Contribution to the knowledge of insects from imported foodstuffs in markets of Niger

Hamé Abdou Kadi Kadi1*, Aboubacar Kadri2, Halidou Issa Maman Sani1, Inno Hamissou2, Oumarou Dari2 et Yatara Daouda Souley2

1INRAN, B.P. 429 Niamey, Niger (West Africa), 2Faculté d’Agronomie BP 10960, UAM, Niamey, Niger

Abstract

In Niger, storage insects reduce the grain quantity and quality during storage period. Worldwide, these insects damage 5-35% of stored grains; and cause >40% of damages in tropical countries. Samples of imported commodities were collected from markets to collect and identify insects infesting the grains, and control methods were identified. The results indicated that grains of millet, sorghum, maize, cowpea, and soybean (Nigeria) and maize (Benin and Burkina), rice (Asia) are sold in the markets. The imported commodities were attacked by storage insects that cause significant losses. From sampled insects, 6 species including Tribolium confusum, Tribolium castaneum, Sitophilus oryzae, Sitophilus granarius and Anthonomus obtectus attack cereal grains and Callosobruchus maculatus on cowpea grain. To control these insects, traders use expensive and toxic insecticides. It was recommended the application of biopesticides for stock treatments and the use of triple bagging to ensure the better storage of grain products in markets. Also, upgrade phytosanitary control stations with modern devices for detecting storage insects to prevent their introduction into grain products found in the markets.

Keywords: storage insects, imported commodities, damages, biopesticides and triple bagging

Introduction

Beetles and moths damage 5-35% of stored grain worldwide, but destroy 40% or more in tropical and subtropical countries (Schulten 1975). In Niger, storage insect pests cause serious damage to stored products and during commercialization and reducing population and quality of grain (Kadi Kadri et al. 2013). In a survey, producers identified eight insect pests that damaged stored products in two regions of Niger (Kadi Kadri et al. 2013). Kadi Kadi and Pendleton (2017) reported that T. castaneum was dominant among insect pests infesting grain in storage facilities in Niger. To control storage insect pests, most producers and traders relied on insecticide, fumigation, hermetic bagging, and application of botanical products without scientifically based formulations. But, insecticides are costly and toxic to living organisms and the environment. The present study was to assess the extent of imported cereals in the markets of study areas, to determine the level of insect infestation during storage, assess applied control methods and recommend appropriate control measures to prevent entry and reduce damages of insects on foodstuffs to guarantee quantity and quality.

Materials and Methods

Surveys were conducted at marketplaces of Maradi region, of Niamey urban areas and at Tibiri Department in Dosso region of Niger (Figure 1). Commodities traders (Photo 1) from the markets within the study zones were interviewed to determine their knowledge of storage insects in imported foodstuffs (from which countries), how they control the insects. Samples of imported foodstuffs were taken and packed in small-sized plastic bags and sealed hermetically. Samples were sieved and carefully examined in laboratory to initially determine the insects found. Then, the samples were stored to follow up the development of insects on the grains in order to assess the level of damages through time. Data were analyzed using SPSS software 16.0 to determine means of each variable measured.

Results and Discussions

Grains of millet, sorghum, maize, cowpea, and soybean (Nigeria), maize (Benin and Burkina), cassava based-products (Benin), rice (Asia) were sold in the markets visited (Table 1). Imported commodities were attacked by storage insects. To control these insects, traders revealed that they use expensive and toxic insecticides.

Fourteen (14) species such as T. confusum, T. castaneum, S. oryzae, S. granarius and P. truncatus attacked cereal grains and products, E. kuehniella and A. obtectus attacked seeds-products, T. castaneum on wheat flour and C. maculatus on cowpea grain. There were no insect recorded attacking soybean imported from Nigeria to Maradi markets (Table 1).

It was noted that the most dominant species found attacking maize and sorghum was S. cerealella with a percentage of infestation of 23.4% and T. castaneum was infesting all the cereals sampled with percentage 21.3% (Figure 2). R. dominica was encountered in 50% of all foodstuffs sampled. C. serratus was found on sample of peanut with a low percentage of infestation of 3.2%.

Recommendations

• Upgrade phytosanitary control stations with modern devices for detecting storage insects to prevent their introduction on imported grain products found in the markets;
• Apply and respect enacted phytosanitary quarantine regulations at border lines;
• Recommend the application of biopesticides for stock treatments and use of triple bagging to ensure the better storage of grain products in markets.

References cited


Acknowledgment: This study is made possible through funding by the Feed the Future Innovation Lab for Collaborative Research on Sorghum and Millet through grants from American People provided to the United States Agency for International Development (USAID) under cooperative agreement number AID-OAA-A-13-00047. The content is the sole responsibility of the authors and do not necessarily reflect the views of USAID or the US Government.

Corresponding Author: hakkadi@intnet.ne