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PRODUCTION OF APPROPRIATE FOOD: sufficient, safe, sustainable

Experimental protocol for the application of nets (Olyset Net) impregnated with permethrin for the protection of cereals from pests in Indian storehouses

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UNIVERSITÀ CATTOLICA DEL SACRO CUORE DI PIACENZA

OBJECTIVES

The aim of this study is to verify the repellent / insecticide efficacy of Olyset nets, that are commonly used as mosquito nets in developing countries. These nets will be used for experimental purposes as a protection for foodstuffs (cereals) from attack by insects. The trials will be conducted under field conditions in India with the nets covering the heaps of grain in rudimentary storehouses. These storehouses usually allow a sufficient level of conservation of the products, probably because of the good isolation of the basal structure from the ground and the smooth circulation of air due to the side walls often realized with *bambuaceae*. However, due to poor isolation from the outside, insects can enter the storehouse attacking the product. The simple application of the net treated with permethrin over the grain, could maintain the effective gas exchange combining it repellent / insecticide activity. If this experiment will provide positive results, indian storehouses could be improved without any chemical direct treatment on the stored product in a perspective of sustainable management.

MATERIALS AND METHODS

PREPARATION OF STOREHOUSE BEFORE FILLING WITH CEREALS

- prefer storehouses away from trees, in a dry conditions, away from animals, waste and handy for the stages of inspection and control, spaced and placed in the same village;
- select a number of storehouses (3-5) in relation to the availability of nets to cover all the grains that will be deposited;
- clean of the interior spaces, especially at the corners (basal and apical structure), removing any residue of infested and non-infested grain, dust and cobwebs;
- inspect the warehouse floor, ensuring that it is effectively isolated from the outside;
- close any cracks present on it with a mixture of clay / mud and lime;

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FILLING THE WAREHOUSE WITH GRAIN

- fill the warehouses with the selected crops of the same type and time of collection;
- do not mix old grain to the new one;
- do not mix grain with foreign materials (es. juta bags etc.)
- use homogeneous product and in sufficient quantitative to fill all the selected storehouses;
- use a healthy and not infested cereal;
- fill in all the warehouses with the same amount of product in the normal manner of management of post-harvest;



COVERAGE OF THE HEAPS OF CEREAL WITH NETS



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- the use of the nets must take place in a closed, ventilated place, away from direct heat sources such as solar radiation that could cause a reduction of its effectiveness;
- excessive stresses on the net could cause abrasion, due to its poor mechanical strength, with a consequent reduction in effectiveness which;
- cover each pile of cereal with the treated net, previously cut in relation to the areas to be covered;
- all the surfaces of the piles could be covered;
- fix the ends of the network to the sides of the pile between the grain and the walls of the storehouse;
- identify the warehouses with nets with an acronym (example A1, A2, A3);
- an equal number of storehouses (away from those with the network) must be provided but without application of the nets, as control, identified with another acronym (example B1, B2, B3)
- different levels of infestation can be compared highlighting any differences.



SAMPLING AND CONTROL

- at regular time intervals (every 30 days if possible) sample from each warehouse a fixed amount of product. It is recommended to sample approximately 500 g of product;
- carry out the sampling slowly raising the network only at certain points, through a container/cup in different parts of the pile (surface, center, and in the middle position);



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- at the end of each sampling reposition the network on the pile, taking care to cover all the surfaces exposed and close the storehouse;
- carefully observe ALL of the sampled material, pouring little by little the sample in a clear tray and noting the number of insects observed (alive and dead) and the relative date on a note-book;



- duration of test: 180 days;

NOTES

Write down on a block-note as many details as possible about the trial (date of beginning and end of the experiment; sampling date, number of experimental thesis made and their abbreviations, type of cereal and amount of product used in the trial, any unexpected factors emerging during the trial). Also describe the characteristics of warehouses chosen for testing (time and materials of construction, years of actual use as a storage area, the presence of fissures / cracks in the walls inside / outside of the structure, type of product stored, how it is stored, the most frequent problems encountered during storage of the last years e.g. rodents, insects, mold , number of openings to the outside; degree of isolation from the outside, often the solutions adopted for the protection / pest control by parasites). If possible, bring all this data in a schematic way in a spreadsheet to keep updated regularly. Take photos when possible to document each stage of the trial.