

ALISEA VIETNAM – ANNUAL GENERAL MEETING
HANOI NOVEMBER 13 2017

Do legume-based intercrops concurrently halt soil erosion, boost soil health and strengthen (natural) pest control services in cassava cropping systems of Northern Vietnam? (LEGINCROP)

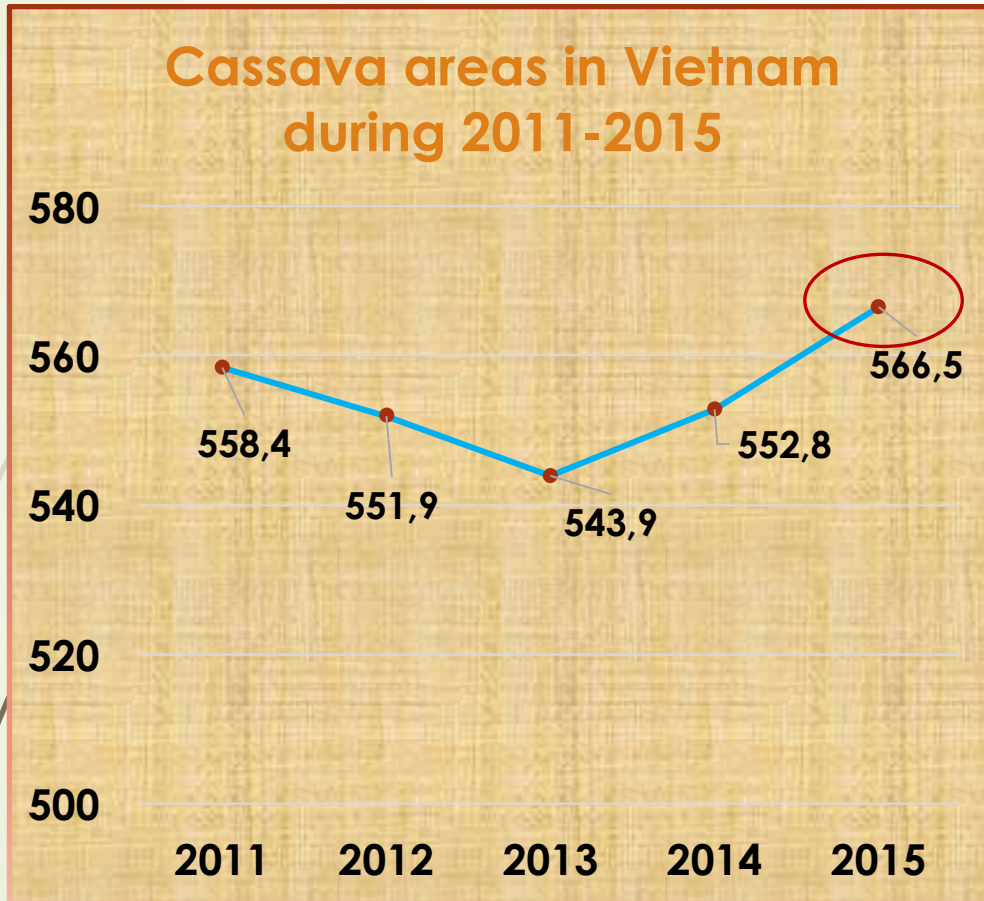
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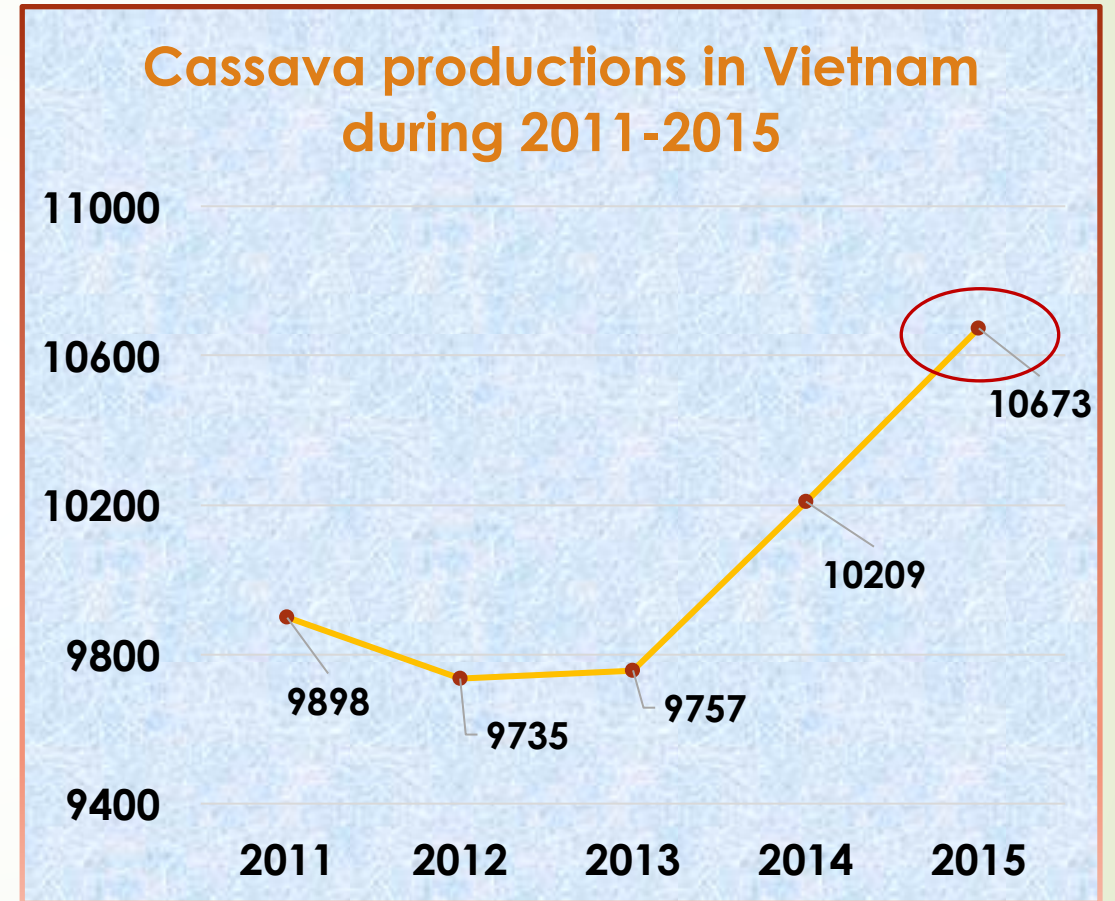


Cassava Situation in Vietnam

'000 tons

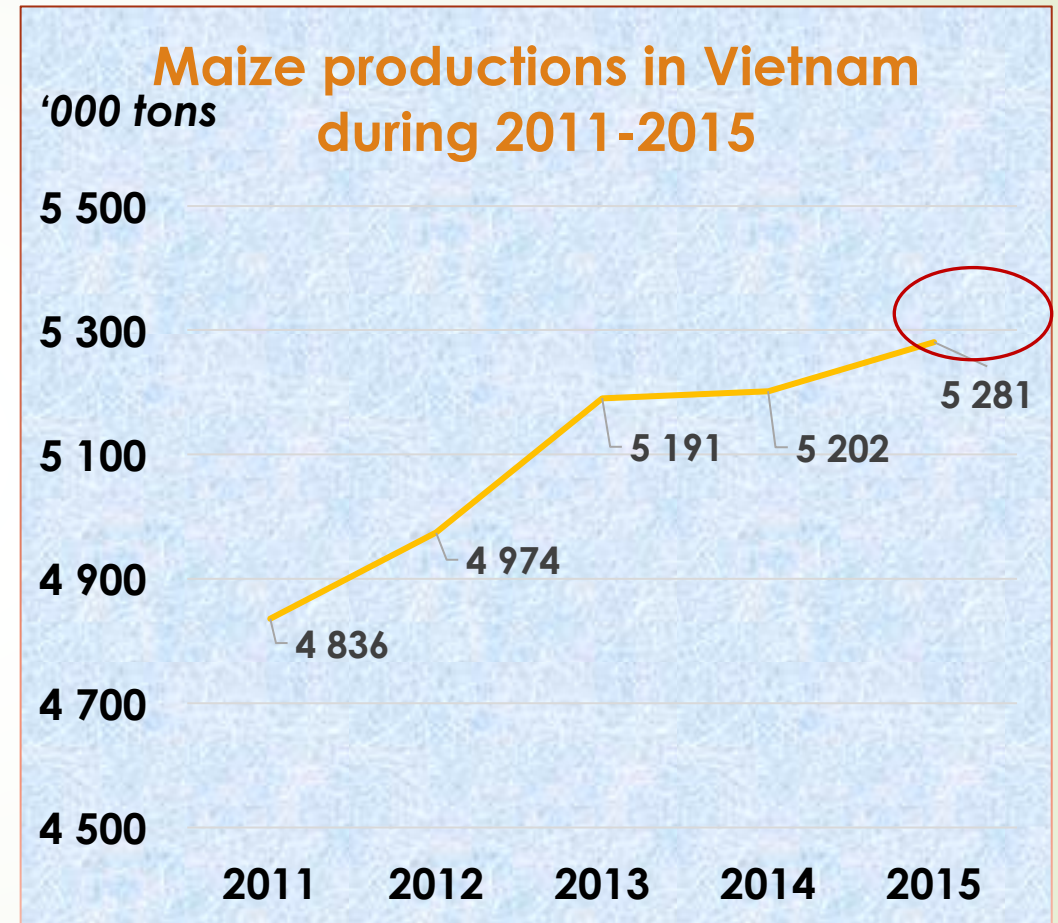
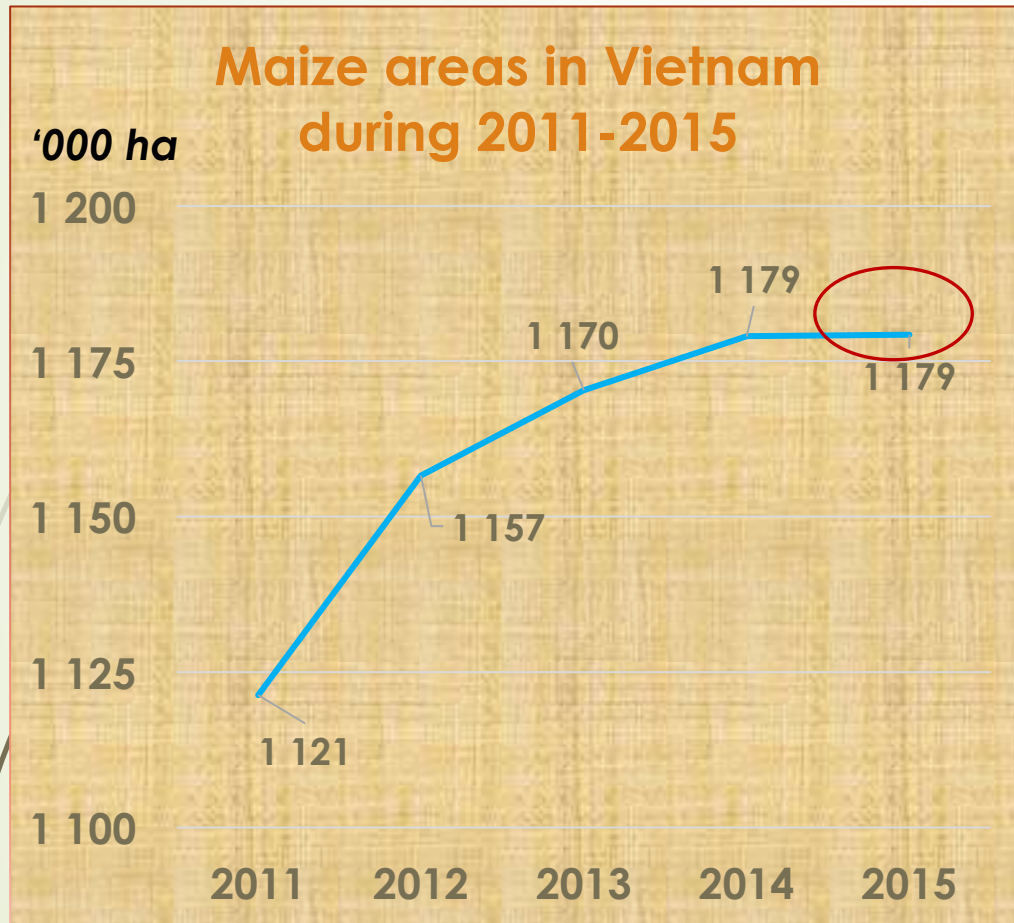


'000 tons



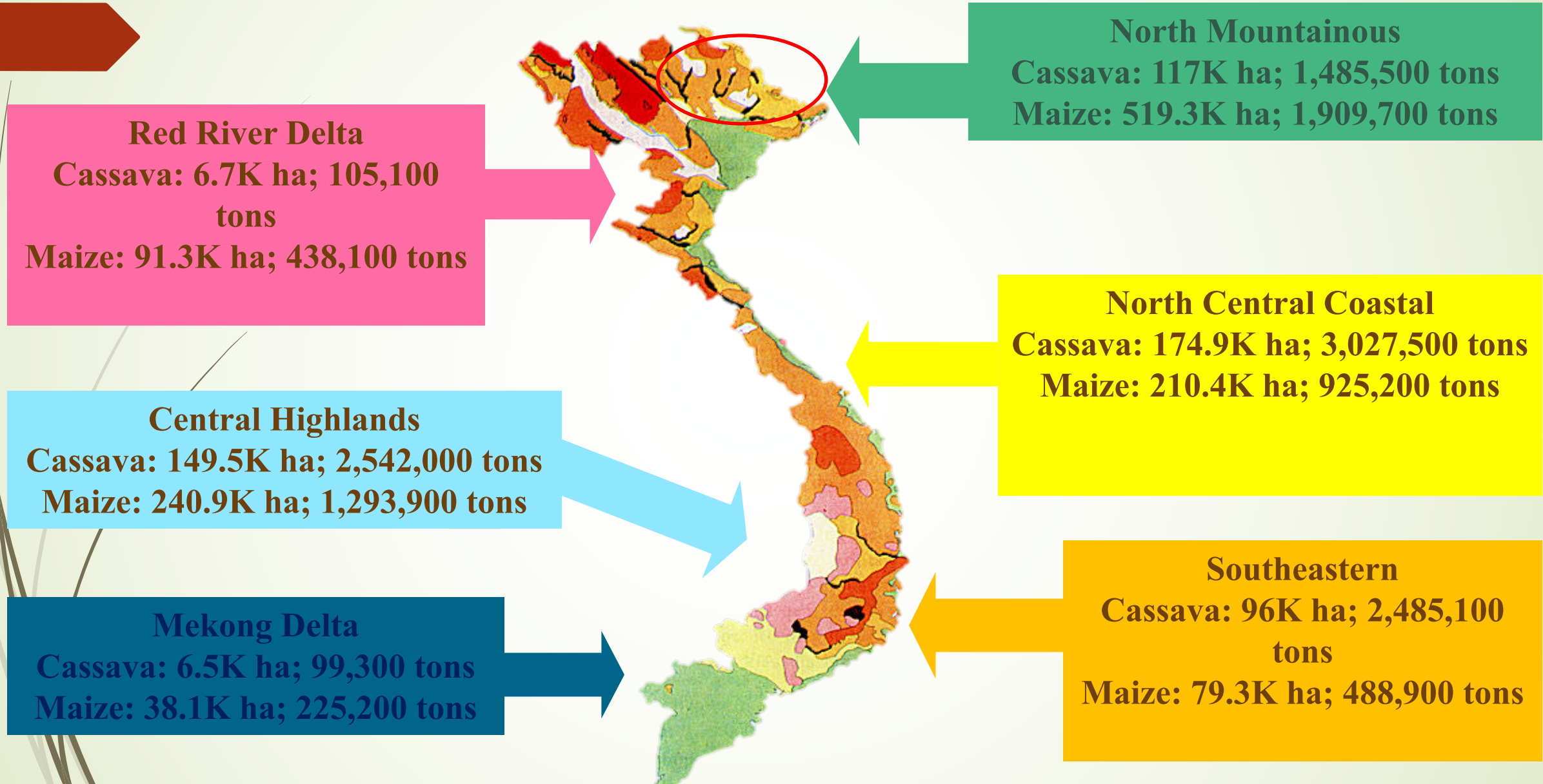
(Source: General Statistics Office of Vietnam, 2016)

Maize Situation in Vietnam



(Source: General Statistics Office of Vietnam, 2016)

Maize and Cassava Production Regions in Vietnam



(Source: General Statistics Office of Vietnam, 2016)

Mono-cropping systems

Growing mostly on slope areas

Low awareness on sustainable agriculture of Ethnic people

Insufficient organic matter

Soil erosion

Imbalance of mineral nutrient input to the soil

Core Problems

Low yield and production & poor soil fertility



Intercropping systems

Enhancing biological dinitrogen fixation in legumes



OVERALL OBJECTIVE

To evaluate cowpea-based intercropping systems effects on cassava yields (Van Yen district) and maize yields (Van Chan district) and total economic benefits as well as on the soil quality.

Specific Objectives

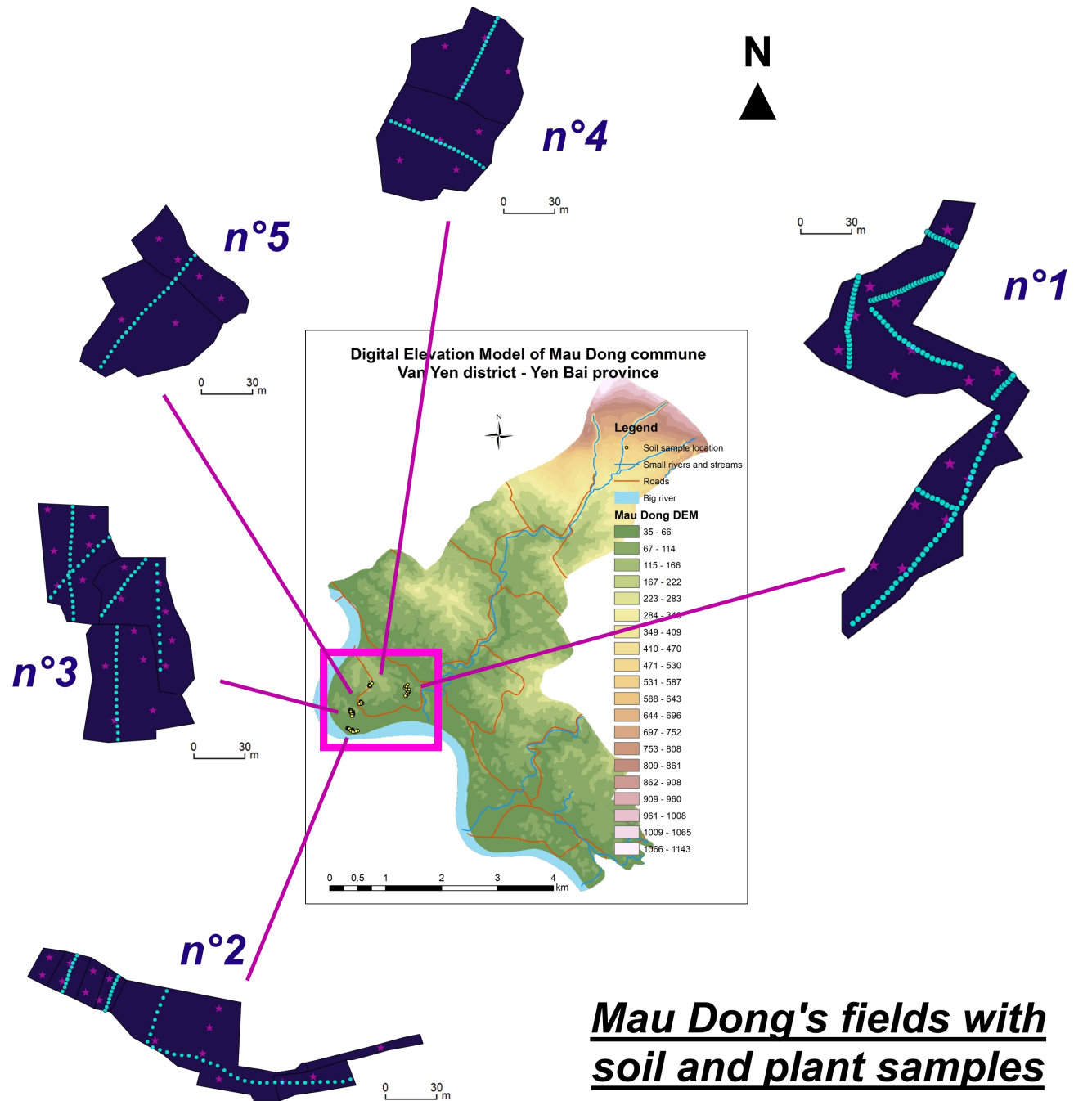
Assess the current nitrogen fixation and root mycorrhizal infection rate in legume species intercropped with maize or cassava in both districts

Optimize the symbiotic N fixation in cowpea by inoculation with effective rhizobia strains (comparison with commercial inoculants)

Measure the impact of legume-based intercropping on crop yields and land productivity ratios

Research locations



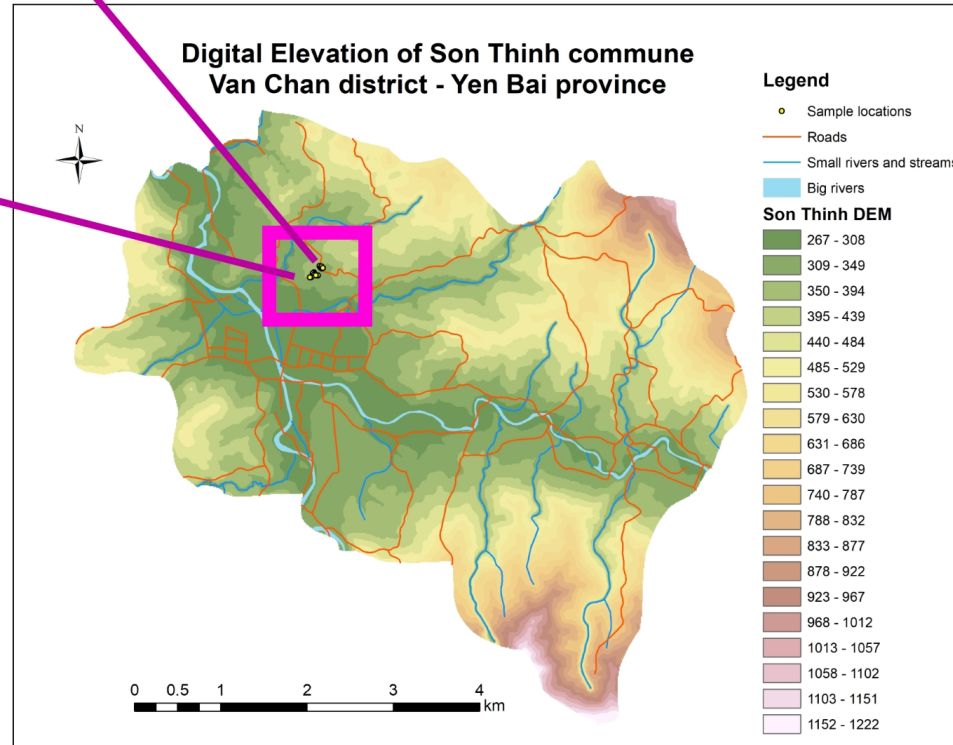
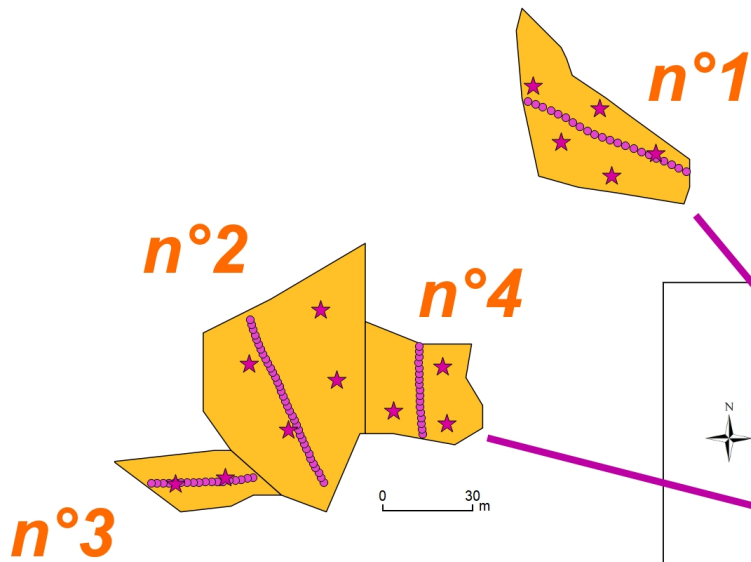


Mau Dong commune, Van Yen district: cassava intercropped with cowpea



**There are 5 farms
with a total area of
3.7 hectares.**

Son Think fields with soil and plant samples



**Son Think
commune,
Van Chan
district:
maize
intercropped
with cowpea**

There are 4 farms with the total area of 0.8 ha.





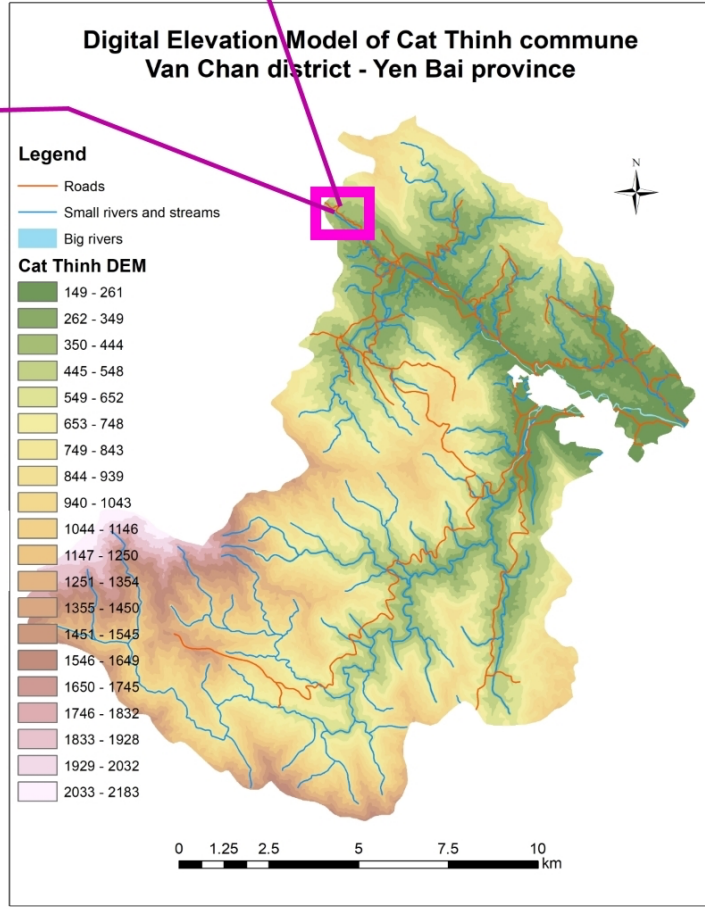
n°2

n°3

n°1

0 30 m

0 30 m



Cat Thinh's fields with soil and plant samples

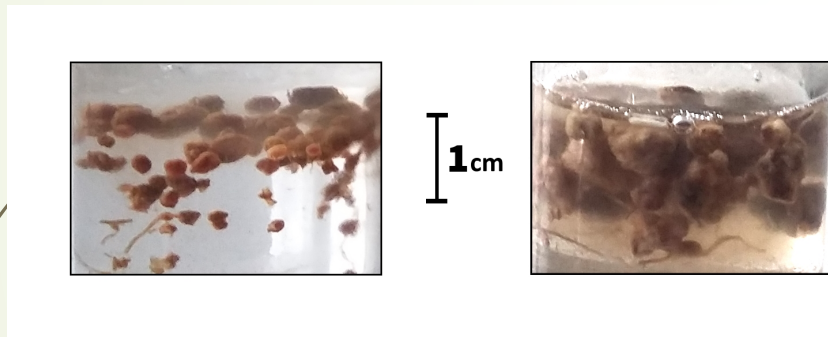
**Cat Thinh commune,
Van Chan district: maize intercropped with cowpea**



There are 3 farms with a total area of 0.65 ha.



Samplings carried out in 2017



* Collecting nodulation data and plant samples at Son Think commune (Oct. 3-4 2017)



Collecting plant
(maize/cowpea)
samples



Cleaning cowpea
roots



Collecting
cowpea
nodules



Collecting root
(maize/cowpea)
samples

* Collecting nodulation data and plant samples at Cat Thinh commune (Oct. 24-25 2017)



Tran Thi Ut's farm



Cleaning and calculating cowpea nodules

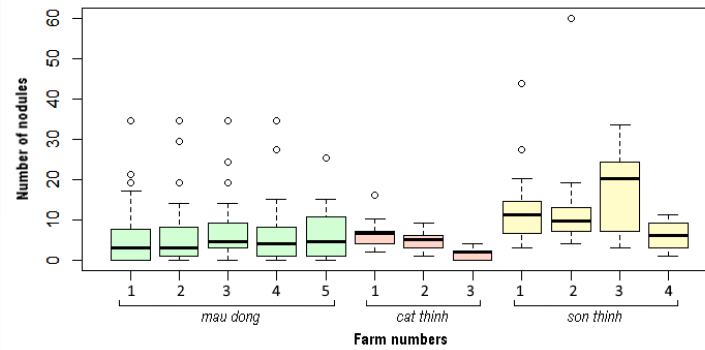


Collecting maize roots

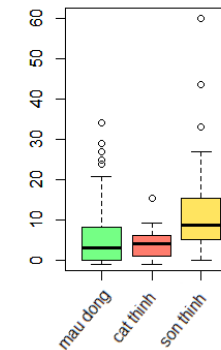
* Collecting cowpea nodules at Mau Dong commune (Oct. 25 2017)



Preliminary results obtained in 2017

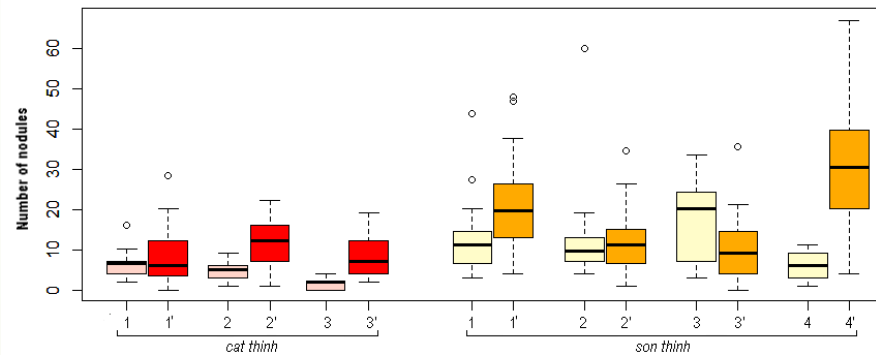


Distribution of the number of nodules according to each field studied (june 2017)

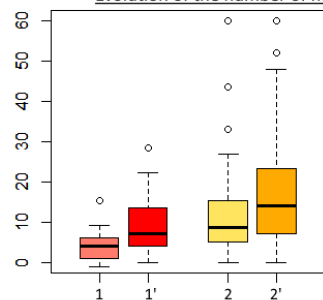


Distribution of the number of nodules for each town (June 2017)

Nodulation of cowpea

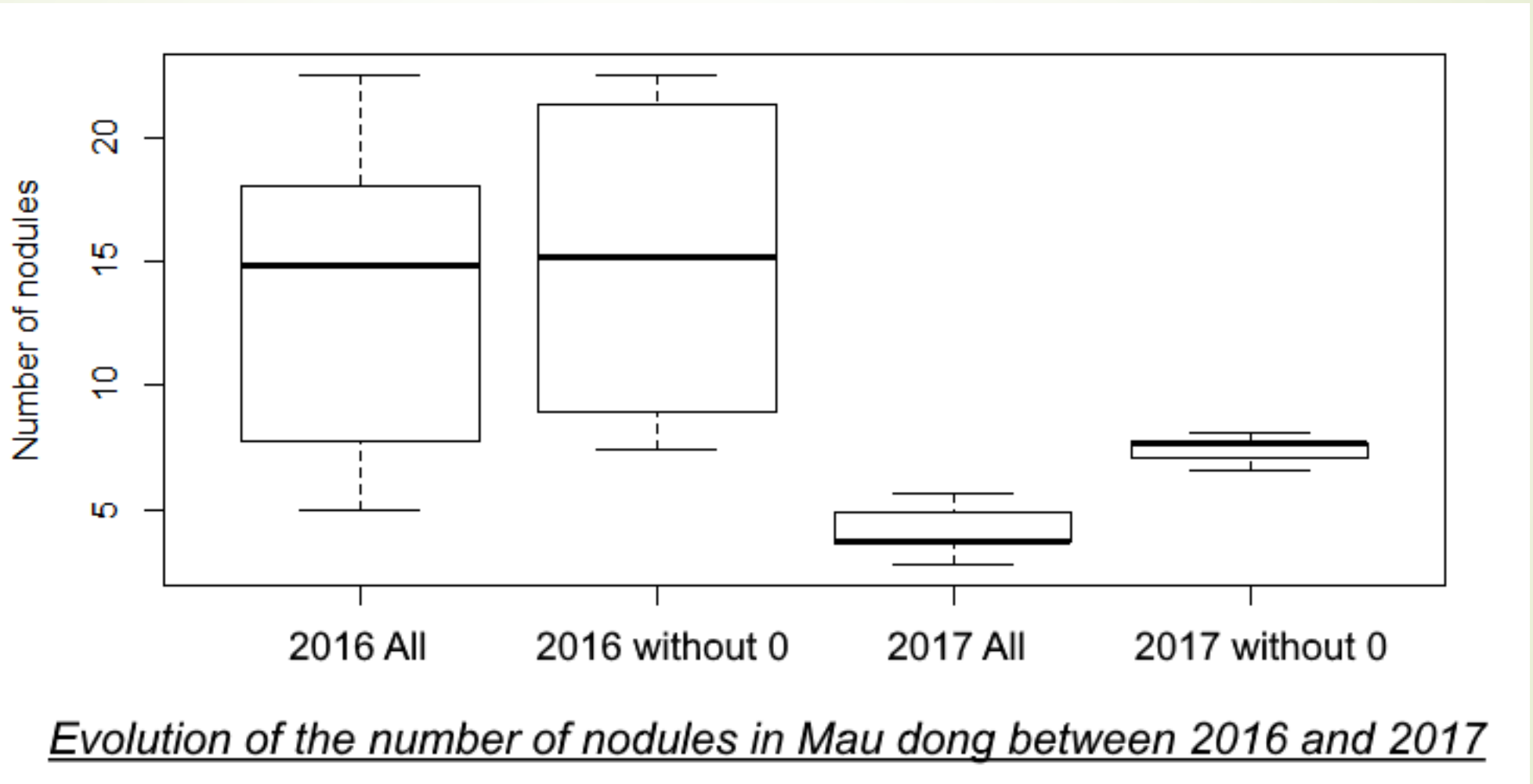


Evolution of the number of nodules between the 2 harvest seasons in Van Chan district (2017)



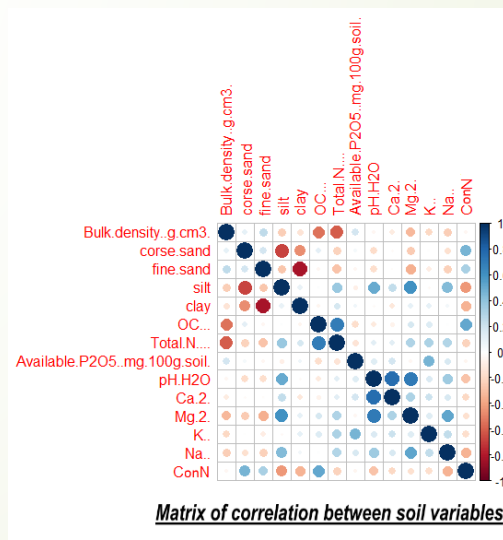
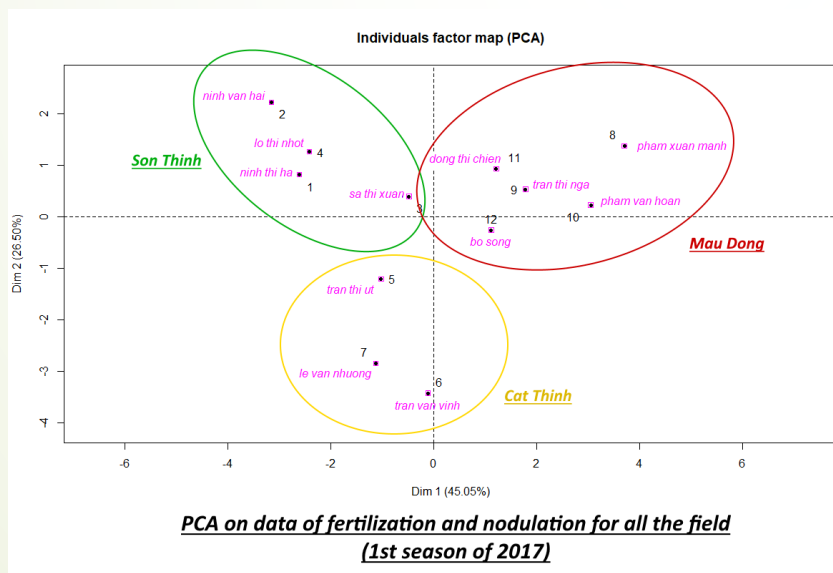
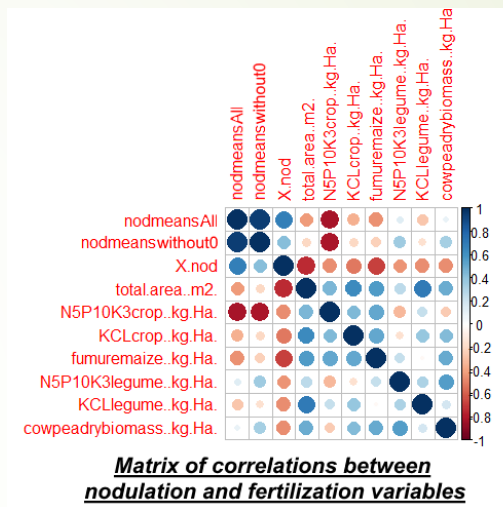
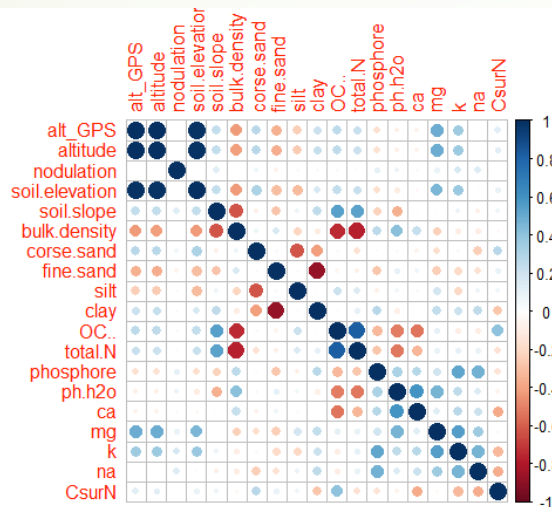
Evolution of the number of nodules between the 2 harvesting seasons for the 2 Van Chan's towns (2017)

Preliminary results obtained in 2017

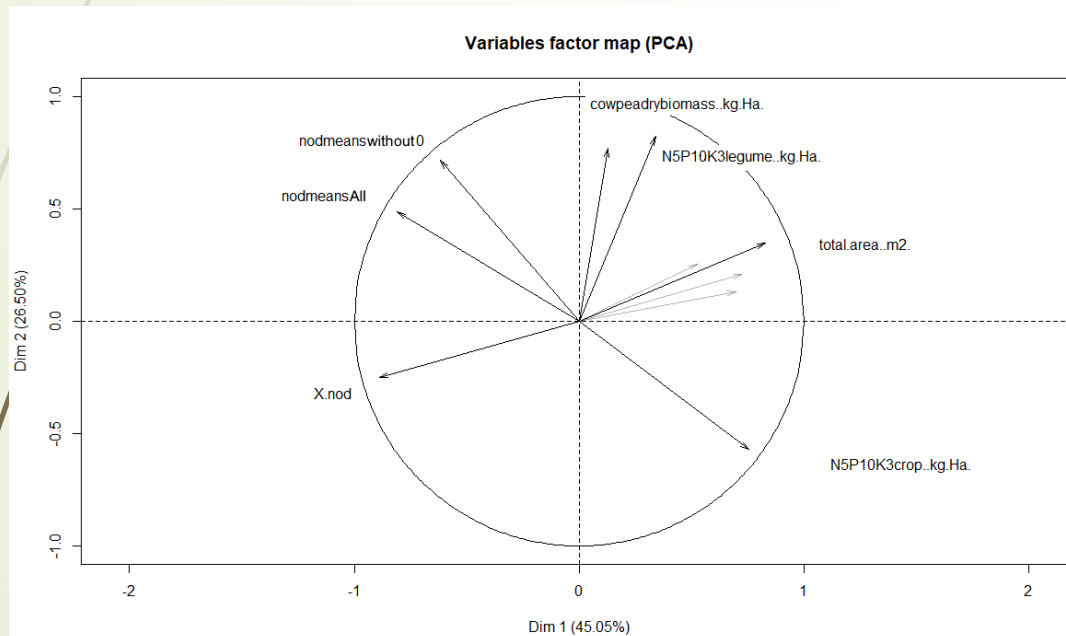


Nodulation of cowpea

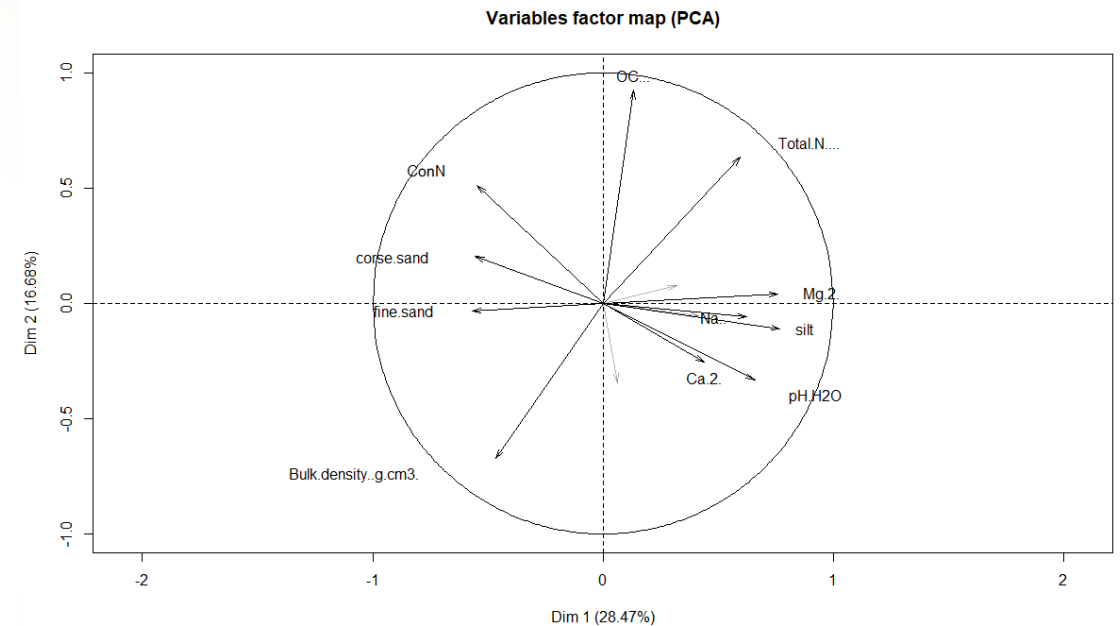
Preliminary results obtained in 2017



Preliminary results obtained in 2017



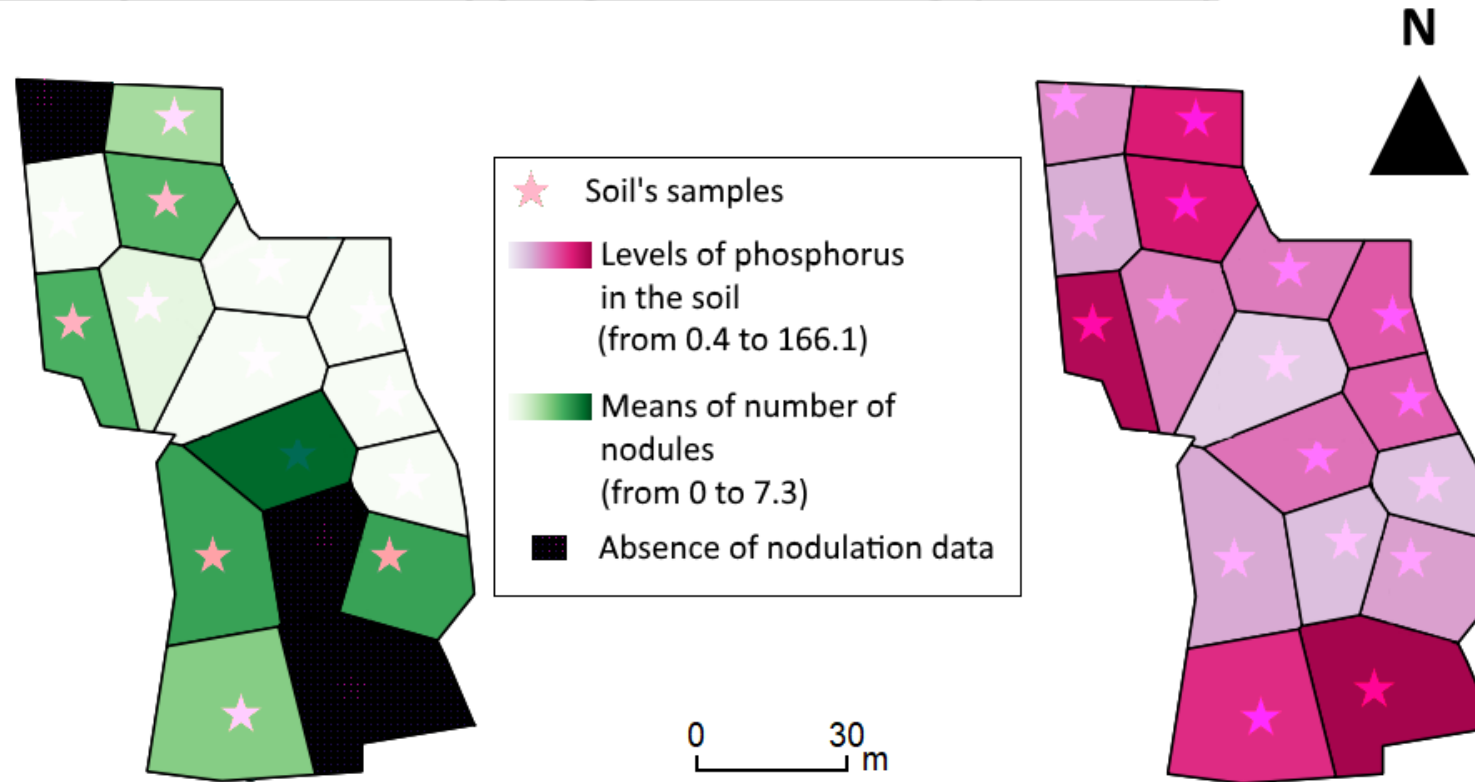
PCA on data of fertilization and nodulation for all the field
(1st season of 2017)



PCA on soil data for all fields

Preliminary results obtained in 2017

Exemple of soil mapping in Mau Dong (field n°3)





Preliminary results obtained in 2017 :

1. Inconsistent and highly variable nodulation of cowpea;
2. Fertilisation applications not compatible with effective nodulation of cowpea;

What is the way forward for 2018?

1. Inoculation of cowpea with rhizobial inoculants (commercial & cocktails with native strains from both districts).

Time schedule for 2018

1. Isolation of native rhizobia nodulating cowpea from nodules collected in both districts
2. Meetings with local committees and farmer associations of both districts to explain them what has been done in 2017 and what is the plan for 2018. Getting feedback from them will be very much relevant.
3. Assess the mycorrhization root infection rates of the samples collected on 2017 and run the same statistic analyses than for the nodulation.