

***Beauveria bassiana* for biological control of banana weevils**



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***BEAVERIA BASSIANA* - FOR BIOLOGICAL CONTROL OF BANANA WEEVILS**

(B. Padmanaban and R. Thangavelu)

Preamble

In banana cultivation, the banana weevils, viz. banana corm weevil, *Cosmopolites sordidus*, and banana stem weevil, *Odoiporus longicollis* are the major entomological production constraints in banana growing areas. The corm weevil and its larvae feed corm portion and affects absorption of nutrients from the soil and consequently growth of the plant. The stem weevil damages above five months old banana plants by making tunnels in the pseudostem and results in the pre-mature lodging of plant.

Microbial control agents such as *Beauveria bassiana*, *Metarhizium anisopliae* and *Lecanicillium lecanii* were isolated from naturally infected weevils. The most promising isolates were identified and tested. Among the several isolates, the promising two isolates were transferred to bio-pesticide manufacturers for mass production and commercialization on technology transfer mode. The strain was transferred to M/s. TARI Biotech, Thanjavur, Tamil Nadu in 2008 for liquid formulation and sales to farming community. The liquid formulation technology for another strain was transferred to M/s. Bio-Cotnrol Research Laboratory (BCRL), Government of Kerala, Thrissur, Kerala in 2015.

Application of *Beauveria bassiana*

Entomopathogenic fungi, *Beauveria bassiana*, are an important biological control agent, a nature's gift for insect control, present in the soil of all eco-systems. These isolates were tested for their pathogenicity and the most effective strains were utilized for bio-control of banana weevil management.

The Entomopathogen is used both as soil application and smeared on the longitudinal split banana stem traps. The weevils attracted to stem trap by means of the volatiles emanated from the stem and the spores infect the weevil and kills. By using this technology, the farmers

prevent the yield loss (10-100% loss) caused by the weevil pests of Banana. Liquid formulation of 60-100 ml is sufficient for 100 stem traps for one occasion and the cost will be Rs.100/- per ha.



Liquid formulation of *Beauveria bassiana*



Grub infected with the pathogen



Weevils infected with pathogen



Stem weevil infestation inside the stem and pre-mature lodging of plant

Impact of *Beauveria bassiana*

The *Beauveria bassiana* has been evaluated in various *Krishi Vigyan Kendras* in front line demonstrations for the management of banana weevils and was found effective against the same.

The microbial biocontrol agent, *Beauveria bassiana*, is effective in the management of banana weevils. The infected weevils are able to contaminate the other banana weevils and spread the disease and kill weevil. Besides the liquid formulation, the rice chaff grain formulation of *Beauveria bassiana* is also equally effective and can be produced by self-help groups; instead of rice chaff, other agricultural waste can also be used as substrate for the mass production of fungi.