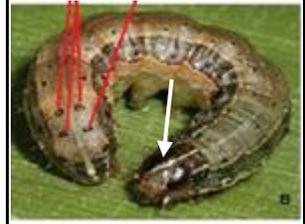


# Fall armyworm in maize

► *Spodoptera frugiperda*

	Prevention	Monitoring	Direct Control	Direct Control	Restrictions
 <p>Fall armyworm eggs (100-200) (Photo by Julie; Russell ipm-agriculture)</p>	<ul style="list-style-type: none"> <li>◆ Keep field free from weeds as these serve as alternate hosts</li> <li>◆ Plant early, at start of rains and avoid late and off-season crops as these promote further pest build up</li> </ul>	<ul style="list-style-type: none"> <li>◆ Start monitoring maize 2 weeks after germination till harvest, twice / week</li> <li>◆ Check for creamy egg masses(100-200) on top or under leaves</li> <li>◆ Search for caterpillars in the middle of the plant, in leaf funnel. Look for small (&lt; ½ cm) dark green or big brown caterpillars (1 to 3 cm) with longitudinal stripes.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Hand-pick caterpillars and crush or place them in hot water</li> </ul>	<ul style="list-style-type: none"> <li>◆ Spray on small caterpillars (&lt; 2cm)</li> <li>◆ Alternate different insecticide to avoid resistance</li> </ul>	
 <p>About 3 cm caterpillar with 4 dots at end, ^ sign on head Photo Marlin Rice</p>	<ul style="list-style-type: none"> <li>◆ Weed fields using a hoe or a cultivator to expose pupae to predators and sun</li> </ul>	<ul style="list-style-type: none"> <li>◆ Look for a distinct yellowish ^ sign on the forehead of a mature caterpillars</li> <li>◆ Look for windowing on leaves = window-pane' damage as well as large ragged and elongated holes</li> <li>◆ If 5 out of 20 not fully grown plants have small (&lt; 2cm) armyworm caterpillars or windowing damage consider action. If old larger &gt; 3cm caterpillars are inside funnels and cobs, action is too late.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Put half a handful of sand or saw dust in the leaf whorls to kill the caterpillars</li> <li>◆ Mix 100g ground chili + 2kg ash, and put a spoonful into leaf whorls when plants are at knee-high</li> </ul>	<ul style="list-style-type: none"> <li>◆ Spray with Lufenuron+ Emamectin Benzoate (such as Match fit) and follow label instructions</li> <li>◆ Lufenuron is an insect growth inhibitor thus only works on caterpillars</li> </ul>	<ul style="list-style-type: none"> <li>◆ Lufenuron WHO toxicity class III, slightly acute hazardous</li> <li>◆ Emamectin Benzoate WHOII moderately hazardous</li> <li>◆ Restricted re-entry interval R.e.i.= 2 d; pre-harvest interval, P.H.I = 14 d; Harmful to bees and fish</li> </ul>
 <p>Male moth, 3 to 4 cm Photo: Martin C.Rice</p>	<ul style="list-style-type: none"> <li>◆ Avoid transporting maize cobs from infested to un-infested areas.</li> <li>◆ Apply recommended amounts of fertilizers 200kg/ha of D compound</li> </ul>	<ul style="list-style-type: none"> <li>◆ Look for a lot of brown excrements on the outside of leaf whorls (other stalkborers also do this). Thus search for the caterpillars to confirm armyworm.</li> <li>◆ Use pheromone traps or universal moth traps to catch moths, 1 trap/acre.</li> <li>◆ If more than 5 moths are captured in a universal trap per week, or 3 to 5 in a pheromone trap per day, action is considered</li> </ul>	<ul style="list-style-type: none"> <li>◆ Feed heavily infested abandoned maize to livestock so that armyworm does not multiply</li> <li>◆ Apply 1 spoonful grind neem into each funnel</li> </ul>	<ul style="list-style-type: none"> <li>◆ Lambda-cyhalothrin – products (pyrethroid group)</li> <li>◆ Usually at 20ml/ 16litres of water (but check product label)</li> <li>◆ Spray chlorpyrifos Organophosphate (Dursban 48% EC, Sinoifos)</li> <li>◆ Usually at 20ml /16litres of water (but check label)</li> </ul>	<ul style="list-style-type: none"> <li>◆ WHO II moderately acute hazardous</li> <li>◆ Max 2 sprays / season; p.hi. 14 d; r.e.i. ½ d; do not spray near water (toxic to aquatic animals)</li> <li>◆ WHO II moderately hazardous</li> <li>◆ Max 1 spray / season; p.hi. 35 d; r.e.i. ½ d; Toxic to bees and aquatic animals</li> </ul>
 <p>Damage Picture by USDA.</p>				<ul style="list-style-type: none"> <li>◆ Deltamethrin based insecticides. Follow label. Pyrethroid group.</li> </ul>	<ul style="list-style-type: none"> <li>◆ WHO class II moderately acute hazardous, p.h.i= 3 days, r.e.i= 1/2d Harmful to to bees and fish</li> </ul>
<ul style="list-style-type: none"> <li>◆ Pre-harvest intervals of pesticides in a certain crop most also be followed for the intercrop, and are sometimes even longer.</li> <li>◆ When using a pesticide (even a botanical home-brew), 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.</li> <li>◆ WHO class II pesticides might not be allowed in local IPM schemes.</li> <li>◆ Always consult recent list of registered pesticides (ZEMA).</li> </ul>					

## Zambia

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