

I. INTRODUCTION

The biodiversity of North Sulawesi has been recognized high and important for sustainable development. Mountains ecosystem of North Sulawesi is home of numerous plant and animal species. The diversity of microbes organism and its potentiality however rarely discussed (Hakim et al., 2012). There are some important aspects of microbe, ranging from food technology and agricultural fields. In agricultural aspect, many microbes has been identified important for land fertility management. Microbes also important for integrated pest management for crop production (Kennedy and Smith, 1995; Lacey et al., 2001; Jacobsen, et al., 2004).

The uses of microbes in pest management relevant with the effort to minimize negative impact of chemical fertilizer in agricultural field. Widely, it has been reported that the use of synthetic chemical pesticides have a negative impact. Pest resistancy, emergence of secondary pests, decrease of soil biodiversity, killed pollinators insect and human health problems (i.e. Parkinson's, brain cancer, leukemia and developmental disabilities) has been widely reported (Zhu, and Chen , 2002; Liu et al., 2010; Savci 2012). The negative impact of the use of synthetic chemical pesticides led numerous experts and practitioners seeks and develops new alternative of pest management. The biological control becomes one of the fascinating methods in recent pest management (Lacey, et al., 2001). Biological control uses natural enemy to reduce pest population and minimize chemical pollutant hazard to environment and human health. Among the agents that have been widely studied and used are Bacteria (Verschuere, et al., 2000; Roh et al., 2007).