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FEASIBILITY OF GROWING SISAL IN THE INTERCROPPING ENVIRONMENT WITH FOREST TREES

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To investigate the feasibility of cultivation of Sisal (*Agave sisalana* Perrine ex Engelm., Family: Agavaceae) by utilizing the space in Teak [*Tectona grandis* Linn f., Family: Lamiaceae; or Verbenaceae in older classification; Common names: Sagun (Hindi), Tekku (Tamil)] and Beechwood [*Gmelina arborea* Roxb., Family: Verbenaceae; Common names: Gamhar (Hindi), Kumla/Kumalamaram (Tamil)] plantation, a long-term experiment was initiated at Sisal Research Station of CRIJAF-ICAR (23.05° N, 84.23° E, and 256.03 m MSL), Bamra, Dist: Sambalpur, Orissa from August 1998. Two types of sisal (*Sisalana* and Hybrid sisal cv. Bamra hybrid-1)

were planted in double row system in between two rows of teak or gamhar in all possible combinations such as, teak + sisal (sisalana); gamhar + sisal (sisalana); teak + sisal (hybrid); and gamhar + sisal (hybrid) and sole sisal (sisalana and hybrid). In this system, the plant density for sisal was 4742 plants/ha and the teak or gamhar population was 470/ha. After an initial lag period of 3 years (which is a common practice for sisal plantation), sisal leaves were harvested from 2001 onwards.

The average fibre yield of sisalana sisal was more when grown with gamhar (1027 kg/ha) than with teak (932 kg/ha). Similarly, hybrid sisal also gave more fibre yield with gamhar (946 kg/ha) than with teak (709 kg/ha). In all the cases of sisalana and hybrid sisal growing with teak and gamhar, the fibre yields were reduced as compared to sole sisal plantation (without shade). Teak reduced the sisal fibre yield by 12.72 and 37.32% in sisalana and hybrid sisal, respectively. Whereas, gamhar reduced the sisal fibre yield by 3.84 and 16.36% in sisalana and hybrid sisal, respectively. Fibre yield depression by forest trees was more pronounced in case of hybrid sisal (16-37%) than sisalana sisal (4-13%) and among the tree species (irrespective of sisal types) teak reduced the fibre yield 21.81% more than gamhar. The average diameter at breast height (DBH at 1.37 m) of forest trees at 10th year (2008) was more in case of teak (23.28 cm) than gamhar (18.55 cm) and the DBH growth rate was more for teak (2.56 cm/year) than gamhar (1.40 cm/year). The DBH growth rate of teak was 11.51% more when grown with hybrid sisal (2.70 cm/year) as compared to sisalana sisal (2.42 cm/year). Similar higher DBH growth rate was observed in case of gamhar when grown with hybrid sisal (1.78 cm/year) than sisalana sisal (1.02 cm/year). It may be deduced that sisalana sisal can be grown by utilizing space in between rows of gamhar planted with a population of 470 trees/ha and it is not advisable to grow hybrid sisal with teak or gamhar.