A Collaborative Project of
Mae Win Villages and CMUPNlab
for Rice Gall Midge Control in Upland Paddies

Rice gall midge is an insect pest that is well known among farmers in the foothill valleys (400-500 m elevations) of Northern Thailand. The insect larva forms a ‘gall’ at the growing point of the rice plant, turning the last leaf into a tube (like onion leaf, known locally as ‘bua’ and generally as ‘silver shoot’) and robbing it of capacity to produce more leaves, panicle and grain. Farmers have, however, been able to cope with a gall midge resistant local rice variety known as Muey Nawng.

In the last few years the gall midge appears to have extended its range to more than 1,000 m. Measurements in upland paddies at elevations up to 1,000 m found gall midge infestation of 40-90% and yield losses of 50-100%. Whether this is an effect of global warming, remains to be verified, but the fact of yield losses and the impact on people’s food security is real.

Solutions have been identified from our studies of agrodiversity of local rice germplasm, in which local rice varieties have been shown to be highly diverse genetically. Muey Nawng is one of these local rice varieties that still have up to 50% of the genetic diversity of the wild rice yet appear to be fairly uniform externally; and are recognized by farmers under the same name. Functional diversity of Muey Nawng accessions in adaptation to local condition and resistance to gall midge population is expected to provide solution to the problem. Muey Nawng is basically rice of the northern lowlands, where glutinous or sticky rice (low or no amylose) is the main local staple. People who live at higher altitudes, however, belong to minority groups who prefer non-sticky rice for their staple. Another element of diversity in Muey Nawng that is useful in this situation is the presence of non-glutinous (non-sticky, with high amylose content) grain type.

Collaborative activities with 7 villages in Mae Win
1. Evaluating farmers’ accessions of non-sticky Muey Nawng for local adaptation and resistance to local population of rice gall midge
2. Selecting for non-sticky Muey Nawng in locally adapted accessions of sticky MN known for gall midge resistance, with at least 25-30% of on-sticky grain
3. Participatory breeding: ‘polygamous crosses’:
   - to combine gall midge resistance with local adaptation
   - to introduce yield enhancing traits, e.g. semi-dwarf and photoperiod insensitive genes
   - to include other locally preferred traits, e.g. non-sticky grain, slender grain shape
4. Agronomic measures (e.g. making sure to remove alternative hosts, delay planting, etc)
5. Training in basics of inheritance, diversity, gall midge (life cycle and infestation, alternative hosts, damage rating), simple methods of selection (iodine stain for starch type, alkali spreading for gelatinization temperature) etc.