DESCRIPTION: The eggs are cylindrical, greenish to white in color, covered with whitish scales with a cottony appearance and contain from 50 to 150 (Figure 1). The younger larvae are pale green or yellow in color while the older larvae are darker when viewed from above and possess a dark lateral stripe (Figure 2). The pupae are light to dark brown in colour and are found in the soil (Figure 3). The forewings are mottled gray and brown, and normally with an irregular banding pattern and a light colored bean-shaped spot (Figure 4).

BIOLOGY & LIFECYCLE: Mating occurs soon after emergence and egg laying commences within 2-3 days. Eggs hatch in 2-3 days, larva has 5 instars which take 8 - 10 days to reach 3rd instar). Pupation occurs in the soil – duration 6-7 days. It takes 24 days to complete the life cycle and after 10 days the adult moth dies.

DAMAGE: Larvae feed on both foliage and fruit. Young larvae feed gregariously and skeletonize foliage. As they mature the larvae become solitary and eats large irregular holes in foliage and produce frass (Figures 5 & 6).
HOSTS: The beet armyworm is an important pest on vegetable, field, and flower crops. These crops include broccoli, cabbage, cauliflower, celery, chickpea, corn, cowpea, lettuce, onion, escallion, pea, pepper, potato, sweet potato, tomato, and turnip. Field crops damaged include corn, cotton, peanut, sorghum, soybean, sugar beet, tobacco and callaloo (Figure 7 below: *Amaranthus* sp. with BAW eggs). Weeds serve as alternate hosts which are suitable for larval development. These weeds include lambsquarters, *Chenopodium album*; mullein, *Verbascum* sp.; pigweed, *Amaranthus* spp.; purslane, *Portulaca* spp.; Russian thistle, *Salsola kali*; parthenium, *Parthenium* sp.; and tidestromia, *Tidestromia* sp.

INTEGRATED PEST MANAGEMENT

**Monitoring:** Damage can be prevented or minimized only by regular monitoring for early pest detection and the timing and application of appropriate control measures. Pheromones in bucket traps can be used for the early detection of adult beet armyworm. Visual sampling for damage and larvae, combined with an action threshold of 0.3 larvae per plant or 5 in 25 plants. Regular monitoring of crops, twice per week, is recommended because adults frequently invade from surrounding crops or weeds. It is critical to detect early infestation particularly egg and young larvae (1\textsuperscript{st} to 2\textsuperscript{nd} instar) before an outbreak occurs to minimize damage and control strategies are more effective. Older larvae (3\textsuperscript{rd} to 5\textsuperscript{th} instar) are much more difficult to manage with insecticides.

**Biological Control:** Numerous natural enemies such as wasps, plant bugs, beetles, spiders and birds feed on the beet armyworm larvae and adult. Parasitoids and predators exist that attack all stages of the pest but may have been reduced due to the use of broad spectrum insecticides. The nuclear polyhedrosis virus is highly specific to beet armyworm which may naturally control the pest in the field. If any infected armyworm larvae are detected they can be crushed in some water and sprayed unto other infested plants.

**Cultural:** Burn all infested material that have been rouged from the field and plough severely damaged fields to prevent infestation of neighbouring farms and reduce pest population in the field.

**Chemical control:** Target very young larvae by alternating treatments containing *Bacillus thuringiensis* (e.g. Xentari®, Dipel® or Agree®), Spinosad (e.g.Success® or Entrust®) or abamectin e.g. (Cure®). Target older instars by alternating treatments containing fenpropathrin (e.g Danitol ®), methomyl (e.g Lannate®) and abamectin (e.g. Cure®).

**Weed Management:** Weeds surrounding the field may harbour the pest and serve as a reservoir for reinvestment hence proper weed control must be practiced.

CHEMICAL APPLICATION

- Ensure applicators wear protective gear
- The lowest effective amount of pesticide is applied
- Calibration for spray application is critical to ensure even distribution of the treatments
- Apply during the coolest, least windy time of the day (early morning or late evening)
- When the crop canopy is dense use high water volumes and label rates.
- Use a sticker along with the treatments especially during the rainy season.

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