



Agri-Food & Veterinary Authority of Singapore

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## EVALUATION ON THE EFFICACY OF BIOACT-T™ EC6K AS FUNGICIDE TREATMENTS FOR THE INHIBITION AND CONTROL OF FUNGAL PATHOGENS

### 1. Objective

Evaluate the fungicidal efficacy of Bioact-T™ EC6K for the control and inhibition of fungal pathogens, *Colletotrichum capsici*, *Fusarium oxysporum*, *Rhizoctonia solani* and *Phytophthora palmivora*.

This proposal is at the request of OKADA ECOTECH PTE LTD, 8 Robinson Road, #06-00 ASO Building, Singapore 048544

### 2. Location

Laboratory isolation for the fungi, *Colletotrichum capsici*, *Fusarium oxysporum*, *Rhizoctonia solani* and *Phytophthora palmivora* was carried out at the Mycology Laboratory, Animal and Plant Health Centre, AVA.

### 3. Materials and Methods

#### a) Materials

- i) Pure fungi cultures of *Colletotrichum capsici*, *Fusarium oxysporum*, *Rhizoctonia solani* and *Phytophthora palmivora*
- ii) Fungicides: Carbendazim and Bioact-T™ EC6K.
- iii) Isolations: Potato dextrose agar (PDA) plates, Chlorox solution 5%, Lab. apparatus and equipment.
- iv) Treatments: Total of 3 treatments and a control were carried out
  - 1) Carbendazim (1g/l),
  - 2) Bioact-T™ EC6K - 1:200 dilution
  - 3) Bioact-T™ EC6K - 1:500 dilution
  - 4) PDA Control

#### b) Methods

- i) Individual pure cultures of *Colletotrichum capsici* from chilli rots, *Fusarium oxysporum* and *Rhizoctonia solani* from caixin and *Phytophthora palmivora* from palm rots were isolated from the respective diseased host plants.

- ii) The fungicide carbendazim (1g/l) or the target fungicide, Bioact-T™ EC6K of different dilutions/concentrations in 3 (iv) above were incorporated into PDA plates in 4 replicates for each treatment.
  - iii) A plug each of the pure cultures from (i) as inoculum was placed in the treatments of (ii).
  - iv) The plates were sealed and incubated at 30°C +/-1°C incubator for fungal growth.
- c) Assessment
- i) Fungal growth was noted and growth diameter measured, and recorded on average every 2 days and compared to growth on the control PDA plates.
  - ii) Statistical analysis was done for the measurements for significant difference according to Duncan's Multiple Range Test.

#### 4. Results

Detailed results and statistical analysis were as given in Appendices I-IV.

Table 1: Evaluation Of Bioact-T™ EC6K Against Plant Pathogens

Chemicals/Pathogens	Mean Fungal Growth (diameter mm) *			
	<i>C. capsici</i>	<i>R. solani</i>	<i>F. oxysporum</i>	<i>P. palmivora</i>
Carbendazim	40.0 b	75.0 c	7.0 a	50.5 b
Bioact-T™ EC6K 1:200	32.0 a	7.0 a	40.0 b	17.6 a
Bioact-T™ EC6K 1:500	56.0 c	65.5 b	71.0 c	74.8 d
Control (water)	73.5 d	84.0 d	84.0 d	65.0 c

\* Values are average of 4 replicates. Different letters within the column denoted highly significant difference (P=0.01) according to Duncan's Multiple Range Test.

Table 1 showed the relative control efficacy of Bioact-T™ EC6K dilutions at 1:200 and 1:500 as compared to the fungicide carbendazim and control. Bioact-T™ EC6K 1:200 was the best in this series of tests against *Colletotrichum capsici*, *Rhizoctonia solani* and *Phytophthora palmivora* but was placed second to carbendazim for the control of *Fusarium oxysporum*. Bioact-T™ EC6K 1:500 at the higher dilution rate was not as efficient as the control fungicide, carbendazim in controlling most of the pathogens except for *Rhizoctonia solani* and exhibited no control for *Phytophthora palmivora*.

#### 5. Conclusion and Discussion

Bioact-T™ EC6K is a fungistatic compound that inhibited the growth of the test pathogens. Bioact-T™ EC6K was more effective at dilution of 1:200 than at 1:500 for the control of the common root and plant rot fungi of *Rhizoctonia spp.* and *Phytophthora spp.* It is moderate in control activity for leaf spot pathogen of *Colletotrichum spp.* and not as effective as carbendazim for wilt pathogen *Fusarium oxysporum*.

Bioact-T™ EC6K at rate of 1:200 dilution may be recommended for use in ornamental plants and vegetables to guard against seedling damping off, root or stem rots which are commonly caused by the fungi, *Rhizoctonia solani* and *Phytophthora palmivora*.

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