

Bollworm in cotton

Helicoverpa armigera



Bollworm larva on cotton flower bud (photo A.B.S. King, CPC, CABI)



Small green (<1.5 cm), greyish-creamy larvae (photo USDA-ARS, CPC, CABI)

Prevention	Monitoring	Direct Control	Direct Control	Restrictions
<ul style="list-style-type: none"> • Destroy crop residues at the end of the season (end August, early September) because bollworm larvae and pupae are inside. Also ploughing helps. • Rotate cotton with crops bollworms do not like, e.g. with ground nuts. • Trap bollworms by planting crops around cotton field that bollworms like, such as local Okra (Delele, Mulembwe) (in cases Okra is less valuable than cotton). • Avoid indiscriminate spraying of insecticides that would kill beneficial parasitic wasps 	<ul style="list-style-type: none"> • Avoid indiscriminate spraying of insecticides that would kill beneficial parasitic wasps • Search for small green (<1.5 cm), greyish-creamy larvae in leaf sheaths and growing tips. • At 8 to 12 young larvae / 100 plants / field, consider action. • Older larvae are bigger (up to 2.5 cm) and often live inside buds, flowers and fruits. Larvae entry holes can be seen on flowers, buds and fruits. Direct control is too late at this stage. 	<ul style="list-style-type: none"> • Spray botanicals such as neem seed extracts (3% in water) over whole plants. This is done every two weeks against young larvae. • Chop hot pepper and chilli fruits, put into a container for few days at 100 g per litre. Add a bit of soap, and spray against young larvae. • Ask Cotton Development Trust to release the natural enemy <i>Trichogramma</i> wasps against the bollworm eggs. 	<ul style="list-style-type: none"> • Apply before flower set, when eggs hatch so that newly hatched larvae are killed. Only the young small < 1 cm long larvae which are still outside plants can be controlled. First use the least toxic products. 	<ul style="list-style-type: none"> • When using a pesticide (even a botanical), always wear protective clothing. Follow the instructions on the product label, such as dosage, timing of application, pre-harvest interval, max number of sprays, restricted re-entry interval. Do not empty into drains. • WHO class II pesticides might be not allowed in local IPM schemes. • Always consult recent list of registered pesticides (ZEMA). • Abamectin -based products. Chloride channel activator pesticide. • Azadirachtin - based products. Larvae moulting disruptor; inhibits egg laying, has antifeedant effects. • <i>Tephrosia</i> leaf extracts 2-4% (200 grams/Kg) can also be sprayed. • Lambda-cyhalothrin or deltamethrin or cypermethrin - based products. Pyrethroid group of pesticide. • Carbaryl –based product. Carbamate group • Acephate –based product. Organophosphate pesticide group.
			<ul style="list-style-type: none"> • Not WHO classified; considered potentially slightly hazardous, but in many formulations of low acute hazard in normal use., r.e.i. 1 d. 	
			<ul style="list-style-type: none"> • Not WHO classified, but considered unlikely to present acute hazard in normal use; r.e.i. 1 d. Little bee toxic. 	
			<ul style="list-style-type: none"> • Not WHO classified, but considered unlikely to present acute hazard in normal use. Max 3 sprays per season. Fish toxic. 	
			<ul style="list-style-type: none"> • WHO class II (moderately hazardous); r.e.i. 1 to 3 d, max 2 sprays per season. Do not spray near water sources. 	
			<ul style="list-style-type: none"> • WHO class II (moderately hazardous); r.e.i. 4d. Spay max twice with 14 day interval. 	
			<ul style="list-style-type: none"> • WHO class II (moderately hazardous); r.e.i. 3d, max 2 spray per season. 	



Zambia

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