Survey of the Groundnut Pod-borers in South India

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Groundnut pods are attacked before harvest by several vertebrate and invertebrate pests. Among invertebrates, several arthropods such as earwigs, termites, wire-worms, false wire-worms, white grubs, red ants, *Spodoptera* etc., feed on developing pods (Wightman and Amin, 1988). Damaged pods have little commercial value because either the kernels are damaged or external damage to the pod wall renders them vulnerable to fungal infection and aflatoxin contamination (McDonald and Harkness, 1967). Importance of soil insects is quite often under-estimated because damage to immature pods can go undetected as they rot and disappear before harvest. Information on pod borers including their occurrence, biology, nature of damage, and economic importance is inadequate. The present survey was undertaken during 1991/92 postrainy season to obtain data on the occurrence and extent of damage by pod borers in Andhra Pradesh, Tamil Nadu, and Karnakata.

Observations on pod borers were taken by uprooting 10 randomly selected plants in each of the 33 farmers' fields, and at two research stations. The soil around the plants was examined for insects. In cases where the crop had been harvested, random pod samples (50 pods in each sample) were taken for pod damage assessment from the produce kept for sun-drying. The causal organisms were identified based on the damage symptoms. Soil types in various fields were also recorded (USDA, 1975).

Pod borer damage was observed in 17 farmers' fields surveyed. Pod borer damage was 1% in eight fields, seven fields had 4-6% pod damage, and two fields had 10% pod damage (Table 1). Earwigs and termites were the most important pod-borers, followed by *Spodoptera*, and wire-worms. Low incidence of pod damage caused by subterranean ants was observed at Peddagottigallu village in Chittoor District, Andhra Pradesh. Groundnut farmers in these areas were in general aware of the occurrence of pod borers but did not use any control measures. An exception was one farmer in Unchouda village of Karnataka, who applied aldicarb (Thimet 10 G) @ 4.5 kg/ha at the time of sowing and achieved good control.

Occurrence of earwigs and their damage was predominant in Vertisols of Tamil Nadu than in other states. Termites were of greater importance in Alfisols of Andhra Pradesh. Low incidence of wire-worms was noticed in Chittoor and Mahboobnagar districts in Andhra Pradesh. *Spodoptera*, which is primarily a defoliator, also attacked pods, particularly in Entisols in coastal areas. Such damage probably occurred when *Spodoptera* took shelter in the soil around pod zone during day time. In general, more pod damage was recorded in groundnut fields in Entisols and Alfisols in Andhra Pradesh and Tamil Nadu than in Vertisols in Karnataka. Since most of the crop was under assured irrigation, it was obvious that soil insects may be different in various soil types. In Vertisols where groundnut was cultivated after paddy, pod borer incidence was very low. In Alfisols at Bodanu in Nellore District and Nallaboyinapalli in Anantapur District in Andhra Pradesh, where limited irrigation was applied, pod borer in-

Table 1. Pod borer incidence in groundnut in farmers' fields during the post-rainy season in South India (April 1992)

Location	Soil type	Pod damage (%)	Remarks
Andhra Pradesh			
Nalgonda			
Inupamula	Alfisols	6	2% Termite, 4% earwig
Ketipalli	Alfisols	2	Earwig
Vaira	Alfisols	Nil	
Khammam			Pinhead size holes casual organisms
Laxmipuram	Alfisols	< 1%	
Krishna			
Mallela	Alfisols	Nil	-
Guntur			
Karlapalem	Entisols	5	2% earwigs and 3% *Spodoptera*
Nellore			
Ulavapadu	Alfisols	< 1x	Termite damage, both pod boring, scarification
Bodanu	Alfisols	10	9% Termites, 1% Wire-worms
Chenugunta	Entisols	< 1%	Casual organism?
Chittoor			
Bandapalli	Alfisols	5	1% Wire-worm, 4% Termite, both pod boring and scarification
Kanigiri	Alfisols	Nil	-
Jakkalvaripalli (Tirupati)	Inceptisols	Nil	-
Peddagottigallu	Alfisols	< 1%	Termite, red ant and Wire-worm noticed
Sanjivapalli	Alfisols	Nil	-
Anantapur			
Kadiri			
Nallaboyinapalli	Alfisols	10	Earwig
Brahmanapalli	Alfisols	Nil	-
Mannila	Alfisols	5	3% Termite and 2% Earwig
Aluru (Adoni)	Alfisols	Nil	-
Kuppugallu (Adoni)	Alfisols	Nil	-
Mahboobnagar		< 1%	Earwig, Wire-worm
Kotagadara	Vertisols		
Rajapur	Alfisols	< 1%	Earwig, Wire-worm

Continued

Table 1. continued

Location	Soil type	Pod damage (%)	Remarks
Tamil Nadu			
Chengalpattu	Entisols	Nil	No pod borers
Saram (Tindivanam)	Vertisols	5	Earwig
Veerareddykuppam (Vriddhachalam)	Alfisols	Nil	Farmers reported that pod borer damage could be seen mostly in Aug-Sept and Feb
Aladi	Alfisols	4	Based on damage the casual organisms determined to be 2% termites, 2% earwigs
Ramanathapuram Res. Stn. farm	Alfisols	Nil	Noticed termite activity
Kodima (S. Arcot)	Vertisols	< 5	Termite damage on young pods
Morukolam (Tiruvannamalai)	Vertisols	Nil	
Muniyandangala	Alfisols	< 1%	Earwig
Karnataka			
Raichur			
Unchouda	Vertisols	Nil	Thimet applied at the time of sowing 4.5 kg ha^{-1}
Kasbe Camp	Vertisols	< 1	Earwig
Bapur	Alfisols	Nil	-
Res. Stn. farm	Alfisols	< 1%	Earwig
Vijayanagar Camp	Vertisols	Nil	-
Sitanagaram	Vertisols	Nil	-

cidence was very high. In places where groundnut was grown under residual moisture on fine Entisols in coastal areas, greater incidence of *Spodoptera* and earwigs was recorded. This survey revealed that termites and earwigs were the most common pod borers in South India. Termites in Nellore and earwigs in Kadiri severely affected groundnut production and quality (Table 1).

This survey indicated that occurrence and the severity of different pod borers varied with soil type, irrigation, previous crop sown, and cultivation practices. Further surveys during rainy season are suggested to assess the importance of pod borer infestation of groundnut production in these three states.

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