

The *Bt* of Choice



***Bt* preserves beneficial insects including oil palm pollinating weevil populations.**



Elaeidobius kamerunicus, also known as the oil palm weevil, is THE most important pollinator in an oil palm plantation. These insects can play a major role in maximizing yields.

Oil palm yields are improved with better pollination[†] and predator preservation.

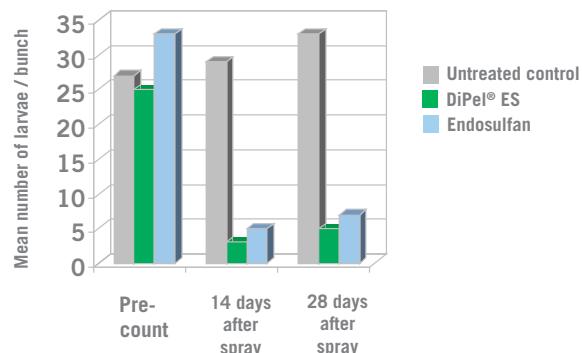
- DiPel® ES preserves other beneficial insects.
 - Parasitic flies
 - Wasps
 - Predatory bugs
 - Praying mantis.
- No demonstrated toxicity in guideline studies for other non-target organisms: birds, fish, earthworms.
- Mammalian regulatory studies present minimum toxicity, so it can be used safely by applicators.

[†]Basri, M.W. 1984. Developments of the oil palm pollinator *Elaeidobius kamerunicus* in Malaysia. Palm Oil Developments 2, 1-3



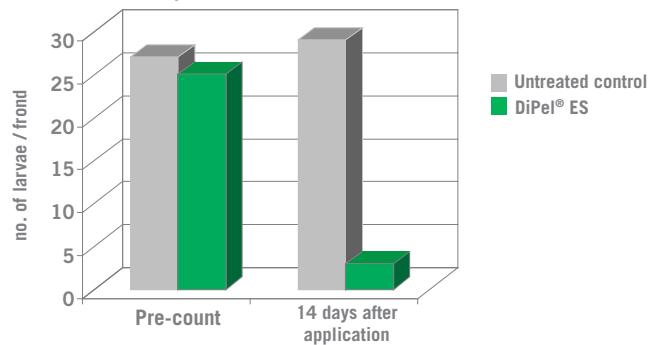
DiPel® ES Biological Insecticide has proven efficacy against oil palm bunch moth.

DiPel® ES efficacy on bunch moth (*Tirathaba rufivena*)
Ranau, Malaysia



DiPel® ES was ground-applied at a rate of 30 ml/10 liters of water. Endosulfan was applied at 38 ml/10 liter of water. A backpack sprayer calibrated at 250 l/ha was used to apply the materials in a randomized block design. Applications were made at 14 and 28 days after pre-count.

DiPel® ES reduces bunch moth populations
Perak, Malaysia



Palms were treated from the ground at 30 ml DiPel® ES/palm tree. The number of bunch moth larvae per frond was evaluated at 14 days after application.

Data is courtesy of Ganesh Rao (Halex (M) Sdn. Bhd.).

DiPel® ES Biological Insecticide mode of action

- Bunch moths ingest DiPel® ES and stop feeding within several minutes. The treated palm kernels are protected.
- Feeding inhibition occurs as quickly as with newer chemical insecticides.
- The *Bt* toxin crystals dissolve in the specific gut environment of the bunch moth (within minutes).^① The toxins bind to receptors in the bunch moth gut.^②
- Cell membrane integrity is compromised. Holes form in the cell wall; the bunch moth's gut is irreparably damaged (<24 hrs).^③
- Germinated *Bt* spores will invade the bunch moth's body; bunch moth death follows (72-96 hrs).^④



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