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Research Paper :

Low cost solar technology for safe storage of gram

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ABSTRACT

A low cost solar bed was developed and tested for safe storage of gram. Low cost solar bed was prepared by spreading insulated mattress of wheat husk, approx. 2.5cm in thickness on the bare surface to avoid losses to the ground. A Ix2m sheet of transparent polyethylene plastic was laid directly over the insulated mattress. The effectiveness of the solar bed as protectant of stored gram *(Cicer arietinum)* against infestation of pulse beetle *i.e. Dhora, C. chiilensis* was tested. Two types of experiments were conducted to test the efficiency of this solar bed *viz.*, gram spread over the solar bed was covered with transparent polyethylene sheet and in the another case, gram was not covered with the transparent sheet. Results indicated that there was no significant increase in infestation level of gram samples, which were exposed on solar bed with transparent covering and on solar bed without transparent covering. Level of infestation was higher for gram stored on bare floor as compared to those gram grains which were exposed on solar beds (with and without transparent covering). Percentage of infestation increased significantly in control groups after 3 months of storage. The findings reflect that the difference between ambient and solar bed temperatures did not allow the pulse beetle to multiply and it also helped to check any further increase in infestation levels of gram grains. These findings on the whole have strong implications for researchers and field level functionaries.

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Key words : Deterioration, Solar bed, Infestation level

Foodgrains are stored in different types of storage structures, which vary from region to region. The selection of storage structure depends upon quantity of grains to be stored. Survey conducted by Chaudhary *et al.* (1998) has revealed that 82 per cent of the grains are stored in traditional storage structures. Large amount of foodgrains are lost every year for want of scientific storage facilities. The losses occur mainly due to spillage, contamination, attack by insects, birds and rodents, and deterioration in storage. Pulses form the major constituent of diet for masses in India where the consumption of animal protein, except milk, is still considered a religious and social taboo. Presently, the availability of pulses is below the stipulated requirement of 80g per day per person. In 1971, this availability dropped to 51.2g per capita per day and it further declined to 36.6g in 1993 (Lal and Brahm, 1996). Therefore, efforts are required to prevent the post¬harvest and storage losses so as to increase its availability per person. Drying of grains to safe moisture limits before storage is the most commonly adopted practice as it increases the storage life of the grains. The drying system currently in use for drying small crop volume involves spreading the material on the ground and exposing it to the sun and wind. This traditional method to dehydrate the material under direct sunshine is a slow process and requires a considerable amount of handling. Sometimes, it also damages the materials because of exposure to adverse conditions. This leads to handling and storage losses. Under such circumstances and due to limited availability of other control methods, use of low cost solar technology has considerable potential for minimizing the losses in storage. It will help in prevention of infestation, besides reducing the need for using insecticides and pesticides. *Chickpea* (gram) saved in this way, will add to family's income and also provide a form of saving to cover future cash needs. It is in this context that the present study was conducted with the specific objective to develop and test a low cost solar bed for safe storage of gram.

METHODOLOGY

Locale :

The effectiveness of solar bed as protectant of stored gram (*Cicer arietinum*) against infestation of pulse beetle *i.e.* Dhora, *Callosobruchus chinensis* (L.) was tested in open area of the laboratory of Department of Family Resource Management, College of Home Science, CCS HAU, Hisar.