

Pigeonpea Seed Damage from Insect Pests on Farmers' Fields in Kenya, Malawi, Tanzania, and Uganda

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Pigeonpea is an important grain legume crop in Southern and Eastern Africa where Kenya, Malawi, Tanzania, and Uganda are the four largest growers in the region (Laxman Singh 1991). The crop is commonly sown as an annual intercropped with cereals, short-duration legumes and other annuals. Pigeonpea seed is an important source of protein for many people; it is important both for home consumption and as an export crop.

Insects are known to cause major losses to the crop both in the field and in storage. Even then, pigeonpea is generally grown with little protection in the field

mainly because of the economic status of the farmers. Insect pest infestations have been reported in several countries in the region (Le Pelley 1959, Materu 1970, Kohler and Rachie 1971, Okeyo-Owuor 1978, Khamala et al. 1978, Sithanantham and Reddy 1990, Lateef and Reed 1990) but little or no information is available on crop damage levels. The insect pests reported as most important in the region are the pod boring lepidoptera (the most important of which are *Helicoverpa armigera*, and *Maruca testulalis*), pod-sucking bugs (dominated by *Clavigralla* spp) and the podfly (*Melanagromyza chalcosoma*). Lateef (1991) reviewed earlier reports of insect damage to pigeonpea in Africa. In the Central Province of Kenya, 30–35% pod damage because of pod borers, and about 11% pod damage because of podfly was reported. In the Coast Province he reported that *M. testulalis* caused more than 30% pod damage. In Tanzania, he reported that pod-sucking bugs are more important than other pests.

To more effectively prioritize pigeonpea pest management research activities in the region, a series of surveys on farmers' fields were conducted in the major pigeonpea-growing regions of Kenya, Malawi, Tanzania, and Uganda between Apr and Oct 1995. The surveys were timed to coincide with similar growth stages in the four countries. The main objective was to determine the key insect pests and their damage levels on pigeonpea seeds in the major growing areas.

Table 1. Percentage seed damage because of different pigeonpea insect pest groups in farmers' fields in Kenya, Malawi, Tanzania, and Uganda, 1995.

Country and survey period	Mean seed damage (%)				Total damage
	Pod borers	Pod-sucking bugs	Podfly	Bruchids	
Kenya					
Jul/	5.5(1.9–9.0) ¹	4.4 (0–10.8)	2.8(0–11.7)	0	12.7(5.8–17.9)
Aug	7.8(2.2–14.3)	7.8(0.5–42.1)	11.8(0–45.9)	0	27.3(7.2–63.0)
Malawi					
Jun	6.0(1.4–14.1)	9.5(3.0–36.4)	0.44 (0–3.9)	0	16.0(7.2–44.3)
Tanzania					
Aug/					
Sep	7.2(2.3–16.0)	5.0(1.2–14.3)	0.3 (0–4.4)	0.4(0–4.6)	12.8(3.7–26.1)
Uganda					
Oct	7.4(4.1–14.2)	3.6(0.8–11.1)	3.2(0.4–12.8)	0	14.2(8.3–21.3)

1. Figures in parentheses indicate range.

The survey technique involved selection of fields at random depending on visibility and accessibility to the road. At each site, 50–150 pigeonpea pod samples were collected from individual fields. Sample sizes varied because of farm size, plant population, and farmer cooperation. The collected pods were later opened, and seed damage because of the various pests calculated.

The complex of insect pests on pigeonpea in Kenya, Malawi, Tanzania, and Uganda appeared to be similar for the major pest groups (pod borers, pod-sucking bugs, and podflies). Among the borers, however, *M. testulalis* was not recorded in Malawi, and yet it was one of the major borers on flower buds, flowers and pods in the coastal provinces of Kenya and Tanzania, and in northern Uganda. The incidence, distribution, and damage levels of specific pests varied among countries. In Kenya there were also variations because of crop maturity (Table 1). Early-season damage in Jul was mainly because of pod borers and pod-sucking bugs, and the total seed damage was 13%. Most seed damage during mid-season in Aug was because of podflies and to a lesser extent to pod borers and pod-sucking bugs. Total seed damage in Aug was 27%. Seed damage because of insect pests in the other countries was 16% in Malawi, 14% in Uganda, and 13% in Tanzania. The insects which caused the greatest seed damage varied among countries: podfly was more damaging in Kenya, pod-sucking bugs in Malawi, and pod borers in both Tanzania and Uganda. These surveys, which provide a 'snapshot' of insect damage and seed losses, highlight the importance of this constraint to pigeonpea production. More detailed studies in each country are needed to assess yield losses, and pest population dynamics in order to develop effective pest-management strategies. A more comprehensive account of these surveys is currently being prepared for publication.

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Pigeonpea Farmers in Southern and Eastern Africa: Do They Spray Their Crop?

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Pigeonpea is an important crop in several African countries, where it is both a cash crop grown for export and a