




# Cotton bollworm on tomato

*Helicoverpa armigera*

	Prevention	Monitoring	Direct Control	Direct Control	Restrictions
					
<p>Adult <i>H. armigera</i> (ICRISAT)</p>	<ul style="list-style-type: none"> <li>If bollworm population is low, plant before and/or during crop growth one or two rows of maize around the crop field as a trap for pest when at larval stage</li> </ul>	<ul style="list-style-type: none"> <li>Monitor the pest + symptoms 1-2 times/week from emergence-harvest</li> </ul>	<ul style="list-style-type: none"> <li>For small plots, hand pick + destroy the eggs/young caterpillars from flower bud tips and fruit bases</li> </ul>	<ul style="list-style-type: none"> <li>Apply when eggs hatch so larvae are killed. Only the &lt;1 cm long larvae outside the fruits can be controlled. Larvae inside fruit are protected.</li> </ul>	<ul style="list-style-type: none"> <li>Many WHO class II pesticides registered against pest, less toxic alternatives can control the pest.</li> </ul>
	<ul style="list-style-type: none"> <li>Plant at correct spacing of tomato crop</li> <li>Provide habitats for natural enemies (e.g. flowering plants) such as: <i>Trichogramma</i> spp. (egg parasitoids), wasps, flies (larva parasitoids), ants, lacewings, ladybugs + birds</li> </ul>	<ul style="list-style-type: none"> <li>Adults: Moth wingspan 35-40 mm wide. Forewings are yellow/brown, hindwings are white. Use pheromone (4-8/acre)/light (2/acre) traps to detect adults</li> <li>Look for small larvae on leaves below highest open flowers + fruit bases. Consider taking actions when detected</li> <li>Look for small, dark entry holes at base of the tomato, near stem + under base leaves of flower. Open fruit to confirm</li> </ul>	<ul style="list-style-type: none"> <li>Plough the soil to expose the pupae to direct sunlight + natural enemies</li> <li>Remove/destroy crop residues immediately after harvest</li> <li>Release natural enemies, e.g. egg parasitoids (2-3 cards per acre of <i>Trichogramma</i> spp., <i>Telenomus</i> spp.), larva parasitoid (<i>Cotesia</i> spp., <i>Bracon</i> spp.)</li> </ul>	<ul style="list-style-type: none"> <li>Azadirachtin 1% based products (neem)</li> </ul>	<ul style="list-style-type: none"> <li>WHO class U. Hazard under normal use. Larvae moulting disruptor; inhibits egg laying, antifeedant effects; PHI 3 d; REI 1 d. 1 spray when flowering. Toxic to bees/aquatic organisms.</li> </ul>
<p>Bollworm and damage to tomato (PM Kodwaran, Kenya)</p>	<ul style="list-style-type: none"> <li>Rotating with non-host crops to prevent the population from increasing, must use with other prevention/control practices as bollworm can attack + harbour on &lt;200 species of plants</li> </ul>	<ul style="list-style-type: none"> <li>Look for small, dark entry holes at base of the tomato, near stem + under base leaves of flower. Open fruit to confirm</li> </ul>	<ul style="list-style-type: none"> <li>Apply neem products on small larvae (e.g. neem oil 40ml/20L water) 3x max. Start 15 days after transplanting reaching coverage of fruits + plants.</li> </ul>	<ul style="list-style-type: none"> <li><i>Bacillus thuringiensis</i> var kurstaki Strain ABTS-351 against small larvae</li> </ul>	<ul style="list-style-type: none"> <li>WHO class III (slightly hazardous); biological multisite stomach poison for insects, must be eaten by insect p.h.i. 1d, r.e.i. 1 d, min retreatment 7 d, 2 sprays per season</li> </ul>
	<ul style="list-style-type: none"> <li>Avoid crop rotation with other plant hosts incl eggplants, okra, soybeans, cotton, maize, beans, chickpea, flax, wheat, barley, oats + sorghum</li> </ul>	<ul style="list-style-type: none"> <li>Large caterpillars: 35-40 mm long. Vary from yellow/green/brown/red with grey-black stripes along the body when fully grown.</li> <li>When large larvae are inside fruits, sprays do not help as caterpillars are protected</li> </ul>	<ul style="list-style-type: none"> <li>Spray entomopathogenic fungi (<i>Metarhizium anisopliae</i> + <i>Beauveria bassiana</i>). See label for dosage.</li> <li>Spray with a solution of <i>Helicoverpa armigera</i> SNPV 8% w/w 2x99 polyhedra per ml</li> </ul>	<ul style="list-style-type: none"> <li>Lambda-cyhalothrin 50g/L (e.g. PENTAGON 5% EC)</li> </ul>	<ul style="list-style-type: none"> <li>WHO class II. Moderately hazardous. MRL: 0.1mg/Kg, PHI: 3 days. REI- when spray dries</li> </ul>
<p>Larva in tomato fruit (A.B.S. King)</p>	<ul style="list-style-type: none"> <li>Remove + destroy crop residues (feed to livestock)</li> <li>Not recommended to apply insecticides as a preventative measure, pest is often resistant</li> </ul>	<ul style="list-style-type: none"> <li>Note the no. of eggs, small/large caterpillars, % defoliation of plant on 30 random plants. If a large number of small larvae are detected apply control measures</li> <li>Necessary to open the fruits + flowers often as larvae are hidden within</li> </ul>	<ul style="list-style-type: none"> <li>Place traps (5/ha) with synthetic sex pheromone <i>Helicoverpa armigera</i> to trap adults</li> <li>Remove any fallen fruit/infested plant parts (feed to livestock)</li> </ul>	<ul style="list-style-type: none"> <li>Spinosad 480g/L (e.g. TRACER 480 SC Soluble Concentrate): foliar application</li> </ul>	<ul style="list-style-type: none"> <li>WHO class III (slightly hazardous). PHI 3 days. REI when spray deposit has dried. Toxic to bees if exposed directly. Apply at night if crop is flowering. Maximum 6 applications per season.</li> </ul>

## Kenya

CREATED/UPDATED: July 2017

AUTHOR(S): CABI

EDITED BY: Plantwise