

Shifting Cultivation System and Crop Symbiosis with Arbuscular Mycorrhizal Fungi

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ABSTRACT

*Farmers of the Karen ethnic group who live in Huai Tee Cha village, Mae Hong Son province in northern Thailand, still practice the rotational shifting cultivation or swidden agriculture system for food and some cash crops. This study investigated the association of upland rice (*Oryza sativa* cv. Bue Bang), other food crops [Job's tears (*Coix lachryma-jobi*), corn (*Zea mays*), sesame (*Sesamum indicum*) and sorghum (*Sorghum bicolor*)] and pada (*Macaranga denticulata*) with AM fungi in farmers' fields. Soils in the farmers' fields were mildly acidic to neutral (pH 5.2 to 7.0) and showed diversity in P status (6.8-271 mg kg⁻¹ soil, Bray II) but not in N (0.29-0.35% total N) or K (103-130 mg kg⁻¹). The roots of all plants investigated were colonized by AM fungi with upland rice and corn the most infected (≥ 90%), followed by Job's tears (75%), then sorghum (50%) and sesame (45%). Rhizosphere spore density ranged from 160 spores 100 g⁻¹ soil for pada and sorghum, to 120 for sesame and half of this in Job's tears, corn and upland rice.*

This study suggests that swidden crops in northern Thailand have a strong relationship with indigenous AM fungi.

Key words: Arbuscular mycorrhizal fungi, Shifting cultivation system, Swidden crops

INTRODUCTION

Karen is the largest of the minority groups living in the mountainous areas of northern Thailand. Karen farmers in Huai Tee Cha village, Sob Moei district, Mae Hong Son province, located at 19° 78' N, 93° 84' E, 700 MASL, manage fields ranging in altitude from 600 to 900 m with steep slopes (Rerkasem and Rerkasem, 1994). These people have lived in this neighborhood for more than 200 years. Crop