

Fall armyworm on maize

Spodoptera frugiperda



Fig 1: Damage to maize leaf (Photo by S. Toepfer)



Fig 2: ^ sign on front of head. Fine hairs. (Photo by S. Toepfer)



Fig 3: 4 squared dots at end of body. Caterpillars ¼ to 4 cm long. (Photo by S. Toepfer)

Prevention	Monitoring	Direct Control	Direct Control	Restrictions
<ul style="list-style-type: none"> Sow maize according to agriculture department recommendations Do not plant near already infested fields Use recommended maize varieties and certified/ good quality seed Remove and destroy crop residues. Deep plough soil to expose pupae to birds and other predators Use dose of fertilizer based on soil analysis Weed regularly to minimize alternative hosts Avoid moving infested plants from the field Do not use broad spectrum chemicals at early crop stage. 	<ul style="list-style-type: none"> Install pheromone traps for monitoring (1 trap per 3 acre) Moths are 2-3 cm with mottled greyish-brown forewings, whitish hindwings with dark edge Start scouting 5 days after germination. Continue weekly monitoring until tasselling. Monitor the field weekly, check at least 3 sets of 10 plants per acre Early symptoms: Cream/grey egg masses covered in silk on the underside or top of the leaves and stem If you see shot holes and window panes on leaves, search for caterpillars in whorl. Late symptoms: Chewed leaves with big ragged elongated holes. Search for sawdust like frass in whorls. Older caterpillars are 1-4 cm grey to brownish with whitish and dark stripes along the back and sides. Dark head with a pale inverted Y. Body has 4 dark spots on back in a square. If damage appears, destroy by hand. If damage exceeds 5% or moths are found, consider control. 	<ul style="list-style-type: none"> Destroy egg masses and caterpillars by crushing with hand. Apply neem-based bio-products Spray virus-based biopesticide (<i>Spodoptera frugiperda</i> NPV) Spray a mixture of water and sugar to attract ants to eat young caterpillars. Use entomopathogenic fungi Avoid spray at silk and tassel stage in maize crop 	<ul style="list-style-type: none"> Flat sprays over a maize field are ineffective as caterpillars hide. Spray into the whorl and furrow. If plants are re-infested, repeat spray every 2 weeks. Use insecticides with different mode of actions within a season to avoid resistance. Prefer biopesticides and pesticides of WHO toxicity class U over more hazardous ones. When using a pesticide or botanical, always wear personal protective equipment (PPE). Follow the instructions on the label, e.g. dosage, pre-harvest interval (PHI) max number of sprays, restricted re-entry interval (REI) Apply chemical in calm weather when rain is not expected Neem (azadirachtin) products. Multi-site action pesticide. Spinetoram 120SC @ 100ml per acre. Contact and ingestion pesticide Emamectin benzoate 19 EC @ 200ml per acre. Chlorantraniliprole. (CTPR) 20% SC @ 50 ml/acre. Anthranilic diamide group. Ingestions pesticide. Flubendiamide 48% SC @ 25ml/acre. Diamides group. Bifenthrin 56 EC @ 300ml/acre. Contact pesticide; IRAC 3A 	<ul style="list-style-type: none"> Not classified by WHO, but considered unlikely acute hazardous. REI ½ day. PHI 1 day. Max. 2 sprays / season. WHO class III (slightly hazardous). REI ½ d, PHI 3 d. Max 2 sprays/ season. Affects aquatics and pollinators. Not classified by WHO, but considered slightly acutely hazardous. REI 1 d, PHI 7 d. Max. 2 sprays / season. WHO class U (unlikely acute hazardous). REI ½ d, PHI 3 d. Max. 2 sprays/ season. WHO class U. REI ½ d, PHI 3 d. Max. 2 sprays/ season. WHO class II (moderately hazardous). REI 1 d; PHI 3 d. Max. 1 spray/ season. Toxic to pollinators, beneficials, aquatics.



Pakistan

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