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Sonamukhi (*Casia angustifolia*) for crop diversification in Agri-horti system under arid rainfed condition

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Abstract

Sonamukhi (*Casia aungustifolia*) was intercropped under rainfed condition with fruit trees grown at three irrigation levels (100,70 & 40% ETc)with drip irrigation on sandy loam soil at CAZRI, Regional Research Station, Bikaner to assess the production potential of Sonamukhi as intercrop under agri-horti system. The growth performance was at par with all the fruit trees grown at 100 and 70% ETc level. The total dry matter stem and dry leaf yield was highest when intercropped with citrus (at 100% ETC) where as leaf : stem ratio was better at 70% ETc level irrigated fruit trees over rest of the irrigation levels. Higher harvest index and water use efficiency was recorded under the inter cropping with citrus grown at 40% ETc level under agri horti system.

Key words: Sonamukhi, agri-horti system, rainfed intercropping, crop diversification, and water-use-efficiency.

Introduction

Approximately 80% of hot arid areas falls in eleven districts of western Rajasthan. The eco-system is hypothermic and characterized by low and erratic rainfall and frequent droughts [1]. Soils of the region are sandy, poor in nutrient content and organic matter, undulated topography with a dominance of sand dunes and interdunal plains. High wind velocity and temperature leads for heavy wind erosion even in irrigated fallow lands. The irrigated area increased from 0.79 million ha in 19720 to 1.62 million ha in 1992 [2]. In-spite of advances of irrigation systems the maximum irrigated area would be hardly 10% of cultivable land leaving 90% as rainfed. The better establishment of fruit trees with minimum water and the water saving through the use of drip irrigation system more area can be developed under orchards with same quantity of available water in comparison to flood irrigation. The fruit trees takes at least minimum three years for fruiting or economic yield. Therefore, the farmer is not able to get income from the orchards. The substitution of some economic and high value crops requiring less water can be intercropped in between the spaces left by fruit trees as rainfed crops during Kharif season under agri-horti system. These crops will provide an extra income to the grower at the initial stage of orchard development and reducing the soil erosion through winds as well. Therefore, there is a need for an intervention for assessing the production potential of crops with out any adverse effect on fruit trees. This will open a new avenue for the crop diversification in arid areas through substitution of high value crops. The present study was undertaken with the aim to assess the production potential of most drought hardy crop like Sonamukhi in rainfed condition under agri-horti system.

Material and methods

The present investigation was carried out at Central Arid Zone Research Institute, Regional Research Station, Bikaner under factorial Randomized Block Design with three replications during Kharif, 2003. The Sonamukhi was grown as rainfed crop in between the spaces left by 2 years old fruit trees of citrus, Bael and Gonda. The fruit plants were irrigated through drip irrigation system at three irrigation levels i.e. 100% ETc, 70% ETc and 40% ETC. Total rainfall during the cropping season was 178.7 mm. The water use efficiency of Sonamukhi was calculated on the basis of rainfall and different production indices.