# NEW PATHWAYS: FARMER'S ECOLOGICAL INNOVATIONS IN LAM DONG PROVINCE

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# Pest outbreaks in Lam Dong

- Cicadas  on Coffee: Affect on 2.619 ha in year 2015 (over 40.000ha – in the whole high lands)
- Clubroot diseases on brassica: appeared in 2003. Serious damage in 2008 – 2009. The total affected area was 683 ha in 2015.
- Fruit flies on Jackfruits: Affect on 100% of tree and 60 -70% of fruits in year 2013.
- Nematodes on coffee:  Over 70% of coffee trees replanted were died by attacks of nematodes.

# Pest control

- Farmers:
  - Chemical overuses: High cost, low efficiency.
  - Change to new varieties and technologies.
- Interventions from governments: Funds for researches, training and technology transfer to farmers.
- Supports from research institutions: Pest control methods, integrated farming techniques, new varieties…
- Supports from NGOs: Training and technology transfers.

# Farmer’s innovations on pest control

- Observations, theorizing on possible bio-relations between pests and natural enemies.
- Take self-trial on field…
- Trial results will be disseminated quickly and widely for surrounding communities

# CICADAS  HARM ON COFFEE

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- In 2007, Collecting the ant nests from the surrounding coffee gardens

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- First year:  No ant ???

# CICADAS HARM ON COFFEE

- Second year: Collected whole ant nests. Thus, amount of ant nests in the coffee garden gradually increased.
- After five years: Density of cicadas and mealybugs on coffee plant decreased; Lush coffee garden, while in the surrounding gardens, 30-50% of trees are affected with leaf diseases

# Observations

- The use of excessive chemicals pesticides made cicada outbreaks because chemicals also killed natural enemies of cicadas such as ants, bees, spiders ...
- For coffee gardens in which ants were thoroughly destroy, cicadas density were 5-10 times higher than gardens of ants protected or released into.

# Nguyen Duy Tan – Loc Phat, Bao Loc, Lam Dong

# Mr. Doan Van Le (Trang Bom, Dong Nai)

# Benefits of ants adopted for coffee

- Save more than 40 million VND/ha from chemical spraying (reduced application number to…
- More stable coffee productivity
- Safe products

# CLUB ROOT CABBAGE

- *Plasmodiophora brassicae*. W
- Soil pH: 4.8 to 5.3, soil humidity> 80%

# Solution

- Cabbage, cauliflower, broccoli and mustards green are the most favorable host for *Plasmodiophora brassicae* fungus.
- Mustards are of short growing cycle (not sufficient for fungi to produce spores).
- Sowing 2-3 mustards green (*Brassica juncea* L.) crops continuously
- Harvest young plants, uprooting, remove the roots (include clubroots), collection and treatment of roots.
- These farming practices help effectively remove fungi spores from soil for following cabbage/Chinese cabbage crops (of longer growing cycle and often higher economic returns).

# Sollution

- In this way, the spores will germinate in the roots of mustards green and we can effectively remove them from soil (by uprooting young mustards).

# NEMATODES ON COFFEE

# Solution

- Sowing *dwarf marigolds* in between two coffee row at the beginning and end of the rainy season
- When *dwarf marigolds* reach a largest biomass, cutting and burying stem and leaves in around base coffee plants.
- Biochemicals released from dwarf marigolds will help to suppress nematode population.

# Other innovative farming practices

- Intercropping wild peanuts with coffee, pepper, dragon fruits to improve soil fertility, control erosion, and reduce evaporation.
- Growing 1-2 lemon grass cycles to suppress cyperus rotundus L.
- Integrating shade trees into coffee gardens to reduce direct sunlights on coffee, which favors for coffee fruiting.

# CONCLUSIONS

- Farmer's testing and findings are successful in helping them to effectively control some serious pests.
- The approach of farmers is based on their daily observation, theorization, and trial.
- The search for and adoption of natural enemies is an effective alternative for pest control taken by farmers.

→ Enhancing famer’s research capacity will thus more ecologically (and economically) effective for surviving and sustaining their dynamic agrosystem.