



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, संग्रहोध और संग्रह निदेशालय

Directorate of Plant Protection, Quarantine & Storage

केंद्रीय कीटनाशी बोर्ड एवं पंजीकरण समिति

Central Insecticide Board & Registration Committee

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N.H.-IV, Faridabad-121 001 (Haryana)

## **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**

1. Major uses of Bio-insecticides - (Page No. 2 to 14).
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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) / %		
<b>Azadirachtin 0.15% EC w/w Min. Neem Seed Kernel Based</b>					
Cotton	White fly, Bollworms	-	2500-5000	500-1000	05
Rice (Paddy)	Thrips, Stem borer, Brown plant hopper, Leaf folder	-	1500-2500	500	05
<b>Azadirachtin 00.30% EC (3000 PPM) Min. Neem Seed Kernel Based</b>					
Cotton	American bollworm	-	4000	1000	05
<b>Azadirachtin 01.00% (10000 ppm) EC Min. Neem Based</b>					
Tea	Thrips	-	400-500	450	01
	Red spider mites	-	400-500	600	01
<b>Azadirachtin 01.00% EC (10000 PPM) Min. Neem Based</b>					
Tomato	Fruit borer ( <i>Helicoverpa armigera</i> )	-	1000-1500	500	03
Brinjal	Shoot & fruit borer ( <i>Leucinodes orbonalis</i> )	-	1000-1500	500	03
<b>Azadirachtin 00.03% EC Min. Neem Oil Based</b>					
Cotton	Bollworm ( <i>Helicoverpa armigera</i> ), Aphids	-	2500-5000	500	05
Rice (Paddy)	Leaf roller, Stem borer, Brown plant hopper	-	2000	1000	05
<b>Azadirachtin 00.03% WSP (300 PPM) Neem Oil Based</b>					
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

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

***Bacillus thuringiensis* var. *galleriae* 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	-

(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>Cnaphalocroci s medinalis</i> )	-	1.0-3.0	1000	-
<b><i>Bacillus thuringiensis</i> var. <i>kurstaki</i></b>					
Cotton	Bollworm	-	750-1000	750-1000	-
<b><i>Bacillus thuringiensis</i> var. <i>kurstaki</i>, serotype H-39, 3B, Strain Z-52</b>					
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 puera</i> ), Skeletonizer ( <i>Eutectona machaeralis</i> )	0.25-0.50	500-750	-	-
<b><i>Bacillus thuringiensis</i> serovar <i>kurstaki</i> (3a, 3b, 3c) 5.0% WP Potency 55000 SU (<i>Spodoptera</i> unit based) (5x10<sup>7</sup> spore/mg)</b>					
Cotton	American Bollworm	25.00-50.00	500-1000	500-1000	-
	Spotted Bollworm	37.50-50.00	750-1000	500-1000	-

Red gram	Pod Borer	50.00-62.50	1000-1250	500-1000	-
Cabbage	Diamond back moth	25.00-50.00	500-1000	500-1000	-
<b><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)</b>					
Caster	Caster 5rustaki5r ( <i>Achaea janata</i> )	-	0.25	250-300	-
<b><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)</b>					
Pigeon pea	Bollworm ( <i>Helicoverpa armigera</i> )	-	1-1.25	1000	-
<b><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)</b>					
Caster	Caster 5rustaki5r ( <i>Achaea janata</i> )	-	0.25- 0.375	250	-
<b><i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 16000IU/mg min.</b>					
Chickpea	Chick pea pod borer ( <i>Helicoverpa armigera</i> )	-	2.0	500	-
<b><i>Bacillus thuringiensis</i> var. <i>kurstaki</i> 2.5% AS (Spicbio-BTK AS)</b>					
Gram	Gram pod borer ( <i>Helicoverpa armigera</i> )	-	1.0-1.5	500	-
<b><i>Bacillus thuringiensis</i> var. krustaki, Serotype H-3a, 3b, Strain Z-52</b>					
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 exigua</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	-

Soyabean	<i>Spodoptera litura</i> , <i>Helicoverpa armigera</i> , <i>Spilosoma grustak</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.	-

***Bacillus thuringiensis* var. *kurstaki* 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	-

***Bacillus thuringiensis* var. *kurstaki* Serotype 3a, 3b, SA II WG Potency:- 53000 SU/mg, 32000 IU/mg**

Cabbage, Cauliflower	Diamond back moth	-	0.5 kg.	500-700	-
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***Bacillus thuringiensis* var. *kurstaki* 10% WSL (CFU:  $2 \times 10^9$  /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
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***Beauveria bassiana* 1.15% WP**

Cotton	Bollworms	-	400	750-1000	-
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***Beauveria bassiana* 01.15% WP**

Cotton	Bollworm	-	2000	400	-
Rice (Paddy)	Leaf folder	-	2.50 kg/ha	750-850	-

***Beauveria bassiana* 1.15% WP. ( $1 \times 10^8$  /gm min) Strain BB-ICAR-RJP, Accession No – MCC 1022**

Rice	Rice leaf folder ( <i>Cnaphalocrocius medinalis</i> )	-	2.5 kg.	750-850	-
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***Beauveria bassiana* 1.15% WP (Strain : BB – 5372, own R & D Isolate)**

Rice	Rice leaf folder ( <i>Cnaphalocrocis medinalis</i> )	-	2.5 kg.	600-750	-
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***Beauveria bassiana* 1.15% WP ( $1\times 10^8$ /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	-
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***Beauveria bassiana* 1.15% WP ( $1\times 10^8$ /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	-
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***Beauveria bassiana* 1.15% WP ( $1\times 10^8$  /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
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***Beauveria bassiana* 1.0% WP, Strain No: NBRI – 9947 ( $1\times 10^8$  CFU/gm Min.)**

Chick pea	Pod borer ( <i>Helicoverpa armigera</i> )	-	3.0 kg.	500	-
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***Beauveria bassiana* 1.0% WP ( $1\times 10^9$  CFU/gm min), Strain No. IPL/BB/MI/01**

Okra (Bhindi)	Fruit borer, Spotted bollworm	-	3.75-5.0 kg.	400-500	-
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***Beauveria bassiana* 1.0% WP ( $1\times 10^8$  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	-
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***Beauveria bassiana* 5.0% WP, ( $1\times 10^8$  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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***Beauveria bassiana* 5.0% SC, Strain: NBAII, Bangalore, Accession No. ITCC-7102, (Strain Isolated by Project Directorate of Bio-logical control, Bangalore)**

Tomato	Fruit borer ( <i>Helicoverpa armigera</i> )	-	500	500	-
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***Beauveria bassiana* 5.0% AS Strain: BB-AAU-RJP Accession No. MCC – 1024**

Tomato	Fruit borer ( <i>Helicoverpa armigera</i> )	-	0.5	500	-
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***Beauveria bassiana* 1.15% WP (1x10<sup>8</sup> /gm min) Accession No – NAIMCC-F-03048**

Chick pea	Gram Pod Borer ( <i>Helicoverpa armigera</i> )	-	2500	500	-
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***Beauveria bassiana* 10.00% SC**

Cabbage	Diamond back moth	1-1.5	-	500-750	-
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***Beauveria bassiana* 1.5% Liquid Formulation (CFU count 10X10<sup>8</sup>) Accession No.MTCC-5171**

Tomato	Fruit borer ( <i>Helicoverpa armigera</i> )	2.0	Foliar spray	500	-
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***Beauveria bassiana* 1.15% WP (1X10<sup>6</sup> CFU /gm min)**

Cotton	Bollworm	20	-	400	-
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***Metarhizium anisopliae* 1% WP (1x10<sup>8</sup> 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	-
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***Metarhizium anisopliae* 1.15% WP (1x10<sup>8</sup> CFU/gm min) Accession No. MTCC – 5173**

Rice	Brown plant hopper ( <i>Nilapavata lugens</i> )	-	2.5 kg.	500	-
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***Metarhizium anisopliae* 1.0% WP (1x10<sup>8</sup> 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	-
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***Metarhizium anisopliae* 1.15% WP (1x10<sup>8</sup> CFU/gm min) Strain No. AAI, Allahabad, Accession No. NAIMCC-F-03037.**

Chickpea	Heliothis armigera	2.5	500	-	--
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***Metarhizium anisopliae* 10% GR (CFU count  $1 \times 10^8$ /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 <sup>2</sup> (=60 kg/ha) along the furrows at the time of sowing and next after one month at the time of earthing up.	NA

***Pseudomonas fluorescens* 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 @ 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.
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 @ 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.

***Trichoderma harzianum* 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 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.
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

***Trichoderma harzianum* 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.

***Trichoderma viride* 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'.

***Verticillium chlamydosporium* 1.0% WP, (2x10<sup>6</sup> 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.

***Verticillium lecanii* 1.15%WP, (1x10<sup>8</sup> CFU/gm min) Strain – AS MEGH-VL Accession No – MCC-1028**

Cotton	White flies	-	2500	500	-
Citrus	Mealybug ( <i>Planococcus citri</i> )	-	2500	550	-

***Verticillium Lecanii* 1.50% Liquid Formulation, (1x10<sup>8</sup> CFU/ml. min.) Strain – T Stanes VI-1,  
Accession No – MTCC-5172**

Tomato	White fly ( <i>Bemisia tabaci</i> )	-	2000 (Foliar spray)	500	-
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***Verticillium lecanii* 3.0% AS, (strain: Accession No. MCC-1127, Strain No. MPKV / Biocontrol/ RVN/  
VL-01**

Onion	Thrips ( <i>Thrips tabaci</i> )	-	2000-2500	500	-
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***Verticillium lecanii* 5.0% SC, (Strain: Accession No. NFCCI - 2638**

Cabbage	Diamond Back Moth ( <i>Plutella xylostella</i> )	-	500	500	-
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***Verticillium lecanii* 5.0% SC, (1x10<sup>8</sup> CFU/gm Min.) Strain – Own Red Isolate, Strain No. VI-17874,  
MTCC No.5716**

Rice	White backed plant hopper ( <i>Sogotella furcifera</i> )	-	3.125 kg.	600	-
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**Nuclear Polyhedrosis Virus of *Helicoverpa armigera* 0.43% AS (1x10<sup>9</sup> POB/ml)**

Cotton	<i>Helicoverpa armigera</i>	-	2700	400-600	-
Tomato	<i>Helicoverpa armigera</i>	-	1500	400-600	-

**Nuclear Polyhedrosis Virus of *Helicoverpa armigera* 2.0% AS, Strain No. GBS/HNPV -01 (1x10<sup>9</sup> 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 *Helicoverpa armigera* 2.0% AS, Strain No. NBRI-8821 (1x10<sup>9</sup> POB/ml Min.)**

Pigeon pea	Pod borer ( <i>Helicoverpa armigera</i> )	-	500	500	-
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**Nuclear Polyhedrosis Virus of *Helicoverpa armigera* 2.0% AS, Strain No. IBH-17268 (1x10<sup>9</sup> 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 *Helicoverpa armigera* 2.0% AS, Strain No. BIL/HV-9 POB(1x10<sup>9</sup> 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	-
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**Nuclear Polyhedrosis Virus of *Helicoverpa armigera* 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 *Helicoverpa armigera* 0.43% AS, Strain No. BIL/HV-9 (1x10<sup>9</sup> POB/ml Min.)**

Cotton	<i>Helicoverpa armigera</i>	-	2700	400-600	-
Tomato	<i>Helicoverpa armigera</i>	-	1500	400-600	-

**Nuclear Polyhedrosis Virus of *Spodoptera litura* 0.5% AS, (1x10<sup>9</sup> POB/ml Min.)**

Tobacco	<i>Spodoptera litura</i>	-	1500	400-600	-
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**NPV of *Helicoverpa armigera* 0.5%AS, (1x10<sup>9</sup> POB/ml Min.)**

Chickpea	Pod borer ( <i>Helicoverpa armigera</i> )	-	250	500	-
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**NPV of *Helicoverpa armigera* 2.0%AS, (1x10<sup>9</sup> POBs count / ml min) Biological Insecticide**

Chickpea	Pod borer ( <i>Helicoverpa armigera</i> )	-	250	600	-
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***Paecilomyces lilacinus* 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	-	-
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***Paecilomyces lilacinus* 01.50% LF (CFU count 1x10<sup>8</sup>/ml min.)(Accession No. MTCC No. 5175, T-Stanes PI-1 Strain)**

Tomato	Root Knot Nematode ( <i>Meloidogyne incognita</i> )	-	6000	500	-
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**2. PUBLIC HEALTH USE**

Name of Insect	Habitat	Dose		Surface	Waiting Period (days)
		a.i. (gm)	Formulation (gm)		

<b>Azadirachtin 0.15% EC</b>					
Mosquito larvae	Stagnant water, Drainage water, Puddle	1.0	1.0	10.7 m <sup>2</sup>	-
	Iron containers, Machinery scraps, Iron box, Iron tanks	5.0	5.0	53.6 m <sup>2</sup>	-
	Plastic scraps, Pit	933.3	933.3	01 ha	-
<b>Bacillus thuringiensis var. israelensis WP</b>					
Anopheles and Culex (larvae)	-	-	2-5 kg.	-	14-28
<b>Bacillus thuringiensis var. israelensis , Serotype H-14 (VECTOBAC 12 AS) Potency 1200 ITU / MG (VCRC Serotype H-14 strain</b>					
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	-
<b>Bacillus thuringiensis var. israelensis, Serotyp H-14 (Vectobac 12 AS) potency 1200 ITU/mg</b>					
Anopphelis	Clean water, cement tanks	-	1-2 liters	-	-
Culex	Polluted water, Casspits, Cement tank, Stagnant and flowering drains	-	2-4 liters	-	-
<b>Bacillus thuringiensis var. israelensis 5.0% AS (Visible spore count 8.6x10<sup>7</sup> /ml min.) (Strain VCRC-B-17, Accession No.- MTCC 5596) potency 630 ITU/mg.min.</b>					
Anopheles, Culex and Aedes	Highly polluted water	0.20 ml/m <sup>2</sup>	1 liter	200liter	-
Anopheles, Culex and Aedes	Clean Water	0.10 ml/m <sup>2</sup>	1 liter	200liter	-
<b>Bacillus thuringiensis var. israelensis 5.0% AS (Strain VCRC-B-17, Serotype H-14, Accession No.- MTCC 5596) potency 630 ITU/mg.min.</b>					

Culex	Polluted water (Drain, Cesspits, Casuarina, Pit, Disused well)	-	05-10 liters	01 liter in 50-100 liters of water	-
Anopopheles	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 <sup>2</sup> )	01 liter in 100 liters of water	-
Anopheles	Clean water (Ponds, Pool, Paddy fields)	-	5 liters(0.5 ml/m <sup>2</sup> )	0.5 liter in 100 liters of water	-
Aedes	Tree holes, disused tyres	-	10 liters (1 ml/m <sup>2</sup> )	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	<b>Polluted water</b> (Drains, Cesspits, Casuarina Pits, Disused wells)		10 lit (1 ml/m <sup>2</sup> )	200 Liters of Water	-
Anopheles	<b>Clean water</b> (Paddy fields, Ponds, Pool)		5 (0.5 ml/m <sup>2</sup> )	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	-
Anopopheles	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
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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

***Bacillus thuringiensis* var. *israelensis*, Strain Designation- ABIL, Accession No. NAMICC-B01318 (CFU Count-  $4.8 \times 10^8$ ) 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	-

***Bacillus thuringiensis* var. *sphaericus* 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	-

***Bacillus thuringiensis* var. *israelensis* 12% AS (Vectobac)**

<i>Anopheles</i>	Clean water, cement tanks	-	1-2 liter	-	-
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species					
<i>Culex</i> species	Polluted water, cess pits, cement tanks, stagnant and flowing drains	-	2-4 liter	-	-

***Bacillus thuringiensis* var. *israelensis* 00.50%WP**

Mosquito spp.	Anopheles, Culex and Aedes (Habitat-Cement tank, Coolers, Drains, Pool pits, Highly polluted underground tanks, Container drums & Tyres.)	0.75 mg/m <sup>2</sup>	-	200	-
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***Bacillus thuringiensis* var. *israelensis* 05.00%WP**

Mosquito spp.	Anopheles, Culex and Aedes (Habitat-Cement Tank, Coolers, Drains, Pool pits)	0.75 g/m <sup>2</sup>	7.50 kg/ha.	200 L	-
	Highly polluted water (underground tanks, Container Drums and Tyres.)	1.00 g/m <sup>2</sup>	10.00 kg/ha	200 L	-

***Bacillus sphaericus* 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	-