

The Study of Shelf Life for Liquid Biofertilizer from Vegetable Waste

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Abstract

Liquid biofertilizer is increasingly available in the market as one of the alternatives to chemical fertilizer and pesticide. One of the benefits from biofertilizer is a contribution from population of microorganisms available. Traditionally, liquid biofertilizer produced from fermentation of effective microorganisms (EM) was recommended to be used within three months. This experiment showed that shelf life of the liquid biofertilizer produced from vegetable waste contains high amount of viable microbial population after four months of storage. The two conditions of storage, with and without light, were tested and it was found that there was no significant difference ($p>0.05$) upon viable microbial population, chemical and physical characteristics. However, there was significant difference from batch to batch of production due to raw materials.

Keywords: *Alternative agriculture, EM microorganisms, plants nutrients, viable microbial population.*

Introduction

Thailand is an agricultural country (FAO 2004). In the last few decades, there were changes in the agricultural practice from small to larger farming that emphasized in production efficiency using modern agricultural strategy. The extensive use of chemical fertilizer and pesticide according to this strategy caused numbers of deaths and illnesses to the farmers. The poor farm management technique and improper use of agrochemicals has also resulted in both soil quality and environmental degradation (Setboonsarng and Gilman 1999). Several methods of alternative agricultural systems were introduced into Thailand in the last decades according to Setboonsarng and Gilman (1999). Their common objective is to provide socioeconomic and ecological benefits. Among these benefits, improvement of soil quality is one of the interesting aspects since it contributes to a broad attributes including food quality and safety, human and animal health, and also environmental quality (Parr, *et al.* 2002). The use of non-chemical fertilizers and pesticides is one of the common practices that have been introduced with alternative

agricultural systems, which include the use of biofertilizer.

Biofertilizer is commonly referred to as the fertilizer that contains living microorganisms and it is expected that their activities will influence the soil ecosystem and produce supplementary substance for the plants (Parr *et al.* 2002). However, the species and quantity will vary depending on the source of cultures and raw materials used to produce the fertilizer. These microorganisms and the nutrients obtained from the raw materials are used to improve soil health and nutrition. There are different types of biofertilizer available and their differences are mainly in the raw materials used, forms of utilization and the sources of microorganisms (DOAE 2003; and Higa and Parr 1994).

Among different techniques to produce biofertilizer, the concept of effective microorganisms (EM), which is available in liquid form, has been introduced in 1991 by Dr. Teruo Higa of Japan (Setboonsarng and Gilman 1999). The major groups of microorganisms contained in the EM include filamentous fungi, yeast, lactic acid bacteria, and other soil bacteria (Higa and Parr 1994).