Background

1. *Fusarium oxysporum* f. sp. cubense (Foc) is a devastating pathogen of banana, that survives for years in soil by thick walled chlamydospores.

2. Graminoids are often observed to be a host of *Fusarium oxysporum* (Fox) and could be potential symptomless carriers of Foc.

3. However, they could also be carrier of non-pathogenic *Fusarium oxysporum* (np-Fox), which are often abundant in soil suppressive to *Fusarium* wilt.

4. Field data suggests that the colonization of graminoids by pathogenic Foc is of minor importance in comparison with np-Fox.

Objective

Goal: to identify if graminoids are harmful or beneficial with respect to *Fusarium* wilt by characterizing the endophytic association of Fox and graminoids.

Research questions:

1. Are graminoids a possible symptomless carrier of Foc?
2. Is colonization by Fox plant and/or strain dependent?
3. Are graminoids preferentially colonized by one strain when more strains are present in soil?

The experiment

- 4 strains of Fox were tested:
  - P
  - Pathogenic Foc race1
  - M, S, G
  - 3 non-pathogenic Fox strains

- 2 graminoid species were tested:
  - *Brachia racemosa*
  - *Cyperus iria*

- Quantification of the Fox strains by qPCR in the roots and shoots of the graminoids (n=4) grown in autoclaved soil inoculated with:
  1. Each Fox strain (5000 cfu g⁻¹ soil) separately
  2. A combination of the pathogen with a np-Fox strain (both 5000 cfu g⁻¹ soil)

Conclusion

Are graminoids a possible symptomless carrier of Foc? Yes

However, the root colonization by Fox of graminoids is competitive and shoots colonization specific. Np-Fox tended to outcompete pathogenic Fox in the roots of both graminoids.

Therefore, the presence of graminoids on the field does not necessarily worsen the disease.

The contribution of graminoids to the build-up of np-Fox population, which can have suppressive properties, can be bigger than the effect as symptomless carrier of the pathogen, but further research is required.