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460

Impact of agroforestry practice on soil conservation- Initial assessment in Northwest Vietnam

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In the Northwest Vietnam, traditional maize (*Zea mays*) cultivation practices of farmers mainly based on sole cropping, intensive tillage combined with burning crop residues on steep slopes. These cultivation practices resulted in severe erosion, soil degradation, reducing crop production and un-sustainable production systems. It requires assessing of the impact of agroforestry practice on the soil conservation in the context of the upland areas in Northwest Vietnam. This study has been carried out since 2017 to present the actual impact of agroforestry practice including longan (*Dimocarpus longan*)+mango (*Mangifera indica L.*)+maize+forage grass strips (*Guinea - Panicum maximum*) on soil conservation. The assessment based on quantifying soil loss by soil traps and evaluating terrace's formation by erosion pins placing above forage grass strips. The sole maize system had been using for the comparison. The initial results showed that the evaluated agroforestry practice reduced soil loss from 18.3 to 37.4% in compared with the sole maize system in 2017 and 2018, respectively. In the second year (2018), the deposition of sediment on the front and rear pins at the above grass trips was 0.81 and 0.41 cm, respectively. It indicated the increment in soil surface at the above grass strips. In contrast, the negative value of the deposition of sediment was recorded in the sole maize system. We are continuing to monitor the impact of agroforestry practices on reducing soil loss and terrace formation, and evaluate the function of the system on soil fertility improvement, nutrient use efficiency and economic profitability.

461

Heterobeltiosis in banana and genetic gains through crossbreeding

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Heterosis, or hybrid vigour, is the superiority of the hybrid for a certain trait over the mean of its two parents. Heterobeltiosis is a form of heterosis where the hybrid is superior to its best parent. Banana breeding is a tedious, time-consuming process, taking up to two decades to develop a hybrid. Understanding heterosis in banana breeding will contribute to selecting right breeding materials for further crossing, thus increasing banana breeding efficiency. Here we document heterobeltiosis by using the recently bred NARITA 'Matooke' hybrids and their ancestors. NARITA hybrids, their parents (*4x* and *2x*), grandparents (*3x* and *2x*), and local *3x* 'Matooke' cultivar checks were planted in a rectangular lattice design with two replications. Yield and other agronomic data were collected at flowering and harvest. The NARITAs were compared with their *3x* 'Matooke' grandmothers. Heterobeltiosis on bunch weight was calculated with the data of 3 cycles. All the NARITAs showed heterobeltiosis for bunch weight. NARITA 17 had the highest grandparent heterobeltiosis (ca. 250%). Genetic gains due to crossbreeding were determined for fruit yield considering three generations: matooke cultigen (C_0), primary tetraploid hybrids (C_1) and secondary tetraploid hybrids (C_2). The average genetic gain (from C_0 to C_2) rates for bunch weight (kg) and yield potential (t ha^{-1} $year^{-1}$) were 1.4% and 1.3% per year, respectively.