

# Intercropping

INTRODUCTION FOR COFFEE FARMER



# Why Intercropping?

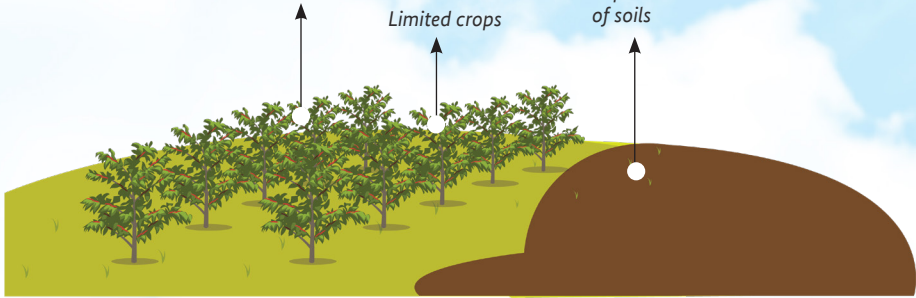
Coffee can be planted either with mono-cropping or intercropping system. While mono-cropping tends to cultivate a single crop on the same land, intercropping practicing a crop diversification, growing of a wider selection of different crops at the same time on the same field.

## MONOCROPPING

*Highly vulnerable to the impact of pests and diseases, adverse weather conditions or the collapsing market that affects the crop*

*Limited crops*

*Further degradation and impoverishment of soils*



## INTERCROPPING

*Additional and diversified income during the off season of coffee harvest, or if main crop is damaged due to changing or extreme weather condition*

*Serves as buffer during coffee price fluctuation*

*Maximizes space for more yield and diversifies produces*

*Brings more organic matter into soil and captures more carbon*

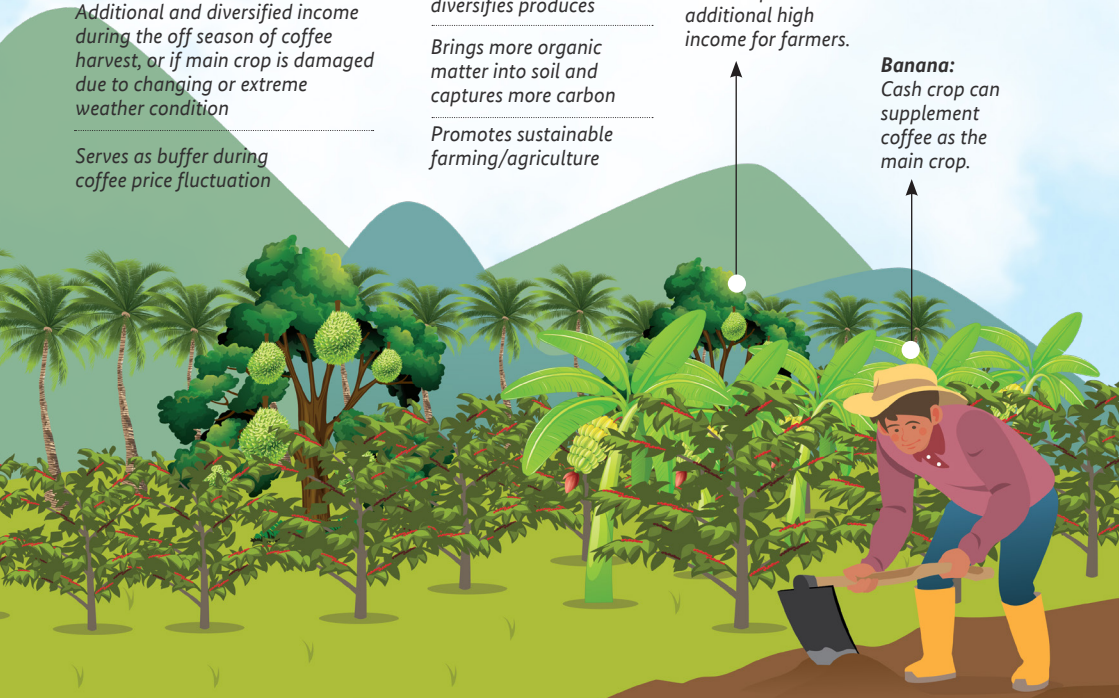
*Promotes sustainable farming/agriculture*

### **Durian:**

*Fruit tree. As shelter for coffee as the main crop and create additional high income for farmers.*

### **Banana:**

*Cash crop can supplement coffee as the main crop.*



"I used to grow coffee as a monoculture crop. However, at certain times, the coffee price drops. Furthermore when coffee is ageing, productivity is also decreased and results in lower-income for me. Applying intercropping helps me diversify the risks and generate revenue all year round. Selected crops under the model chosen can grow very well together and the model made the farm easier to maintain and manage. Through supported training, I can estimate incomes and expenses and able to plan for farm improvements.."

**Mr.Pongsak Suksiri**  
Farmer



"Problems with soil fertility resulting from using the land to grow coffee for a long time means that productivity is reduced. When deciding to improve soil quality as well as rejuvenate or replant coffee trees, I could also see an opportunity to create additional income. Therefore, I am interested in trying the intercropping system. Before selecting crops and models, I conducted a preliminary study of potential crops that can grow alongside coffee and for which there is a market opportunity. I found that durian can potentially create additional high income and banana as cash crop can be harvested anytime. I hope my farm can be a learning source for other farmers."

**Mr.Sarkon Phiwkham**  
Farmer

"I decided to become one of the demo plot owners for coffee intercropping and I now can see the benefits in terms of how I can utilize the land to create more income instead of having several pieces of land for different crops. As a farmer, it's important to know the characteristics of different crops and manage the farm according to a crop calendar. I found a crop calendar is a useful tool for me to know precisely when to apply the fertilizer, do pruning, and other activities to my trees and crops."

**Mrs.Woraphan Samiso**  
Farmer



"I decided to apply the intercropping system as I want to minimize market risks and the risk of a drop in price that arise from planting just a single crop, and to earn additional income from other crops. By applying the intercropping system and participating in FBS activities, I can improve my farm management skills and keep my cashflow monitored in a more systematic way. Neighbours and other farmers are very welcome if they want to visit and learn from my intercropping coffee farm."

**Mr.Aekapol Hidrod**  
Farmer

# Recommended Intercropping Model



## COFFEE

*Main Crop*

To calculate the planting density, a hectare or 10,000 m<sup>2</sup> must be divided by the area need for one coffee plant. Consequently, where the spacing of the coffee plant requires 3 x 3 meters (Square)

Planting Space:

**3x3 m**

66 trees per rai



## DURIAN

*Fruit Trees*

High yield and long production period, a plant provides high revenue per unit compared to other plants

Planting Space:

**9x9 m**

6 trees per rai



## BETEL NUT

*Border Trees*

2m from land border and 2m from coffee plants at all sides. Harvested after the coffee harvest is completed and the cost per unit is quite low

Planting Space:

**2 x 2 m**

76 trees per rai



## BANANA

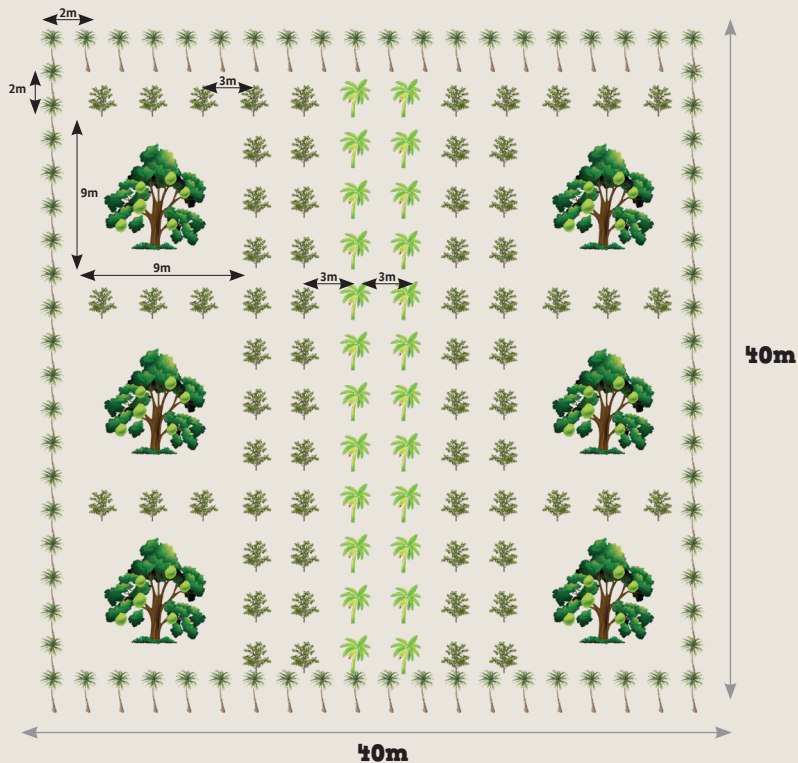
*Cash Crop*

Banana grows in the roll between coffee trees.

Planting Space:

**3 x 3 m**

24 trees per rai



# Setting up your farm land for intercropping

## 1. Evaluate your farm

Identify and analyze the condition of existing crops on the farm



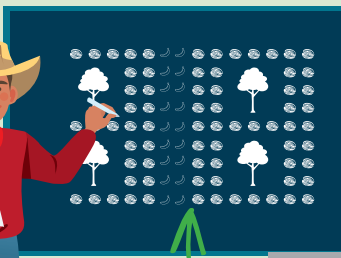
Plant	Age	Total Production (kg)	
		Productive	Not Productive

## 2. Prepare your farm for coffee intercropping

a. Removing aging/  
unproductive coffee trees



b. Visualize your planned intercropping model

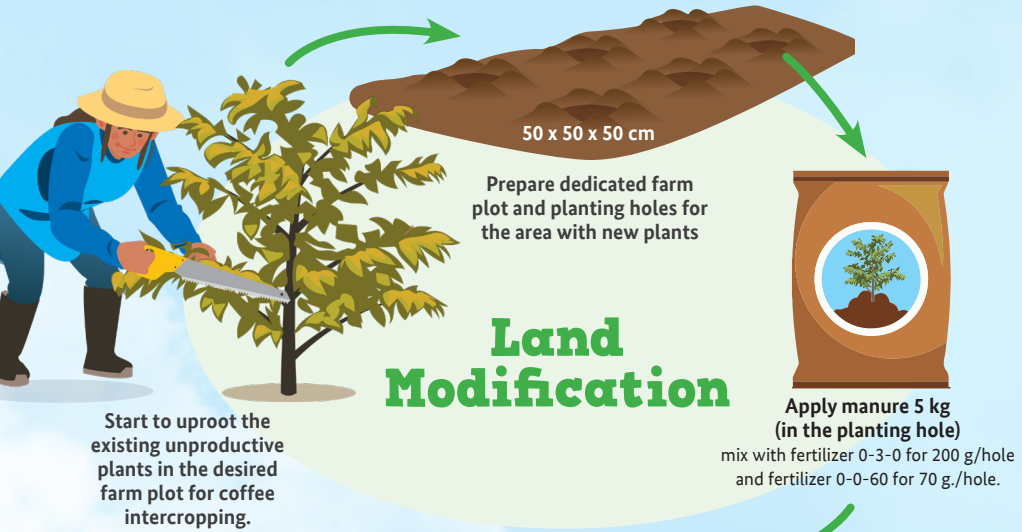


Cash crops can be grown in-between rows or as border plants

Crop Calendar for your Coffee Production		
Jan	Feb	Mar
Apr	May	Jun
Jul	Aug	Sep
Oct	Nov	Dec

Use crop calendar as guideline to conduct proper planning.

### 3. Setting up your farm for coffee intercropping



## Planting

Planting needs to be done in a structured manner to facilitate handling (management/ harvest) and optimize land usage. Spacing from the recommended intercropping model can be taken as reference.



# 1

Plant coffee trees as a main crop. Square planting system (3x3 meters) is recommended for coffee to support pollination.



# 2

Plant other intercropped plants such as Durian together with border trees (i.e. Betel Nut). Cash crop like banana can be planted in between the rows

## 4. Maintenance of intercropped farm land



# Tips to improve your Coffee Intercropping Farm



COFFEE



DURIAN



BETEL NUT



BANANA

## Fertilizer Application When and How

	<1 year	1-2 years	>3 years	<1 year	1-7 years	>7 years	15-15-15 or 13-13-21	46-0-0
FERTILIZER APPLICATION	46-0-0 50 gr/tree/time 15-15-15 50 gr/tree/time	15-15-15 150-200 g/tree/year 46-0-0 50-100 g/tree/year	46-0-0 200 g/tree, 15-15-15 150-200 g/tree 13-13-21 150-200 g/tree	15-15-15 or 16-16-16 for 150- 200 gr/tree/time manure 5 kg/tree/time	15-15-15 or 16-16-16 ½ to 3 kg./tree/time <i>(while Durian still has no yield):</i> depends on canopy size, manure 15-50 kg./tree/ year	8-24-24 2 kg/tree, 12-12-27 2 kg/tree, 16-16-16 or 20-20-20 3 kg/tree	15-15-15 or 13-13-21 500 gr/tree	46-0-0 500 gr/tree, 15-15-15 500 gr/tree 13-13-21 500 gr/tree
FREQUENCY	March, June, August, October	March, June, August, October	March, June, August, October	February, May, September	February, May, September	February, May, September	May, September	May, August, November

## Improving your coffee crop

WEEDING	March, June, August, October	January	Based on needs	Based on needs
PRUNING	March, June, August, October	Early September	Based on needs	Based on needs

## Crops selection for coffee intercropping



Farmers Interest



Consumer Preference



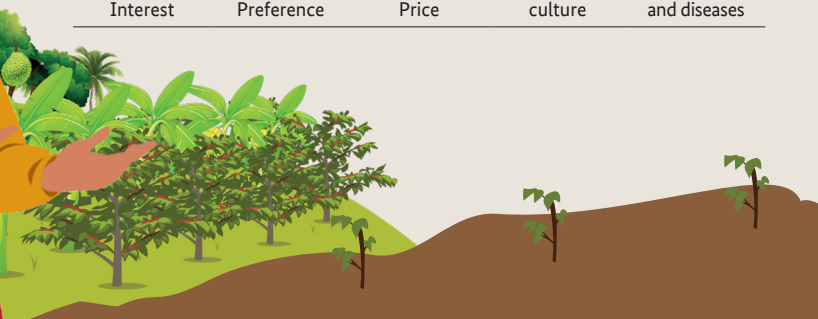
Market Price



Adaptable with local culture



Free as host plants for major pests and diseases





# Tips to improve your Coffee Intercropping Farm

## Setting Crop Calendar for your coffee production planning

Tasks of the agripreneur	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Land preparation												
Land maintenance												
Preparation of planting materials												
Planting												
Irrigation												
Fertilizer application												
Weeding (manual & chemical)												
Integrated Pest Management												
Pruning												
Grafting												
Harvest and Storage												

### Crops/trees which are not recommended to be planted with coffee



# Calculation of Intercropping Profitability

Intercropping is a long-term investment. It is therefore recommended to start applying the model gradually. The following recommendations should be taken into account:



## Adjust the coffee farm density.

Remove the old coffee trees >20 year as a priority and start using 3x3 m density.

## Optimize the space.

Plant intercrop plants by choosing economic value plants and/or seasonal cash crops as border plants (i.e. betel nut) as well as the plants in between the rows of coffee trees (i.e. durian and banana).

By applying the intercropping model rather than planting coffee as a monocrop, farmers can earn additional income as well as diversify risks.

Year	Removing Old Coffee Trees	Revenue			
					
1 <sup>st</sup> year	20%	80%			
2 <sup>nd</sup> year	20%	60%			X
3 <sup>rd</sup> year	20%	60%			X
4 <sup>th</sup> year	20%	60%			X
5 <sup>th</sup> year	20%	60%	X	X	X
6 <sup>th</sup> year		80%	X	X	X
7 <sup>th</sup> year		100%	X	X	X
8 <sup>th</sup> year		100%	X	X	X



## Coffee (Main Crop):

- Harvested at 3<sup>rd</sup> year production
- Main income with Lowest volatility risk
- Economic period: 10-12 years
- Economic potential: Bht 70/Kg (66 plants / 1 rai (0.16 ha))



## Durian (Seasonal Crop):

- Harvested at 7th year production
- High income generation with high risk
- Optimizes space
- Economic potential: Bht 80/Kg (6 plants / 1 rai (0.16 ha))



## Betel Nut (Border trees):

- Good market potential
- Harvested at 5th year after planting
- Additional income for farmers
- Economic potential: Bht 50/kg (76 plants / 1 rai (0.16))



## Banana (Intercropped cash crop):

- Harvested after 8-12 months production (depends on variety)
- Additional income for farmers
- Economic potential: 5 Baht/kg. (24 plants/ 1 rai (0.16 hectare))

## Calculating the total income on an Intercropped Farm\*

Crop	Spacing (meter)	Tree/rai	Production (Kg/tree)	Total Production (Kg/rai)	Price/unit (THB/kg)	Total Income (THB/rai)
Coffee	3 x 3	66	5	330	70	23,100
Durian	9 x 9	6	250	1,500	80	120,000
Betel nut	2 x 2	76	10	760	50	38,000
Banana	3 x 3	24	8	192	5	960
<b>Total</b>						<b>182,060</b>

\*Remarks: This is an estimated income before deducting costs

## Profit or Loss?

	Coffee	Durian	Betel Nut	Banana
Money in (Income)	😊😊😊	😊😊😊	😊😊😊	😊😊
Money Out (Total Cost) **	😞	😞😞😞	😊	😊
PROFIT or LOSS? 😊😞	😊😊	😊😊😊	😊😊	😊

\*\*Total Cost: Inputs and services (Seeds, Fertilizer, Bags, etc) + Labor Needs (pruning, weeding, harvesting)

Further information on calculation of revenue (before deducting costs) from possible intercropping models, see Farmer Business School Module 11: Earning more money by improving productivity and reducing costs







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# Supporting smallholder coffee growers in Southeast Asia

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