

Original Research Article

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## Effect of Dates of Sowing on Incidence of Insect Pests on Castor Genotypes

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### ABSTRACT

Study on effect of dates of sowing on incidence of insect pests on castor genotypes revealed that incidence of *Achaea janata* was observed when castor was sown either early or late, however there was a decrease in larval incidence when the crop was sown late during the month of August as compared to that during July. Maximum of 2.73 larvae were observed on 48-1 when sown early which was reduced to 1.07 with late sowing. Incidence of *S. litura* was high in early sown crop compared to late sown crop. In case of early sown castor, high larval population was recorded on 48-1 (3.20) and no larvae were observed on DPC-9 and in case of late sown crop high larval population was observed on DCS-9 (1.40) where no larvae were observed on DPC-9.

#### Keywords

Effects, Castor,  
*Achaea janata*,  
*Spodoptera litura*.

#### Article Info

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### Introduction

Castor (*Ricinus communis* Lin.) in an important non edible oilseed crop which is grown in arid and semi-arid regions. In India, Castor is sown during July or August and harvested around December or January. More than 20 species of insect pests were found associated with castor, but many of them were highly irregular in occurrence over years, distributed in patches with low population causing no remarkable damage to the crop. Only 10 species belonging to Lepidoptera, Hemiptera, Orthoptera and Thysanoptera showed variable economic importance and of them, five species were found regular with high degree of severity as major pests. Most of the insect pests were either defoliators or

sucking pests (Sarma *et al.*, 2005). The magnitude of insect pest problem is quite high in Southern India where castor is grown mainly as rainfed crop, resulting in lower seed yield. The major pest problems in castor include the defoliators, semilooper, *Achaea janata* L., tobacco caterpillar, *Spodoptera litura* Fab. capsule borer, *Conogethes punctiferalis* Guen. and the sucking pests, leafhopper, *Empoasca flavescens* Fab. thrips, *Retithrips syniacus* Mayet and whitefly, *Trialeurodes ricini* Misra (DOR, 2005; Lakshminarayana and Raof, 2005). Studies on relationship between different dates of sowing aid to find out the incidence of insect pests which helps to forewarn the cultivators

to resort to preventive measures against such pests in time. Usually, pest occurrence and its population fluctuations depend on the changing environmental situation.

## **Materials and Methods**

The field was ploughed thoroughly thrice to obtain fine tilth and properly levelled after removing stubbles, weeds and trash. Two sowings were taken up on 30.07.2013 and 30.08.2013 by dibbling the seed with a spacing of 90x60 cms at the rate of two seeds per hill. Gap filling was done a week after germination. The seedlings were thinned out within 15 days after sowing allowing one healthy seedling to grow for hill. The recommended dose of fertilizer i.e., 80 kg N, 60 kg P and 40 kg K/ha was applied, of which half dose of nitrogen and the entire dose of potash and phosphorus were applied as basal and rest of nitrogen at 30, 60 and 90 days after germination in equal doses. The experimental plots were irrigated as and when required. Pre-emergence herbicide Pendimethalin 30 EC was applied a day after sowing to arrest the growth of weeds. Hand weeding was done twice so as to keep the crop free of weeds. Observations recorded on larvae per plant at 30, 60, 90, 120 and 150 days of crop for castor semilooper and tobacco caterpillar.

## **Results and Discussion**

### **Effect of early sowing on incidence of castor semilooper, *Achaea janata***

Studies were conducted on effect of early and late sowing of castor genotypes, with an interval of 30 days during month of July and August, 2013 and the data recorded on incidence of defoliators i.e. *A. janata* and *S. litura* during these two periods of crop growth are presented in the table 1. It was clear from the present study that incidence of *A. janata*

though started from 30 days after sowing but comparatively significant population was recorded from 60 days after sowing. Among the genotypes, maximum of 4.67 larvae was observed on RG-2928 followed by 3.67 in PCH-106 and 3.0 in GCH-4. However, in other genotypes, lowest of 1 larva and highest of 1.67 larvae and no larvae were observed on DCS-9. At 90 days after sowing maximum of 3.33 larvae were observed on RG-2928, where majority of the genotypes have recorded an average of 1.00 to 1.67 larvae per plant. By 120 days crop age, the larval population remained almost same or with a slight decrease or increase from the same at 90 days. However, by 150 days after sowing, absolutely no larvae were recorded feeding on PCH-248 whereas on other genotypes, the larval population ranged between 0.67–1.33 in DPC-9. On an average, when the genotypes were sown early during the month of July, among all genotypes, maximum of 2.73 larvae of *A. janata* were observed on 48-1 followed by 2.04 larvae in RG-2928, 2.02 larvae in Kranthi, 2.00 larvae in GCH-4 and PCH-106 where other genotypes recorded minimum of one larva per plant.

### **Effect of late sowing on incidence of castor semilooper, *Achaea janata***

When sowing of castor was delayed by 30 days, no significant effect incidence of *A. janata* was observed up to 60 days after sowing. After 90 days, larval population to a maximum of 2.67 was recorded on DCS-9, PCH-222 and RG-1180 followed by 2.33 larvae on 48-1, RG-2835, PCH-106 and 2.00 larvae on Kranthi. Very low population of *A. janata* i.e. one larvae per plant was observed on DPC-9, Haritha, PCH-288, PCH-111, PCH-254, M-574, PCH-248, PCH-294, GCH-4, PCH-282 and 1.33 in RG-776 and 1.67 on PCH-262. As the age of the crop increased to 120 days, total larval population per plant was reduced on all genotypes. However, highest

of 0.33 followed by 0.67 larvae i.e. less than 1.00 larva was observed on all genotypes and zero population on DPC-9, GCH-4 and RG-776. By 150 days, no pest incidence was observed on any of the genotypes (Table 2).

### **Effect of early sowing on incidence of tobacco caterpillar, *Spodoptera litura***

Studies were conducted on influence of different dates of sowing of castor genotypes during month of July and August, 2013 with 30 days interval and the results are presented in the table 3. It is evident from the study that when castor is sown early i.e. during July and data was recorded 30 days after sowing, incidence of *S. litura* was observed throughout the crop growth period. At 30 days after sowing, majority of the genotypes have recorded either one or two larvae except the genotypes viz., DPC-9, PCH-248, GCH-4, PCH-222 and RG-2928 on which not even a single larva was observed. However, at 60 days after sowing, all the genotypes have showed larval population ranging from 1.00 to 3.00 except DPC-9 which did not record a single larva of *S. litura*. At 90 days age crop, significantly maximum of 6.00 larvae per plant was observed in PCH-262 followed by 48-1, RG-1180 and Kranthi with five larvae per plant which remained on par with each other. Four larvae per plant were recorded in the case of Haritha, PCH-111, RG-2835, PCH-222 and RG-776. Minimum of one larva was observed in the genotypes, PCH-288, M-574 and PCH-248. Absolutely even at 90 days after sowing no larval population was observed in the case of genotypes viz., DPC-9 and RG-2928. At 120 days age of the crop, maximum of 4.00 larvae were recorded on DCS-9, 48-1 and PCH-288 and 3.00 larvae on PCH-294 and RG-1180. Majority of the genotypes have recorded only 2.00 larvae per plant as seen in the case of Haritha, PCH-111, PCH-248, GCH-4, RG-2835, RG-2928, RG-776 and Kranthi. Minimum of 1.00 larva was

seen in the case of PCH-262, PCH-282, PCH-106 and PCH-222 where no *S. litura* infestation was observed on DPC-9. At 150 days after sowing, maximum of only one larva was observed on the genotypes where no larva was observed in the genotypes, DPC-9, Haritha, PCH-288, PCH-254, Kiran, PCH-294, PCH-262, PCH-282, PCH-106, PCH-222, RG-2928 and RG-776. On an average, no *S. litura* incidence was observed on DPC-9 throughout the crop growth period and maximum of 3.2 larvae on 48-1 was recorded. However, mean number of larvae of 2.4 was observed on RG-2835, RG-1180 and Kranthi followed by 2.2 larvae on DCS-9 and PCH-262 and 2.0 larvae in the case of PCH-111. Larval population ranging from 1.0 to 1.8 larvae per plant was observed in the genotypes, Haritha (1.80), PCH-288 (1.20), Kiran (1.20), PCH-294 (1.60), GCH-4 (1.20), PCH-282 (1.20), PCH-106 (1.40), PCH-222 (1.40) and RG-776 (1.60). Minimum of 1.0 larva per plant was recorded in the genotypes, PCH-254, M-574, PCH-248 and RG-1180.

### **Effect of late sowing on incidence of tobacco caterpillar, *Spodoptera litura***

When sowing of castor genotypes delayed by 30 days i.e. sowing was done during month of August, data was recorded from 30 days onwards and presented in the table 4 which reveals that all the genotypes significantly differed in incidence of *S. litura* at 30 days after sowing where majority of the genotypes have recorded either one or two larvae except on the genotypes viz., DPC-9, PCH-111, Kiran, PCH-294, PCH-262, RG-2928 and RG-1180 on which not even a single larva was observed. However, at 60 days after sowing, all the genotypes have showed larval population ranging from 1.00 to 3.00 except DPC-9, 48-1, PCH-111, PCH-248, PCH-262, RG-2835, PCH-106, RG-2928, RG-776 and Kranthi on which no infestation of *S. litura* was recorded.

**Table.1** Effect of early sowing on incidence of castor semilooper, *Achaea janata*

Genotypes	Number of larvae/plant					Mean
	30 das (30.09.2013)	60 das (30.10.2013)	90 das (30.11.2013)	120 das (30.12.2013)	150 das (30.01.2014)	
DPC-9	0.67 (1.28)	1.67 (1.63)	1.00 (1.38)	1.00 (1.41)	1.33 (1.52)	1.13 (1.46)
DCS-9	0.00 (1.00)	0.33 (1.34)	0.00 (1.00)	0.00 (1.00)	0.67 (1.28)	0.20 (1.17)
48-1	1.00 (1.38)	1.33 (1.52)	0.67 (1.24)	7.33 (2.9)	3.33 (2.08)	2.73 (1.84)
Haritha	0.67 (1.28)	1.67 (1.58)	1.67 (1.63)	2.00 (1.72)	1.67 (1.61)	1.54 (1.6)
PCH-288	1.33 (1.52)	1.33 (1.52)	1.33 (1.49)	0.67 (1.28)	0.67 (1.24)	1.07 (1.43)
PCH-111	1.00 (1.38)	1.33 (1.52)	1.33 (1.52)	1.33 (1.59)	1.00 (1.38)	1.20 (1.5)
PCH-254	0.33 (1.34)	1.00 (1.41)	1.00 (1.38)	1.00 (1.41)	1.33 (1.48)	0.93 (1.4)
M-574	0.33 (1.34)	1.00 (1.41)	1.00 (1.41)	2.00 (1.72)	1.67 (1.62)	1.20 (1.5)
Kiran	0.67 (1.28)	1.67 (1.63)	2.00 (1.73)	1.00 (1.41)	1.00 (1.38)	1.27 (1.49)
PCH-248	0.33 (1.34)	1.00 (1.33)	1.00 (1.41)	0.33 (1.14)	0.00 (1.00)	0.53 (1.22)
PCH-294	0.67 (1.28)	1.00 (1.41)	1.00 (1.41)	1.33 (1.52)	1.33 (1.48)	1.07 (1.44)
PCH-262	0.67 (1.28)	1.33 (1.52)	0.33 (1.14)	0.67 (1.24)	0.67 (1.24)	0.73 (1.31)
GCH-4	0.33 (1.34)	3.00 (1.99)	1.67 (1.61)	2.33 (1.82)	2.67 (1.90)	2.00 (1.71)
PCH-282	0.33 (1.34)	1.00 (1.41)	1.00 (1.41)	1.00 (1.38)	1.33 (1.52)	0.93 (1.4)
RG-2835	1.00 (1.41)	1.67 (1.63)	1.67 (1.61)	1.67 (1.62)	1.00 (1.41)	1.40 (1.55)
PCH-106	1.33 (1.52)	3.67 (2.15)	2.00 (1.73)	1.33 (1.52)	1.67 (1.62)	2.00 (1.72)
PCH-222	1.33 (1.52)	1.33 (1.52)	1.33 (1.48)	3.00 (2.00)	1.00 (1.41)	1.60 (1.6)
RG-2928	0.67 (1.28)	4.67 (2.39)	3.33 (2.06)	1.00 (1.38)	0.67 (1.28)	2.07 (1.7)
RG-1180	1.67 (7.42)	1.00 (1.41)	1.00 (1.38)	2.67 (1.90)	2.00 (1.72)	1.67 (1.62)
RG-776	0.67 (1.28)	0.67 (1.24)	1.00 (1.41)	1.67 (1.61)	2.00 (1.67)	1.20 (1.5)
Kranthi	1.00 (1.28)	2.00 (1.71)	2.67 (1.90)	3.00 (2.00)	1.67 (1.58)	2.02 (1.75)
SEm		0.12	0.14	0.14	0.17	0.10
CD (P=0.05)	NS	0.36	0.39	0.41	0.50	0.29

Figures in parenthesis are square root transformed values.

SEm =Standard error of mean

CD (P=0.05) = Critical Difference at 5% level of significance

DAS= Days after sowing. NS=Non-significant

**Table.2** Effect of late sowing on incidence of castor semilooper, *Achaea janata*

Genotypes	Number of larvae/plant					Mean
	30 das (30.09.2013)	60 das (30.10.2013)	90 das (30.11.2013)	120 das (30.12.2013)	150 das (30.01.2014)	
DPC-9	1.00 (1.41)	0.67 (1.24)	1.00 (1.38)	0.00 (1.00)	0.00 (1.00)	0.53 (1.46)
DCS-9	0.33 (1.14)	1.00 (1.38)	2.67 (1.90)	1.00 (1.38)	0.00 (1.00)	1.00 (1.3)
48-1	1.00 (1.38)	0.33 (1.34)	2.33 (1.82)	1.67 (1.63)	0.00 (1.00)	1.07 (1.34)
Haritha	1.33 (1.52)	1.67 (1.61)	1.00 (1.41)	0.67 (1.24)	0.00 (1.00)	0.93 (1.52)
PCH-288	1.00 (1.41)	1.33 (1.52)	1.00 (1.41)	0.33 (1.14)	0.00 (1.00)	0.93 (1.43)
PCH-111	0.67 (1.24)	0.67 (1.28)	1.00 (1.38)	0.33 (1.14)	0.00 (1.00)	0.53 (1.5)
PCH-254	0.33 (1.34)	0.67 (1.28)	1.00 (1.41)	0.67 (1.28)	0.00 (1.00)	0.53 (1.4)
M-574	0.67 (1.24)	1.00 (1.41)	1.00 (1.41)	0.67 (1.28)	0.00 (1.00)	0.66 (1.5)
Kiran	0.67 (1.24)	1.00 (1.41)	0.67 (1.28)	0.00 (1.00)	0.00 (1.00)	0.49 (1.5)
PCH-248	1.00 (1.41)	0.67 (1.24)	1.00 (1.41)	0.33 (1.34)	0.00 (1.00)	0.80 (1.23)
PCH-294	0.67 (1.24)	0.67 (1.24)	1.00 (1.38)	1.00 (1.41)	0.00 (1.00)	0.67 (1.44)
PCH-262	0.67 (1.24)	0.67 (1.28)	1.67 (1.62)	1.00 (1.41)	0.00 (1.00)	0.60 (1.31)
GCH-4	0.67 (1.24)	1.00 (1.41)	1.00 (1.41)	0.00 (1.00)	0.00 (1.00)	0.53 (1.55)
PCH-282	0.67 (1.24)	1.00 (1.38)	1.00 (1.41)	1.67 (1.63)	0.00 (1.00)	0.90 (1.4)
RG-2835	1.33 (1.52)	1.67 (1.61)	2.33 (1.82)	1.00 (1.38)	0.00 (1.00)	1.27 (1.48)
PCH-106	2.00 (1.72)	1.67 (1.58)	2.33 (1.82)	0.67 (1.28)	0.00 (1.00)	1.33 (1.47)
PCH-222	1.33 (1.47)	0.67 (1.24)	2.67 (1.91)	1.00 (1.38)	0.00 (1.00)	1.13 (1.48)
RG-2928	1.00 (1.38)	2.67 (1.88)	2.00 (1.73)	0.33 (1.34)	0.00 (1.00)	1.2 (1.49)
RG-1180	1.67 (1.58)	1.00 (1.38)	2.67 (1.88)	0.67 (1.24)	0.00 (1.00)	1.20 (1.46)
RG-776	0.33 (1.34)	0.67 (1.28)	1.33 (1.52)	0.00 (1.00)	0.00 (1.00)	0.47 (1.41)
Kranthi (Check)	1.00 (1.38)	1.00 (1.38)	2.00 (1.73)	1.67 (1.61)	0.00 (1.00)	1.13 (1.46)
SEm	NS	NS	0.16	0.14		0.19
C(P=0.05)	NS	NS	0.33	0.41	NS	0.55

Figures in parenthesis are square root transformed values.

SEm =Standard error of mean

CD (P=0.05) = Critical Difference at 5% level of significance

DAS= Days after sowing.

NS=Non-significant

**Table.3** Effect of early sowing on incidence of tobacco caterpillar, *Spodoptera litura*

Genotypes	Number of larvae/plant					Mean
	30 das (30.09.2013)	60 das (30.10.2013)	90 das (30.11.2013)	120 das (30.12.2013)	150 das (30.01.2014)	
DPC-9	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)
DCS-9	2.00 (1.72)	2.00 (1.73)	2.00 (1.72)	4.00 (2.23)	1.00 (1.38)	2.20 (1.79)
48-1	2.00 (1.00)	3.00 (1.79)	5.00 (2.29)	4.00 (2.23)	2.00 (1.00)	3.20 (1.89)
Haritha	1.00 (1.41)	2.00 (1.73)	4.00 (1.41)	2.00 (1.72)	0.00 (1.00)	1.80 (1.58)
PCH-288	0.00 (1.00)	1.00 (1.38)	1.00 (1.38)	4.00 (2.23)	0.00 (1.00)	1.20 (1.43)
PCH-111	1.00 (1.38)	2.00 (1.72)	4.00 (2.23)	2.00 (1.72)	1.00 (1.41)	2.00 (1.72)
PCH-254	1.00 (1.38)	1.00 (1.41)	2.00 (1.72)	1.00 (1.33)	0.00 (1.00)	1.00 (1.38)
M-574	0.00 (1.00)	2.00 (1.73)	1.00 (1.41)	1.00 (1.41)	1.00 (1.38)	1.00 (1.40)
Kiran	1.00 (1.38)	2.00 (1.73)	2.00 (1.71)	1.00 (1.38)	0.00 (1.00)	1.20 (1.39)
PCH-248	0.00 (1.00)	1.00 (1.41)	1.00 (1.41)	2.00 (1.72)	1.00 (1.38)	1.00 (1.38)
PCH-294	2.00 (1.73)	1.00 (1.38)	2.00 (1.72)	3.00 (1.79)	0.00 (1.00)	1.60 (1.75)
PCH-262	1.00 (1.38)	3.00 (1.79)	6.00 (1.00)	1.00 (1.41)	0.00 (1.00)	2.20 (1.08)
GCH-4	0.00 (1.00)	1.00 (1.41)	2.00 (1.73)	2.00 (1.73)	1.00 (1.38)	1.20 (1.46)
PCH-282	2.00 (1.72)	1.00 (1.73)	2.00 (1.72)	1.00 (1.41)	0.00 (1.00)	1.20 (1.46)
RG-2835	2.00 (1.72)	3.00 (1.72)	4.00 (2.23)	2.00 (1.00)	1.00 (1.38)	2.40 (1.23)
PCH-106	1.00 (1.41)	2.00 (1.73)	3.00 (1.79)	1.00 (1.41)	0.00 (1.00)	1.40 (1.63)
PCH-222	0.00 (1.00)	2.00 (1.66)	4.00 (2.23)	1.00 (1.37)	0.00 (1.00)	1.40 (1.23)
RG-2928	0.00 (1.00)	3.00 (1.99)	0.00 (1.00)	2.00 (1.72)	0.00 (1.00)	1.00 (1.35)
RG-1180	1.00 (1.38)	1.00 (1.41)	5.00 (2.27)	3.00 (1.79)	2.00 (1.72)	2.40 (2.43)
RG-776	1.00 (1.38)	3.00 (1.79)	2.00 (1.72)	2.00 (1.72)	0.00 (1.00)	1.60 (1.23)
Kranthi (Check)	2.00 (1.72)	1.00 (1.38)	5.00 (2.27)	2.00 (1.72)	2.00 (2.23)	2.40 (2.41)
SEm	0.09	0.13	0.10	0.13	0.10	0.13
CD(P=0.05)	0.25	0.37	0.30	0.36	0.29	0.33

Figures in parenthesis are square root transformed values.

SEm =Standard error of mean

CD (P=0.05) = Critical Difference at 5% level of significance

DAS= Days after sowing.

**Table.4** Effect of late sowing on incidence of tobacco caterpillar, *Spodoptera litura*

Genotypes	Number of larvae/plant					Mean
	30 das (30.09.2013)	60 das (30.10.2013)	90 das (30.11.2013)	120 das (30.12.2013)	150 das (30.01.2014)	
DPC-9	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)
DCS-9	2.00 (1.73)	3.00 (2.00)	0.00 (1.00)	2.00 (1.72)	0.00 (1.00)	1.40 (1.49)
48-1	1.00 (1.38)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.20 (1.08)
Haritha	1.00 (1.41)	0.00 (1.00)	2.00 (1.72)	1.00 (1.41)	0.00 (1.00)	0.80 (1.31)
PCH-288	1.00 (1.41)	1.00 (1.41)	2.00 (1.73)	2.00 (1.73)	0.00 (1.00)	1.20 (1.46)
PCH-111	0.00 (1.00)	0.00 (1.00)	2.00 (1.72)	2.00 (1.72)	0.00 (1.00)	0.80 (1.29)
PCH-254	1.00 (1.38)	1.00 (1.38)	2.00 (1.73)	1.67 (1.63)	0.00 (1.00)	1.13 (1.44)
M-574	1.00 (1.38)	1.00 (1.41)	0.00 (1.00)	1.00 (1.38)	0.00 (1.00)	0.60 (1.25)
Kiran	0.00 (1.00)	1.00 (1.41)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.20 (1.08)
PCH-248	1.00 (1.41)	0.00 (1.00)	0.00 (1.00)	1.00 (1.41)	0.00 (1.00)	0.40 (1.17)
PCH-294	0.00 (1.00)	1.00 (1.38)	2.00 (1.73)	0.00 (1.00)	0.00 (1.00)	0.60 (1.23)
PCH-262	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	1.33 (1.52)	0.00 (1.00)	0.27 (1.11)
GCH-4	1.00 (1.41)	1.00 (1.38)	2.00 (1.72)	0.00 (1.00)	0.00 (1.00)	0.80 (1.31)
PCH-282	2.00 (1.73)	1.00 (1.41)	1.00 (1.41)	0.00 (1.00)	0.00 (1.00)	0.80 (1.31)
RG-2835	1.00 (1.41)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.00 (1.00)	0.20 (1.08)
PCH-106	1.00 (1.38)	0.00 (1.00)	0.00 (1.00)	1.00 (1.41)	0.00 (1.00)	0.40 (1.17)
PCH-222	2.00 (1.72)	2.00 (1.72)	2.00 (1.73)	0.00 (1.00)	0.00 (1.00)	1.20 (1.44)
RG-2928	0.00 (1.00)	0.00 (1.00)	1.00 (1.38)	0.00 (1.00)	0.00 (1.00)	0.20 (1.08)
RG-1180	0.00 (1.00)	2.00 (1.73)	0.00 (1.00)	2.00 (1.72)	0.00 (1.00)	0.80 (1.29)
RG-776	2.00 (1.73)	0.00 (1.00)	1.00 (1.38)	0.00 (1.00)	0.00 (1.00)	0.60 (1.23)
Kranthi	1.00 (1.41)	0.00 (1.00)	1.00 (1.41)	0.00 (1.00)	0.00 (1.00)	0.40 (1.17)
SEm	0.10	0.08	0.09	0.09		0.12
CD(P=0.05)	0.28	0.23	0.27	0.25	NS	0.29

Figures in parenthesis are square root transformed values.

SEm =Standard error of mean

CD (P=0.05) = Critical Difference at 5% level of significance

DAS= Days after sowing.

At 90 days age of crop, maximum of 2.00 larvae per plant was observed in Haritha, PCH-288, PCH-111, PCH-254, PCH-294, GCH-4 and PCH-222 which were on par with each

other, followed by PCH-282, RG-2928, RG-776 and Kranthi with one (1.00) larva per plant and no infestation of *S. litura* was recorded in genotypes DPC-9, DCS-9, 48-1, M-574, Kiran, PCH-248, PCH-262, RG-2835, PCH-106 and RG-1180. At 120 days age of the crop, maximum of 2.00 larvae was recorded on DCS-9, PCH-288, PCH-111 and RG-1180. The genotype, PCH-254 has recorded 1.67 larvae per plant followed by 1.33 larvae in PCH-262. Minimum of 1.00 larva was observed on the genotypes, Haritha, M-574, PCH-248 and PCH-106. No infestation of *S. litura* was observed on genotypes DPC-9, 48-1, Kiran, PCH-294, GCH-4, PCH-282, RG-2835, PCH-222, RG-2928, RG-1180, RG-776 and Kranthi. At 150 days after sowing no incidence of *S. litura* was observed in all the genotypes. On an average, no *S. litura* incidence was observed on DPC-9 throughout the crop growth period and maximum of 1.40 larvae was recorded on DCS-9. However, mean number of larvae of 1.20 per plant was observed on PCH-288 and PCH-222 followed by 1.13 larvae per plant on PCH-262; 0.80 larvae per plant were recorded on genotypes, Haritha, PCH-111, GCH-4, PCH-282 and RG-1180. Larval population of 0.60 was recorded on M-574, PCH-294 and RG-776, followed by 0.40 larvae per plant on the genotypes, PCH-248, PCH-106 and Kranti; 0.27 larvae per plant were recorded on PCH-262 and minimum of 0.20 larvae was recorded on 48-1, Kiran, RG-2835 and RG-2928.

It is clear from the study that occurrence of both *A. janata* and *S. litura* was comparatively more in early sown crop than late sown crop. Similar results reported by (APR castor, 1986). However, in some genotypes, there was a slight increase in the population of *A. janata* i.e. in the case of DCS-9 and PCH-248 when the crop was raised late by one month during August.

Similarly, with respect to *S. litura*, the genotypes PCH-254 has recorded slight increase in the number of larvae. Present results confirm the observations made by Jayaraj and Basheer (1964), Jayraj (1966) and (Akashe *et al.*, 2015).

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