

Government of India recommended use of Endosulfan for various crops & available alternatives in NPM

Crop	Pest	Chemicals	Biologicals	NPM Methods
Paddy	Leaf Folder	Endosulfan Cypermethrin lambda cyhalothrin	<i>Trichogramma chilonis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Removing Leaf folds using Thorny twigs • Spraying Vitex solution
	Hispa/case worm/cut worm	Endosulfan Quinalphos Monocrotophos Chlorpyrifos	<i>Trichogramma chilonis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Removing Leaf folds using Thorny twigs • Spraying Vitex solution
	Swarming caterpillar/surti caterpillar	Carbaryl Quinalphos Monocrotophos Endosulfan Triazophos Chlorpyrifos		<ul style="list-style-type: none"> • NSKE – 5% spray • Removing Leaf folds using Thorny twigs • Spraying Vitex solution
Pigeonpea	Pod Borer	Acephate Endosulfan	<i>Helicoverpa armigera</i> <i>Nuclear polyhedrosis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Shaking Method • Deep Summer Ploughing
		Triazophos	virus (NPV) <i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Shaking Method • Deep Summer Ploughing
	Pod bug	endosulfan chlorpyrifos methyl oxydemeton imidacloprid		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem oil 3% spray

	<u>Pod fly</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem oil 3% spray
	Defoliators	endosulfan acephate		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem oil 3% spray
Bengal gram	Pod borer	azadiractin endosulfan	<i>Helicoverpa armigera</i> NPV <i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Deep Summer Ploughing
Greengram, Blackgram	Pod borer	monocrotophos triazophos endosulfan	<i>Helicoverpa armigera</i> NPV <i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Deep Summer Ploughing
Groundnut	Leafminer	monocrotophos endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Pheromone Traps
	Defoliator (<i>Spodoptera litura</i>)	endosulfan	<i>Spodoptera litura</i> NPV Pheromone traps	<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Pheromone Traps • Deep Summer Ploughing • Poison baits
Mustard	<u>Leaf and pod caterpillar</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray
	<u>sawfly</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Collection of large caterpillars
	Leaf webber	ethofenprox endosulfan	<i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Collection of leaf webs and destruction
Sesamum	<u>Antigastra sp/ Pod capsule borer</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray
	<u>Spingid caterpillar</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray

Sunflower	<i>Helicoverpa</i> (head borer)	endosulfan	<i>Helicoverpa armigera</i> NPV Pheromone traps	<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Pheromone Traps • Deep Summer Ploughing • Poison baits
	Defoliators	endosulfan azadirachtin		<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Pheromone Traps • Deep Summer Ploughing • Poison baits
	Cutworm	dichlorvos endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Erecting bird perches • Pheromone Traps • Deep Summer Ploughing • Poison baits
	<u>Castor semilooper</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray
Niger	Lucern caterpillar defoliator	endosulfan monocrotophos		<ul style="list-style-type: none"> • NSKE – 5% spray
Linseed	Lucern caterpillar	chlorpyrifos endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray
	Defoliator	endosulfan carbaryl		<ul style="list-style-type: none"> • NSKE – 5% spray
Safflower	Bihar hairy caterpillar	endosulfan methyl oxydemeton dimethoate		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray

Soyabean	Leaf roller Leaf miner	triazophos phosalone endosulfan		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray
	Stemfly defoliator	monocrotophos phosalone endosulfan		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray
Maize	Stalk borer	endosulfan carbofuran		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing • Chilli-garlic Solution spray
	Corn earworm/defoliator	endosulfan carbaryl		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing • Chilli-garlic Solution spray • Pheromone Traps
Ragi	<u>Pink borer</u>	endosulfan		<ul style="list-style-type: none"> • Deep Summer Ploughing

				<ul style="list-style-type: none"> • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing • Spraying 3% neem oil
	<u>Millets shoot fly</u>	endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray
Sorghum	Defoliators	quinalphos fenvalerate endosulfan chlorpyrifos		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing • Spraying 3% neem oil
	Gram pod borer	endosulfan	<i>Helicoverpa armigera</i> NPV <i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing • Spraying 3% neem oil • Pheromone Trap
Cotton	Spotted bollworm; pink bollworm; <i>Helicoverpa</i> ; Red cotton bug; Dusky cotton bug	endosulfan triazophos spinosad indoxacarb	Pheromone traps <i>Trichogramma chilonis</i> <i>Bacillus thuringiensis</i> <i>Helicoverpa armigera</i> NPV	<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing • Spraying 3% neem oil • Cow dung - Urine Solution • 5% Vitex Solution

	Leaf roller	endosulfan chlorpyrifos		<ul style="list-style-type: none"> • NSKE – 5% spray
Jute	Semilooper	endosulfan quinalphos phosalone		<ul style="list-style-type: none"> • NSKE – 5% spray
	Bihar hairy caterpillar; Indigo caterpillar	endosulfan monocrotophos		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray
	Mites	dicofol endosulfan propargite		<ul style="list-style-type: none"> • Spraying 2% wettable sulphur
Mesta	Jassid	phosalone endosulfan dimethoate		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem Oil 3% Spray
Sugarcane	Top shoot borer; Internode borer	endosulfan carbaryl quinalphos carbofuran	<i>Trichogramma japonicum</i> <i>Trichogramma chilonis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Application of 200 Kg Neem cake during ploughing
Bhindi	Leaf roller	endosulfan carbaryl		<ul style="list-style-type: none"> • NSKE – 5% spray
Cucurbits	Red pumpkin	carbaryl endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem Oil 3% Spray
Chilli	Fruit borer	endosulfan triazophos dicofol	Spodoptera NPV <i>Trichogramma chilonis</i>	<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray • Pheromone Traps
Tomato	Fruit borer (<i>Helicoverpa</i>	endosulfan	<i>Helicoverpa armigera</i>	<ul style="list-style-type: none"> • Deep Summer

	<i>armigera</i>)	triazophos	NPV <i>Trichogramma chilonis</i> <i>Bacillus thuringiensis</i> <i>Pheromone traps</i>	<ul style="list-style-type: none"> Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray • Pheromone Traps
Cabbage/Cauliflower	Cabbage borer	endosulfan carbaryl malathion	<i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Chilli-garlic Solution spray
	Tobacco caterpillar	endosulfan carbaryl		<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches • Chilli-garlic Solution spray • Pheromone Traps
	Leaf webber (<i>Crociodoloma binotalis</i>)	acephate endosulfan malathion	<i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Chilli-garlic Solution spray
	Cabbage butterfly	endosulfan carbaryl malathion	<i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • NSKE – 5% spray • Chilli-garlic Solution spray
Potato	Cutworm	chlorpyriphos endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Application of 200 Kg Neem cake during Ploughing • Poison baits
Pea	Pod borer	endosulfan triazophos carbaryl	<i>Helicoverpa armigera</i> NPV <i>Bacillus thuringiensis</i>	<ul style="list-style-type: none"> • Deep Summer Ploughing • NSKE – 5% spray • Erecting bird perches

				<ul style="list-style-type: none"> • Chilli-garlic Solution spray • Pheromone Traps
Mango	Mango hopper	endosulfan carbaryl		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem Oil 3% spray
	Mealy bug	endosulfan monocrotophos chlorpyrifos malathion		<ul style="list-style-type: none"> • Field sanitation • NSKE – 5% spray • Neem Oil 3% spray
Citrus	Lemon butterfly	endosulfan (carbaryl/malathion in fruiting stage)		<ul style="list-style-type: none"> • Field sanitation • NSKE – 5% spray • Neem Oil 3% spray • Cow dung urine solution spray
Guava	Bark eating caterpillar	monocrotophos endosulfan		<ul style="list-style-type: none"> • Removal of insect galleries • Field Sanitation • Painting the stem with neem oil
	Fruit borer	carbaryl endosulfan		<ul style="list-style-type: none"> • NSKE – 5% spray • Neem Oil 3% spray