Technical Brief N°03/2015

Protecting riparian areas using Cardamom

Guangdong cardamom seeds @ Thip. Boupha, 2015

Cardamom : a highly profitable product underlining the multi-benefits of agroforest systems in Lao Uplands

Medicinal cardamom (*Amomum spp.*) spontaneously sprouts anywhere in Lao PDR under the cover of the forest canopy at elevation upwards of 700 m. The cardamom fruit, in particular the domesticated Guangdong variety of cardamom, contains an essential oil of high medicinal value, which accounts for over 80% of all official medicinal cardamom used in China. Cardamom production has decreased about 40% over the past 10 years due to ecosystem degradation and replacement of natural forests by rubber and banana plantations. However, the demand for medicinal cardamom remains high. Producers of domesticated cardamom and collectors of natural cardamom in Northern Lao PDR have thereby benefited from the rising farm-gate price of dry cardamom, which increased from about 100,000 Lao kip/kg in 2011, to about 450,000 kip/kg in 2014. However, many farmers are complaining about irregular and hazardous fruit production, cardamom plants flowering but producing limited to no fruits. In 2015, EFICAS project supported on-farm experiments in 3 villages to assess the impact of weeding and clearing practices on cardamom fruit production.

Above: Harvest of cardamom fruits in Phialouang, Samphan district
Left: Flower of Guangdong cardamom
@ Soulikone, 2015

Above: Cardamom stolons at flowering stage in Sanamha, Samphan district
Right: Agroforest system with cardamom in Phialouang @ Soulikone, 2015

Eco-Friendly Intensification and Climate-resilient Agricultural Systems

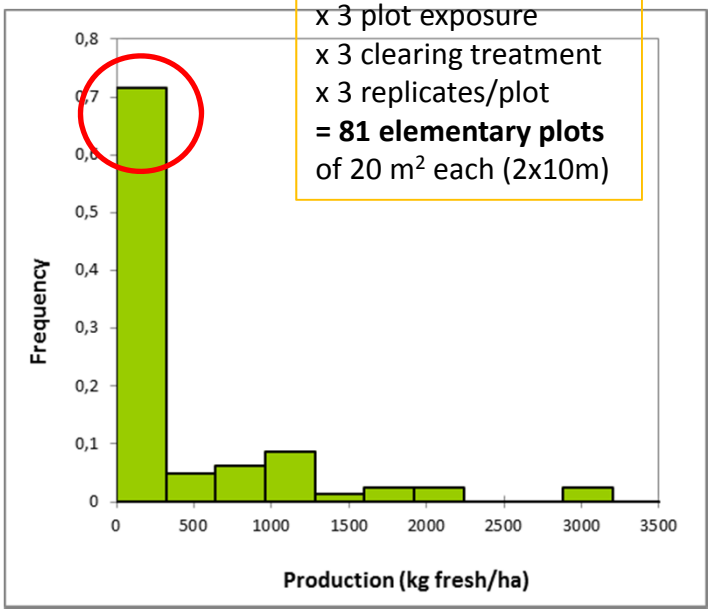
EFICAS project

On-farm experiments to improve cardamom production

According to farmers, the best Cardamom production is observed where plant stolons are exposed out of the soil (e.g. eroded area). This could be linked to environmental (e.g. moisture condition around the flower) or biological (e.g. pollinators access to the flower) issues. In addition, plant exposure to solar radiation may also affect final production. Simple on-farm experiments were designed with farmers based on the following factors and modalities:

Factor	Modalities
Clearing (modif. of flower environment)	- Treatment 1: no leaf clearing in April - Treatment 2: leaf clearing (conventional system) - Treatment 3: leaf clearing + stolon slight removal from soil
Plot exposure (to solar radiation)	- North-oriented - West-oriented - East-oriented

Experimental design
3 villages
x 3 plot exposure
x 3 clearing treatment
x 3 replicates/plot
= 81 elementary plots
of 20 m^2 each (2x10m)



Main results from on-farm experiments

- Failure risk: the risk of getting no cardamom production is high with 70% of the 81 elementary plots not getting any fruit production in 2015

- No statistical differences in fruit production between clearing treatments

- Statistically lower production in plot east-oriented as compared to plots north or west-oriented

Clearing treatment	Obs	Min	Max	Mean	Group
No leaf clearing	27	0	1800	399	A
Leaf clearing (conv)	27	0	2200	444	A
Leaf + stolon clearing	27	0	3150	413	A

Plot exposure	Obs	Min	Max	Mean	Group
North	36	0	3150	718	A
East	27	0	350	60	B
West	18	50	1150	357	A

Conclusions and recommendations

- Need to confirm preliminary results of sun exposure impact on cardamom production on a larger sample

- Need to test other practices favoring pollination such e.g. what is promoted in China, e.g. beekeeping close to cardamom plantations or spraying honey or sugar-rich solutions to attract pollinators.

Beekeeping in cardamom garden in Xianghong, Xishuangbanna @ Thipavong Boupha, 2015

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