



 BIOLOGICAL SOLUTIONS AUSTRALIA



BIO DEFENCE



AFRICAN BLACK BEETLE (HETERONYCHUS ARATOR) BIOLOGICAL PEST AND LARVAE ERADICATION FORMULA

SCIENTIFICALLY PROVEN TO KILL PEST INSECTS AND ERADICATE LARVAE TO PREVENT INFESTATION

Beetles and weevils present significant threats beyond mere nuisances; they pose serious risks to agriculture, livestock, and human safety. Among these pests, the African Black Beetle (*Heteronychus arator*) is particularly notorious across in Australia. These destructive pest insects are known for damaging crops and compromising agricultural productivity as well as impacting commercial lawns, fields and pasture. They feed on seeds, roots, and young plants, leading to reduced yields and inferior crop quality. The presence of these pests in fields and pastures complicates farming operations, significantly impacting productivity and profitability.

Biological Solutions Australia's Bio Defence pest control offers a natural comprehensive solution for safe-guarding the agricultural landscape without the requirement for harmful chemicals. This biological pest insect treatment formulation is designed to provide broad-spectrum protection and contains multiple bio-active microbial ingredients that eradicate African black beetles and their larvae to prevent infestation outbreaks. Bio Defence offers a chemical resistant, sustainable solution to support the eradication of black beetles and improve plant health, produce, pasture and fields.

Bio Defence is a scientifically formulated bio active pest solution enriched with nature's own organic biological microorganisms and nutrients including beneficial strains of bacteria and fungi. These essential components serve as the foundation for creating optimal environmental conditions that promote plant vitality and resilience. By harnessing the power of natural ingredients, the formulation empowers plants to combat aetiology, infestation, and pest insects effectively. Unlike traditional chemical treatments, Bio Defence relies on non-toxic organic biological mechanisms to support plant health and eradicate insect pests. This ensures that your plants thrive in a safe and sustainable manner, free from the harmful effects of synthetic pesticides.

BSA Bio Defence offers a natural alternative to harsh chemical pesticides providing a highly effective resistance free solution. The Bio Defence formula disrupts the pest insect life-cycle killing the pest insect and their larvae preventing future infestations and ensuring long-term protection for your environment. Scientifically proven to eradicate using active biological inputs it ensures safety for humans, animals and the environment. Bio Defence is suitable for use in agricultural fields, pastures, and residential areas, making it a versatile solution in pest control management. Suitable for use in both tropical and sub-tropical climates this sustainable cost effective treatment solution is ideal for resistance management and in-crop disease control. This safe pest control and eradication solution can be applied up to day of harvest. The non-toxic pest control formula allows for faster and safer decomposition for reduced pollution and sustainable management.



SAFE - NON-TOXIC - CHEMICAL FREE - BIOLOGICAL SOLUTION - CAN BE APPLIED UP TO DAY OF HARVEST





BIO DEFENCE

AFRICAN BLACK BEETLE PEST CONTROL FORMULA



FULLY SOLUBLE DRY POWDER CONCENTRATE INSTANTLY BLENDS WITH WATER FOR APPLICATION

HOW BIO DEFENCE PEST CONTROL WORKS TO ERADICATE AFRICAN BLACK BEETLES AND LARVAE

Biological Solutions Australia's Bio Defence contains Bio-Active Ingredients composed of a Proprietary strain isolated from *B. thuringiensis* bacteria and a Proprietary strain isolated from *Beauveria bassiana* fungal spores from (Cordycipitaceae family) scientifically proven to kill African black beetles and their larvae to prevent infestation.

The active strain isolated from *Beauveria bassiana* fungal strain is an entomopathogenic fungus containing the *Beauveria bassiana* fungus spore that controls black beetles on contact, impacting multiple life stages of a wide variety of soft-bodied insects in nests, trees, shrubs, greenhouse, field and nursery crops. When *Beauveria bassiana* fungus spores come in contact with a host beetle's cuticle (skin) they germinate and grow directly through the cuticle to the inner body of the host where the fungus feeds on the nutrients present in the host's body and rapidly multiplies inside of the insect, producing toxins in the process which causes death within 24-48 hours. When the host insect dies, the *Beauveria bassiana* fungus spores cover the carcass in a layer of white mold that produces more infective spores for continued results.

The active strain isolated from *B. thuringiensis* bacteria is a microbial insecticide that works by introducing bacterial spores and toxins, endotoxin and exotoxin into the body of the beetle larvae as it feeds on soil and plant matter. These toxins disrupt and ultimately stop digestive functions of the pest insect. The infected larvae will cease eating within minutes and succumb to the effects of the BTK causes within 2-5 days. Its 4 hour re-entry interval (REI) makes the Isolated strain from *B. Thuringiensis* bacteria ideal for use eradicating the pest insects on land and edible crops for control of African black beetle insects and larvae.

ACTIVE INGREDIENTS: *Ascophyllum Nodosum*, *Saccharomyces cerevisiae*, *Bacillus thuringiensis*, *Beauveria bassiana*

BLEND 10 KG OF BSA BIO PROTECT DRY POWDER CONCENTRATE WITH 1000 LITRES OF WATER

African Black Beetle (*Heteronychus arator*) Application Recommendations

- Apply BioProtect at the first appearance of the insect pest.
- For best result apply in early morning or evening when the air is calm, ensure even coverage.
- Repeat applications at intervals sufficient to maintain control, typically every 3-10 days.
- If attempting to control an insect population with a single application, treat when eggs start hatching.
- When applying in the early stages of population development ensure thorough coverage.
- Apply when larvae are small, newly hatched, and actively feeding.
- Repeat applications, according to economic threshold, as necessary to maintain control.
- After contact and ingestion, larvae cease feeding within a few hours, and death occurs in 2-5 days.
- Do not apply through irrigation systems, target foliage where larvae are feeding.

Store in cool dry place. Avoid contact with direct sunlight.

Store item in a locked area. Keep out of reach of children. May be prone to staining.

Individual application requirements may vary. All recommendations are provided as general advice only.

All microorganism contained in the Biological Solutions Australia Bio Defence formulations are naturally occurring and sourced from nature. They are readily bio-degradable and have not been genetically modified (GMO free). These microorganism are extracted using a proprietary enzymatic fermentation process avoiding chemical polluting treatments and carbon polluting methods.