



GOVERNMENT OF INDIA
Ministry of Agriculture
Department of Agriculture & Cooperation
Directorate of Plant Protection, Quarantine & Storage
Central Insecticides Board & Registration Committee
N.H.- IV, Faridabad-121 001

MAJOR USES OF BIOPESTICIDES
(Registered under the Insecticides Act, 1968)

UPTO- 31.08.2015

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A. Major uses of Bio-fungicides : Page 1-15

Crop	Common name of the disease	Dosage per ha			Waiting period from last application to harvest (in days)
		a.i. (g)	Formulation (g/ml)/%	Dilution in water (L)	
Neem oil based EC containing Azadirachtin 0.030% (300 ppm)					
Bhindi	Powdery mildew		2-2.5	500	3

<i>Pseudomonas fluorescens</i> 1.75% WP (In house isolated Strain Accession No. MTCC 5176)					
Wheat	Loose smut		5 g/kg seed (Seed treatment)	Mix the required quantity of seeds with the required quantity of <i>Pseudomonas fluorescens</i> 1.75% WP formulation and ensure uniform coating. Shade dry and sow the seeds.	-
			5 g/litre (Foliar spray)	Dissolve 5 kg of <i>Pseudomonas fluorescens</i> 1.75% WP in 1000 litres of water and spray	
<i>Pseudomonas fluorescens</i> 0.5% WP (TNAU Strain Accession No. ITCC BE 0005)					
Groundnut	Late leaf spot		10 g/kg seed	Seed treatment Mix the required quantity of seeds with the required quantity of	-

			1 kg/hectare	<p><i>Pseudomonas fluorescens</i> 0.5% WP formulation and ensure uniform coating. Shade dry and sow the seeds.</p> <p>Soil treatment : 1 kg of <i>Pseudomonas fluorescens</i> 0.5% WP spread uniformly over 1 hectare of land (foliar spray @ 2%)</p>	
Rice	Leaf and neck blast (<i>Pyricularia oryzae</i>)		10 gm / kg seed	<p>Seed treatment: Mix required quantity of the seeds with the required quantity of <i>Pseudomonas fluorescens</i> 0.5% WP</p>	Nil
			1 kg/ha	<p>Soil treatment: Broadcast 1 kg <i>Pseudomonas fluorescens</i> 0.5% WP by mixing with 2.5 kg organic manure in one ha area</p>	
			1 kg/ha	<p>Foliar spray: Spray <i>Pseudomonas fluorescens</i> 0.5% WP @ 1 kg/ha</p>	

Chili seedlings	Damping off (<i>Pythium aphanidermatum</i>)		10 g/kg seed	Seed treatment Mix required quantity of the seeds with the required quantity of <i>Pseudomonas fluorescens</i> 0.5% WP and ensure uniform coating, shade dry and sow.	Nil
Tomato	Wilt (<i>Fusarium oxysporum</i> F.sp)		10 gm/kg of seeds	Seed treatment Mix required quantity of the seeds with the required quantity of <i>Pseudomonas fluorescens</i> 0.5% WP and ensure uniform coating, shade dry and sow	Nil
			2.5 kg/hectare	Soil Treatment- 2.5 kg of <i>Pseudomonas fluorescens</i> 0.5% wp. Spread uniformly over a hectare of land	-
<i>Pseudomonas fluorescens</i> 1.5% WP (BIL-331 Accession No. MTCC5866)					
Paddy	Bacterial Leaf blight (<i>Xanthomonas oryzae</i>)	5gm/kg of seed		Seed treatment :- Make a this paste of required quantity of <i>Pseudomonas fluorescens</i> 1.5 % WP with min. volume of water and coat the seed uniformly , shades dry the seeds just before sowing.	NIL

	Blast (Pyricularia oryzae) Leaf spot (Helminthosporium oryzae)	2.5 kg /hectare	Soil treatment:- Mix 2.5 kg of Pseudomonas fluorescens 1.5% WP with 50kg FYM or and broadcast uniformly over hectare of land 30days after planting.	
<i>Pseudomonas fluorescens</i> 1.0% WP (IPL/PS-01 Accession No. MTCC5727)				
Tomato	Wilt (Fusarium Oxyporam) Damping Off (Pythium aphanidermatum) Root rot (Rhizoctonia spp.)	5gm/kg of seed 2.5kg/hectare 10gm/litres of water	Seed Treatment:- Make a thin paste of required quantity of Pseudomonas fluorescens 1.0% WP with the minimum volume of water & coat the seed uniformly , shade dry the seed just before sowing. Soil Treatment:- Mix 2.5kg of Pseudomonas fluorescens 1.0% WP with 62.5 kg FYN and broadcast uniformly over a hectare of land. Seedling Root Dip Treatment:- Mix 10 gm of Pseudomonas fluorescens 1.0% WP in one litre of water and dip the tomato seedling root rot for minutes.	NIL
<i>Pseudomonas fluorescens</i> 1.0% WP (Strain No. IIHR-PF-2 Accession No. ITCCB0034)				
Tomato	Wilt (Fusarium Oxysporum)	Treat the seed with <i>Pseudomonas fluorescens</i> 1% WP @ 20 gm/kg of seeds & treat the nursery beds with the <i>Pseudomonas fluorescens</i> 1% WP @ 50gm/sq.m and apply <i>Pseudomonas fluorescens</i> 1% WP @ 5kg/ha enriched FYM* @5tons /hectare to the soil before transplanting.		
Brinjal	Wilt (Fusarium solani)	-do-		
Carrot	Root rot (Sclerotium rolfsi)	Treat the seed with <i>Pseudomonas fluorescens</i> 1% WP @ 20gm/kg of seeds and apply <i>Pseudomonas fluorescens</i> 1% WP @ 5kg/ha enriched FYM* @ 5tons/hectare to the soil		

		before sowing.			
Okra	Wilt (Fusarium Oxysporum)	-do-			
Trichoderma harzianum 0.50% WS					
Cardamom	Capsule rot (<i>Phytophthora meadii</i>)		100 gm /plant (Soil treatment)	Soil treatment: Apply 100 gm product/ plant along with neem cake (0.5 kg/ plant) and 5 kg FYM/ plant	-

Trichoderma harzianum 1.0% WP(Strain No. IHR-TH-2 Accessions No. ITCC6888)					
Tomato	Wilt (Fusarium Oxysporum)	Treat the seed with trichoderma Harzianum 1% WP @ 20 gm/kg of seeds & treat the nursery beds with the trichoderma harzianum 1% WP @ 50gm/sq.m and apply Trichoderma Harzianum 1% WP @ 5kg/ha enriched FYM*@5tons /hectare to the soil before transplanting.			
Brinjal	Wilt (Fusarium solani)	Treat the seed with trichoderma Harzianum 1% WP @ 20 gm/kg of seeds & treat the nursery beds with the trichoderma Harzianum1% WP @ 50gm/sy.m and apply Trichoderma Harzianum 1% WP @ 5kg/ha enriched FYM*@5tons /hectare to the soil before transplanting.			
Carrot	Root rot (Sclerotium rolfsi)	Treat the seed with trichoderma Harzianum 1% WP @ 20gm/kg of seeds and apply trichoderma Harzianum 1% WP @ 5kg/ha enriched FYM*@ 5tons/hectare to the soil before sowing.			
Okra	Wilt (Fusarium Oxysporum)	Treat the seed with trichoderma Harzianum 1% WP @ 20gm/kg of seeds and apply trichoderma Harzianum 1% WP @ 5kg/ha enriched FYM*@ 5tons/hectare to the soil before sowing.			
Trichoderma harzianum 2.0% WP					
Maize	Root rot		20 gm	Seed treatment: Make a thin paste	-

	Fusarium wilt (<i>Fusarium moniliforme</i>)		/kg seed	of required quantity of <i>Trichoderma harzianum</i> 2% WP with minimum volume of water and coat the seeds uniformly, shade dry the seeds just before sowing.	
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<i>Trichoderma viride</i> 1% WP					
Pigeon pea	Wilt, root rot		8 gm /kg seed 5.0 kg/ha	Seed treatment Soil treatment	Nil Nil
Pulses (Cowpea , mung bean, urdbean)	Root rot	4g/kg of seed	-	-	-
Chilli	Damping off	-do-	-	-	-
<i>Trichoderma viride</i> 1% WP (TNAU Strain Accession No. ITCC 6914)					
Cowpea	Root Rot		5 gm /kg seed	Seed treatment: Make a fresh slurry of required quantity of <i>Trichoderma viride</i> 1.0% WP with minimum volume of water and coat the seeds niformly, shade dry the seeds just before sowing.	Nil

			2.5 kg/ha	Soil treatment : Mix 2.5 kg of <i>Trichoderma viride</i> 1.0% WP with 62.5 kg FYM and broadcast uniformly over a hectare of land and irrigate the field immediately	
Chili seedlings	Damping off (Pythium aphanidermatum)		4 g/kg seed	Seed treatment Mix required quantity of the seeds with the required quantity of trichoderma viride 1% WP and ensure uniform coating shade dry and sow	Nil
Urd bean	Root rot (Macrophomina phaseolina)		4 g/kg seed	Seed treatment:- Mix required quantity of the seeds with the required quantity of trichoderma viride 1% WP and ensure uniform coating shade dry and sow	Nil
Pigeon Pea	Root rot (Macrophomina phaseolina)		4 g/kg seed	Seed treatment :- Mix required quantity of the seeds with the required quantity of trichoderma viride 1% WP and ensure uniform coating shade dry and sow	Nil
Trichoderma viride 1% WP (Strain T-14 in house isolate of M/s Indore Biotech Inputs & Research (P) Ltd., Indore)					

Chickpea	Wilt (<i>Fusarium oxysporum</i>)		5 gm /kg seed	Seed treatment: Make slurry of required quantity of <i>Trichoderma viride</i> 1.0% WP with minimum volume of water & coat the seeds uniformly, shade dry the seeds just before sowing	
	Root Rot (<i>Rhizoctonia solani</i> & <i>Sclerotium rolfsii</i>)		5.0 kg/ha	Soil treatment : Mix 5.0 kg of <i>Trichoderma viride</i> 1.0% WP in 100 kg FYM and broadcast over a hectare land mix well with soil and irrigate the field immediately.	-
Paddy	Sheath blight (<i>Rhizoctonia solani</i>)		5-10 gm/litre of water	Foliar spray: Mix 2.5 kg of <i>Trichoderma viride</i> 1.0% WP in 500 litres of water. Spray three times at 15 days interval uniformly over one hectare land 30 days after planting	

***Trichoderma viride* 1.5% WP (Strain No. IHR-TV-5, Accession No. ITCC 6889)**

Tomato	Wilt (Fusarium Oxysporum)	Treat the seed with trichoderma Virride 1.5% WP @ 20 gm/kg of seeds & treat the nursery beds with the trichoderma virride 1.5% WP @ 50gm/sy.m and apply Trichodrma virride 1.5% WP @ 5kg/ha enriched FYM* @5tons /hectare to the soil before transplanting.			
Brinjal	Wilt (Fusarium solani)	Treat the seed with trichoderma Virride 1.5% WP @ 20 gm/kg of seeds & treat the nursery beds with the trichoderma virride 1.5% WP @ 50gm/sy.m and apply Trichodrma virride 1.5% WP @ 5kg/ha enriched FYM* @5tons /hectare to the			

		soil before transplanting.			
Carrot	Root rot (<i>Sclerotium rolfsii</i>)	Treat the seed with trichoderma viride 1.5% WP @ 20gm/kg of seeds and apply trichoderma viride 1.5% WP @ 5kg/ha enriched FYM* @ 5tons/hectare to the soil before sowing.			
Okra	Wilt (<i>Fusarium Oxysporum</i>)	Treat the seed with trichoderma viride 1.5% WP @ 20gm/kg of seeds and apply trichoderma viride 1.5% WP @ 5kg/ha enriched FYM* @ 5tons/hectare to the soil before sowing.			
Trichoderma viride 1% WP					
Cauliflower	Stalk rot – <i>Sclerotinia sclerotiorum</i>		4 gm /kg seed	Seed treatment: Make a thin paste of required quantity of <i>Trichoderma viride</i> 1.0% WP with minimum volume of water and coat the seeds uniformly, shade dry the seeds just before sowing	-
			2.50 kg/ha	Soil treatment : Mix 2.5 kg of <i>Trichoderma viride</i> 1.0% WP with 62.5 kg FYM and broadcast Uniformly over a hectare of land and irrigate the field immediately	
Brinjal	Root Rot/ Wilt/ Damping off <i>Rhizoctonia bataticola</i> , <i>Sclerotium rolfsii</i> , <i>Fusarium oxysporum</i> ,		5 gm/kg seeds	Seed treatment: Make a thin paste of required quantity of <i>Trichoderma viride</i> 1.0% WP with minimum	

	<i>Rhizoctonia solani</i>			volume of water and coat the seeds uniformly, shade dry the seeds just before sowing	
	Root Rot/ Wilt/ Damping off <i>Rhizoctonia bataticola</i> , <i>Sclerotium rolfsii</i> , <i>Fusarium oxysporum</i> , <i>Rhizoctonia solani</i>		250 gm/50 litre of water/ 400 sq. mt.	Nursery Treatment: Mix 250 gm of <i>Trichoderma viride</i> 1.0% WP in 50 litre of water and drench the soil in 400 sq. mt. area Seedling Root dip treatment: Mix 10 gm of <i>Trichoderma viride</i> 1.0% WP in one litre of water and dip the Brinjal seedling root for 15 minutes	
			2.5 kg/ hectare	Soil treatment : Mix 2.5 kg of <i>Trichoderma viride</i> 1.0% WP with 62.5 kg FYM and broadcast uniformly over a hectare of land and irrigate the field immediately	
Cabbage	Root rot/Collar rot <i>Rhizoctonia solani</i>		10 gm/ litre water	Seedling Root dip treatment: Mix 10 gm of <i>Trichoderma</i>	

				<i>viride</i> 1.0% WP in one litre of water and dip the Cabbage seedling root for 30 minutes	
			2.5 kg/ hectare	Soil treatment : Mix 2.5 kg of <i>Trichoderma viride</i> 1.0% WP with 62.5 kg FYM and broadcast uniformly over a hectare of land and irrigate the field immediately	
Trichoderma viride 1% WP					
Tomato	Seedling wilt <i>Fusarium oxysporum</i> Damping off <i>Pythium aphanidermatum</i> <i>Rhizoctonia solani</i>		9 g/kg seed 2.5 kg	Seed treatment Mix 9 kg of the product per kg seed. Root zone application Mix thoroughly 2.5 kg of the product in 150 kg of compost or farmyard manure and apply this mixture in the field after sowing/transplanting of crops	-
Bengal gram	Seedling wilt <i>Fusarium oxysporum</i> Damping off		9 g/kg seed 2.5 kg	Seed Treatment:- Mix 9 kg of the product per kg seed.	-

	<i>Pythium aphanidermatum</i> <i>Rhizoctonia solani</i>			Root zone application Mix thoroughly 2.5kg of the product in 150 kg of compost or farmyard manure and apply this mixture in the field after sowing/ transplanting crops	
Trichoderma viride 1% WP					
Sunflower	Seed rot <i>Sclerotium rolfsii</i>		6 g/kg seed	Seed treatment Mix required quantity of the seeds with the required quantity of product in rice gruel, ensure uniform coating, shade dry and sow	
	Root rot <i>Sclerotium rolfsii</i>		1.25-2.5 kg/ha	Soil treatment Mix with 30-60 kg of compost/ farmyard manure and spread uniformly over 1 hectare of land	
Trichoderma viride 1% WP (TNAU Strain Accession no. ITCC 6914)					
Cowpea	Wilt (<i>Fusarium oxysporum</i>)		4 gm/kg seed	(Seed treatment) Mix required quantity of the seeds with the required quantity of <i>Trichoderma</i>	

				<i>viride</i> 1% WP and ensure uniform coating, shade dry and sow.	
Pigeon Pea	Root rot (Macrophomina Phaseolina)		4 gm/kg seed	Seed treatment) Mix required quantity of the seeds with the required quantity of <i>Trichoderma viride</i> 1% WP and ensure uniform coating, shade dry and sow.	
Urd Bean	Root rot (Macrophomina Phaseolina)		4 gm/kg seed	Seed treatment) Mix required quantity of the seeds with the required quantity of <i>Trichoderma viride</i> 1% WP and ensure uniform coating, shade dry and sow.	
<i>Trichoderma viride</i> 5% WP					
Groundnut	Stem rot (<i>Sclerotium rolfsii</i>)		4 gm Formulated <i>Trichoderma viride</i> 1% WP / kg of seed (Seed Treatment)	Seed treatment) Mix required quantity of the seeds with the required quantity of <i>Trichoderma viride</i> 1% WP and ensure uniform coating, shade dry and sow.	
			2.5 kg Formulated	Apply 2.5 kg <i>Trichoderma viride</i> 1% WP in 500 kg	

			<i>Trichoderma viride</i> 1% WP /hectare (Soil Treatment)	Castor cake in furrow at the time of sowing.	
<i>Trichoderma viride</i> 5% WP					
Ground Nut	Stem rot (<i>Sclerotium rolfsii</i>)		4 gm/kg seed + 2.5kg/ha	Seed treatment) Mix required quantity of the seeds with the required quantity of <i>Trichoderma viride</i> 1% WP and ensure uniform coating, shade dry and sow. Soil treatment: Apply 2.5 kg product in 50 kg castor cake in furrow at the time of sowing.	

B. Bio-Insecticides:

Ampelomyces quisqualis 2.0% WP, Strain No. MTCC-5683) (CFU Count: 2 x 10⁶ g/min.)				
Name of Crop	Name of Insect	Dose / ha (Formulation)	Dilution in water (Litre)/ha	Waiting period (Days)
Bhindi	Powdery mildew (<i>Erysiphe cichoracearum</i>)	2.5 kg	500 liters	-

Azadirachtin 0.15% W/W Min. Neem Seed Kernel Based E.C.				
Name of Crop	Name of Insect	Formulation (ml)	Dilution in water (Litre)	Waiting period (Days)
Cotton	White fly	2500-5000 ml	500-1000 lit	5
	Bollworm	2500-5000	500-1000 lit	5
Rice	Thrips, Stem borer, Brown Plant hopper, Leaf folder	1500 to 2500 ml	500	5

Azadirachtin 0.3% (3000 PPM) Min. Neem Seed Kernel Based E.C.				
Cotton	American bollworm	4000	1000	5

Azadirachtin 1% Min. E.C. Neem based.				
Tea	Thrips	400-500	450	1
	Red Spider mites	400-500	600	1

Azadirachtin 1% (10000 ppm) Min. Neem Based E.C. Containing				
Tomato	Fruit borer (<i>Helicoverpa armigera</i>)	1000-1500	500	3

Brinjal	Fruit and Shoot borer (Leucinodes orbonalis)	1000-1500	500	3
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Azadirachtin 0.03% Min. Neem Oil Based E.C. Containing

Cotton	Bollworm (Helicoverpa Armigera),	2500-5000	500	5
	Aphids	2500-5000	500	5
Rice	Leaf roller, Stem borer, BPH	2000	1000	5

Azadirachtin 0.03% (300 ppm) Neem Oil Based WSP Containing

Bengal Gram	Pod Borer (Heliothis)	2500-5000	500-1000	7
Red Gram	Pod Borer (Melangromyze)	2500-5000	500-1000	7
Cotton	Aphids Jassids, White Flies, Bollworms,	2500-5000	500-1000	7
Okra	Fruit borer, White flies, Leaf Hopper	2500-5000	500-1000	7
Brinjal	Shoot & Fruit borer, beetles	2500-5000	500-1000	7
Cabbage	Aphids, DBM, Cabbage - worm, Cabbage - looper	2500-5000	500-1000	7
Jute	Semi looper, Hairy caterpillar	2500-5000	500-1000	7

Azadirachtin 5% w/w Min. Neem Extract Concentrate Containing				
Tea	Caterpillar,	200	400	5
	Pink mite,	200	400	5
	Red Spider mites,	200	400	5
	Thrips	200	400	5
Tobacco	Tobacco caterpillar,	200	400	5
	Aphids	200	400	5
Rice	Brown Plant Hopper,	200	400	5
	Leaf Folder,	200	400	5
	Stem Borer	200	400	5
Cotton	White Fly,	375	750	5
	Leaf hoppers	375	750	5
	Heliothis, Aphids	375	750	5
Cauliflower	Spodoptera,	200	400	5
Bhindi	Leafhopper,	200	400	5
	whitefly, Aphid, Pod Borer	200	400	5
Tomato	Aphids, Whitefly, Fruit borer	200	400	5

Bacillus thuringiensis var. galleriae 1593 M sero type H 59 5b, 1.3% flowable concentrate Potency 1500 IU/mg				
Name of the Crop	Name of the Insect	Formulation (litre)	Dilution in water (Litre)	
Cabbage & Cauliflower	Diamond back moth (Plutella xylostella)	0.6-1.0	500	-
Tomato	Fruit borer (Helicoverpa armigera)	1.0-1.5	500	
Bhindi	Fruit borer (Earias spp.)	1.0-1.5	500	
Chillies	Fruit borer (spodoptera litura)	1.5-2.0	1000	
Cotton	Bollworm (Heliothis armigera)	2.0-2.5	1000	

Rice	Leaf folder (<i>Cnaphalocrocis medinalis</i>)	1.0-3.0	1000	
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Bacillus thuringiensis-k

Cotton	Bollworm	750-1000ml	750-1000 ltr	Nil
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Bacillus thuringiensis Serovar Kurstaki (3a, 3b, 3c) 5% WP Potency 55000 su(spodoptra unit based) (5×10^7 spore/mg)

Cotton	American Bollworm	25.00-50.00	500-1000	500-1000	-
	Spotted Bollworm	37.50-50.00	750-100	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	-

Bacillus thuriengiensis var Kurstaki 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 9000 IU/mg min. U/s 9(3b)

Crop	Common name of Pest	Formulation (kg)	Dilution of water (lit.)
Caster	Caster Semilooper (<i>Achaea janata</i>)	0.25	250-300

Bacillus thuriengiensis var Kurstaki 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 9000 IU/mg min. U/s 9(3b)

Crop	Common name of Pest	Formulation (kg)	Dilution of water (lit.)
Caster	Caster Semilooper (<i>Achaea janata</i>)	0.25- 0.375	250

Bacillus thuriengiensis var Kurstaki 0.5% WP serotype 3a, 3b, 3c, Strain DOR Bt-1, Potency 16000 IU/mg min.

Crop	Common name of Pest	Formulation (kg)	Dilution of water (lit.)
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Chickpea	Chick pea podborer (<i>Helicoverpa armigera</i>)	2.0	500
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Bacillus thuringiensis var Kurstaki 2.5% AS.(Spicbio-Btk AS)			
Crop	Common name of Pest	Formulation (Lit.)	Dilution of water (lit.)
Gram	Grampod borer (<i>Helicoverpa armigera</i>)	1.0-1.5	500

Bacillus thuringiensis var. Kurstaki, Serotype H-3a, 3b, Strain Z-52					
Potency:-					
3000 IU/mg min - on Gypsy moth					
32000 IU/mg min – Trichoplusia vi					
50000 IU/mg min – H.armigera					
55000 IU/mg min – Spodoptera exiqua					
Cotton	Bollworms, Spodoptera	-	0.75-1.0 kg.	500-750	-
Rice	Stem borer & Leaf folder	-	1.50 kg.	500-750	-
Gram	Heliothis	-	0.75 kg.	500-750	
Pigeon Pea	Heliothis	-	0.75 kg.	500-750	-
Soyabean	Spodoptera, Heliothis, Spilosoma, Semilooper, Leaf miner		0.75 kg.	500-750	
Tobacco	Spodoptera,	-	1.50-2.00 kg.	500-750	-

	Heliiothis				
Castor	Hairy caterpillar, Ahea janata	-	1.00 kg.	500-750	
Teak	Dfoliater (Hyblaea pured), Skeletonizer (Eutectona machaeralis)	-	0.25-0.50% Sol.	As required.	

Bacillus thuriengiensis var Kurstaki Strain HD-1, serotype 3a, 3b, 3.5% ES for Import & repack.Potency17600 IU/mg

Crop	Common name of Pest	Formulation (ml/ha)	Dilution of water (lit.)
Cotton	Bollworm	750-1000	750-1000

Bacillus thuriengiensis Var Kurstaki Serotype 3a, 3b, SA II WG Potency:- 53000 SU/mg, 32000 IU/mg

Crop	Common name of Pest	Formulation (ml/ha)	Dilution of water (lit.)
Cabbage, Cauliflower	Diamond back moth	0.5 kg/ha	500-700ha

Beauveria bassiana 1.15% W.P.

Cotton	Bollworm	400 gm/ha	750-1000 lit/hac
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**Beauveria bassiana 1.15% W.P. (1x10⁸/gm min) Strain BB-ICAR-RJP
Accession No – MCC 1022**

Rice	Rice leaf folder (Cnaphalocrosis medinalis)	2.5 kg/ha	750-850 L/Ha	-
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Beauveria bassiana 1.15% W.P. (1x10⁸/gm min) Strain ICAR, Research Complex, Umiam, Meghalaya, Accession No – NAIMCC-F-03045					
Rice	Rice leaf folder (<i>Cnaphalocrosis medinalis</i>)	2.5 kg/ha	750-850 L/Ha	-	

Beauveria bassiana 1.15% W.P. (1x10⁸/spores/ml) Strain BCRL, Accession No – BCRL BbpX-6892					
Cabbage	Diamond back moth (<i>Plutella xylostella</i>)	1.1.5 litre/ha formulation	500-750 litre/ha of water	Apply using any type of sprayer (high, low or ultra low volume) which gives good coverage	NA

Beauveria bassiana 1% WP Strain No: NBRI – 9947 (1x10⁸ CFU/gm min)					
Chick pea	Pod borer (<i>Helicoverpa armigera</i>)	-	3 kg.	500 L/Ha	-

Beauveria bassiana 1% WP (1x10⁹ CFU/gm min) Strain No. IPL/BB/MI/01					
Okra	Fruit borer / spotted bollworm	-	3.75-5.0 kg	400-500 L/Ha	-

Beauveria bassiana 1% 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/ha	500 l/ha	-

Metarhizium Anisopliae 1.15% WP (1x10⁸ CFU/gm min) Accession No. MTCC – 5173				
Crop	Name of the Pest	Dosage per hectare		Waiting period
Rice	Brown plant hopper (BPH) (<i>Nilaparvata lugens</i>)	2.5 kgs (Formulated)	500 Liters of water	-----

Metarhizium Anisopliae 1.0% WP (1x10⁸ CFU/gm min) Strain No. IPL/KC/44 (Own R & D Isolate), Accession No. 6895.				
Crop	Name of the Pest	Dosage per kg/hectare	Dilution in Water (Liter)/ha	Waiting period
Brinjal	Shoot & Fruit borer (<i>Leucinodes orbonalis</i>)	2.5-5.0	500-750	-----

Verticillium Chlamydosporium 1% 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 Verticillium chlamydosporium 1% WP @ 20 gm/kg of seeds & nursery bedswith the Verticillium chlamydosporium 1% WP @ 50 gm/sq.m and also apply Verticillium chlamydosporium 1% 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 Verticillium chlamydosporium 1% WP @ 20 gm/kg of seeds & nursery bedswith the Verticillium chlamydosporium 1% WP @ 50 gm/sq.m and also apply Verticillium chlamydosporium 1% 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 Verticillium chlamydosporium 1% WP @ 20 gm/kg of seeds and apply Verticillium chlamydosporium 1% 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 Verticillium chlamydosporium 1% WP @ 20 gm/kg of seeds and apply Verticillium chlamydosporium 1% WP @ 5 kg/ha enriched FYM @ 5 tons/ha to the soil before transplanting.

Verticillium Lecanii 1.15% WP (1x10⁸ CFU/gm min) Strain – AS MEGH-VL Accession No – MCC-1028				
Cotton	White flies	2500 (formulated)	500 litres of water	----

Verticillium Lecanii 1.15% WP (1x10⁸ CFU/gm min) Strain – AS MEGH-VL Accession No – MCC-1028				
Citrus	Mealybugs (Planococcus citri)	2.5 kg	550 litres of water	----

Verticillium Lecanii 1.15% WP (1x10⁸ CFU/gm min) Strain – AS MEGH-VL Accession No – MCC-1028				
Citrus	Mealybugs (Planococcus citri)	2.5 kg	550 litres of water	----

Nuclear Polyhedrosis Virus of Helicoverpa Armigera 0.43% AS (1x10⁹ POB/ml)					
Cotton	Helicoverpa Armigera		2700 ml	400-600 L/Ha	-
Tomato	Helicoverpa Armigera		1500 mlo	400-600 L/Ha	-

NPV 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 ml	500-750	-
Gram	Pod borer (<i>Helicoverpa armigera</i>)	-	250-500 ml	500-750	-

NPV of <i>Helicoverpa armigera</i> 2.0% AS Strain No. NBRI-8821 (1x10⁹ POB/ml min)			
Crop	Name of Pest	Dose (ml)/ha	Dilution in Water

		(Formulation)	(Litre/ha)
Pigeon pea	Pod borer (<i>Helicoverpa armigera</i>)	500	500

NPV of <i>Helicoverpa armigera</i> 2.0% AS Strain No. IBH-17268 (1x10 ⁹ 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	-

Strain No. BIL/HV-9 POB(1x10 ⁹ POB/ml)					
Pigeon pea	Pod borer (<i>Helicoverpa armigera</i>)	-	250-500 ml	500-750	-
Chick pea	Pod borer (<i>Helicoverpa armigera</i>)	-	250-500 ml	500-750	-
Tomato	Fruit borer (<i>Helicoverpa armigera</i>)	-	250-500 ml	500	-

Strain No. IBL-17268					
Pigeon pea	Pod borer (<i>Helicoverpa armigera</i>)	-	250-500 ml	500-750	-

Chick pea	Pod borer (<i>Helicoverpa armigera</i>)	-	500-1000 ml	500-750	-
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NPV of *Helicoverpa armigera* 0.43% AS Strain No. BIL/HV-9 (1x10⁹ POB/ml)

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

NPV of *Spodoptera litura* 0.5%AS (1x10⁹ POB/ml min)

Tobacco	<i>Spodoptera litura</i>	-	1500	400-600	-
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NPV of *Helicoverpa armigera* 0.5%AS (1x10⁹ POB/ml min)

Crop	Name of Pest	Dose (ml)/ha (Formulation)	Dilution in Water (Litre/ha)	Waiting period
Chickpea	Pod borer (<i>Helicoverpa armigera</i>)	250	500	-

C. Public health use

Azadirachtin 0.15% EC				
Mosquito larvae	Habitat	a.i. (gm)	Formulation (gm)	Surface
Mosquito larvae	Stagnant water, drainage, water puddle, iron containers, machinery scraps, iron box, iron tanks, plastic scraps, pit.	1.0	1.0	10.7 m ²
		5.0	5.0	53.6 m ²
		933.3	933.3	1 hectare

Bacillus thuringiensis var. israelensis WP.			
Name of insect	Dosage/h		Interval between applicatio
	a.i. (gm)	Formulation(Kg.)	
Anopheles and Culex (larvae)	---	2 – 5 Kg/ha	2-4 weeks

Bacillus thuringiensis Var-esraelensis , 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.	1 liter in 100 lts of water
Anopheles	Paddy fields, Ponds, pools	10.0 litres.	1 liter in 50 lts of water
Aedes	Tree holes, disused tyres	10.0 litres.	1 liter in 50 lts of water
Culex	Drains, Cesspits Casuarina pits, Disused wells	5.0 litres.	1 liter in 100 lts of water

Bacillus thuriengiensis var Israelensis, Serotyp H-14 (Vectobac 12 AS) potency 1200 ITU/mg		
Name of Insect	Habitat	Formulation (lit/ha.)
Anopheles	Clean water, cement tanks	1-2 ltrs
Culex	Polluted water, Cesspits, Cement tank, Stagnant and flowering drains	2-4

Bacillus thuriengiensis var Israelensis, Serotyp H-14, 5% WP Potency 2000 ITU/mg		
Area and Breeding (Habitat)	Dose (g/m ²)	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

Bacillus thuriengiensis var Israelensis, Strain Designation- ABIL, Acession 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
		Gm/m ²	Kg/ha	
Anopheles, Culex & Aedes	Clean water, (cement tanks, coolers, drains, pools and pits)	0.75	7.50	200
	Highly Polluted water- (Underground tanks, container, drums & tyros)	1.00	10.00	200

Area and Breeding (Habitat)	Dose (g/m ²)	Recommended application Frequency
River bed pool	0.5	Weekly
Cement tanks	0.5	Fortnightly
Pokhars small kaccha or cement tanks with low	0.5	Weekly

walls		
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 thuriengiensis var. sphaericus 1593 M sero type H 59 5b

Name of Insect	Habitat	Formulation (Kg.)	Dilution in water
Anophles species Culex species	For Drains, Cesspits Cesspools, Paddy fields, ponds	112	1 liter in 10 lts of water
Anophles species Culex species	Camsuarina pits, unused wells, unused overhed tanks, Domestic wells (Not for drinking requirements)	112	1 liter in 10 lts of water

Bti 12% AS (Vectobac)

Anopheles	Clean water, cement tanks	1-2 ltrs.
Culex	Polluted water, cess pits, cement tanks, stagnant and flowing drains	2-4ltrs.

**Bacillus sphaericus 1593 M sero type H 59 5b, 1.3% flowable concentrate
Potency 13000 IU/mg**

Anophles species Culex species	For Drains, Cesspits Cesspools, paddy fields, ponds	112ml	1 ltr/10 ltr of water	-
Anophles species Culex species	Camsuarina pits, unused wells, unused overhed tanks, Domestic wells (Not for drinking requirements)	112ml	1 ltr/10 ltr of water	

