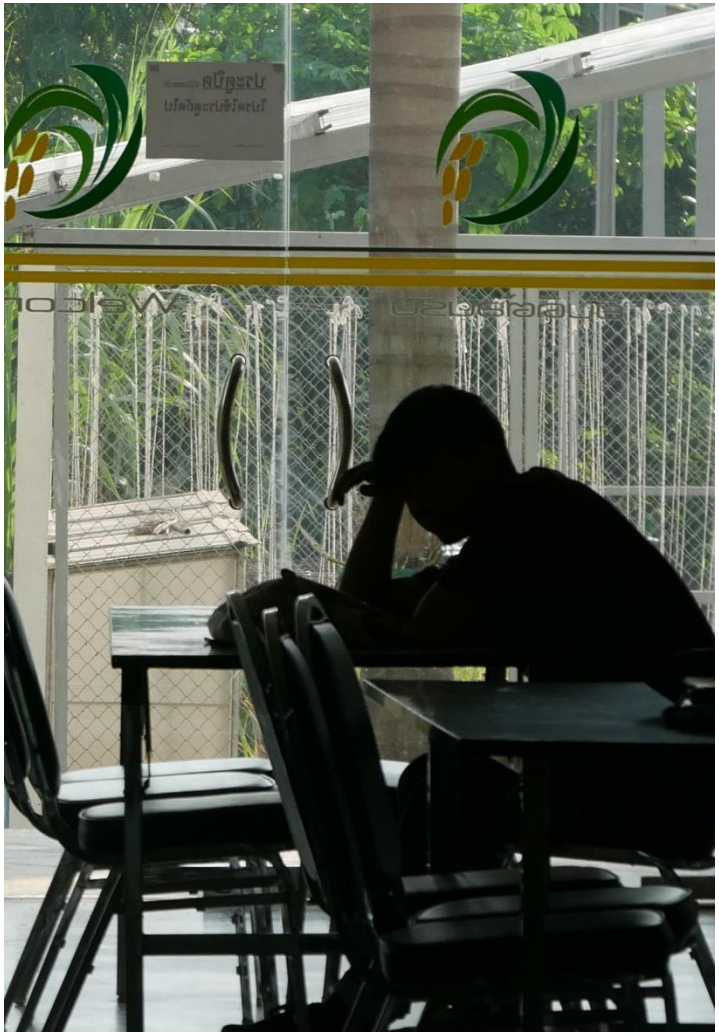
Challenges：

- More complicate business and field management
- Higher labor demand
- Continuously renew the activities
- Competition to sightseeing spots and the like
- Negotiation with satellite farms
- Invasion and acceptance of new crops



Thank you for your attention!

Kakrun~Kra!