Effect of formulation and spray application characteristics on the biological efficacy of a contact fungicide; case of banana black sigatoka

ADEL BAKACHE
What is black sigatoka?
Why contact fungicides?

Leaf surface → Fungicide barrier → Inhibiting spore germination
Factors influencing biological efficacy

Dose + Formulation

Atomization

Transport + deposition

Source: Ebert 1999
Study aims

- Fungicide formulation
- Spray characteristics
- Black sigatoka control
  - Small scale
  - Plantation level

Dose reduction
Different modalities were tested

- Fungicide dose: 50%, 25%, 10%
- Droplet size/number: Water
- Formulation: Fungicide +
  - 15% of paraffinic oil
  - 35% of paraffinic oil
Experimental design
Infestation

Artificial infestation with artificial necrosed banana leaves
Spray characteristics assessment

Qualitative approach

Quantitative approach

Image analysis method

Tracer dye method
Disease assessment

- Counting the number of disease lesions for leaf 1

Treatment efficacy (\%) = \frac{\text{Nb of lesions local control} - \text{Nb of lesions banana tree leaf}}{\text{Nb of lesions local control}} \times 100
Results and discussion
Infestation dispersal

Inter plot comparison is possible
Formulation and nozzle type effect

- 35% of oil
  - FF nozzle: 35%
  - AI nozzle: 15%

- 15% of oil
  - FF nozzle: 35%
  - AI nozzle: 15%

- Water
  - FF nozzle: 35%
  - AI nozzle: 15%

Treatment efficacy
Formulation and nozzle type effect

Oil spreading effect

0% oil
15% oil
35% oil
Dose effect

Dose (%)

Treatment efficacy
Conclusions

- Globally, these experiments demonstrated the effects of the factors influencing biological efficacy.
- Formulations with oil were more effective than water formulations.
- No significant effect of nozzle.
Approach limits

- High biological variability
- Inadequate replication.
- Pathogen dispersal heterogeneity
Thank you for your attention