

## INTRODUCTION

The rainfed uplands occupy about nine million rai or 17 percent of the upper Northern Thailand. These lands are characterized by undulating topography and uneven moisture distribution. The areas are utilized for agricultural production. However, low soil fertility and unreliable rainfall are the main physical factors that limit high and stable crop yields.

In the Upper North, leguminous crops such as soybean, mungbean and peanut are important cash crops in the rainy season. Yields of legumes vary, but they are adapted to short growing season and therefore provide certain flexibility for upland farmers to design appropriate cropping arrangement. They are planted either in the early or late rainy seasons. The early season crop is mainly sold as grain whereas the late season crop is grown for seed production.

Among the leguminous crops, soybean is the most important economic crop for the rainfed uplands. Farmers in the Lower North grow soybean in the early rainy season mainly as grain for oil processing while those in the Upper North incorporate the soybean into the late rainy season planting. The product is mainly used as planting material for irrigated soybean in the dry season.

The post rainy season soybean will normally suffer from water deficit during the blooming and seed filling period. Yield reduction due to water stress is a common phenomenon. In recent years, improved lowland soybean technologies have been introduced and have met with certain success. However to delineate farmers with similar circumstances into homogeneous groups would also help designing and disseminating technologies pertinent to the farmers.

The Land Reform Project Area at Chom Thong district, Chiang Mai, was selected for on-farm research. This Project was established in 1982. The Office of Land Reform (OLR) has taken the encroached and degraded forest land with the total area of 16,317 rai. The Office aimed to distribute the land to 1,855 families each with five rai (Chiang Mai Land Reform Office, 1987).

During the early settlement period, The OLR provided substantial credit for land preparation to the farmers. However, technical advice is minimum. Farmers acquire their own information for crop production. Contract farming is operative in case of tobacco. Since 1986, area for soybean production has increased and soybean has become an important cash crop in the area.

The majority of farmers grow single soybean crop in late August. With about 167 days of growing season (Randhawa, 1987), double cropping of mungbean-soybean has been tested by the Chiang Mai University but only accepted by a few farmers. However, farmers would still consider soybean as their main crop and all decisions made about annual cropping have to reconcile with soybean planting schedule for maximum return.

To ensure high crop yield, farmers are very selective about variety with high germination rate. Chemical fertilizer is also applied at about three weeks after planting. However, crop yields vary over sites. Farmers claimed that soybean planted on the upper terrace normally provides lower yield than those planted on the lower terrace.

In order to minimize risk and maintain production stability, the farming practices at the post rainy season where farmers depend heavily for income generation have to be properly managed. In addition, soybeans produced in this target area are the important source of seed for the irrigated lowland soybean in the dry season. Determination of recommendation domain for soybean production in the uplands would be one approach for generating and disseminating suitable technology to the farmers.

The objectives of this research are to evaluate a set of technology (variety and fertilizer) adaptation under rainfed upland in the farmers field and to define recommendation domains for disseminating suitable soybean production technology to this area.