

Market garden production systems in periurban area of Mahajanga. Determinants of agricultural practices of organic fertilizer for technical innovation



Context of the study

- **Urbanization in developing country and food demande growth**
- **Importance of market gardening to insure the food security and incomes**
- **Constraints**
 - Scarcity of land
 - Socio-economical : land tenure, investment capacity, costs of inputs (fertilizers, pesticides)

Context

Fertilization constraints and alternatives

- Valorisation of urban wastes from urban livestock, from agro-industries, or domestic wastes.

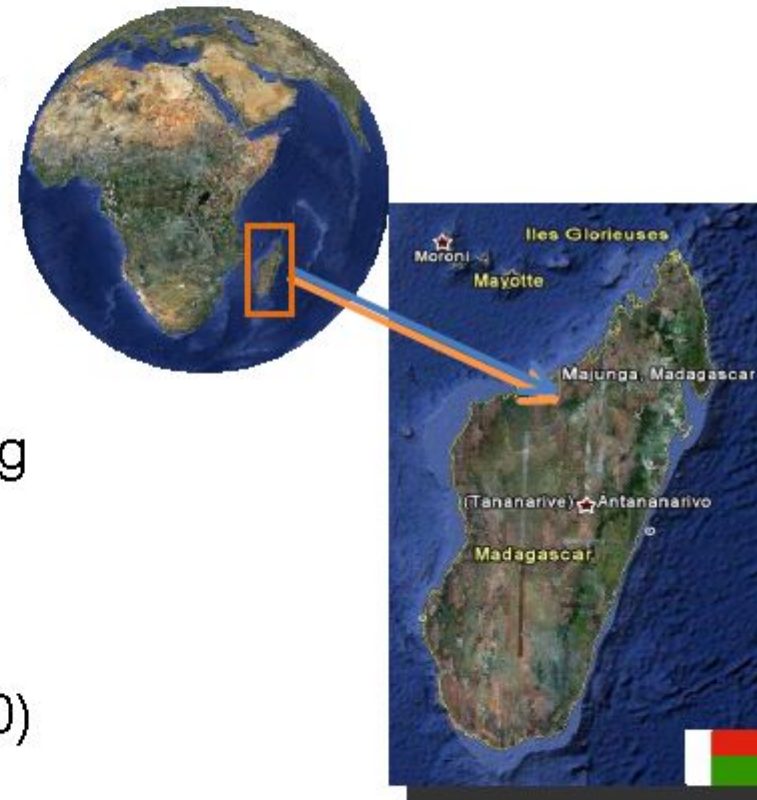
It is necessary to assess

- The traditional fertilization practices
- The available urban organic matters and their agronomic characteristics



Materials & Methods

- The study site : Mahajanga
 - Dry tropical climate
 - Main plant production : leafy vegetables
- Conceptual model of technical decision
 - Samples of market gardening farms (12)
 - Record weekly cultural operations during two years
 - Verify on a larger sample (30)





Results and discussion

Farming systems of market production systems



- **Unit of crop management : plot of 12-14m²**
 - ✓ **Lake : 120 beds (1680 m²)**
 - ✓ **Depressions: 400-1200 m²**
- **Crops dominated by Brassicaceae family**



Fotsitaho
Brassica campestris
amplexicaulis



Salady
Lactuca sativa



Felimafana
Acmeilla oleracea



Anantsonga
Brassica campestris



Petsai
Brassica campestris nekinensis



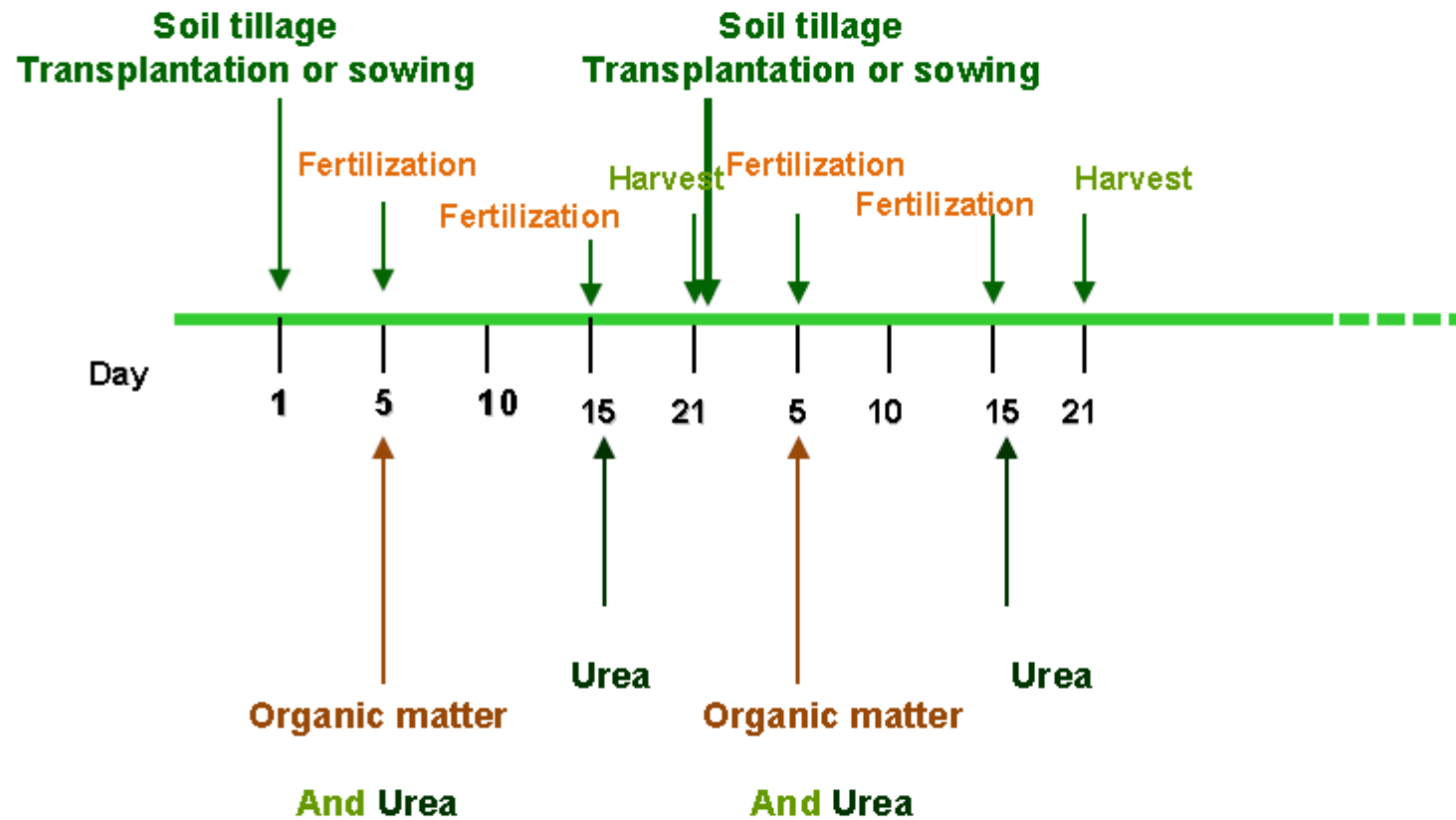
Anamamy
Solanum nigrum

Farming systems of market production systems

- **Labor force: mainly manual and familial**
- **Vegetables sold in the urban markets of Mahajanga**
 - **sold through female retailers, chemical fertilizers suppliers**
 - **exclusive source of vegetables supply**



Planning fertilization of « Anantsonga » (short cycle species)



Urea	Cattle	Pig	Poultry	Sheep
460mg.g⁻¹	16 mg.g⁻¹	12 mg.g⁻¹	29 mg.g⁻¹	21 mg.g⁻¹
100 kg N ha⁻¹	18-24 N kg	18-24 kg	18-24 kg	18-24 kg



Organic and mineral fertilizers functions according to farmers

Manure application

- Fertilizer for the current cycle: growing vegetables in width
- Mulch effect (fundamental) : water limited , irrigation entirely manual,
- Amendment for the rice crops

Urea application

- First supply: plant growth in high
- Second supply: green color



Farmers determinants

- Availability on the local market of these fertilizers :

- Frequently lacking during the season

- Organic matters: lacking in the main months (June to August) : demand > offer

- Capacity of farmers to buy and/or to apply it :

- No investment capacity : vegetables cycles in April: money /fertilizers for following cycles.

- Work organization = no time to look for organic matter and depend to go-between mens



Conclusions

Conclusion

- **Complexity of the role of fertilizers**
 - Fertilizer, amendment and soil water conservation
 - Role of mineral fertilizer : plant growth and plant quality (green color)
- **Importance of livestock**
- **Alternatives**
 - Inventory of other organic resources from domestic urban waste, Agro industries wastes, Fisheries wastes
 - Assessment of their capacity to substitute all the functions of mineral and organic fertilizers