ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 05, pp.31558-31560, May, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

MANAGEMENT OF GROUNDNUT SEED BEETLE THROUGH DIFFERENT STORAGE RECEPTACLES

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ARTICLE INFO

Article History:
Received 25th February, 2016
Received in revised form
18th March, 2016
Accepted 04th April, 2016
Published online 31st May, 2016

Key words:

Pod damage, Polythene bag, Gunny bag , polythene and coal tar coated gunny bag, ground nut beetle.

ABSTRACT

The study was conducted to determine the effects of different storage materials to protect the ground nut from the attack of groundnut seed beetle in stored condition. To provide protection few materials like polythene bag, gunny bag, polythene coated gunny bag, coal tar coated gunny bag, polythene & coal tar coated gunny bag, decis impregnated and malathion impregnated gunny bag were tried . The observations on pod damage was recorded upto 150 days of storage. The results after five months showed that maximum number of beetles i.e., 392 were counted from polythene bag followed by 351 on jute gunny bag and 330 in polythene + jute gunny bag. There were no pod damage or beetle found in Polythene - coal tar coated gunny bag, Decis impregnated gunny bag and Malathion impregnated gunny bag (0.01%).

Citation: Pravasini Behera, Dharitri Patra and Anita Mohanty, 2016. "Management of groundnut seed beetle through different storage receptacles", *International Journal of Current Research*, 8, (05), 31558-31560.

INTRODUCTION

Groundnut is called as the 'king' of oilseeds. It is one of the most important food and cash crops of our country. While being a valuable source of all the nutrients, it is a low priced commodity. Especially in the developing countries, groundnut has to play an important role both as oil and food crop. For example in India about 10 kg groundnut per capita are available for domestic consumption. Fat and oil consumption averages less than 5 kg per capita per year. It has been estimated that in the year 2000, approximately 34 million MT of groundnuts were produced worldwide of which 15 million MT were produced in China,6 million MT in India. Reasonable losses of between 20 – 50% have been reported on stored groundnut due to attack by groundnut bruchid (*Caryedon serratus*) and may sometimes reach 100% if not controlled (Alabi *et al*., 2003). Apart from direct damage to the grains, losses may also occur as a result of contamination with the insect waste materials such as feaces, nitrogenous wastes and exuviae (Emoisairue *et al.*, 2004). The use of quality seed in cultivation is one of the most important factor. Though seed quality is goverened by genetic makeup, seed storage and retention of viability is important for seed vigour. (Deepa *et al.* 2011). Effort has been made by farmers in the management of groundnut bruchid amongst which includes the use of synthetic and non-synthetic insecticides.

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Of recent, many researchers have turned to the use of botanicals, plant products and storage packing material in the control of pest due to the hazardous effects of synthetic insecticides on the environment (Omongo *et al*., 1997). The protection of stored products by the use different packing material is a common practice among smallholder farmers.

MATERIALS AND METHODS

A laboratory experiment was conducted to determine the efficacy of storage receptacles in controlling the attack of ground nut seed beetle in storage condition.

Test insect: *Caryedon serratus (Oliv.)*, (Bruchidae: Coleoptera)

The groundnut seed beetle is one of die obnoxious pest and multiplies rapidly under Orissa climatic conditions inflicting damage both in die larval and adult stages. The test insect is defined by its very broad hind femur, serrated antenna and elytra that do not completely cover the last part of die abdomen.

Storage receptacles: Seven types of fabric storage receptacles were used in different treatment to avoid the infestation of the groundnut seed beetle to groundnut during storage. After filling 250gms groundnut in each receptacle, these were kept

Table 1. Materials used in different storage receptacles for storing groundnut pods

Sl.No.	Storage Structures	Wt. of pod stored(gm)
1.	Polythene bag	250.0
2.	Gunny bag	250.0
3.	Polythene coated gunny bag	250.0
4.	Coal tar coated gunny bag	250.0
5.	Polythene - coal tar coated gunny bag	250.0
6.	Decis impregnated gunny bag (0.0089%)	250.0
7.	Malathion impregnated gunny bag(0.01%)	250.0

Table 2. Adult Caryedon serratus (Oliv.) emergence and weight loss of stored ground nut in storage receptacles during storage period

Sl No.	Receptacle	Pod weight stored (gm)	Number of adult counted					Weight loss (%)				
			After 30 days	After 60 days	After 90 days	After 120 days	After 150 days	After 30 days	After 60 days	After 90 days	After 120 days	After 150 days
1	Polythene bag	250.0	-	12	78	216	392	1.1	9.2	16.9	27.5	40.6
2	Gunny bag	250.0	-	9	67	198	351	1.0	7.1	14.7	25.0	34.0
3	Polythene bag coated Gunny bag	250.0		8	66	180	330	0.8	5.7	13.2	22.1	31.2
4	Coal tar coated Gunny bag	250.0	-	-	-	-	-	0.9	1.4	2.5	3.4	4.0
5	Polythene - Coal tar coated Gunny bag	250.0	--	-	-	-	-	1.1	1.8	2.1	2.9	3.2
6	Decis impregnated gunny bag(0.0089%)	250.0	-	-	-	-	-	0.9	1.4	1.8	2.1	2.6
7	Malathion impregnated gunny bag(0.01%)	250.0	-	-	-	-	-	0.8	1.8	2.5s	3.1	3.6

inside a drum where bulk amount of groundnut were stored and infested with groundnut seed beetles to facilitate the infestation of test groundnut receptacle by the pest. Then the mouth of the drum was tied with muslin cloth and kept in dark place. Storage receptacle designed for different treatment is presented in the table 1.

RESULTS AND DISCUSSION

After harvest groundnut pods were mainly stored in gunny bags. Storage receptacles are used to keep harvested groundnut pods, which do not provide proper protection to *C. serratus* infestation. Many reports revealed that during summer *C. serratus* attacks groundnut pods and damage severely on rainy day, To replace only gunny bag as storage receptacles few other materials were used with gunny bags and groundnut pods were stored to study the efficacy of added materials for protecting pods from *C. serratus* attack. To provide to the protection to storage receptacles few materials like polythene bag, gunny bag polythene coated gunny bag, coal tar coated gunny bag, polythene -t coal tar coated gunny bag, decis impregnated and malathion impregnated gunny bag were tried to observed the beetle infestation. The observations on pod damage was recorded upto 150 days of storage. During summer months observations on beetle emergence inside the test receptacles showed that observations at 30 days there was no beetle infestation in any pods of all the treatments.

After 2 months of storage polythene, jute and polythene lined jute bags containing pods were recorded 12, 9, and 8 beetles respectively. Pods of other bags were completely free from beetle infestation. Likewise observations continued till 150 days and pods of same 3 treatments i.e. polythene bags, polythene lined gunny bags and gunny bags recorded 392, 351 and 330 beetles. Pods of other treatments viz. coal tar coated gunny bag, polythene + coal tar coated gunny bag, decis and malathion impregnated gunny bags were free from beetle infestation upto 150 days.(table2). It may be due to high indoor temperature in intial storage period and high relative humidity especially at 3-5 month storage period must have provided congenial conditionfor thegrowth and multiplication of seed beetle in polythene bags. It is also due to impervious containers encouraged the activity of beetle and leads to highest damage of pod. Conway (1983) reported that fabric of jute bags greatly restrict the movement of C. serratus adult. Prakash & Jagadis wari (1980) noted that among storage structures, ghumma followed by doli and gunny bags restricted the movement and development of C. chinensis. Singh & Yadav (1996) studied the effect of the insecticidal application on storage structures like jute, polypropylene, aluminium and plywood with deltamethrin, malathion, chlorpyrithos-methyl and fenvalerate against Trogoderma granarhim and Sitophilus oryzae. They conducted that delta methrin was most persistent insecticide followed by malathion and chlorpyriphos-methyl.

Insecticides were most persisted on aluminum followed by polythene, polypropylene, plywood & jute. The present investigation showed that coal tar coated gunny bag and polythene-coal tar coated gunny bag recorded no infestation of *C. serratus*. It is also observed that impregnation of decis @ 0.0089% and malathion 0.01% persistent for long time i.e., upto five months and did not allow *C. serratus* adult to penetrate and develop. The results partially agreed with the result of Singh & Yadav (1996) and Lafleur (1994).

Conclusion

Result obtained from the present study suggested that use of impregnated jute bags with safer insecticides and coal tar lining with fabrics receptacles can prove effective in long term storage of ground nut against *C.serratus* attack. The use of this technology by resource poor farmers is low cost and will allow them to save enough seed of high quality for future planting.

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