# Fruit- based Agroforestry System for Hill Zone of West Bengal, India

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**Abstract—***Soil in the hilly region is severely weathered, contain only little organic matter and have little capacity for moisture and nutrients. In addition, they are prone to serious erosion if not managed carefully. The land-use pattern varies markedly in accordance with topographical and climatic variations. Depending on the situation and agro-climatic conditions, suitable combination could be suggested wherein horticultural crops might be suitably combined with forest tree spp. for food, vegetables, fruits, fodder, fuel and timber. Suitable combinations could be plantation crops, medicinal plants, food and oil-producing trees, and fruits trees (orange, pear, peach etc.), spice crops with suitable forest trees. In view of the future prospects and to increase tree cover area a field experiment was conducted during the year 2013-2015 at Dalapchand Science Farm, Krishi Vigyan Kendra, Kalimpong, West Bengal to evaluate the performance of silvi (Alnus nepalensis) and fruit trees (Citrus reticulata Blanco. and Pyrus communis) in fruit based agroforestry system in hill zone of West Bengal. The experimental site is located at 27.06$^{o}$ N latitude and 88.47$^{o}$ E longitudes at an elevation ranging between 979.93 m. to 1257.30 m. above msl. The experiment was fitted in randomized block design (RBD) which was replicated thrice. The grafted saplings of fruit were planted at 10m x 10m and silvi saplings were planted in between the fruits plants and boundary at spacing 2.5 m during kharif season of 2013. Ten intercrops viz. maize, rice, french bean, pea and pumpkin during kharif and potato, cabbage, cauliflower, mustard and onion during rabi season of two consecutive years were grown in between the two fruit trees and different growth parameters of silvi species, crops and fruit trees were recorded. Experimental results revealed that all the growth attributing characters of silvi specie and fruit trees were on higher side where the crops were cultivated in the inter-spaces in fruit based agrofoestry system as compared to only trees and fruit trees and, thus, exhibiting a*

*positive effect of intercropping on the growth of fruit trees and silvi species. Experimental results indicate that vegetables as intercrops fetched higher profit/ha/year by Alnus nepalensis + Citrus reticulata + French bean+ Cauliflower and Alnus nepalensis + Citrus reticulata + Pumpkin + Onion followed by Alnus nepalensis + Pyrus communis + French bean+ Cauliflower. Studies on soil fertility reveal that available N, P and K as well as organic carbon (%) were higher with highly remunerative under agroforestry system.*