



भारत सरकार / Government of India
कृषि एवं किसान कल्याण मंत्रालय / Ministry of Agriculture & Farmers Welfare
कृषि एवं किसान कल्याण विभाग
Department of Agriculture & Farmers Welfare
वनस्पति संरक्षण, संगरोध और संग्रह निदेशालय
Directorate of Plant Protection, Quarantine & Storage
केंद्रीय कीटनाशी बोर्ड एवं पंजीकरण समिति
Central Insecticide Board & Registration Committee
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MAJOR USES OF PESTICIDES

(Registered under the Insecticides Act, 1968)

(As on – 30/11/2024)

(Based on certificate issued)

**Disclaimer: 'The document has been compiled on the basis of available information for guidance and not for legal purposes'.*

BIO-INSECTICIDES

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| 1. MAJOR USES OF BIO-INSECTICIDES | | | | | |
|---|---|----------|----------------------|------------------------------|-----------------------|
| Name of crop | Name of Insect | Dose/ha | | Dilution in water (liter/ha) | Waiting period (Days) |
| | | a.i. (g) | Formulation (g/ml)/% | | |
| Azadirachtin 0.15% EC w/w Min. Neem Seed Kernel Based | | | | | |
| Cotton | White fly, Bollworms | - | 2500-5000 | 500-1000 | 05 |
| Rice (Paddy) | Thrips, Stem borer, Brown plant hopper, Leaf folder | - | 1500-2500 | 500 | 05 |
| Azadirachtin 00.30% EC (3000 PPM) Min. Neem Seed Kernel Based | | | | | |
| Cotton | American bollworm | - | 4000 | 1000 | 05 |
| Azadirachtin 01.00% (10000 ppm) EC Min. Neem Based | | | | | |
| Tea | Thrips | - | 400-500 | 450 | 01 |
| | Red spider mites | - | 400-500 | 600 | 01 |
| Azadirachtin 01.00% EC (10000 PPM) Min. Neem Based | | | | | |
| Tomato | Fruit borer (<i>Helicoverpa armigera</i>) | - | 1000-1500 | 500 | 03 |
| Brinjal | Shoot & fruit borer (<i>Leucinodes orbonalis</i>) | - | 1000-1500 | 500 | 03 |
| Azadirachtin 00.03% EC Min. Neem Oil Based | | | | | |
| Cotton | Bollworm (<i>Helicoverpa armigera</i>), Aphids | - | 2500-5000 | 500 | 05 |
| Rice (Paddy) | Leaf roller, Stem borer, Brown plant hopper | - | 2000 | 1000 | 05 |
| Azadirachtin 00.03% WSP (300 PPM) Neem Oil Based | | | | | |
| Bengal Gram (Gram or Chickpea) | Pod borer (<i>Helicoverpa armigera</i>) | - | - | - | 07 |
| Red Gram (Tur or Arhar) | Pod borer (<i>Melanagromyza</i> sp.) | - | 2500-5000 | 500-1000 | 07 |

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|--|--|---|-----------|----------|----|
| Cotton | Aphids, Jassids, Whitefly, Bollworms | - | 2500-5000 | 500-1000 | 07 |
| Okra (Bhindi) | Fruit borer, Whitefly, Leaf Hopper | - | 2500-5000 | 500-1000 | 07 |
| Brinjal | Shoot & Fruit borer, beetles | - | 2500-5000 | 500-1000 | 07 |
| Cabbage | Aphids, Diamond back moth, Cabbage worm, Cabbage looper | - | 2500-5000 | 500-1000 | 07 |
| Jute | Semi looper, Hairy caterpillar | - | 2500-5000 | 500-1000 | 07 |
| Azadirachtin 05.00% w/w Min. Neem Extract Concentrates | | | | | |
| Tea | Caterpillar, Pink mite, Red spider mites, Thrips | - | 200.0 | 400 | 05 |
| Tobacco | Tobacco caterpillar, Aphids | - | 200.0 | 400 | 05 |
| Rice (Paddy) | Brown plant hopper, Leaf folder, Stem borer | - | 200.0 | 400 | 05 |
| Cotton | Whitefly, Leaf hoppers, <i>Helicoverpa armigera</i> , Aphids | - | 375.0 | 750 | 05 |
| Cauliflower | <i>Spodoptera</i> , Diamond back moth, Aphids | - | 200.0 | 400 | 05 |
| Bhindi (Okra) | Leafhopper, whitefly, Aphid, Pod borer | - | 200.0 | 400 | 05 |
| Tomato | Aphids, Whitefly, Fruit borer | - | 200.0 | 400 | 05 |
| <i>Bacillus thuringiensis</i> var. <i>galleriae</i> 1593 M serotype H 59 5b, 1.3% flowable concentrate Potency 1500 IU/mg | | | | | |
| Cabbage & Cauliflower | Diamond back moth (<i>Plutella xylostella</i>) | - | 06-1.0 | 500 | - |
| Tomato | Fruit borer (<i>Helicoverpa armigera</i>) | - | 1.0-1.5 | 500 | - |
| Bhindi | Fruit borer (<i>Earias</i> spp.) | - | 1.0-1.5 | 500 | - |

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|---|---|-------------|----------|----------|---|
| (Okra) | | | | | |
| Chilli | Fruit borer (<i>Spodoptera litura</i>) | - | 1.5-2.0 | 1000 | - |
| Cotton | Bollworm (<i>Helicoverpa armigera</i>) | - | 2.0-2.5 | 1000 | - |
| Rice (Paddy) | Leaf folder (<i>Cnaphalocrocis medinalis</i>) | - | 1.0-3.0 | 1000 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> | | | | | |
| Cotton | Bollworm | - | 750-1000 | 750-1000 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i>, serotype H-39, 3B, Strain Z-52 | | | | | |
| Cotton | Bollworms, <i>Spodoptera</i> | 0.75-1.00 | 500-750 | - | - |
| Rice (Paddy) | Stem borer & Leaf folder | 1.50 | 500-750 | - | - |
| Gram | <i>Heliothis</i> sp. | 0.75 | 500-750 | - | - |
| Pigeon Pea | <i>Heliothis</i> sp. | 0.75 | 500-750 | - | - |
| Soybean | <i>Spodoptera</i> , <i>Heliothis</i> , <i>Spilosoma</i> , Semilooper, Leaf miner | 0.75 | 500-750 | - | - |
| Tobacco | <i>Spodoptera</i> , <i>Heliothis</i> | 1.50-2.00 | 500-750 | - | - |
| Castor | Hairy caterpillar, <i>Achaea janata</i> | 1.00 | 500-750 | - | - |
| Teak | Defoliator (<i>Hyblaea pueria</i>), Skeletonizer (<i>Eutectona machaeralis</i>) | 0.25-0.50 | 500-750 | - | - |
| <i>Bacillus thuringiensis</i> serovar <i>kurstaki</i> (3a, 3b, 3c) 5.0% WP Potency 55000 SU (<i>Spodoptera</i> unit based) (5x10⁷ spore/mg) | | | | | |
| Cotton | American Bollworm | 25.00-50.00 | 500-1000 | 500-1000 | - |
| | Spotted Bollworm | 37.50-50.00 | 750-1000 | 500-1000 | - |

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|---|---|-------------|--------------|----------|---|
| Red gram | Pod Borer | 50.00-62.50 | 1000-1250 | 500-1000 | - |
| Cabbage | Diamond back moth | 25.00-50.00 | 500-1000 | 500-1000 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 9000 IU/mg min. U/s 9(3b) | | | | | |
| Caster | Caster 5rustaki5r (<i>Achaea janata</i>) | - | 0.25 | 250-300 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1 NAIMCC-B-01118, Potency 13329 IU/mg min. U/s 9(3b) | | | | | |
| Pigeon pea | Bollworm (<i>Helicoverpa armigera</i>) | - | 1-1.25 | 1000 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 9000 IU/mg min. U/s 9(3b) | | | | | |
| Caster | Caster 5rustaki5r (<i>Achaea janata</i>) | - | 0.25- 0.375 | 250 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 16000IU/mg min. | | | | | |
| Chickpea | Chick pea pod borer (<i>Helicoverpa armigera</i>) | - | 2.0 | 500 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 2.5% AS (Spicbio-BTK AS) | | | | | |
| Gram | Gram pod borer (<i>Helicoverpa armigera</i>) | - | 1.0-1.5 | 500 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> , Serotype H-3a, 3b, Strain Z-52 Potency:- 3000 IU/mg min – on Gypsy moth 32000 IU/mg min – <i>Trichoplusia vi</i> 50000 IU/mg min – <i>Helicoverpa armigera</i> 55000 IU/mg min – <i>Spodoptera exiqua</i> | | | | | |
| Cotton | Bollworms, Spodoptera | - | 0.75-1.0 kg. | 500-750 | - |
| Rice | Stem borer & Leaf folder | - | 1.50 kg. | 500-750 | - |
| Gram | <i>Helicoverpa armiger</i> | - | 0.75 kg. | 500-750 | - |
| Pigeon Pea | <i>Helicoverpa armiger</i> | - | 0.75 kg. | 500-750 | - |

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|--|---|---|-----------------|-----------------|--------|
| Soyabean | <i>Spodoptera litura</i> , <i>Helicoverpa armigera</i> , <i>Spilosoma brustak</i> , Semilooper, Leaf miner | - | 0.75 kg. | 500-750 | - |
| Tobacco | <i>Spodoptera litura</i> , <i>Helicoverpa armigera</i> | - | 1.50-2.00 kg. | 500-750 | - |
| Castor | Hairy caterpillar, Caster semilooper (<i>Achaea janata</i>) | - | 1.00 kg. | 500-750 | - |
| Teak | Defoliator (<i>Hyblaea puera</i>), Skeletonizer (<i>Eutectona machaeralis</i>) | - | 0.25-0.50% Sol. | As required. | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> Strain HD-1, serotype 3a, 3b, 3.5% ES for Import &repack. Potency 17600 IU/mg | | | | | |
| Cotton | Bollworms | - | 750-1000 | 750-1000 | - |
| Tea | Leaf roller (<i>Caloptilia theivora</i>) | - | 1000 | 750-100 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> Serotype 3a, 3b, SA II WG Potency:- 53000 SU/mg, 32000 IU/mg | | | | | |
| Cabbage, Cauliflower | Diamond back moth | - | 0.5 kg. | 500-700 | - |
| <i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 10% WSL (CFU: 2×10^9 /gm min.) Strain- NBAIR-BtG4, Accession no- JN120763, JN120765, Potency- 14245 IU/ml min. | | | | | |
| Pigeon Pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 10 liter | 200 | 12 hrs |
| <i>Beauveria bassiana</i> 1.15% WP | | | | | |
| Cotton | Bollworms | - | 400 | 750-1000 | - |
| <i>Beauveria bassiana</i> 01.15% WP | | | | | |
| Cotton | Bollworm | - | 2000 | 400 | - |
| Rice (Paddy) | Leaf folder | - | 2.50 kg/ha | 750-850 | - |
| <i>Beauveria bassiana</i> 1.15% WP. (1×10^8 /gm min) Strain BB-ICAR-RJP, Accession No – MCC 1022 | | | | | |
| Rice | Rice leaf folder (<i>Cnaphalocrocis medinalis</i>) | - | 2.5 kg. | 750-850 | - |

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|--|---|-------------|--------------|---|----|
| <i>Beauveria bassiana</i> 1.15% WP (Strain : BB – 5372, own R & D Isolate) | | | | | |
| Rice | Rice leaf folder (<i>Cnaphalocrocis medinalis</i>) | - | 2.5 kg. | 600-750 | - |
| <i>Beauveria bassiana</i> 1.15% WP (1x10⁸/gm min) Strain ICAR, Research Complex, Umiam, Meghalaya, Accession No – NAIMCC-F-03045 | | | | | |
| Rice | Rice leaf folder (<i>Cnaphalocrocis medinalis</i>) | - | 2.5 kg. | 750-850 | - |
| <i>Beauveria bassiana</i> 1.15% WP (1x10⁸/gm min) Accession No – NAIMCC-F-03045, Strain No. NBAIM, MAU. | | | | | |
| Rice | Rice leaf folder (<i>Cnaphalocrocis medinalis</i>) | - | 2.5 kg/ha | 750 liter/ha | - |
| <i>Beauveria bassiana</i> 1.15% WP (1x10⁸ /spores/ml) Strain BCRL, Accession No – BCRL Bbpx-6892 | | | | | |
| Cabbage | Diamond back moth (<i>Plutella xylostella</i>) | 1-1.5 litre | 500-750 | Apply using any type of sprayer (high, low or ultra low volume) which gives good coverage | NA |
| <i>Beauveria bassiana</i> 1.0% WP, Strain No: NBRI – 9947 (1x10⁸ CFU/gm Min.) | | | | | |
| Chick pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 3.0 kg. | 500 | - |
| <i>Beauveria bassiana</i> 1.0% WP (1x10⁹ CFU/gm min), Strain No. IPL/BB/MI/01 | | | | | |
| Okra (Bhindi) | Fruit borer, Spotted bollworm | - | 3.75-5.0 kg. | 400-500 | - |
| <i>Beauveria bassiana</i> 1.0% WP (1x10⁸ CFU/gm min), Strain No. SVBPU/CSP/Bb-10, Accession No. ITCC-7520 | | | | | |
| Chick pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 3.0 kg. | 500 | - |
| <i>Beauveria bassiana</i> 5.0% WP, (1x10⁸ CFU/gm min) Strain IARI, Accession No. ITCC-7353 | | | | | |
| Cabbage | Diamond back moth (<i>Plutella xylostella</i>) | - | 2.0 kg. | 500 | - |

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| <i>Beauveria bassiana</i> 5.0% SC, Strain: NBAIL, Bangalore, Accession No. ITCC-7102, (Strain Isolated by Project Directorate of Bio-logical control, Bangalore) | | | | | |
| Tomato | Fruit borer (<i>Helicoverpa armigera</i>) | - | 500 | 500 | - |
| <i>Beauveria bassiana</i> 5.0% AS Strain: BB-AAU-RJP Accession No. MCC – 1024 | | | | | |
| Tomato | Fruit borer (<i>Helicoverpa armigera</i>) | - | 0.5 | 500 | - |
| <i>Beauveria bassiana</i> 1.15% WP (1x10⁸ /gm min) Accession No – NAIMCC-F-03048 | | | | | |
| Chick pea | Gram Pod Borer (<i>Helicoverpa armigera</i>) | - | 2500 | 500 | - |
| <i>Beauveria bassiana</i> 10.00% SC | | | | | |
| Cabbage | Diamond back moth | 1-1.5 | - | 500-750 | - |
| <i>Beauveria bassiana</i> 1.5% Liquid Formulation (CFU count 10X10⁸) Accession No.MTCC-5171 | | | | | |
| Tomato | Fruit borer (<i>Helicoverpa armigera</i>) | 2.0 | Foliar spray | 500 | - |
| <i>Beauveria bassiana</i> 1.15% WP (1X10⁶ CFU /gm min) | | | | | |
| Cotton | Bollworm | 20 | - | 400 | - |
| <i>Metarhizium anisopliae</i> 1% WP (1x10⁸ CFU/gm min) Strain No. IPL/KC/44, Accession No. ITCC-6895. | | | | | |
| Brinjal | Shoot & Fruit borer (<i>Leucinodes orbonalis</i>) | - | 2.5-5.0 Kg | 500-750 | - |
| <i>Metarhizium anisopliae</i> 1.15% WP (1x10⁸ CFU/gm min) Accession No. MTCC – 5173 | | | | | |
| Rice | Brown plant hopper (<i>Nilaparvata lugens</i>) | - | 2.5 kg. | 500 | - |
| <i>Metarhizium anisopliae</i> 1.0% WP (1x10⁸ CFU/gm min) Strain No. IPL/KC/44 (Own R & D Isolate), Accession No. 6895. | | | | | |
| Brinjal | Shoot & Fruit borer (<i>Leucinodes orbonalis</i>) | - | 2.5-5.0 kg | 500-750 | - |
| <i>Metarhizium anisopliae</i> 1.15% WP (1x10⁸ CFU/gm min) Strain No. AAI, Allahabad, Accession No. NAIMCC-F-03037. | | | | | |
| Chickpea | Heliothis armigera | 2.5 | 500 | - - | -- |

| <i>Metarhizium anisopliae</i> 10% GR (CFU count 1 X 10 ⁸ /gm. min.) Strain BCRL– Me, Accession No. ITCC 6911 | | | | |
|---|--|--|--|----------------|
| Crop | Common name of the target organism | Dosage /ha/application | | Waiting period |
| | | Formulation | Method of application | |
| Potato | White grub | 60kg. | Mix <i>Metarhizium anisopliae</i> (Grub –X 10% GR) with FYM @ 1 : 10 and apply at the root base by broadcasting method @ 6gm/m ² (=60 kg/ha) along the furrows at the time of sowing and next after one month at the time of earthing up. | NA |
| <i>Pseudomonas fluorescens</i> 1.0% WP (Strain No. IIHR-PF-2, Accession No. ITCC- B0034) | | | | |
| Tomato | Root-knot nematodes (<i>Meloidogyne</i> spp.) | Treat the seed with <i>Pseudomonas fluorescens</i> 1.0% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Pseudomonas fluorescens</i> 1.0% WP @ 50 gm/sq.m and apply <i>Pseudomonas fluorescens</i> 1.0% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | |
| Brinjal | Root-knot nematodes (<i>Meloidogyne</i> spp.) | Treat the seed with <i>Pseudomonas fluorescens</i> 1.0% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Pseudomonas fluorescens</i> 1.0% WP @ 50 gm/sq.m and apply <i>Pseudomonas fluorescens</i> 1.0% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | |
| Carrot | Root-knot nematodes (<i>Meloidogyne</i> spp.) | Treat the seed with <i>Pseudomonas fluorescens</i> 1.0% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Pseudomonas fluorescens</i> 1.0% WP @ 50gm/sq.m and apply <i>Pseudomonas fluorescens</i> 1.0% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | |
| Okra | Root-knot nematodes (<i>Meloidogyne</i> spp.) | Treat the seed with <i>Pseudomonas fluorescens</i> 1.0% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Pseudomonas fluorescens</i> 1.0% WP @ 50gm/sq.m and apply <i>Pseudomonas fluorescens</i> 1.0% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | |
| <i>Trichoderma harzianum</i> 1.0% WP (Strain No. IIHR-TH-2 Accessions No. ITCC 6888) | | | | |
| Tomato | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma harzianum</i> 1.0% WP @ 20 gm/kg of seeds & nursery beds with the <i>Trichoderma harzianum</i> 1.0% WP @ 50 gm/sq.m and also apply <i>Trichoderma harzianum</i> 1.0% WP (@ | | |

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|---|--|--|-----------------------|---------------------------------------|------------|
| | | 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | | |
| Brinjal | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma harzianum</i> 1.0% WP @ 20 gm/kg of seeds & nursery beds with the <i>Trichoderma harzianum</i> 1.0% WP @ 50 gm/sq.m and also apply <i>Trichoderma harzianum</i> 1.0% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | | |
| Carrot | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma harzianum</i> 1.0% WP @ 20 gm/kg of seeds and apply <i>Trichoderma harzianum</i> 1.0% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before sowing. | | | |
| Okra | Root-knot nematodes (<i>Meloidogyne</i> | Treat the seeds with <i>Trichoderma harzianum</i> 1.0% WP @ 20 gm/kg of seeds and apply <i>Trichoderma harzianum</i> 1.0% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before sowing. | | | |
| | <i>incognita</i>) | | | | |
| Gerbera | <i>Meloidogyne incognita</i> | Apply the Nemastin @ 50 gm/sq.m at the time of planting | | | |
| Carnations | <i>Meloidogyne incognita</i> | Apply the Nemastin @ 50 gm/sq.m at the time of planting | | | |
| Tuberose | <i>Meloidogyne incognita</i> | Apply 2 Kg Nemastin 1% Wp mixed in 2 tones of FYM per acre to the soil before planting | | | |
| Banana | <i>Meloidogyne incognita</i> | Apply 2 Kg Nemastin enriched FYM @ 2 Kg/pant at the time of planting and at an interval of 3 months after planting for a period of one year | | | |
| Acid lime | Citrus nematodes (<i>Tylenchulus semipenetrans</i>) | Apply 2 Kg Nemastin enriched FYM @ 2 Kg/pant at the time of planting and at an interval of 3 months after planting for a period of one year | | | |
| Papaya | <i>Meloidogyne spp.</i> Reniform Nematodes (<i>Rotelenchulus reniformis</i>) | Apply 2 Kg Nemastin enriched FYM @ 2 Kg/pant at the time of planting and at an interval of 3 months after planting for a period of one year | | | |
| PB Rope L | | | | | |
| Crop | Common name of | Dosage | | | PHI (Days) |
| | pest | a.i.(mg/dispenser) | Pheromones dispensers | Recommended area of treatment in (Ha) | |
| Cotton | Pink bollworm (<i>Pectinophora gossypiella</i>) | >140 | 9875 | 25 | NA |
| <i>Trichoderma harzianum</i> 1.5% WP (Strain No. IIHR-TV-5 Accessions No. ITCC 6889) | | | | | |
| Tomato | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seed with <i>Trichoderma harzianum</i> 1.5% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Trichoderma harzianum</i> 1.5% WP @ 50gm/sq.m and also apply <i>Trichoderma harzianum</i> 1.5% WP @ 5kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | | |

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| Brinjal | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seed with <i>Trichoderma harzianum</i> 1.5% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Trichoderma harzianum</i> 1.5% WP @ 50 gm/sq.m and also apply <i>Trichoderma harzianum</i> 1.5% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. |
| Carrot | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seed with <i>Trichoderma harzianum</i> 1.5% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Trichoderma harzianum</i> 1.5% WP @ 50 gm/sq.m and also apply <i>Trichoderma harzianum</i> 1.5% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. |
| Okra | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seed with <i>Trichoderma harzianum</i> 1.5% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Trichoderma harzianum</i> 1.5% WP @ 50 gm/sq.m and also apply <i>Trichoderma harzianum</i> 1.5% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. |
| <i>Trichoderma viride</i> 1.5% WP (Strain No. IIHR-TV-5 Accessions No. ITCC 6889) | | |
| Tomato | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma viride</i> 1.5% WP @ 20 gm/kg of seeds & nursery beds with the <i>Trichoderma viride</i> 1.5 % WP @ 50 gm/sq.m. and also apply <i>Trichoderma viride</i> 1.5% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. |
| Brinjal | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma viride</i> 1.5% WP @ 20 gm/kg of seeds & nursery beds with the <i>Trichoderma viride</i> 1.5% WP @ 50 gm/sq.m. and also apply <i>Trichoderma viride</i> 1.5% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. |
| Carrot | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma viride</i> 1.5 % W P @ 20 gm/kg of seeds and apply <i>Trichoderma viride</i> 1.5% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before Planting’. |
| Okra | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Trichoderma viride</i> 1.5 % W P @ 20 gm/kg of seeds and apply <i>Trichoderma viride</i> 1.5% WP (@ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before Planting’. |
| <i>Verticillium chlamydosporium</i> 1.0% WP, (2x10⁶ CFU/gm min) Strain – IIHR-VC-3 Accession No – ITCC-6898 | | |

| | | | | | |
|---|--|--|---------------------|-----|---|
| Tomato | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Verticillium chlamydosporium</i> 1.0% WP @ 20 gm/kg of seeds & nursery beds with the <i>Verticillium chlamydosporium</i> 1.0% WP @ 50 gm/sq.m and also apply <i>Verticillium chlamydosporium</i> 1.0% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | | |
| Brinjal | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Verticillium chlamydosporium</i> 1.0% WP @ 20 gm/kg of seeds & nursery beds with the <i>Verticillium chlamydosporium</i> 1.0% WP @ 50 gm/sq.m and also apply <i>Verticillium chlamydosporium</i> 1.0% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | | |
| Carrot | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Verticillium chlamydosporium</i> 1.0% WP @ 20 gm/kg of seeds and apply <i>Verticillium chlamydosporium</i> 1.0% WP @ 5 kg/ha enriched FYM* @ 5 tons/ha to the soil before transplanting. | | | |
| Okra | Root-knot nematodes (<i>Meloidogyne incognita</i>) | Treat the seeds with <i>Verticillium chlamydosporium</i> 1.0% WP @ 20 gm/kg of seeds and apply <i>Verticillium chlamydosporium</i> 1.0% WP @ 5 kg/ha enriched FYM * @ 5 tons/ha to the soil before transplanting. | | | |
| <i>Verticillium lecanii</i> 1.15%WP, (1x10⁸ CFU/gm min) Strain – AS MEGH-VL Accession No – MCC-1028 | | | | | |
| Cotton | White flies | - | 2500 | 500 | - |
| Citrus | Mealybug (<i>Planococcus citri</i>) | - | 2500 | 550 | - |
| <i>Verticillium Lecanii</i> 1.50% Liquid Formulation, (1x10⁸ CFU/ml. min.) Strain – T Stanes VI-1, Accession No – MTCC-5172 | | | | | |
| Tomato | White fly (<i>Bemisia tabaci</i>) | - | 2000 (Foliar spray) | 500 | - |
| <i>Verticillium lecanii</i> 3.0% AS, (strain: Accession No. MCC-1127, Strain No. MPKV / Biocontrol/ RVN/ VL-01 | | | | | |
| Onion | Thrips (<i>Thrips tabaci</i>) | - | 2000-2500 | 500 | - |
| <i>Verticillium lecanii</i> 5.0% SC, (Strain: Accession No. NFCCI - 2638 | | | | | |
| Cabbage | Diamond Back Moth (<i>Plutella xylostella</i>) | - | 500 | 500 | - |
| <i>Verticillium lecanii</i> 5.0% SC, (1x10⁸ CFU/gm Min.) Strain – Own Red Isolate, Strain No. VI-17874, MTCC No.5716 | | | | | |

| | | | | | |
|--|---|---|------------|---------|---|
| Rice | White backed plant hopper (<i>Sogatella furcifera</i>) | - | 3.125 kg. | 600 | - |
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 0.43% AS (1x10⁹ POB/ml) | | | | | |
| Cotton | <i>Helicoverpa armigera</i> | - | 2700 | 400-600 | - |
| Tomato | <i>Helicoverpa armigera</i> | - | 1500 | 400-600 | - |
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 2.0% AS, Strain No. GBS/HNPV -01 (1x10⁹ POB/ml Min.) | | | | | |
| Pigeon pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 | 500-750 | - |
| Gram | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 | 500-750 | - |
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 2.0% AS, Strain No. NBRI-8821 (1x10⁹ POB/ml Min.) | | | | | |
| Pigeon pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 500 | 500 | - |
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 2.0% AS, Strain No. IBH-17268 (1x10⁹ POB/ml Min.) | | | | | |
| Pigeon pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 ml | 500-750 | - |
| Gram | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 ml | 500-750 | - |
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 2.0% AS, Strain No. BIL/HV-9 POB(1x10⁹ POB/ml Min.) | | | | | |
| Pigeon pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 | 500-750 | - |
| Chick pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 | 500-750 | - |

| Tomato | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 | 500 | - |
|--|--|-----------|---|---------|-----------------------|
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 2.0% AS, Strain No. IBL-17268 | | | | | |
| Pigeon pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250-500 | 500-750 | - |
| Chick pea | Pod borer (<i>Helicoverpa armigera</i>) | - | 500-1000 | 500-750 | - |
| Nuclear Polyhedrosis Virus of <i>Helicoverpa armigera</i> 0.43% AS, Strain No. BIL/HV-9 (1x10⁹ POB/ml Min.) | | | | | |
| Cotton | <i>Helicoverpa armigera</i> | - | 2700 | 400-600 | - |
| Tomato | <i>Helicoverpa armigera</i> | - | 1500 | 400-600 | - |
| Nuclear Polyhedrosis Virus of <i>Spodoptera litura</i> 0.5% AS, (1x10⁹ POB/ml Min.) | | | | | |
| Tobacco | <i>Spodoptera litura</i> | - | 1500 | 400-600 | - |
| NPV of <i>Helicoverpa armigera</i> 0.5%AS, (1x10⁹ POB/ml Min.) | | | | | |
| Chickpea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250 | 500 | - |
| NPV of <i>Helicoverpa armigera</i> 2.0%AS, (1x10⁹ POBs count / ml min) Biological Insecticide | | | | | |
| Chickpea | Pod borer (<i>Helicoverpa armigera</i>) | - | 250 | 600 | - |
| <i>Paecilomyces lilacinus</i> 01.15% WP (Accession No. MTCC No. 5175, T-Stanes PI-1 Strain) | | | | | |
| Brinjal | Root Knot Nematode | 03.0 kg | 500 kg Organic manure/ Organic fertilizer | - | - |
| <i>Paecilomyces lilacinus</i> 01.50% LF (CFU count 1x10⁸/ml min.)(Accession No. MTCC No. 5175, T-Stanes PI-1 Strain) | | | | | |
| Tomato | Root Knot Nematode (<i>Meloidogyne incognita</i>) | - | 6000 | 500 | - |
| 2. PUBLIC HEALTH USE | | | | | |
| Name of Insect | Habitat | Dose | | Surface | Waiting Period (days) |
| | | a.i. (gm) | Formulation (gm) | | |

| | | | | | |
|--|--|------------------------|-------------|--------------------------------|-------|
| Azadirachtin 0.15% EC | | | | | |
| Mosquito larvae | Stagnant water, Drainage water, Puddle | 1.0 | 1.0 | 10.7 m ² | - |
| | Iron containers, Machinery scraps, Iron box, Iron tanks | 5.0 | 5.0 | 53.6 m ² | - |
| | Plastic scraps, Pit | 933.3 | 933.3 | 01 ha | - |
| <i>Bacillus thuringiensis</i> var. israelensis WP | | | | | |
| Anopheles and Culex (larvae) | - | - | 2-5 kg. | - | 14-28 |
| <i>Bacillus thuringiensis</i> var. israelensis , Serotype H-14 (VECTOBAC 12 AS) Potency 1200 ITU / MG (VCRC Serotype H-14 strain | | | | | |
| Culex | Drains, Cesspits Casuarina pits, Disused wells | - | 5.0 litres | 01 liter in 100 liter of water | - |
| Anopheles | Paddy fields, Ponds, Pools | - | 10.0 litres | 01 liter in 50 liter of water | - |
| Aedes | Tree holes, Disused tyres | - | 10.0 litres | 01 liter in 50 liter of water | - |
| Culex | Drains, Cesspits Casuarina pits, Disused wells | - | 5.0 litres | 01 liter in 100 liter of water | - |
| <i>Bacillus thuringiensis</i> var. israelensis, Serotyp H-14 (Vectobac 12 AS) potency 1200 ITU/mg | | | | | |
| Anoppehes | Clean water, cement tanks | - | 1-2 liters | - | - |
| Culex | Polluted water, Casspits, Cement tank, Stagnant and flowering drains | - | 2-4 liters | - | - |
| <i>Bacillus thuringiensis</i> var. israelensis 5.0% AS (Visible spore count 8.6x10⁷ /ml min.) (Strain VCRC-B-17, Accession No.- MTCC 5596) potency 630 ITU/mg.min. | | | | | |
| Anopheles, Culex and Aedes | Highly polluted water | 0.20 ml/m ² | 1 liter | 200liter | - |
| Anopheles, Culex and Aedes | Clean Water | 0.10 ml/m ² | 1 liter | 200liter | - |
| <i>Bacillus thuringiensis</i> var. israelensis 5.0% AS (Strain VCRC-B-17, Serotype H-14, Accession No.- MTCC 5596) potency 630 ITU/mg.min. | | | | | |

| | | | | | |
|--|---|-----------------|----------------------------------|--|---|
| Culex | Polluted water (Drain, Cesspits, Casuarina, Pit, Disused well) | - | 05-10 liters | 01 liter in 50-100 liters of water | - |
| Anoppheles | Clean water (Ponds, Pool, Paddy fields) | - | 05 liters | 01 liter in 100 liters of water | - |
| Aedes | Tree holes, disused tyres | - | 10 liters | 01 liter in 100 liters of water | - |
| Culex | Polluted water (Drain, Cesspits, Casuarina, Pit, Disused well) | - | 10 lit (1 ml/m ²) | 01 liter in 100 liters of water | - |
| Anopheles | Clean water (Ponds, Pool, Paddy fields) | - | 5 liters(0.5 ml/m ²) | 0.5 liter in 100 liters of water | - |
| Aedes | Tree holes, disused tyres | - | 10 liters (1 ml/m ²) | 01 liter in 100 liters of water | - |
| Culex | Drains, Cesspits, casuarinas pits, Disused Wells | - | 5 lit/ha | 01 liter in 100 liters of water | - |
| Anopheles | Paddy fields, ponds, pools | - | 10 lit/ha | 01 liter in 50 liters of water | - |
| Aedes | Tree holes, disused tyres | - | 10 lit/ha | 01 liter in 50 liters of water | - |
| Culex | Polluted water (Drains, Cesspits, Casuarina Pits, Disused wells) | 10 lit (1 ml/m2 | | 200 Liters of Water | - |
| Anopheles | Clean water (Paddy fields, Ponds, Pool) | 5 (0.5 ml/m2) | | 200 Liters of Water | - |
| Bacillus thuringiensis var. israelensis (H-14) 5.0% AS | | | | | |
| Culex | Drains, Cesspits, casuarinas pits, Disused Wells | - | 5 lit/ha | 01 liter in 100 liters of water | - |
| Anoppheles | Paddy fields, ponds, pools | - | 10 lit/ha | 01 liter in 50 liters of water | - |
| Aedes | Tree holes, disused tyres | - | 10 lit/ha | 01 liter in 50 liters of water | - |
| Bacillus thuringiensis var. israelensis, Serotype H-14, 5% WP Potency 2000 ITU/mg | | | | | |
| Area and Breeding (Habitat) | | | Dose (g/m2) | Recommended application Frequency | |

| River bed pool | | 0.5 | Weekly | | |
|---|---|-----------------------|--------------------|------------------------------|-----------------------|
| Cement tanks | | 0.5 | Fortnightly | | |
| Pokhars small kaccha or cement tanks with low walls | | 0.5 | Weekly | | |
| Pits and ditches | | 0.5 | Weekly | | |
| Paddy fields | | 0.5 | Weekly | | |
| Semi polluted pits | | 0.5 | Weekly | | |
| Ornamental fountains | | 0.5 | Fortnightly | | |
| Septic tanks | | 1.0 | Weekly/Fortnightly | | |
| Flood prone polluted cesspits and ditches | | 0.5 | Weekly | | |
| Drains with polluted stagnant or flowing very slowly | | 0.5 | Weekly/Fortnightly | | |
| <i>Bacillus thuringiensis</i> var. <i>israelensis</i>, Strain Designation- ABIL, Accession No. NAMICC-B01318 (CFU Count- 4.8 x 10⁸) Serotyp H-14, 5% WP Potency 7000 ITU/mg | | | | | |
| Name of Insect | Habitat | Formulation (lit/ha.) | | Dilution in water (Liters) | Waiting period (Days) |
| | | Gm/m2 | Kg/ha | | |
| <i>Anopheles</i> species, <i>Culex</i> species, <i>Aedes</i> | Clean water, (Cement tanks, coolers, Drains, Pools and Pits) | 0.75 | 7.50 | 200 | - |
| species | Highly Polluted water- (Underground tanks, Container, Drums & Tyros) | 1.00 | 10.00 | 200 | - |
| <i>Bacillus thuringiensis</i> var. <i>sphaericus</i>1593 M serotype H 59 5b | | | | | |
| <i>Anopheles</i> species, <i>Culex</i> species | For Drains, Cesspits Cesspools, Paddy fields, ponds | - | 112 | 1 liter in 10 liter of water | - |
| <i>Anopheles</i> species, <i>Culex</i> species | Casuarinas pits, unused wells, unused overhead tanks, Domestic wells (Not for drinking requirements) | - | 112 | 1 liter in 10 liter of water | - |
| <i>Bacillus thuringiensis</i> var. <i>israelensis</i> 12% AS (Vectobac) | | | | | |
| <i>Anopheles</i> | Clean water, cement tanks | - | 1-2 liter | - | - |

| species | | | | | |
|--|---|------------------------|-------------|---------------------------|---|
| <i>Culex</i> species | Polluted water, cess pits, cement tanks, stagnant and flowing drains | - | 2-4 liter | - | - |
| <i>Bacillus thuringiensis</i> var. <i>israelensis</i> 00.50%WP | | | | | |
| Mosquito spp. | Anopheles, <i>Culex</i> and <i>Aedes</i> (Habitat-Cement tank, Coolers, Drains, Pool pits, Highly polluted underground tanks, Container drums & Tyres.) | 0.75 mg/m ² | - | 200 | - |
| <i>Bacillus thuringiensis</i> var. <i>israelensis</i> 05.00%WP | | | | | |
| Mosquito spp. | Anopheles, <i>Culex</i> and <i>Aedes</i> (Habitat-Cement Tank, Coolers, Drains, Pool pits | 0.75 g/m ² | 7.50 kg/ha. | 200 L | - |
| | Highly polluted water (underground tanks, Container Drums and Tyres.) | 1.00 g/m ² | 10.00 kg/ha | 200 L | - |
| <i>Bacillus sphaericus</i> 1593 M serotype H 59 5b, 1.3% Flowable concentrate Potency 13000 IU/mg | | | | | |
| <i>Anopheles</i> species, <i>Culex</i> species | For Drains, Cesspits Cesspools, paddy fields, ponds | - | 112 ml | 1 liter/10 liter of water | - |
| <i>Anopheles</i> species, <i>Culex</i> species | Casuarinas pits, unused wells, unused overhead tanks, Domestic wells (Not for drinking requirements) | - | 112 ml | 1 liter/10 liter of water | - |