DEVELOPMENT OF A SUSTAINABLE INTERVENTION FOR THE MANAGEMENT OF THE MANGO BACTERIAL BLACK SPOT DISEASE

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INTRODUCTION.

Managing the mango bacterial black spot disease requires the use of an integrated control method that includes preventive, cultural and chemical control methods. In this research work, an integrated control in which good agronomic practices were held constant, several copper based fungicides which were applied either singly or in combination with BION (Acibenzolar S-methyl) were evaluated for their effect against the causal agent of the disease and the disease incidence and severity in the field.

MATERIALS AND METHODS

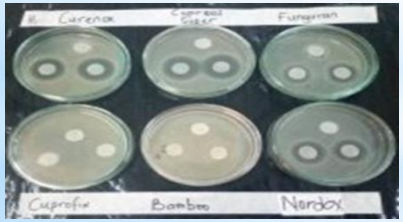
The trials were carried out between July and November, 2019
Selected fungicides were first evaluated in the laboratory
To determine whether they can kill the bacterium or not.
The fungicides used and their rates are stated in Table 1.

Table 1. Fungicides and their concentrations evaluated in-vitro

Product	Active ingredient	T1	T2	T3
Curenox	500 g/kg Copper oxychloride	1.25 g	2.5 g	5.0 g
Cuprous super	850 g/kg Copper oxychloride	2.5 g	5.0 g	10.0 g
Cuprofix disperse	120 g/kg Copper+ 300 g/kg Mancozeb	6.0 g	12 g/l	18.0 g
Yellow gold	Bamboo distillate	15 ml	30 ml	45 ml
Funguran	Copper hydroxide	2.5 g	5.0 g	10g
Nordox	750 g/kg Cuprous oxide	1.25 g	2.5 g	5.0 g

T1=Lowest rate, T2=recommended rate, T3=highest rate

RESULTS



Curenox, cuprous super, Nordox and Funguran were effective at lower rates. Cuprofix disperse was Effective at 12 g/l

FIELD TRIALS

Eight different treatments (Table 2) were evaluated in the field. The treatments were applied at 2 weekly intervals. In all there were 6 applications. Two weeks after each application, the number of fruits infected on tree/dropped were estimated as percentage of fruits counted. Results are stated in Table 2 .

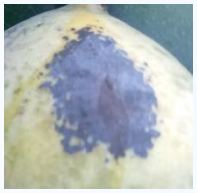
Table 2. Effect of different fungicidal treatments on control of the mango bacterial black spot disease in the field

Treatments	Rate of application	Control (%)	
		Final	2 weeks*
Cuprous super+Bion	60 g+2.5 g/12 l	73.3	66.7
Cuprous super only	60 g/12 l	73.2	53.3
Curenox+Bion	30 g+2.5 g/12 l	73.3	53.3
Nordox (reference)	60 g/12 l	73.3	66.7
Cuprofix disperse	144 g/12 l	66.7	53.3
Cuprofix disperse+Bion	144 g+2.5 g/12 l	66.7	53.3
Curenox	30 g/12 l	66.7	53.3
Nordox	30 g/12 l	66.7	53.3

The effect of BION was not felt in the trial. The trees need time to build resistance. May be felt next season

SOME IMPORTANT OBSERVATIONS FROM THE FIELD

Cotton stainer



Sun scalding

Mummified fruits damage

Latex from infected pedicel

Fruits rubbing against each other

Protect yourself

Promptly remove abscised fruits

TEN CARDINAL POINTS OF BBS CONTROL

1. Maintain farm hygiene including good weed control throughout the production period
2. Select copper based fungicide with not more than 5 g/l application rate.
3. Control the cotton stainer
4. Select fungicides with lower rates but good control ability.
5. Prune off fruit pedicles of previous season and do not allow these to cause scratches on the fruit
6. As much as possible prevent two fruits from rubbing against each other. If possible, remove some fruits .
7. Remove mummified fruits and sun scalded fruits from the tree canopy
8. Addition of a systemic fungicide could help to prevent rapid fruit abscission.
9. Harvest fruits as soon as they mature
10. Protecting yourself during pesticide application is key to the success of the program

ACKNOWLEDGEMENT

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german cooperation
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MoFA
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* WAY FORWARD

* For more reliable results, the trial would need to be repeated.

* In the repeated trial we will evaluate anthracnose as well to determine whether the treatments to control BBS is also controlling anthracnose.

* Formulation of methods to find uses for the fruits with the minimal infection in the field.

* Genomic analysis to determine whether bacterium is resistant to which fungicides.