



## ARC-PHP LOCUST FACT-SHEET SERIES

### AFRICAN MIGRATORY LOCUST

*Locusta migratoria migratorioides* (Reiche & Fairmaire)

Order Orthoptera

Family Acrididae

#### **Other common names**

Tropical migratory locust; tropiese treksprinkaan (A); migratorio african gafanhotos (P)

#### **Origin and distribution**

There are nine subspecies of the Migratory Locust, *Locusta migratoria*, found in different parts of the 'old' world. The African subspecies, *Locusta migratoria migratorioides*, occurs in grassland areas throughout Africa south of the Sahara. In southern Africa, the African migratory locust (AML) is commonly found in moist grasslands and adjacent areas of cereal cultivation. The AML is a regular pest of maize crops in southern Zambia, as well as in south-eastern Zimbabwe and southern Angola. It is also an occasional pest in grasslands and adjacent subsistence maize and sorghum crops in southern Malawi, northern Namibia (in the eastern Caprivi Strip) and in Botswana in the Chobe, Okavango and Lake Xau areas. In South Africa, it is found in sub-tropical grassland areas and has been reported as an occasional pest in maize, wheat and sorghum crop areas of the north-west Free State Province and adjacent areas of the North West Province.

#### **Identification**

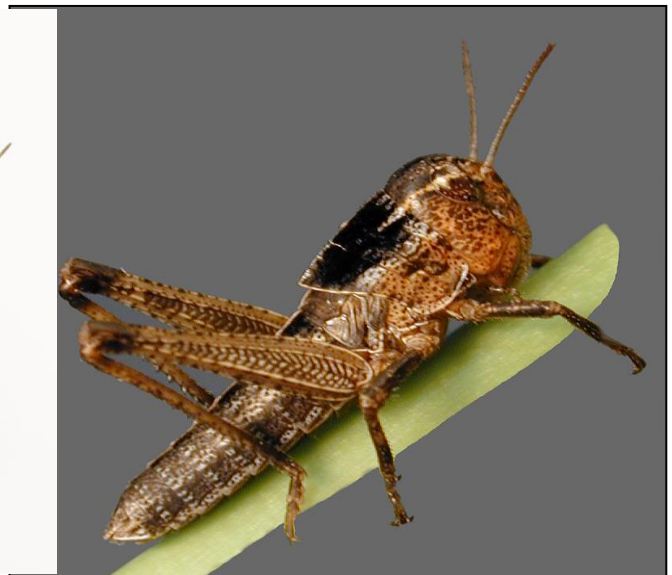
**Egg:** J-shaped, 5-7 mm in length, and laid in batches (egg pods) which are 5-10cm long. A distinctive characteristic of the AML egg pod is that the eggs are arranged bilaterally symmetrically in four parallel rows, with all micropylar ends facing ventrally, and with the top part of the egg pod covered with a layer of froth (plug) which hardens.

**Nymph (hopper stage):** solitary phase hoppers are bright green, with a distinctive beige stripe running from the eye to the raised pronotum. As hoppers become more crowded and gregarious they become more brown and orange in colour in the IV<sup>th</sup> and V<sup>th</sup> instar. True gregarious hoppers are red/orange, with a black top to the pronotum, and the characteristic beige stripe through the eye and into the pronotum.



Solitary phase AML hopper (5<sup>th</sup> instar)

©National Geographic



Gregarious phase AML hopper (4<sup>th</sup> instar)

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**Adult:** Body length ranges from 36-54 mm (female) and 35-45 mm (males). The most important distinguishing features are the yellowish hind wings seen in flight and the 'hairy' ventral surface of the thorax. Solitary phase adults are green to light brown in colour, with mottled brown areas on forewings, and a raised pronotum. Females are a lot larger than males. In contrast, the true gregarious swarm phase adults are a lot smaller than the solitary phase and the swarming males and females are of more equal size. Usually yellow-brown in colour, with dark spots on fore wing, and a flat pronotum. Throat spur is absent.



Solitary phase AML adult female. ©ARC

Swarm phase AML adult. ©IRLCO-CSA

### **Host plants**

Predominantly graminivorous (grass feeders). Eat a wide range of wild grasses.

### **Damage**

The AML is considered as being polyphagous, but with preference for wild and cultivated grasses, as well as cereal crop plants. AML has been recorded causing considerable damage to field crops, such as planted pastures, maize, rice, sugarcane, sorghum and wheat. Swarming populations have reportedly damaged other crops in the past, such as bananas, cotton, barley, millet, groundnuts, and oats.

### **Pest status**

The classic AML plagues originate from the Niger River delta area in West Africa, which then invaded most of Africa south of the Sahara. The last recorded invasion into South Africa was in 1934, with swarms flying over Malawi and Zimbabwe into the Republic. Although high-density populations requiring chemical control occur regularly in various southern African countries (Angola, Botswana, Malawi, Namibia, Zambia, Zimbabwe), these local outbreaks peter out and have never reached a plague status in southern Africa. In South Africa, the AML has been reported as an occasional pest in maize, wheat and sorghum crop areas of Free State and North West Provinces, the Springbok

flats in Limpopo Province and in some wheat-growing areas of the Western Cape Province (eg. Porterville). The last major control campaign against the AML in South Africa was conducted in the Free State and North West Provinces in 1980, with smaller outbreaks regularly and requiring control throughout the 1980s and into the 1990s. The outbreaks in cereal crop areas in South Africa are 'man-made' as crop cultivation, especially the growing of wheat during winter, enhances overwintering survival and leads to development of outbreaks in the summer maize crop.



Migrating AML swarm in the North West Province of South Africa in May 1980 ©ARC

### **Life history**

There are three life forms, namely eggs, nymphs (hoppers), and flyers (adults), with the hopper passing through five instars. Under cereal cropland conditions in South Africa, the AML is multivoltine with usually 3 generations per year (with part of 4th generation sometimes recorded). The female lays an average of 3.7 egg pods (2-6 pods) in moist soil at a pod interval of 1-2 pods/week. Adults that survive the winter lay eggs in winter wheat crops in September-October to give a first hopper generation before the end of December. Adults mature and oviposit in young maize crops in January-February producing scattered hoppers, with an overlapping third generation with more gregarious

populations developing in April-May. Evidence suggests that only 2 generations are possible in natural grassland areas. Mean clutch size in South African crops is 75 eggs/pod (range 23-130 eggs/pod), with seasonal means of 85 eggs/pod in summer maize and 66 eggs/pod in spring wheat. Mean clutch size in gregarious swarming populations is reported at 39 eggs/pod. Egg incubation periods range from 12-20 days (summer conditions) to 25-60 days during the cooler autumn. Some egg pods laid during May in the Free State overwintered in a cold dormancy in the moist sandy soils for up to 160 days before hatching in Spring. The interval between hopper instars in the field in summer is approximately one week, with the entire hopper life lasting 4-6 weeks. Hopper interval is extended under cooler conditions in autumn, sometimes for months. Adult longevity is 9 weeks during summer and 11 weeks during autumn. Adults may live for up to 5 months during the winter season.

### **Natural enemies**

Loss of eggs from predation and parasitism is unknown in the natural grassland habitat in southern Africa. In the cropland environment the egg mortality was found to be very low, with *Scelio* sp. wasp parasites, facultative beetle larvae predation and bird predation being rarely reported. Predators of hoppers and adults are more common, especially on young instar hoppers, viz. Lycosid hunting spiders, orb web spiders, scorpions, blaesoxipha flies, asilid flies, dragonflies, numerous bird species, lizards, mongooses and field rodents. Epizootic outbreaks of fungal pathogens have been reported in the literature, but such outbreaks have not been observed during the past 40 years at least.

### **Management**

**Monitoring:** ground and aerial surveys can be undertaken to estimate hopper densities and flying adult populations. Foot transect surveys should be undertaken in susceptible crops. Locusts are a notifiable pest in South Africa and landowners are legally responsible to report outbreaks occurring on their land to their local agricultural extension office.

**Control:** control operations of AML in South Africa are the direct responsibility of the South African Department of Agriculture (DoA): Directorate of Disaster Management and Climate Change. DoA locust officers undertake control against hopper bands with broad-spectrum insecticides (synthetic pyrethroids) such as deltamethrin and esfenvalerate, using motorized backpack, or vehicle-mounted sprayers. However, control operations can be very difficult to undertake in the cropland environment. Adult swarms roost in trees and can usually only be controlled with spray aircraft. The International Red Locust Control Organization for Central and Southern Africa (IRLCO-CSA), based in Zambia, is mandated to monitor and control this locust in member countries in southern Africa. However, the DoA is able to control AML outbreaks in South Africa when necessary.

### **Further reading**

- Botha, D.H. 1969. Locusts and their control in South Africa (Part III). African migratory locust. *Farming in South Africa*, 45, 39–40.
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- Steedman, A. (Ed.) 1990. Locust Handbook. (3<sup>rd</sup> edn). Chatham: Natural Resources, vi: 204pp.