

Research Article

INTERCROPPING OF SOME MEDICINAL PLANTS WITH MULBERRY

*Shashi Kanta

Panjab Institute of Technology, Dinanagar

*Author for Correspondence

ABSTRACT

In Punjab, sericulture is facing acute problems due to bivoltine crops, limited spare land resources, competition with other agricultural crops and climatic reasons. Few area of Kandi belt of Punjab and Himachal also has its vital importance as herbal rich. Therefore, it invites the interest of researchers to develop mutual harmony between sericulture and medicinal industries for of sustainable co- existence.

Mulberry is cultivated as tree under rain –fed conditions in North-western Himalayan states including Kandi Area of Pathankot, Punjab for sericulture. The gestation period of mulberry for sustaining silkworm rearing is 3-4 years. When plants are raised through saplings/ cuttings. Further, sericulturists do not earn much due to bivoltine rearing during spring and autumn, which keeps them busy only for three months and their 9 months, in this region. The gestation period and afterwards lean periods of 9 months, every year may be efficiently utilized for intercropping of medicinal plants to raise income of sericulturists of this region. Present communication deals with the Survivality and prospects of intercropping of seven medicinal plants viz. *Aloe barbandense*, *Asparagus racemosus*, *Andrographis paniculata*, *Acorus calamus*, *Plumbago zeylanica*, *Rauvolfia serpentina* and *Cyperus scarious* under tree system

Keywords: Mulberry, Medicinal Plants, Cultivation

INTRODUCTION

In Punjab, sericulture is facing tough competition due to bivoltine crops, limited land resources and competition with other agricultural crops. Besides, the part of Kandi area of Punjab also has importance as herbal rich area (Gupta *et al.*, 2010). Therefore, there is an urgent need to develop mutual harmony between sericulture and medicinal industries for of sustainable co- existence. The gestation period (4-5yrs) between transplantation of the saplings and full tree capable of sustaining silkworm rearing and the lean periods after pruning of mulberry is July / December may effectively be utilized every year for the intercropping of medicinal plants to increase the income of sericulture Farmers and government (Ahasn *et al.*, 1989). Due to heavy demands from pharmaceutical of industries, the over- exploitation of medicinal plants is leading to the destruction of habits and habitats and unsustainable harvesting practice has conservation and cultivation support of many valuable herbs. Since majority of sericultural farmers have very small land holdings and depend mainly upon family labor and simple tools, they neither have the capacity to take risk nor have enough land to diversify the cropping system. Thus, by growing other of short duration crops along with mulberry, the farmer gets additional benefits from intercrops (Ahasn *et al.*, 1989).

In Punjab, intercropping of bush mulberry with lentil and Mung at (8'+2')x2' spacing have maximum returns from sericulture and cost of pulses thereby facilitating additional net gain from one acre of mulberry plantations during spring and autumn seasons (Koul *et al.*, 1996). An additional income can easily be fetched by growing short duration crops like mustard and beans between rows of mulberry. Lot of work has already been done for integration of Sericulture with agriculture and horticulture (Gargi *et al.*, 1997). However, so far as intercropping of medicinal plants is concerned to increase the income of farmers and Government mulberry gardens, very little works has been done for integration of sericulture with medicinal industries. In hilly region of west Bengal, the net profit is increased by 26.3% from the Same piece of land without any additional investment When intercropping of turmeric and ginger, turmeric and field pea were practiced along with mulberry (Kaur *et al.*, 2002). Intercropping of mulberry with saffron in Kashmir yielded a good quality of mulberry leaf from the same field Where saffron was cultivated alone to generate work as well as good deal of returns to farmers during lean period when there are no operations related to saffron cultivation (Kaur *et al.*, 2002). Present communication deal with the

Research Article

initial studies conducted with respect to intercropping of seven medicinal plants in the mulberry gardens of directorate of sericulture, Dhar Block (Pandey and Dhar, 2013).

MATERIALS AND METHODS

Intercropping of Medicinal plants was made under tree as well as bush cultivation system of mulberry. The mulberry plants maintained as tree under 10'x10' and 6'x6' spacing or as bush plantation under (8'+3')x2' spacing were utilized for intercropping of medicinal plants (Rathore *et al.*, 2012) viz. *Aloe barbadensis*, *Acorus colamus*, *Andrographis paniculata*, *Asparagus racemosus*, *Cyperus scarious*, *Plumbago zeylanica* and *Rauvolfia serpentine*. The propagation and nursery period during which these medicinal plants were raised is given in table 1 (Fotadar and Dhar, 2012).

Table 1: Medicinal Plants Intercropping With Mulberry at Dhar Block

Name	Botanical name	Altitude	Propagation	Nursery	Spacing for intercropping
Gheekunwar	Tropical/ Rhizome/ Root	July	3'x3'		
Subtropical suckers	Kalmegh	Tropical/	Seeds	March-April	1'x1'
Subtropical Satavari	Seeds/ roots	May -August	2'x2'		
Chitrak	Rhizome	March- April	3'x3'		
Sarpagandha	Seeds/ cutting	May-june	1'x1'		
Bach	Rhizome	May-June	Nagarmotha Rhizome	May June	1'x1'

Table 2: Survivality % of Medicinal plants under Intercropping with Mulberry

	Medicinal plants	Survivality % rate in free system(10"x10")	Survivality % rate in free system(10"x10")	Survivality % rate in free system(10"x10")	Grand mean of Survivality %
1	Aloe Barbandensts	100	98.61	90.27	96.29
2	Andrographis Paniculata	98.61	95.83	65.27	86.34
3	Asparagus racemosus	100	100	98.61	99.34
4	Plumbago zeylanica	98.61	91.66	88.88	93.05
5	Rauvalfia serpentina	94.44	88.88	77.77	87.03
6	Acorus Calmus	97	97	100	98.00
7	Cyperus Scariosus	88	98.66	97	94.55
8	Grand Mean of Survivality %	96.66	95.80	88.26	
9	Cd at %	10.280	9.596	14.92	

The saplings/ seedling of these medicinal plants were transplanted at their recommended spacings in Dhar block design in three replication during July-August in sericulture Research Centre of Dhar Block. Each replication had 24 plants in all the treatments except in case of *Acorus calamus* and *Cyperus scariosus* which had 25 plants/ replication in all the spacing. The living percentage of the medicinal plants was recorded and analysis was calculated following standard statistical procedures (Madhusudan *et al.*, 2013). The mulberry plants were Pollarded/ Pruned at 1.5 ft height from ground in bush system and at 5ft. height in tree system before transplantation of medicinal plants (Madhusudan *et al.*, 2013).

Research Article

RESULTS AND DISCUSSION

The live percentage of seven medicinal plants cultivated as intercrops in all the three plantation of mulberry raised (8'x3') x2' as bush and 6'x6' and 10'x10' as tree has shown in table 2 (Fotadar and Dhar, 2012). Results reveal that maximum grand mean of Survivability was notice in 10'x10' spacing whereas maximum Survivability (100%) was found in Aloe barbandense and asparagus racemous and minimum Survivability was found in Cyperus Scariosus (Fotadar and Dhar, 2012). 6'x6' Spacing of mulberry ranked Second Since Grand Mean of Survivallity was shown by Rauvolfia Serptentina in 6'x6' Spacing of mulberry plants as Paired bush ranked third from the survivability points of view since it exhibited survivability (Madhusudan *et al.*, 2013). The cumulative overall survivalityb was shown by Asparagus racemous followed by Acorus calaumn Aloe barbandense, cyperus scariosus, Plumbago zeylanica, Rauvlfia Serpentina and andrographis paniculata Which Shows that these medicinal Plants can successfully be grow as intercrops in mulberry gardens (Madhusudan *et al.*, 2013).

When individual Survivability of medicinal plants is considered under all three spacings of mulberry bush/tree it was found that Aloe barbadense, Assparagus racemosus has performed well. It is shown that these medicinal plants may be grown in all the three system (Madhusudan *et al.*, 2013). Results further revealed that Andrographis paniculata Plumbago Zeylanica and Rouvolfia serpentine Exhibited minimum survivability in 10'x10' tree system, hence these systems are not much suitable for intercropping of aforesaid four medicinal plants (Arora, 2006). Significant variation was observed between the survivability of cyperus with Aloe Barbandense, Andrographis paniculata, Asparagus racemous and plumbago Zeylanica at 10'x10' Spacing of mulberry tree, significant Variation in survivability of Rauvolfia Serpentina was observed with that of Aloe Barbadense, Aspargus racemosus (Arora, 2006). And cyperus scariosus while Andrographis paniculas and Rauvolfia Serpentina exhibited significant difference from the survivability of Asparagus racemosus, Acorus Calamus and cyperus scariosus in paired bush system of mulberry (Ahasn *et al.*, 1989). Andrographis paniculata exhibited significant difference with the survivability of Aloe barbadense and plumbago zeylanica also under paired row bush system (Arora, 2006). The medicinal importance and the availability of market in the revealed in this area. These seven medicinal plants very high and if Seri cultural farmers and Govt. Farms take up intercropping of these medicinal plants with mulberry their income will increase manifold (Ahasn *et al.*, 1989).

REFERENCES

- Ahasn MM, Dhar KL, Fotadar RK and Dhar A (1989). Studies on the intercropping of short durations crops with mulberry. *Indian Journal of Sericulture* 28(2) 194- 199.
- Ahasn MM, Dhar KL, Fotadar RK and Dhar A (1989). Studies on the intercropping of short durations crops with mulberry. *Indian Journal of Sericulture* 28(2) 194- 199.
- Arora S (2006). Preliminary assessment of soil and water conservation status in drought prone foot hill region of north-west India. *Journal of World Association of Soil Water Conservation* 5 55-63.
- Fotadar RK and Dhar A (2012). Intercropping mulberry with aromatic plants in Jammu and Kashmir. *Indian Silk* 3(7) 14-16.
- Gargi Sukla P, Kumar D, Kumar R and Pandey RK (1997). Intercropping for profitable in purvanchal. *Indian Silk* 35(11) 31-32.
- Gupta RD, Arora S, Gupta GD and Sumberia NM (2010). Soil physical variability in relation to soil erodibility under different land uses in foothills of siwaliks in N-W India. *Tropical Ecology* 51(2) 183-187.
- Kaur R, Mir MR, Khan MA and Mir S (2002). Intercropping of mulberry with saffron. *Indian Silk* 41(2) 5-6.
- Koul A, Gupta A, Singh D and Gupta SP (1996). Intercropping of vegetables in mulberry. *Journal of Sericulture* 4(20) 48-51.
- Madhusudan Chamoli VK, Varshney PK, Srinivasan Rajeev Pandey and Rameshwar Dayal (2013). Assessment of Biomass Yield ,Essential Oil and Beta Asarone content of Acorus Calamus L. intercropped With Morus alba L. *Journal of Essential oil Bearing Plants* 16(6) 763-770.

Research Article

Pandey RK and Dhar Anil Mulberry (2013). Intercropping for Sustainable Livelihood in Kandi Area of RuralSub-Himalayan, India. Regional Sericultural Research Station, CSB Complex, Miransahib - 181 101, Jammu (Jammu & Kashmir), India. *Research Journal of Agriculture Sciences* **4**(4) 484-487.

Rathore MS, Srinivasulu V, Kour R, DharAnil and Sahaf KA (2012). Biochemical Analysis of Mulberry Associated with intercropping Medicinal Plants under Temperate Condition. *Journal of Pharmaceutical & Scientific Innovation* **1**(4) 45.