- STOCK -

Soil: Testing the impact of OrganiC amendments for the benefit of marKet gardening farmers

Phimmasone Sisouvanh, Christian Hartmann, Alain Pierret, Xaysatith Souliyavongsa, Sonemany Nigole, Khampaseuth Xayyathip, Khampasith Chanthavong, Chanthavong Somsalao, Namphon Sichanhavong, Lartick Keomexay, Khamphien Louangoudom

Introduction

Agro-ecology: replace chemical fertilizers by:
+ **organic amendments (OA)**, mainly compost,
+ mineral amendments, mainly **lime**.

In Laos:

(i) compost is prepared by farmers, application depends on its availability;

(i) lime: under-used because farmers are not yet convinced.

Objectives

To determine the impact on plant yield:

(i) of the OA prepared by the farmers,

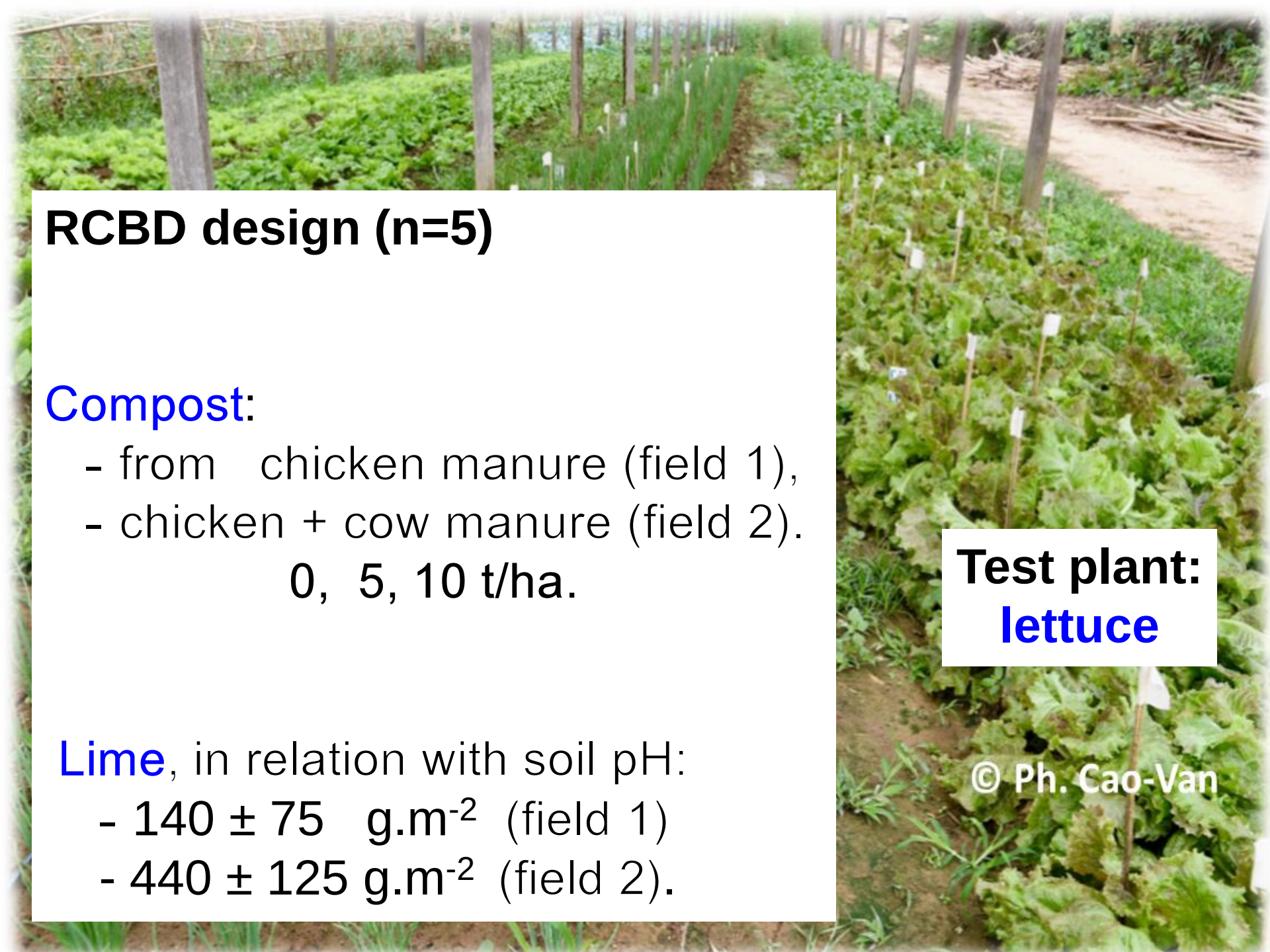
(ii) additional impact of liming.


Material and methods


Location

Thaxang,
a pilot organic village
(80 families)

(45 km from Vientiane city)



RCBD design (n=5)

Compost:

- from chicken manure (field 1),
- chicken + cow manure (field 2).

0, 5, 10 t/ha.

Lime, in relation with soil pH:

- 140 ± 75 $g.m^{-2}$ (field 1)
- 440 ± 125 $g.m^{-2}$ (field 2).

Test plant: lettuce

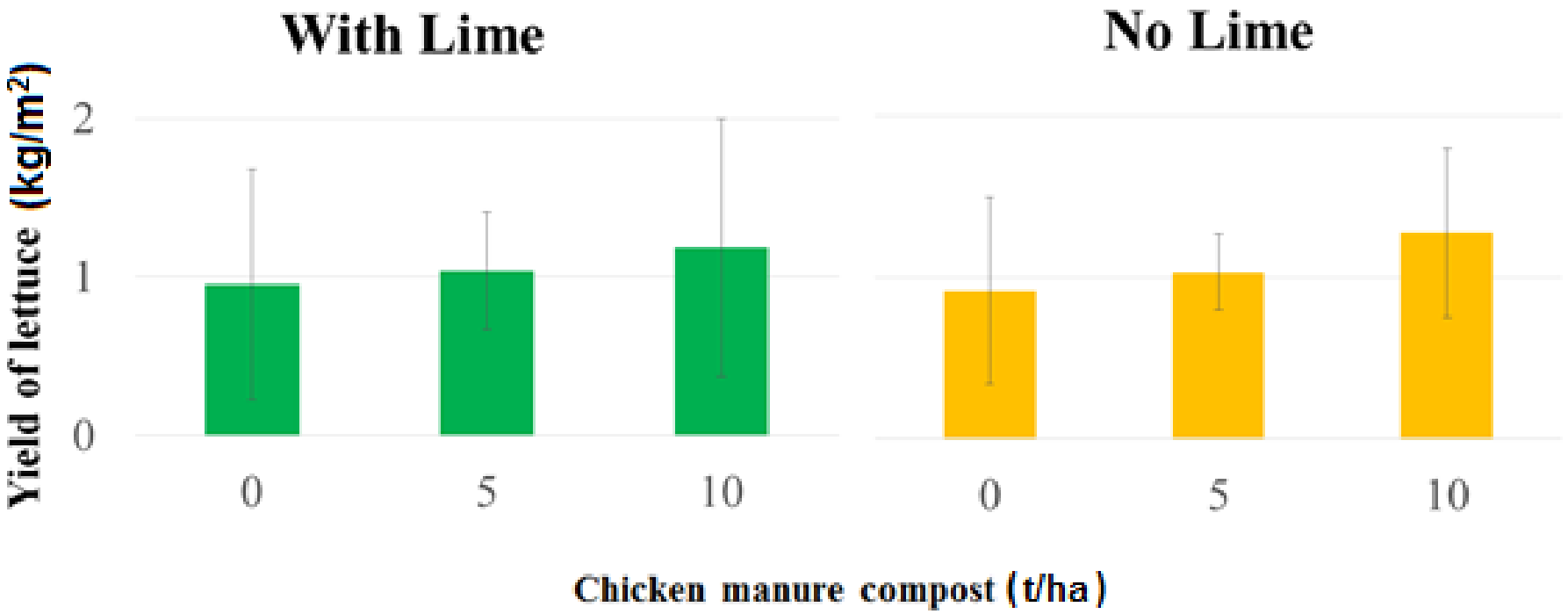
Soil and OA characteristics

Parameters	Field 1		Field 2	
	Soil	Chicken manure **compost**	**Soil**	Chicken + Cow manure **compost**
Sand (%)	40	-	21	-
Silt (%)	26	-	33	-
Clay (%)	**34**	-	**46**	-
pH (H_2O)	**6.2** (0.2)	9.2 (0.2)	**5.1** (0.7)	7.6 (0.6)
OC (%)	**2.3** (0.4)	19.1 (3.8)	**2.1** (0.5)	19.1 (5.0)
Total N (%)	**0.2** (0.0)	2.2 (0.4)	**0.2** (0.0)	1.9 (0.3)
Available P ($mg.kg^{-1}$)	**126** (41)	-	**44.1** (46.0)	-
Total K (%)	**1.6** (0.3)	1.9 (0.6)	**1.7** (0.6)	1.6 (0.3)

(the number in bracket represent the standard deviation)

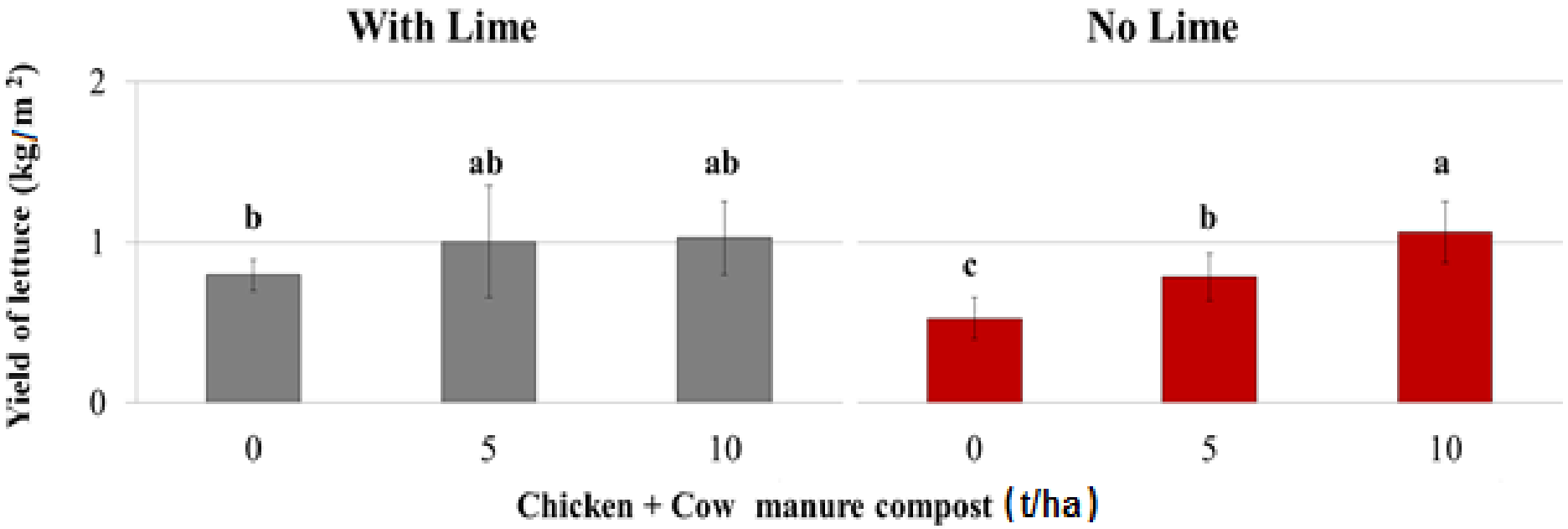
Results

Field 1



no impact of OA & liming on plant yield.

Field 2



Positive impact of both OA & lime.

Conclusions

For lettuce yield:

- **OA efficiency depends on initial soil characteristics:**

in good soil conditions, it is not useful to add OA on each crop rotation.

- **In acidic soils,**

liming increases plant yield & decreases need of OA .

Perspectives

Recommendations to farmers:

Research questions:

Perspectives

Recommendations to farmers:

- **adapt the amount of compost to soil characteristics**

  (farmers could save time and organic wastes)

- **use lime when pH is too low**

  (can improve plant yield and soil biological activity).

Research questions:

Perspectives

Recommendations to farmers:

- **adapt the amount of compost to soil characteristics**
  (farmers could save time and organic wastes)
- **use lime when pH is too low**
  (can improve plant yield and soil biological activity).

Research questions:

- **improve the process of compost production**
  (better control of initial C/N, better aeration, longer maturation)
- make similar **experiments with improved compost**
- test **different plants and soil types**
- observe the improvement in **soil biological activity**.

Thank you for your attention