Impact of pruning intensities on cocoa tree productivity, mirid and black pod disease infestations on farmer field trials in Côte d'Ivoire

Kam-Rigne Laossi[1], Julie Lestang[3], Siaka Koné[1], Marine Marchetti[1] & Pierre Broun[2]

1. *ofi, Outspan Ivoire SA Côte d'Ivoire*
2. *NC2, Neom, Saudi Arabia*
3. *ETH Zurich, Switzerland*

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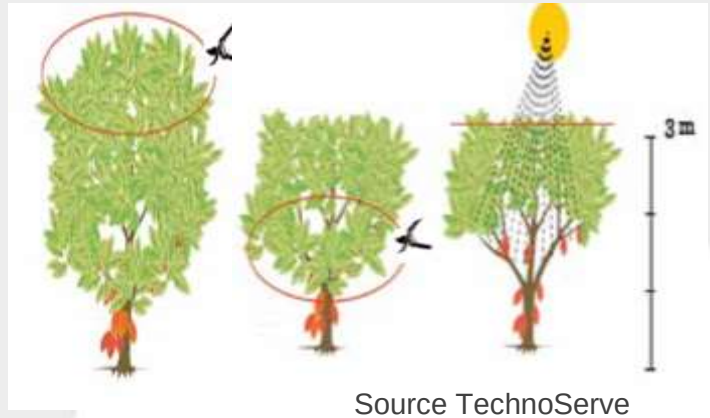
Backgound

- Pruning: Important agricultural practice for pest and disease control + enhancement of crop productivity
- Lack information on which pruning intensity optimizes cacao productivity, which pruning intensity for which agroecological zone (AEZ)
- Tested effects of 2 pruning intensities on cocoa productivity and in 2 AEZ
- Better understanding of pruning effects on cocoa productivity, for improved and tailored recommendations
- Update current recommendations based on trial findings



Source TechnoServe

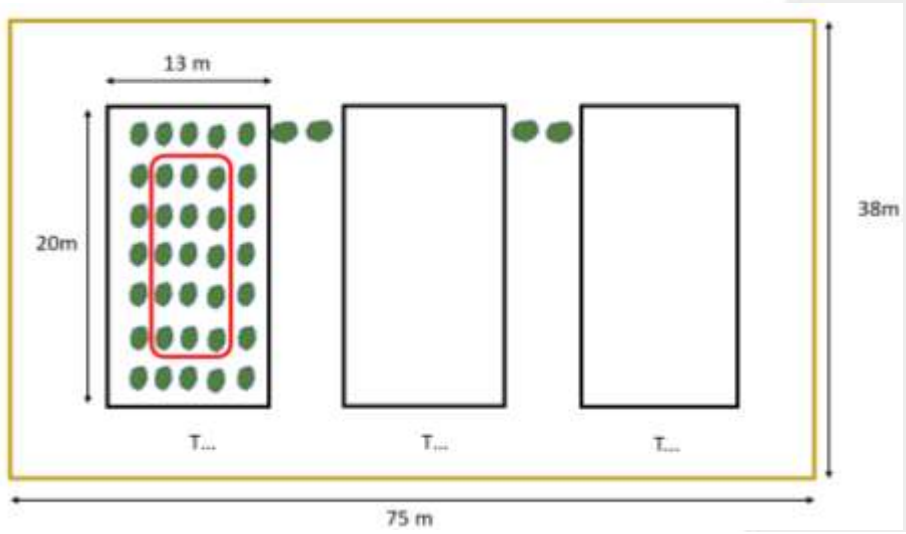
Material & methods

• Materials

- Plantation ages : 10-15 years old
- Planting material : hybrids
- Trial site area: 0.29 Ha
- Number of trial sites: 25 sites
- 105 trees per site
- 5 locations
- 2 AEZ:
  - Evergreen forest
  - Deciduous forest areas
- Duration: 2020-2022

• Methods

- 5 replicates
- Plot arrangement



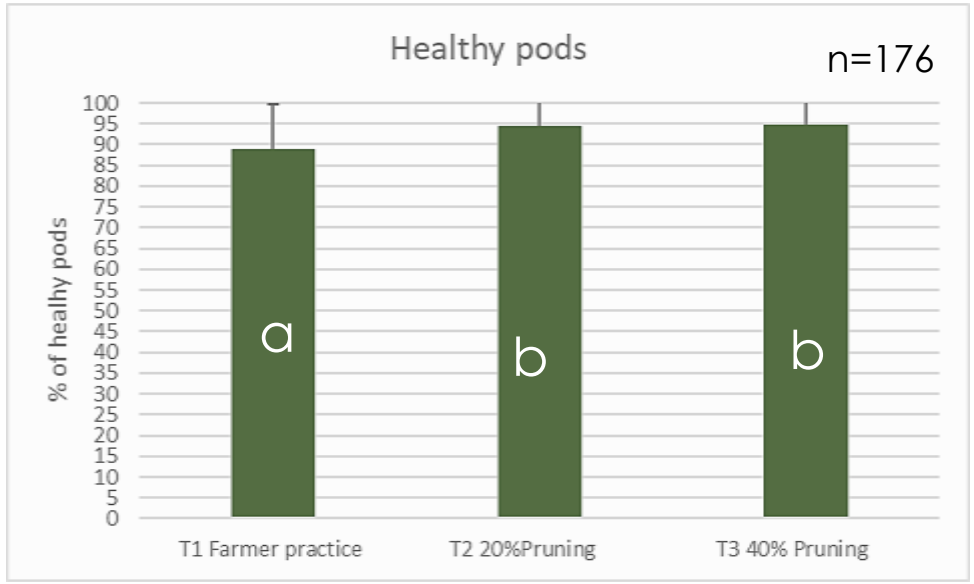
Measurements

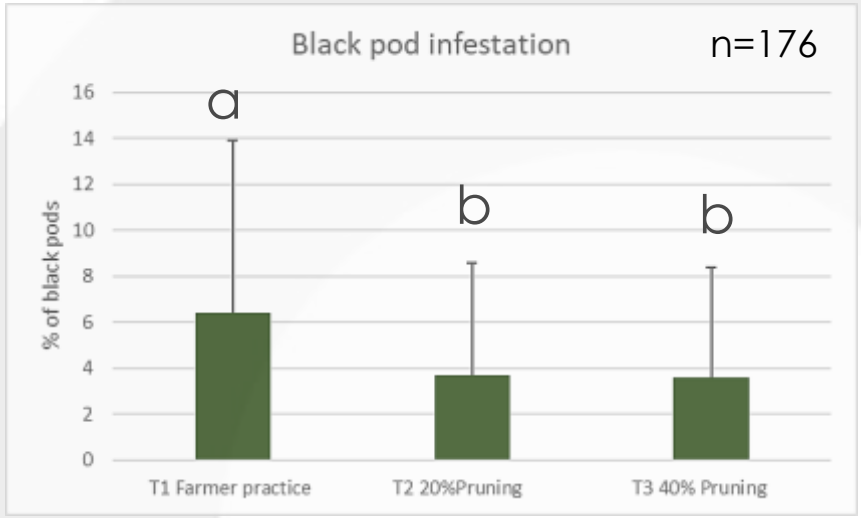
- Frequency : at every harvest
- Data collected :
  - N Heathy pods
  - N mirid infected pods (slightly curved + narrows at apical tip)
  - N black pods (1/3 covered by symptoms)
  - Pod size; N fresh beans per pod; Fresh bean weight
  - Dry bean yield

T1	Control (unpruned) + weeding + insecticide applications + fungicide applications
T2	Removal of 20% of secondary branches + sanitary pruning + weeding + insecticide applications + fungicide applications
T3	Removal of 40% of secondary branches + sanitary pruning + weeding + insecticide applications + fungicide applications

Key results : Pod health

Healthy and unhealthy pods per treatment (p<0.001)



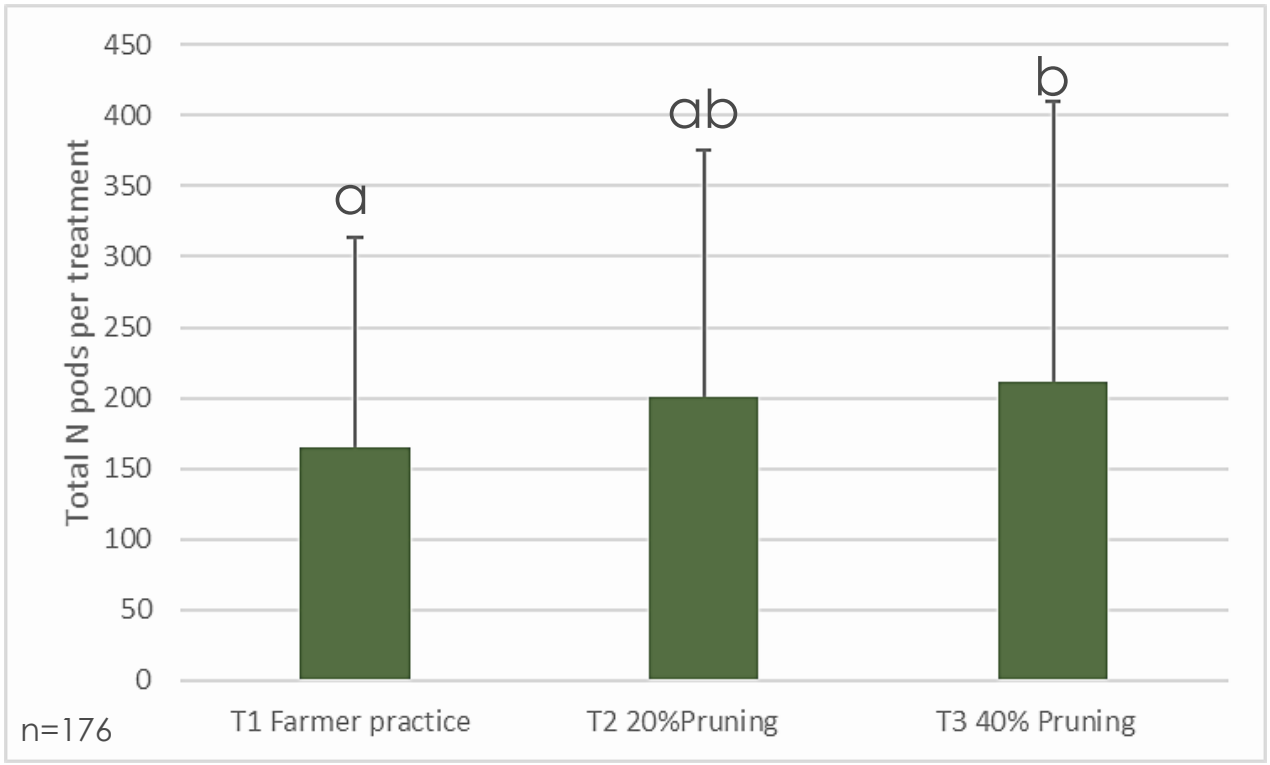


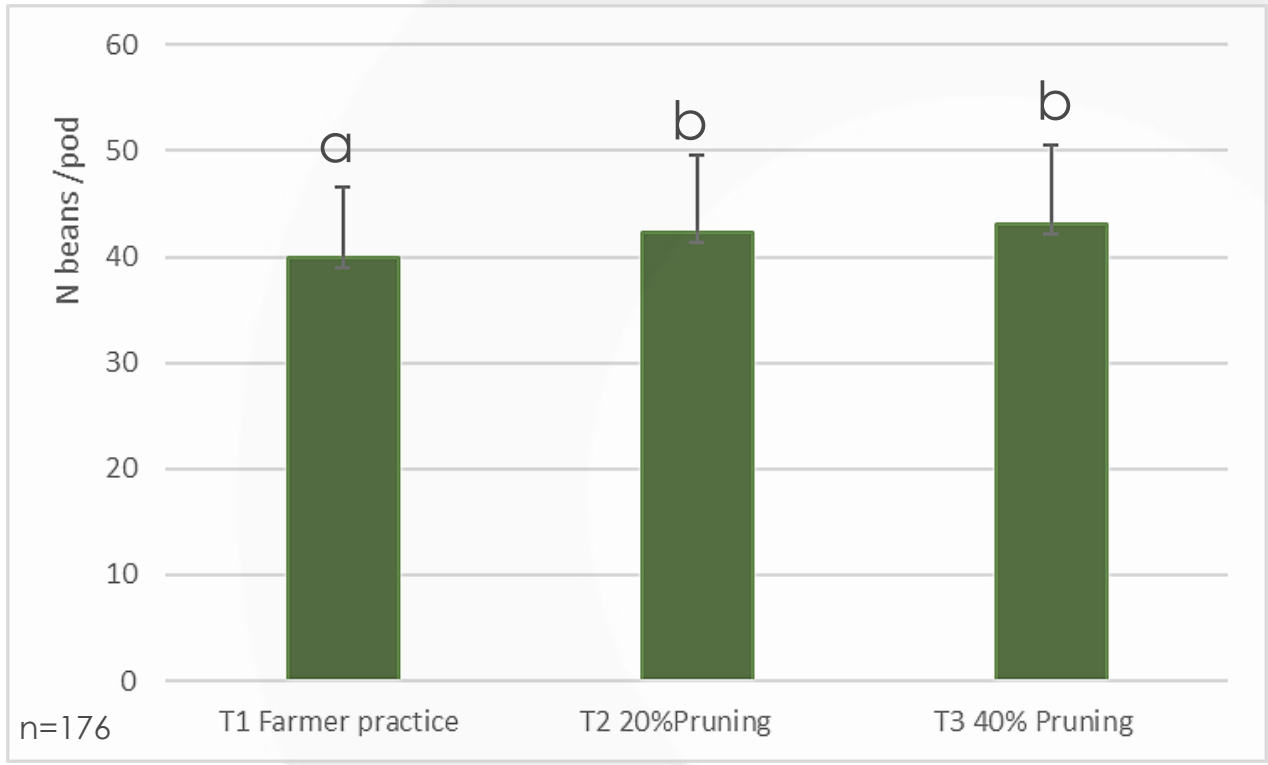
- Pruning increased proportion of healthy pods (+5,62%) and decreased proportion of unhealthy ones (-52% to-60% for mirid infected pods and -43% to -45% for black pods)

  → **Consistent trends over 2 years**

Key results : Yield

Yield parameters (p<0.001)

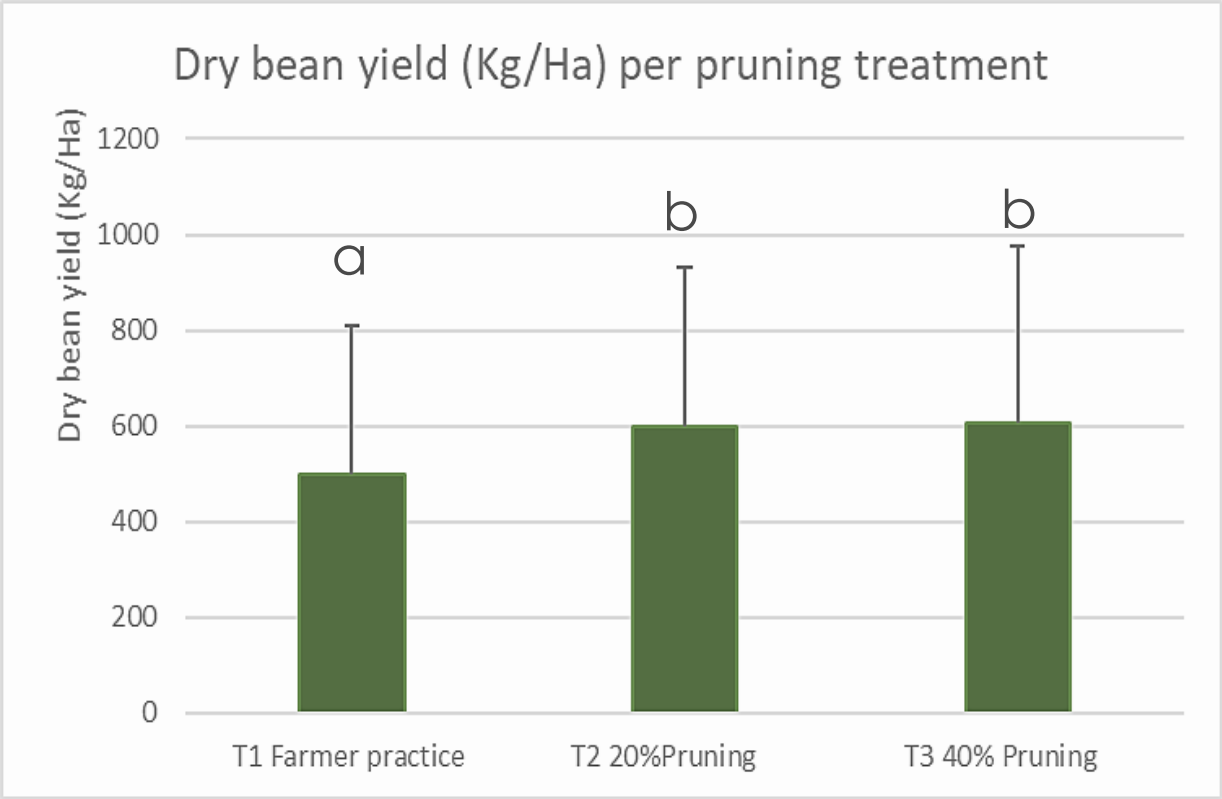




→ Pruning increased total number of pods (+21,53% to 28.6%) and number of beans per pod (+5,9% to +8%)

Key results : Yield

Dry bean yield per treatment (p<0.001)



n=176

Pruning increased dry bean yield by about 100kg/ha (+20 % increase) compared to unpruned

→ **Consistent results over 2 years**

Year 1: Significant difference between T2 and T3

- higher yield with 40% pruning in evergreen forest area
- higher yield with 20% pruning in deciduous forest area

Year 2 : No significant difference between the 2 pruning treatments

→ **T2 and T3 similar effects on productivity** after 2 years of regular pruning

Key take aways and perspectives

- Consistent **yield increase** : +20% (+ 100 Kg/Ha)
- Consistent **reduction in mirid and black pod disease** infestation: up to -60% and – 45% respectively
- Increase pod/bean health : better final cocoa bean quality (low level of spoiled beans)
- **Gain for farmers** (with current price 900 XOF/Kg and 25000/Ha investment): **65 000 XOF/Ha**
- *Pruning=> contributes to increased income for farmer via yield increase, reduction of pest/disease infestation and better bean quality*
- Impact on farmer income and bean quality: **ofi** is currently **promoting and supporting adequate implementation of pruning and other GAPs**