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QUANTITATIVE AND QUALITATIVE LOSSES IN STORED MOONG [*VIGNA RADIATA* (L.)] DUE TO PULSE BEETLE (*CALLOSOBRUCHUS CHINENSIS*)

Moong [*Vigna radiata* (L.)] is one of the most important pulse croups grown in arid and semi and regions of the country. The availability of pulses may go down considerably due to heavy losses caused by insect-pest during storage. Among fourteen important insect pests of stored grain, the pulse beetle *C. chinensis* is mainly responsible for causing damage to stored pulses. The larvae destroy the endosperm completely and leave the seed coat. The seed thus completely lose their viability as well as nutritive value and rendered unfit for sowing and human consumption. In severe cases, the entire quantity of stored grain is reduced to a mass of empty shell and dust. It has been reported that *C. chinensis* also harbours certain pathogenic micro-organisms that cause food poisoning and spoilage (Neelgund and Kumari, 1983). Little work has been done to ascertain the qualitative and quantitative losses caused by *C. chinensis*. Therefore, an effort has been made to study the effect of period of storage on the qualitative and quantitative losses caused by *C. chinensis* in moong.

The seeds of Moong were disinfected and a lot of 500 g seed was taken in plastic jar of 2 kg capacity. Four sets of Jars with three replications were prepared, which were covered with perforated lid. Five pairs of 0-24 hours old adult of *C. chinensis* were released in plastic jar. The jars were maintained at room temperature. Observations on Quantitative and Qualitative losses were recorded on 30, 60, 90 and 120 days after storage.

10g of seeds were taken from each and percentage of damage seeds was calculated at 30, 60, 90 and 120 days of storage (Adams and Schulten, 1978). Similarly, for estimation of losses in weight 10g seeds were taken from each replication and the total number of seed were counted in each replication, equivalent number of sound seeds were taken from uninfected samples and weighted separately at 30, 60, 90 and 120 days of interval in each replication and percent loss in weight was calculated as:

$$\text{Percentage loss in weight} = \frac{W_1 - W}{W_1} \times 100$$

W_1 = the weight of sound seeds equivalent to the total number of grains in the infected sample

W = the weight of the total grains in the infected sample (sound + Damaged grains)

Similarly, 100 seeds were taken randomly from each experimental jar and placed in petridish (10 cm diameter) lined with blotting paper. Three such sets were prepared for germination test, after one, two three and four months these Petri dishes were kept at room temperature for six days to allow sufficient time for all the seeds to germinate. Water was sprinkled regularly. The number of unsprouted seeds was counted and the percent loss in germination was calculated.

Protein content in the samples of Moong from each replication was worked out using the standard Kjeldhal method as adopted by AOAC (1965).

It was observed that insect infestation caused 7.61 percent damage after 30 days of release which increased with the storage duration resulting in 100 percent damage after 120 days, Singh and Sharma (1981) were also found similar results (Table-1).

The weight loss was initially negligible (4.13%) after 30 days of storage. However, due to fast multiplication of

Table 1: Effect of the *C. chinensis* infestation under different storage period on seed damage, weight loss and percent germination loss in Moong

Storage period days	Percent seed damage	Percent weight loss	Percent seed germination loss
30	16.02 (7.61)	11.73 (4.13)	31.08 (26.65)
60	46.33 (52.33)	23.15 (15.46)	59.78 (74.67)
90	72.21 (90.67)	41.50 (44.73)	73.93 (92.34)
120	90.00 (100.00)	44.75 (49.57)	90.00 (100.00)
SEm ±	0.71	0.35	0.45
CD at 5%	2.34	1.14	1.45

Figure in parenthesis are retransformed percent value

the pulse beetle population in subsequent storage period up to 120 days, the loss increased tremendously reaching 49.57% (Table-1). The similar, results was also reported by Gujar (1975). The increase in insect population had adverse effect on germination. The initially losses in germination in Moong was 26.29% which increased up to 74.67, 88.33 and 100.00% 60, 90 and 120 days after the release of *C. chinesis* (Table-1). Similar finding was recorded by Doharey *et al.* (1987). The protein content varied from 24.38 to 24.80

Table 2: Protein content in Moong seeds infested by *C. chinensis* at different storage period

Storage period	Mean protein contain (%) (moisture free basis)		"T" test calculation
(days)	Un infested seed	Infested seed	
Initial	24.38	24.40	0.14 NS
30	24.40	25.39	6.11**
60	24.60	29.71	12.81**
90	24.77	49.28	77.08**
120	24.80	53.10	165.75**

* Significant at 5% level of significance
** Significant at 1% level of significance

percent in uninfected Moong clearly indicating that there was no change in protein without infestation, whereas, in infested seeds, the corresponding values varied from 24.40 to 53.10 percent showing a drastic increase in the protein content. The protein content was more than double at 90 days (Table-2) after initial infestation and during the subsequent storage increase in protein content was comparatively less. Similar increases in protein content of the infested pulses have been reported by Modgil and Mehta (1994).

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