

Incidence of long brown scale, *Coccus longulus* (Douglas) (Hemiptera : Coccidae) on pigeonpea

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Pigeonpea is one of the most important grain legume crops cultivated in semi-arid tropics. The Indian subcontinent, Eastern Africa and Central America, in that order, are the world's three main pigeonpea producing regions. Pigeonpea is cultivated in more than 25 tropical and sub-tropical countries, either as a sole crop or intermixed with cereals such as sorghum (*Sorghum bicolor*), pearl millet (*Pennisetium glaucum*), or maize (*Zea mays*), or with other legumes, such as peanut (*Arachis hypogaea*). Being a legume, the pigeonpea enriches soil through symbiotic nitrogen fixation. The crop is cultivated on marginal land by resource-poor farmers, who commonly grow traditional medium- and long-duration (5–11 months) land races. Short-duration pigeon pea (3–4 months) suitable for multiple cropping has recently been developed. The crop is infested by a number of insect pests, of which, long brown scale of late is appearing as a serious pest. Scale insects (Hemiptera: Coccidae) are sap feeding pests of many agricultural and horticultural crops and are difficult to identify. The scale occurring on pigeonpea has been identified as *Coccus longulus* (Douglas). Adult female is elongated-oval with lateral margins almost parallel to each other, measuring 2.4mm, width 1.1mm (young female) to 6 mm x 3 mm (reproductive female). Young female is flat with dorsal surface yellowish-brown with

pattern of minute black spots. Males have not been reported so far indicating that it is uniparental species and females are viviparous. It is a polyphagous soft scale breeding on more than 200 plant species (Anonymous, 2010; http://vasat.org/learning_resources/pigeonpea/pest/Attack%20Stem/scaleinsects.htm).

Preliminary observations on Pigeon pea brown scale were recorded during Kharif (Aug- Dec) in 2009 to ascertain the incidence. The present studies were taken up at Dry Land Farm, GKVK Campus, UAS, Bangalore during 2010. The incidence of *Coccus longulus* on pigeonpea was recorded at monthly intervals from 90 days after emergence of plant till harvest. Observations were made by selecting 15 plants at random and counting the number of scales per plant. The colonization of scales with respect to height of the plants was also monitored by measuring the height of infestation from ground level. Also the scale infestation on primary, secondary and tertiary branches was also documented. Development of sooty mould growth and associated insects like ants and membracids were also recorded. Brown scale incidence was recorded at two spacings viz., 90 x 90 and 120 x 120 cm of crop at GKVK farm during 2010. Management of pigeonpea scale was also taken up. A mixture of neem-oil @ 2 ml / liter of water and soap solution @ 1 ml / 20

liters of water was sprayed on crop canopy when plants were 60 days old. After 20 days, dimethoate 0.2% was sprayed on main stem, underneath the crop canopy. The crop yields were measured by harvesting matured pods from 100 plants x 5 patches from scale affected and unaffected plants.

Incidence of *Coccus longulus* was found on pigeonpea, variety - TTB-7 sown on 18th May 2010. Scales colonized heavily upto 0.3m the stem from the base of stem and the infestation was noticed upto 75% height of the plant (Table 1). As the plant height increased, incidence of scale also increased, there being significant and positive ($r=+0.89$) correlation between the two. Number of coccids infestation ranged from 12-35 / 5 cm length of the plants. The *Otinotus oneratus* (Walker) (Membracidae: Hemiptera) was also associated with sucking the sap from stem. Both nymphs and adults of membracids in clusters of 3-21/plant at nodal regions of main stem were observed. The coccids and membracids were more actively attended by ants (*Componotus compestris* Fab.) where population of ants ranged from 4 to 21 per plant (Table 2). After one month of initiation of management practice i. e. spraying with dimethoate @ 0.2%, the number of coccids drastically reduced (5-8 / plant) in the infested plots, similarly number of membracids reduced to 2 to 3 and ants rarely seen on the plants. However, a mixture of neem oil @ 2ml/litre of water and soap solution was ineffective in suppressing scale population. Humid, shaded microclimatic conditions exacerbated scale population below the thick overlapping crop canopy on stem. Closer row spacing (90 cm x 90 cm) favored population build up of scales as wider (120 cm x 120 cm) spaced crop held less coccids. Both the scale affected and unaffected

patches gave 15 q / acre suggesting that there were no yield differences between the scale affected and unaffected plants.

CONCLUSION

Scales, *C. longulus* colonized heavily upto 0.3 m of the pigeonpea stem from the ground. Humid, shaded microclimatic conditions exacerbated scale population below the thick overlapping crop canopy on stem. Closer row spacing (90 cm x 90 cm) favored population build up as wider (120 cm x 120 cm) spaced crop harboured less coccids. The *Otinotus oneratus* was also associated with sucking the sap from stem. The coccids and membracids were more actively attended by ants, *C. compressus*. Spraying with dimethoate 0.2% drastically reduced the coccid incidence without affecting the crop yields.

REFERENCES

Anonymous. 2010, Annual report on ICAR Net work project on Insect Biosystematics. Department of Entomology, Univ.of Agril.Sci., GKVK, Bangalore, pp-163.

http://vasat.org/learning_resources/pigeonpea/pest/Attack%20Stem/scaleinsects.htm

Table 1: Incidence of Long Brown scale on Pigeonpea in 2010 at GKVK, Bangalore

Height of Plant (cm)	No. of coccids colonized/plant							Height with colony covered / plant (cm)
	Primary branch	Diameter	Secondary branch	Diameter	Tertiary branch	Diameter		
150.00	35	7.50	15	3.20	04	1.20	90.00	
120.00	18	6.00	10	2.40	03	0.80	75.00	
112.50	16	5.50	08	2.50	03	0.75	67.50	
120.00	15	4.75	06	2.20	04	0.80	75.00	
112.50	17	5.50	08	2.70	-	0.60	60.00	
150.00	30	6.60	15	3.00	-	0.45	90.00	
127.50	21	6.00	12	2.75	-	0.50	75.00	
112.50	18	5.60	10	2.00	04	1.00	60.00	
120.00	19	6.00	11	2.75	06	1.20	75.00	
150.00	25	6.70	15	3.00	-	0.60	90.00	
150.00	28	7.00	19	3.00	-	0.40	90.00	
120.00	30	7.40	15	3.20	04	1.00	75.00	
127.50	17	5.60	10	2.50	-	0.50	60.00	
150.00	20	5.75	09	2.40	03	1.00	82.50	
120.00	17	5.25	08	2.00	04	1.00	60.00	

No. of plants selected for observation = 15

Table 2: Incidence of long brown scale on Pigeonpea at GKVK, Bangalore, 2010

Height of plant (m)	No. of coccids/5cm	No. of ants/plant	No. of membracids/plant	Stem length with sooty mould (cm)
150.00	35	20	21	08
120.00	18	12	-	05
112.50	16	04	03	-
120.00	15	08	-	05
112.50	17	05	03	-
150.00	30	10	-	04
127.50	21	08	04	-
112.50	18	04	03	05
120.00	19	10	-	04
150.00	25	21	-	09
150.00	28	18	08	05
120.00	30	12	-	-
127.50	17	04	-07	-
150.00	20	06	-	-
120.00	12	15	03	04

No. of plants selected for observation = 15; - = Nil

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