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# Evaluation of selected cowpea (*Vigna unguiculata* (L.) Walp) lines for thrips resistance (Megalurothrips sjöstedti) in Burkina Faso

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Legume Innovation Lab

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# OUTLIER

- Introduction
- Materials and methods
- Results and discussion
- CONCLUSION
- On-going

# Introduction

- Cowpea (*Vigna unguiculata* (L) Walp.) is a legume crop grown all over the world.
- well adapted to the semi-arid
- 2013, an overall of 11, 316, 105 ha were planted with cowpea in the world
- More than 83% of this area was found in West Africa

# INTRODUCTION

- Protein content ranging between 23-32% of the seed weight,
- easily balance the diet of most people whose staples are cereal
- Effects of abiotic and biotic constraints which drastically reduce the productivity
- Drought, low soil fertility, and heat are some of the most important abiotic stresses

# INTRODUCTION

- Among the biotic constraints thrips is one of the most damaging in Africa (Jackai and Daoust, 1986; Jackai et al., 1992).
- West Africa, the flower bud thrips, M. sjostedti is the most economically important thrips pest of cowpea causing yield losses between 20 and 70% depending on the severity of infestation (Ngakou et al., 2008).

Flower buds become dry and brown, progressively

Distortion and discoloration of the floral parts

Reduction of pollen production, Flower abortion

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# MATERIALS AND METHODS

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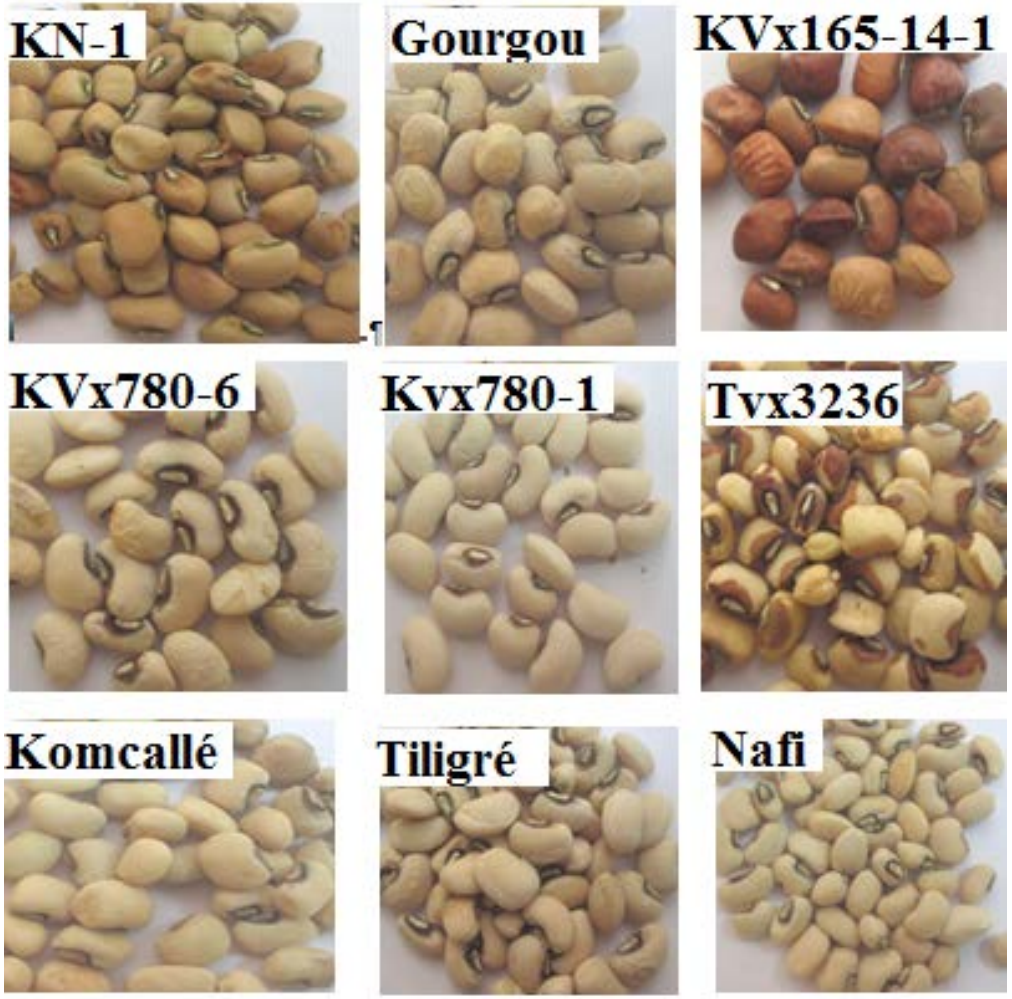
# MATERIEL AND METHODE

- **Night (09)** cowpea genotypes
- KN1 susceptible variety
- TVU3236 **resistant variety**
- **tolerant variety** KVx165-14-1
- **Varieties popularized** in 2012: Nafi ,Komcallé, Gourgou and Tiligré
- **Varieties currently being popularized**: KVX780-1 and KVX780-6

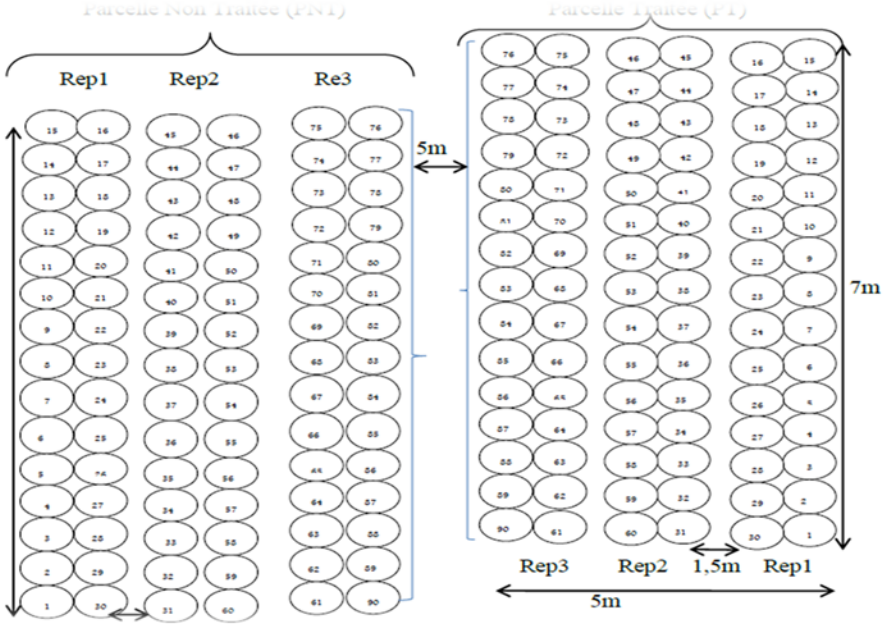


# MATERIEL AND METHODE

## Experimental design

- Breeding Management System (BMS) was used to design the trial field books and tablet for data recording.
- A fully randomized block design with three (03) repeats in two trials (PT treated plot and untreated PNT plot) was used for the experiment.
- The experiment was conducted in pots under screen house.

**treated plot plot and plot untreated**



# MATERIEL AND METHODE

- Flower bud initiation stage, each plant was infested manually with 10 thrips.
- Highly susceptible cowpea variety KN-1 was sowed in advance in the field to attract/produce thrips
- Adapted mouth aspirator has been used to suck the thrips from flowers into a collector tube.
- Cowpea genotypes to be screened were planted in plastic pots with each pot having a single cowpea plant.
- At flower bud initiation stage cover the plants with sleeve cages and artificially infest each plant with Thrips.

KN1

flowers in a bottle

LAB

mosquito net

Connes with 10 thrips

Aspirateur muni de conne

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# DATA COLLECTION

- Total number of buds produced per plant during infestation period (count buds every other day)
- Number of matured flowers per plant
- Number of buds aborted per plant (total number of buds produced – total number of matured flowers)
- Number of flowers aborted per plant (Number of matured flowers – number of pods)

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# RESULTS AND DISCUSSION

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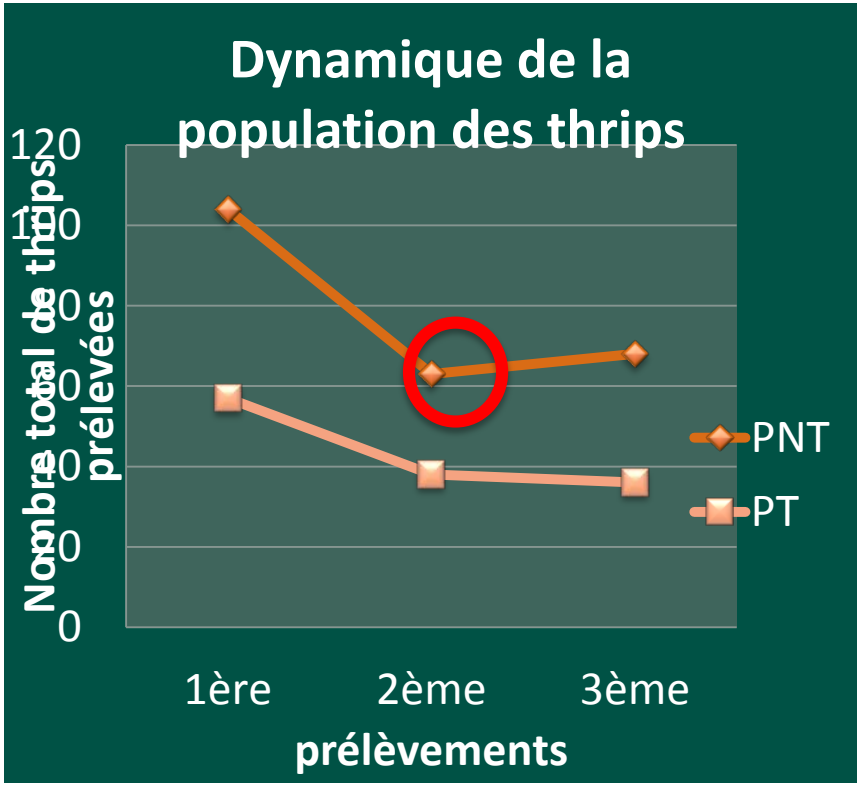
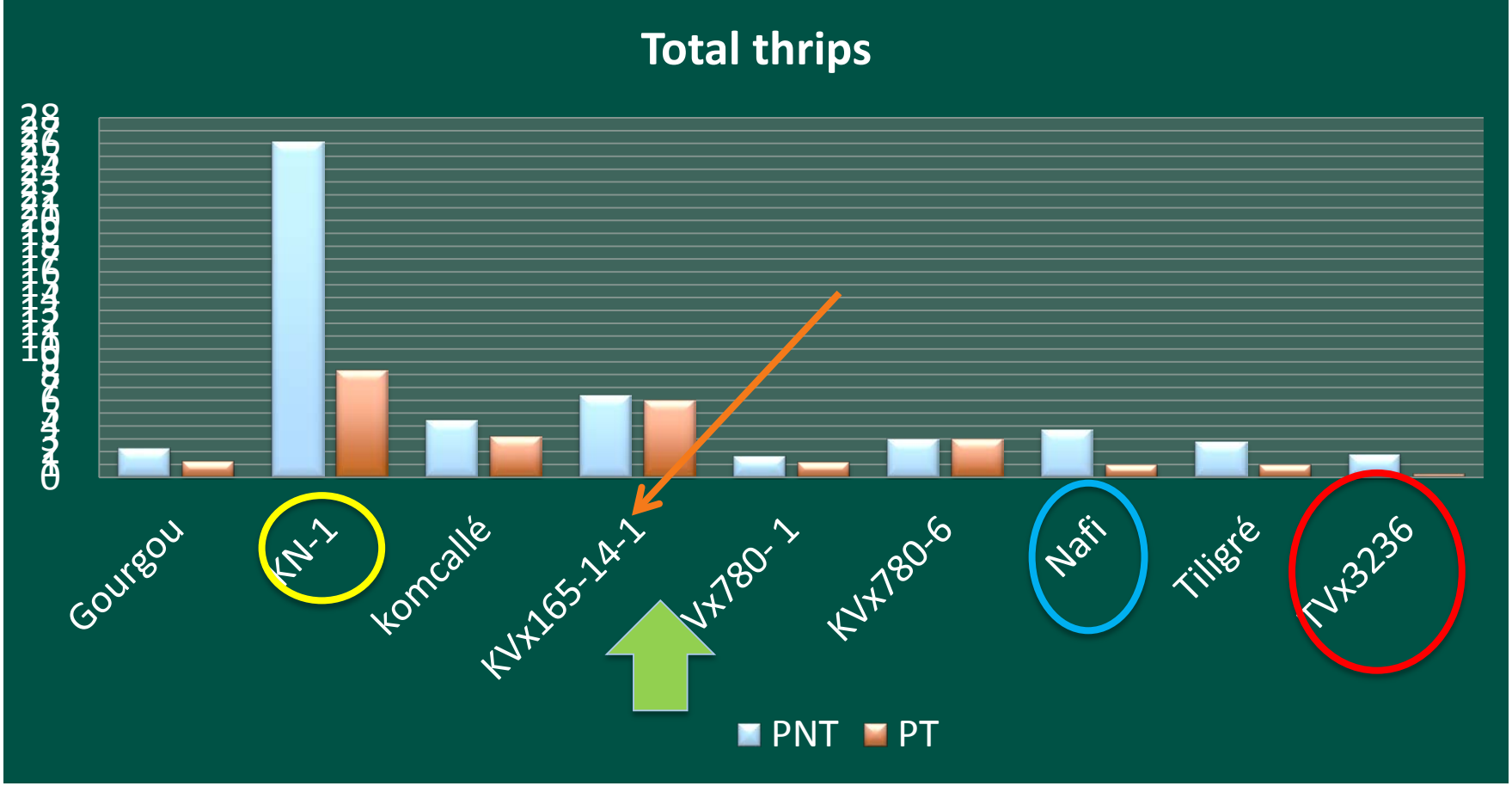
# Population dynamics of thrips in plots

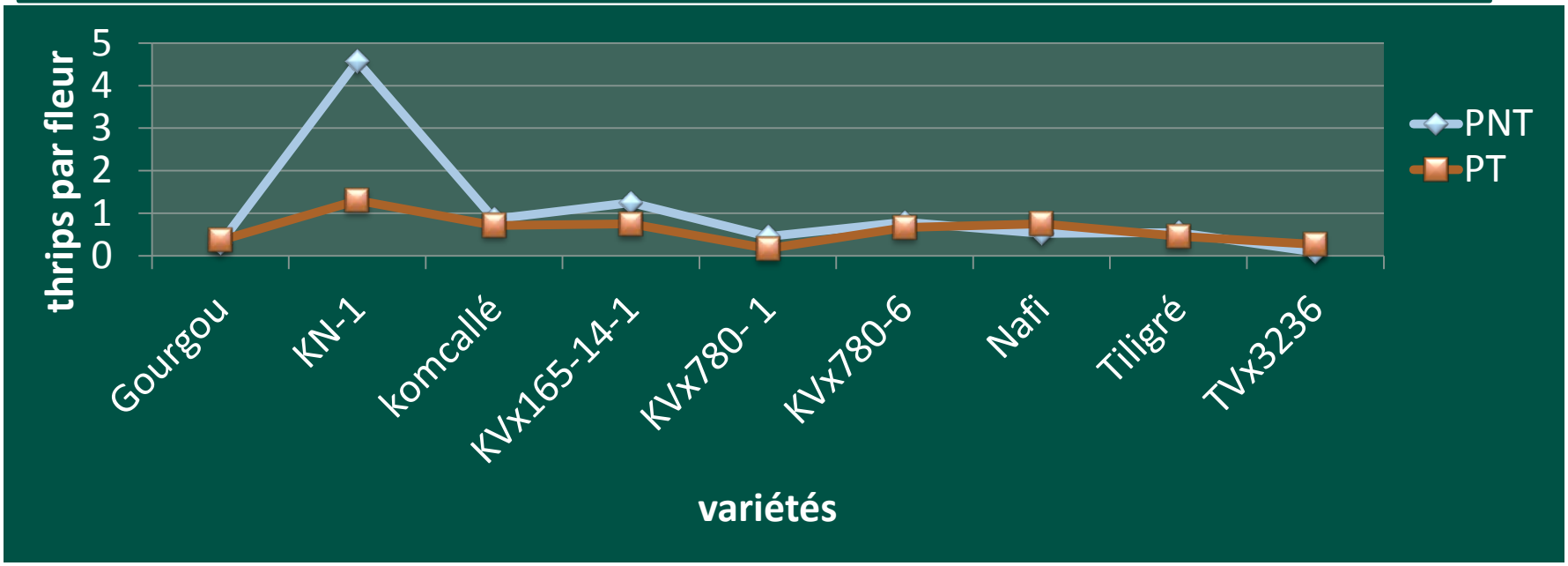
- The evolution of the population is down due to the action of the insecticide
- Descending curve followed by a slight ascendancy at the second sampling may be explained by rains at this period.




Evolution of the thrips population for all varieties in the untreated (PNT) and treated plots (PT)


Total thrips
Gourgou
KN-1
komcallé
KVx165-14-1
Vx780- 1
KVx780-6
Nafi
Tiligré
TVx3236
PNT
PT

Number of Thrips per flowers/variety

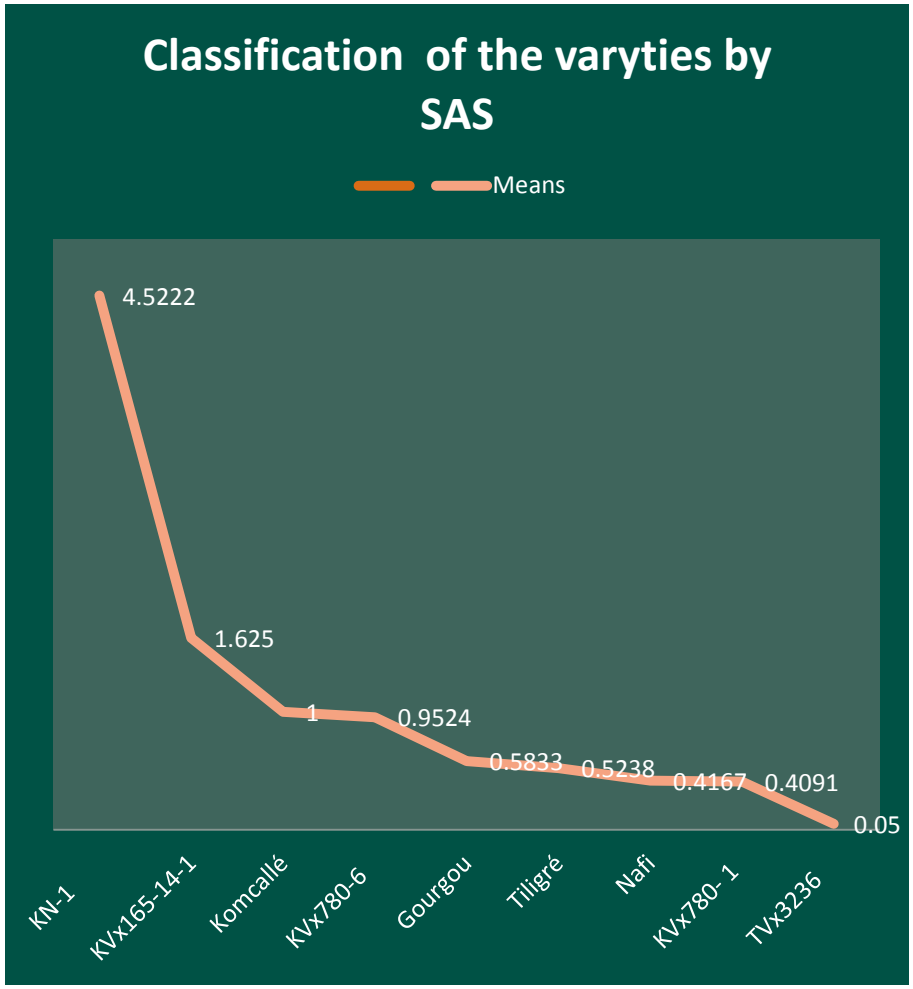



the **variety KN-1**, tolerant of **the variety KVx165-14-1** and resistant of the **TVx3236 variety** (SAFGRAD 1982 and SAFGRAD 1983)

**Varieties currently being popularized**: KVx780-1 is more resistant to thrips compared to KVx780-6

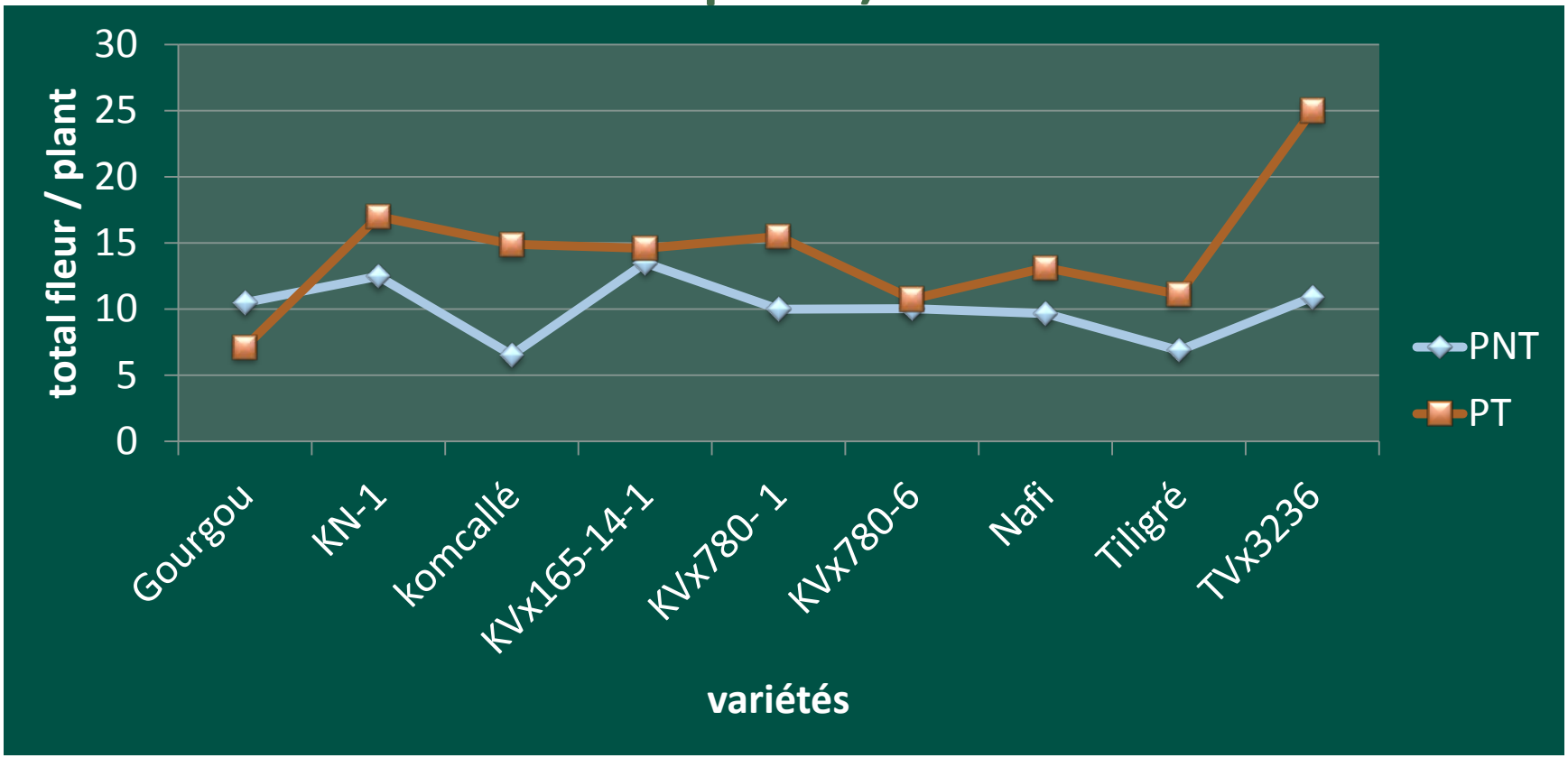
**Varieties popularized in 2012**: the Nafi variety is more resistant to thrips compared to others (Komcallé, Gourgou and Tiligré)

| Rang | Varieties | | Moyenne |
|---|---|---|---|
| 1 | KN-1 | | 4,5222A |
| 2 | KVx165-14-1 | | 1,6250 B |
| 3 | Komcallé | | 1,0000 B |
| 4 | KVx780-6 | | 0,9524 B |
| 5 | Gourgou | | 0,5833 B |
| 6 | Tiligré | | 0,5238 B |
| 7 | Nafi | | 0,4167 B |
| 8 | KVx780- 1 | | 0,4091 B |
| 9 | TVx3236 | | 0,0500 B |
| R-carré 0.727755 | Coefficient de Variation75.62488 | Racine MSE =1.099156 | Thrips par fleur Moyenne=1.453431 |
| Probabilité | PPDS 5% | Pr > F | <.0001 |

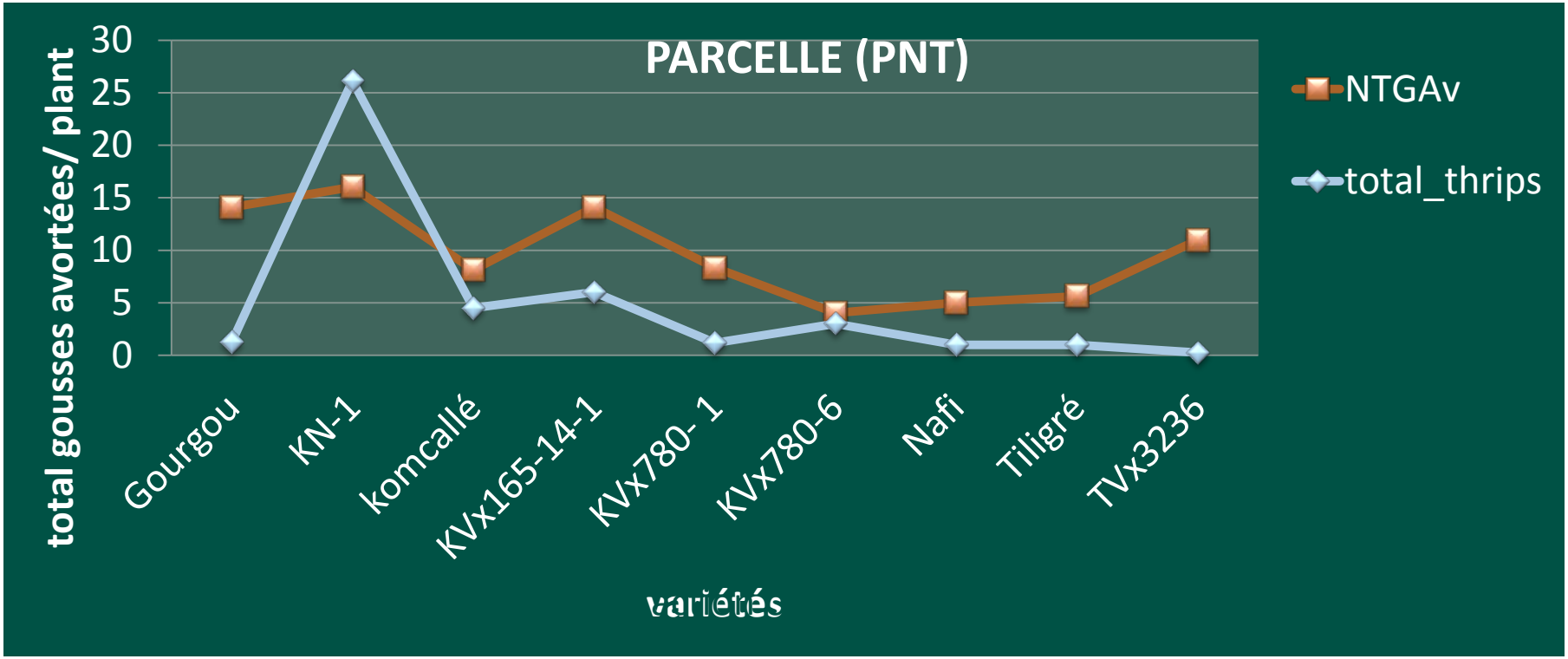



In order to confirm our results of the analysis of this parameter, another analysis of the data on the number of thrips per flower with the Statistical Analysis System version 9.1 software classified the varieties according to their susceptibility to thrips

# flowers number per plant (unT and T plot)



# Plot untreated:Total number of aborted pods (unT)




Pod abortion is due to the action of thrips on the plant
40.91% and 52.90% respectively in the treated and untreated plot
This result is similary to NDOYE et al., 1984 in Bambey determined the percentage of flower drop caused by thrips of 51.15% and 80.46%, respectively, in plots with and without pest protection

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# CONCLUSION

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- The best genotypes are those that had a low number of thrips per flower and a high production of pods,
- The KVx780-1 is the best genotype compared to the KVx780-6 (the varieties being popularized),
- The Nafi variety is the best compared to the varieties popularized in 2012 (Gourgou, Komcallé and Tiligré),
- The results confirmed the sensitive characteristics of the variety KN-1, tolerant of the variety KVx165-14-1 and resistant of the variety TVx3236,

# On-going activities

- To repeat the study this time on two sites here but we will use the larvae to infest because we are rearing the thrips with the laboratory entomology of kamboinse and recorded the damages (damage will be scored by adapting on a scale of 1 – 9 (Jackai and Singh 1988)
- To determine the Mode of inheritance of the resistance to cowpea flower bud Thrips
- To identify SSR polymorphic markers between flower Thrips resistant and susceptible genotypes
- To identify QTLs for flowers bud Thrips resistant using SSR Marker (RIL)

# Acknowledgment

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INERA

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