

Farmers participatory *in-situ* soil moisture conservation through residue management for ensuring double cropping in upland

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The North Eastern Region of India known for its high rainfall, suffers from severe water scarcity during major parts of the year (Nov –April). Because of this, fields remain fallow during these periods, particularly under terrace and upland condition, where scope of growing crops with stored water is limited. A simple and very low-cost technique of *in-situ* moisture conservation has been developed for growing *rabi* crop (mustard) using residue of preceding maize crop grown during rainy season. Maize was sown in June with recommended agronomic practices. Biomass of a local weed *Ambrossia* spp, the only external input, has been applied between rows of standing maize at 20 days before its harvest in the month of September to recharge *in-situ* soil moisture profile by preventing run-off from the field at the later part of rainy season. Immediately after harvest of maize, its stalk is spread over the field just above the applied *Ambrossia* biomass and kept as such till sowing of succeeding mustard. This way *Ambrossia* spp and maize stalk act as “**double mulch**” not only to ensure optimum soil moisture for sowing of mustard in October but also to recharge the soil profile for support growth and development of mustard during the whole growing season. Mustard was sown in October between maize rows by removing maize stalk and placed again between mustard rows on the same day immediately after sowing and kept till harvest of mustard.

The technology was demonstrated at 26 farmers’ field in 22 villages of four districts of Meghalaya namely Ri-Bhoi, East Khasi, West Khasi and Jaintia district on a participatory mode. The expenditure on *in-situ* management is computed at Rs. 2,500 per ha including labour cost for cutting, transportation and spread of *ambrossia* biomass. About 6 times increase in seed yield of mustard was observed by this technology over no cover under terraced condition. Application of *Ambrossia* 10t/ha recorded a seed yield of 8.02 q/ha compared to only 1.92 q/ha under control under experimental field of the Institute. The mustard yield increase recorded with *Ambrossia* biomass application of 10t and 5t/ha was 316 and 190 %, respectively over control. This technique of *in-situ* residue management for carry over moisture of *rabi* crop ensures double cropping under terrace and flat upland situation using only *Ambrossia* weed as external input where some labour charges are involved for cutting, transporting and applying in the field. Besides, *Ambrossia* leaf and stem being rich in the nutrient particularly N, on decomposition may enrich *in-situ* soil fertility in maize-mustard system.

At present, this technology is being demonstrated at the farmers’ field throughout the state of Meghalaya. Krishi Vigyan Kendra (KVKs), State Agricultural Dept. and various NGOs are collaborating to disseminate the technology to the resource poor tribal farmers of North-east.