AU J.T. 7(1): 31-47 (Jul. 2003)

Protection of Stored Products with Special Reference to Thailand*

Narong Chomchalow
Office of the President, Assumption University
Bangkok, Thailand

Abstract

Stored products include materials, which may be dried, rendering them storable for future use as food, industrial raw materials, medicines, or as planting materials. These include cereals, pulses, dried seeds and root crops. Insect infestation is a major contributor to quality deterioration of stored products kept in warm and humid climates. Considerable physical and nutritional loss sustained are due to infestation of stored food products by weevils, bruchids and other insects. Apart from the detrimental economic impact, these losses pose a major threat to food security. Traditional methods of applying spices, medicinal plants and their extractives, and inert materials with pest control potential as storage protectants, have increasingly been explored and exploited in the developing world as alternatives for the control of pests of stored products. In addition to insects, several other organisms attack stored products. These include microorganisms (mainly fungi and bacteria, which cause infection and deterioration), mites, rodents and birds. Plants and plant products can affect insects and other storage pests in various ways by exhibiting pest control activities as toxicants, attractants, repellents, antifeedants and growth regulators; they are also effective as antimicrobials and antifungals. Several kinds of materials are used as a means of stored food protection, including chemical fumigation, treatment with synthetic pesticides, and inert materials. This paper will review research relevant to the application of botanical pesticides, particularly those derived from spices and medicinal plants, and also inert materials, which are traditionally applied to control stored food pests in Thailand.

Keywords: Stored products, stored pests, insect infestation, weevils, bruchids, storage protectants, toxicants, attractants, repellents, antifeedants, growth regulator, antimicrobials, antifungals, chemical fumigation, synthetic pesticides.

Introduction

Insect infestation is a major contributor to quality deterioration of durables (cereals, pulses, roots and tubers) stored in warm and humid climates. Considerable physical and nutritional loss sustained in these countries are due to infestation of stored food products by weevils, bruchids and other insects. Apart from the detrimental economic impact, these losses pose a major threat to food security. Currently, insect control in stored products relies primarily upon the use of gaseous, synthetic fumigants and residual insecticides, both of which may pose serious hazards to warm-blooded animals and the environment. Residues of methyl bromide, one of the two synthetic fumigants still used in the disinfestation of stored foods, have been found to exhibit carcinogenic effects in rats (Dansi *et al.* 1984). The other fumigant, phosphine, is becoming ineffective as a stored food protectant, since insects are beginning to exhibit resistance to this insecticide (Tyler *et al.* 1983).