



 SYMPTOMS AND SAMPLING
PROCEDURE FOR PANAMÁ DISEASE
CAUSED BY
Fusarium oxysporum f. sp. cubense


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Regional Workshop on the prevention and diagnostic of *Fusarium*
Wilt (Panama disease) of bananas and plantains caused by
Fusarium oxysporum cubensis – Tropical Race 4 (TR4)
Port Spain, Trinidad and Tobago April 28th-May 9th, 2014


 Symptoms of *Fusarium* wilt or
Panama disease




 External symptoms: syndrome of *Fusarium* wilt


 

Yellow leaf syndrome Green leaf syndrome

 External symptoms of Fusarium wilt




Shortening of emergent leaf



Brownish streaks in internal leaf sheaths


 Fusarium wilt. External symptoms

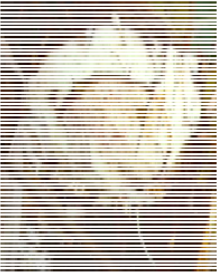
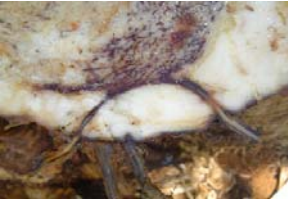



Splitting of pseudostem at soil level

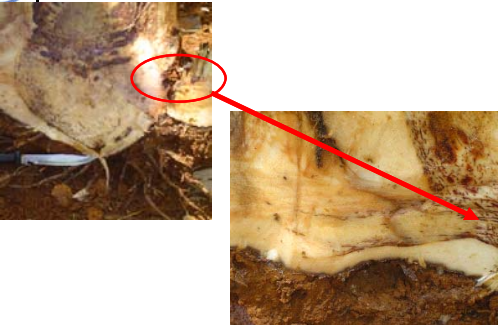



death plants remaining standing


 Fusarium wilt: Internal symptoms




 **Fusarium wilt: Internal symptoms**




 **Internal symptoms:
Discolored vascular strands.**




Sampling zone. →


 **Safety procedure to take a sample of *Foc* TR4 in a new outbreak in a free region**




- A-B. Cut of a pseudostem fragment.
- C. View of the pseudostem severed fragment showing necrotic vascular strands.
- D. Fragments of affected tissue inside of a flask or envelop hermetically closed.
- E. Dissected vascular strands of pseudostem showing necrosis caused by pathogen.
- F-G. Sampled plant with reposition of the fragment cut in the original place and covered by adhesive tape to avoid exposition of tissues and exudates at environment

 **Samples vascular strand extraction.**

- ✓ Dissection of vascular strands must be carry out in aseptic conditions.
- ✓ Sterilize sample surface with ethanol 70% or sodium hipoclorite 1%.
- ✓ Separate vascular strands and transfer to sterile filter paper and let them dry (usually two days are enough).
- ✓ Do not dry samples in a oven or let them in very hot places with direct sun light or in a car trunk.
- ✓ Wash scalpel blade with 70% ethanol between different samples.
- ✓ *Fusarium* specimen do not require cold store temperature (refrigeration)- room temperature is ok.
- ✓ Do isolation from vascular strands as soon that is possible after sample collection.



 **Thank You**
