Coping with the Rice Gall Midge, a New Insect Pest of Highland Paddies,
In Upland Villages in Mae Win, Chiang Mai, Thailand
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Upland villages in Mae Win and their people
Mae Win is a sub-district of Mae Wang district of Chiang Mai province. It is made up of several villages situated at elevations from 400 m to more than 1,000 m. Villages of the uplands in Mae Win, from about 600 m upwards, are populated mainly by people who belong to the Karen minority group. Rice is the main staple crop in Mae Win, as in the rest of Thailand. Rice in the uplands is grown on aerobic soil as ‘upland rice’ and in ‘highland paddies’ where terrain and water supply permit soil submergence for the growing of wetland rice. Upland rice in rotational shifting cultivation can be quite productive and sustainable, providing enough land is available to allow the fallow to regenerate fully before cropping again. For the condition of northern Thailand, the minimum is one year cropping and six years of fallow. Highland paddies are far more productive and sustainable, with a crop every year, and sometimes even two crops per year, on the same land. Rice production in the highland paddies has, however, come under threat from an insect pest called gall midge in the last few years.

Rice gall midge in Mae Win
The rice gall midge, an insect related to the mosquitoes, is not new in Mae Win. It is well known in the villages at lower elevations (400-500 m), and in similar environments in other parts of northern Thailand. Rice farmers in these affected foothill villages have long recognized that although most rice varieties are damaged by the gall midge there are some that are not. Most well known throughout the north for its tolerance to the gall midge is a local variety called Muey Nawng. Farmers’ accessions of Muey Nawng from Chiang Mai, Chiang Rai and Nan have the same general appearance of tall plant type and bold grain with straw coloured husk. However, this rice recognized under the one name of Muey Nawng is greatly diverse, with molecular markers and functional traits. The functional diversity includes tolerance to different populations of gall midge, adaptation to different micro-environments as exemplified by flowering time of up to 30 days apart when grown in same location and the presence of non-sticky grains. Finding the right gall midge resistant Muey Nawng for the highland paddies was not too difficult. Several of the accessions did as well with the gall midge as local varieties did without the gall midge, but Muey Nawng does not quite meet the taste of the people who live at the higher elevations.

Finding all midge resistant rice with grain type that also meets local requirement
Muey Nawng is glutinous or sticky rice, because villagers at lower elevations (400-500 m, original range of the gall midge) in Mae Win and in Chiang Mai and the rest of the northern lowlands, prefer glutinous or sticky rice. People of the uplands, who belong to several other ethnic minority groups as well as the Karen, prefer non-sticky or ordinary rice, in common with those in central and southern Thailand. The presence of up to 55% non-waxy (non-sticky) endosperm in some Muey Nawng accessions brought a possible solution. Selection and evaluation are underway. An even better solution was found in the next door district of Mae Chaem, where some Karen villages appeared to have lived with the gall midge problem longer than those in Mae Win and non-sticky version of Muey Nawng has been developed. Accessions of the Mae Chaem non-sticky Muey Nawng were tested in several upland villages in Mae Win in 2008, by the research team for verification at 3 upland villages by farmers in these and 4 other villages. Discussions were made with farmers on the problem, how to estimate infestation, how to solve it, and so on. Results look promising, by measurement and by farmers’ estimation. There was generally less gall midge infestation in the non-sticky Muey Nawng accessions than farmers’ own and Rice Department’s varieties (Figure 1) and
yield at Thung Luang (Figure 2). On their own valuation, the farmers found most of the non-sticky Muey Nawng to be very promising in yield and eating quality. Seed harvested from last year trial planting (of just a couple handfuls each) is now planted in larger scale and by more farmers.

Figure 1. Gall midge infestation in accessions of regular, sticky Muey Nawng (MN1-20 and MN62M); non-sticky Muey Nawng from Mae Cham, recommend varieties from the Rice Department and farmers’ varieties at 3 locations (Huai Khao Leeb, HKL; Huai Tong, HT and Thung Luang, TL). Thung Luang is the village for field visit, but farmers from the other villages will also join in discussion on June 20.

Figure 2. Comparing grain yield of Muey Nawng accessions (open symbols are non-sticky Muey Nawng and closed symbols are sticky Muey Nawng) at Thung Luang (865 m, with gall midge) and Chiang Mai University (330 m, with no gall midge)