

Study of relation between physical characters of sorghum grain with oviposition and grain weight loss due to *sitophilus oryzae*(L)

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Abstract

The present investigation was undertaken to study correlation between physical characters of Sorghum grain with oviposition and grain weight loss due to *sitophilus oryzae* (L). Seventy sorghum germplasm were evaluated by using artificial infestation method. Present study reports positive correlation between seed size and egg laying. However, grain hardness and corneousness showed significant negative correlation with ovipositional preference. Same correlation was observed between seed characters such as seed size, grain hardness, corneousness and percent weight loss. However, seed colour and 100 grain weight showed no correlation with oviposition and loss in grain weight.

Key words: Correlation, seed characters, oviposition, grain weight loss.

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INTRODUCTION

Jowar (Sorghum) is one of the most important cereal crop in the World. Sorghum being grown on 44.00 million hectares in the World with production of 60.00 million tonnes. India's contribution is 11.27 per cent in area and 12.10 per cent in the production of the world. In India area under grain sorghum is 7.93 million hectares and production is 7.78 million tones with national average of 719 Kg/ha (Anonymous, 2010a). In Maharashtra, Sorghum is an important staple food of the people and contributes 51 per cent of the total cereal production in the state. The state has a total area of 40.87 lakh hectares under this crop. Out of this total area 8.47 and 32.24 lakh

hectares are under *Kharif* and *rabi* crop with average per hectare yield of 1162 and 734 Kg/ha, respectively (Anonymous, 2010b). The grains are hardly consumed soon after harvest; they are stored under varying types of storage conditions. Among various pests associated with sorghum, storage, rice weevil, *Sitophilus oryzae* is one of the noxious pest of sorghum. Some varieties are less suitable than others for insect development based on their physical characters of grain. So with the point of view, present study was undertaken to study correlation between physical characters of sorghum grain with oviposition and grain weight loss.

MATERIALS AND METHODS

Studies were carried out under laboratory condition during 2010-11 at Department of Entomology, MPKV, Rahuri. Seeds of seventy germplasm were obtained from All India Co-ordinated Sorghum Improvement Project, MPKV, Rahuri. Colour of seed coat was recorded with the help of Methuen Handbook of colour (Kornerup and Wanscher, 1978). Seed size was taken by visual observation. Hardness of seed was recorded with the help of Tablet Hardness Tester. For grain corneousness test, method suggested by House (1980) was adopted. 100 grain weight was measured on

weighting balance. Average number of eggs laid and average percent weight loss was measured by using artificial infestation method.

RESULTS AND DISCUSSION

Correlation coefficient 'r' between physical characters and ovipositional preference (Table 1) revealed that egg laying was positively correlated with seed size. Thus, bigger the size, more was the number of eggs laid and vice versa. However, seed colour and 100 grain weight did not show correlation with number of eggs laid. There was significant negative correlation between grain hardness and corneousness with oviposition. It means that increase in hardness and grain corneousness, the number of eggs laid per 100 grains of *S. bicolor* decreased. The significant positive correlation between

seed size and egg laying in sorghum was in agreement with results obtained by Russel (1962). Similar indications about correlation of hardness and corneousness with egg laying were observed by Roger & Mills (1974), Mote & Kadam (1984) in Sorghum & Leuscher *et.al* (2000) in pearl millet. Results in respect of seed characters and weight loss in grain (Table2) indicated that there was positive correlation with seed size and significant negative correlation with grain hardness and corneousness. However, seed colour and 100 grain weight did not show correlation with percent loss in grain weight. These results are agreement with Shazali (1987) for grain weight, Reddy *et al.* (2002) for colour. The results showing negative correlation of grain with weight loss was in agreement with Bamaiyi *et al.* (2007)

Table 1: Correlation coefficient 'r' between physical characters and ovipositional preference

Seed Characters	Seed Size	Seed Colour	100 grain weight	Hardness of seed (kg / grain)	Corneousness of grain.
Average number of eggs laid	0.185*	0.091 N. S.	0.157 N. S.	-0.207*	-0.249*

Table 2: Correlation coefficient 'r' between physical characters and per cent weight loss

Seed Characters	Seed Size	Seed Colour	100 grain weight	Hardness of seed (kg / grain)	Corneousness of grain.
Average per cent weight loss	0.205*	0.145 N. S.	0.152 N. S.	-0.189*	-0.374**

N. S. = Non Significant, ** = Significant at 1%, * = Significant at 5%

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