

Effect of leaf litter fall on baby corn intercrop under poplar-based agroforestry system

**VIKRAM SINGH, SAMEER DANIEL, RAMCHANDRA and
PREETI YADAV**

**Department of Agroforestry, School of Forestry and Environment, SHIATS
Allahabad 211007 Uttar Pradesh, India**
Email for correspondence: vikramsng051@gmail.com

ABSTRACT

The experiment was conducted to estimate the effects of leaf litter fall on baby corn intercrop under poplar-based agroforestry system at SHIATS, Allahabad, UP during 2015-2016 growth season. The experiment was laid out in randomized block design with three replications. In total ten treatments were tested on different plant characters viz plant height, number of leaves per plant, shoot dry weight, shoot fresh weight, stem diameter, cobs per plant, straw yield, cob yield, weight of leaf litter and harvest index. Analysis of variance showed that they were statistically significant. No removal of leaf litter significantly increased the yield parameters.

Keywords: Baby corn; leaf litter; poplar; yield; parameters

INTRODUCTION

Agroforestry is the intentional combination of trees with crops/livestock/fisheries on the same piece of land and is a verified practice which has the ability to improve both economic and ecological conditions of rural areas. It is a collective name for land use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc) are deliberately used on the same land management unit as agricultural crops and/or animals either in some form of spatial or temporal sequence. In agroforestry systems there are both

ecological and economic interactions between the different components (King and Chandler 1978).

In India no cultivar has been exclusively bred for baby corn purpose. Prolific and early maturing cultivars have been mostly popularized as baby corn cultivars. In order to encourage uniformity in the material more emphasis is to be given towards development of early maturing prolific hybrids. As baby corn with light yellow colour and regular row arrangements fetches better market price, at the time of breeding for baby corn

attention must be kept in this direction. In recent past baby corn has gained popularity in regular vegetable markets in urban areas. However keeping in mind the nutritive value of baby corn there is a need to popularize it further in urban and rural areas. Though baby corn is being sold in domestic market it is being sold without proper processing. As a result there is considerable reduction in quality of the cobs. This is principally due to lack of awareness among the farmers, non-existence of proper storage facilities and location of the farms far away from the market.

MATERIAL and METHODS

The experiment was carried out in the School of Forestry and Environment, Department of Agroforestry, SHIATS, Allahabad, UP during the growing season of 2015- 2016. The soil characteristics of the experiment are shown in Table 1. Plantation of poplar variety G-48 field was selected. The spacing of trees in the field was 9 x 3 m and the baby corn varieties HIM 123 and DHM 107 were sown throughout the field. The same varieties were also sown in an open field near the plantation to serve as control. Three replications of the five treatments were laid out in randomized complete block design. The treatments were T₁ (maize variety HIM 123 in open field), T₂ (maize variety DHM 107 in open field), T₃ (leaf litter removal once a week), T₄ (leaf litter removal once in two weeks), T₅ (leaf litter removal once in three

weeks), T₆ (no leaf litter removal), T₇ (leaf litter removal twice a week), T₈ (leaf litter removal twice in two weeks), T₉ (leaf litter removal twice per three weeks), T₁₀ (no leaf litter removal). Leaf litter was initially removed on 20 November 2016. Thereafter leaves were removed from the plots as per the above schedule.

RESULTS and DISCUSSION

The analysis of variance showed that T₆ (no removal of leaf litter) significantly affected yield components viz plant height at 75 days after sowing (DAS) ranged from 71.33 cm to 79.40 cm (Table 2). The tallest plants were recorded in T₆ (79.40 cm) followed by T₁₀ (78.37 cm) which were found significantly superior over all the treatments while smallest plants were recorded in T₂ (71.33 cm). The maximum number of leaves per plant at 75 DAS was recorded in T₆ (11.00) which was found significantly superior over all the treatments while minimum was recorded in T₂ (3.00). At 75 DAS the highest fresh weight of shoot was recorded in T₆ (167.30 g) followed by T₁₀ (165.93 g) and minimum in T₂ (109.80 g). The highest dry weight of shoot at 75 DAS was recorded in T₆ (47.70 g) which was found significantly superior over all the treatments followed while lowest was recorded in T₂ (28.23 g). The highest stem diameter was recorded in T₆ (20.10 cm) followed by T₁₀ (19.10 cm) which was found significantly superior to all the treatments and the lowest stem diameter

Leaf litter fall effect on baby corn

Table 1. Soil characteristics of the site

Sand (%)	Silt (%)	Clay (%)	Textural class	Organic carbon (%)	N (kg/ha)	P (kg/ha)	K (kg/ha)	Soil pH	EC (dS/m)
58	24	18	Sandy loam	17	43	14.6	24.5	7.6	0.17

Table 2. Effect of leaf litter fall and its impact on the growth and yield components of baby corn

Treatment	Plant height	# leaves/plant	Dry weight of shoot (g)	Fresh weight of shoot (g)	Stem diameter (mm)	Cobs /plant	Cob yield	Harvest index
T ₀	71.90	8.67	30.40	122.70	16.20	1.61	12.62	17.80
T ₁	71.33	8.33	28.23	109.80	15.67	1.43	11.94	17.61
T ₂	75.27	9.67	40.70	149.40	17.07	2.05	20.52	18.03
T ₃	77.07	10.33	43.20	161.43	17.83	2.37	22.65	19.68
T ₄	77.83	10.33	45.23	161.50	18.43	2.62	23.38	19.73
T ₅	79.40	11.00	47.70	167.30	20.10	2.89	24.49	20.14
T ₆	74.00	9.00	32.47	128.70	16.37	1.87	18.79	18.58
T ₇	74.90	9.67	34.30	135.20	16.97	1.92	19.98	18.85
T ₈	76.27	9.67	42.43	160.73	17.33	2.17	21.57	19.00
T ₉	78.37	10.67	45.50	165.93	19.10	2.67	23.46	19.77
T ₁₀	71.90	8.67	30.40	122.70	16.20	1.61	12.62	17.80

T₁: Maize variety HIM 123 in open field, T₂: Maize variety DHM 107 in open field, T₃: Leaf litter removal once a week, T₄: Leaf litter removal once in two weeks, T₅: Leaf litter removal once in three weeks, T₆: No leaf litter removal, T₇: Leaf litter removal twice a week, T₈: Leaf litter removal twice in two weeks, T₉: Leaf litter removal twice per three weeks, T₁₀: No leaf litter removal

was recorded in T₂ (15.67 cm). The maximum number of cobs per plant was recorded in T₆ (2.89) followed by T₁₀ (2.67) which was found significantly superior to all the treatments. The minimum number of cobs was recorded in T₂ (1.43) followed by T₁₀ (2.60 kg) and the minimum cob yield was recorded in T₂ (1.70 kg) and maximum in T₆ (2.80 kg) which was found significantly superior to all the treatments. The highest harvest index at 75 DAS was

recorded in T₆ (9.93) which was found significantly superior to all the treatments followed by T₁₀ (9.47) while lowest harvest index was recorded in T₂ (6.13) (Table 2).

These findings indicate that maximum cobs/plant, straw yield (q/ha) and cob yield (q/ha) increased with the application of the above mentioned treatments. Singh et al (1997) and Kumar and Rajput (2003) found similar findings.

Ahmed et al (2008), Pannu and Dhillon (1999) and Raj et al (2010) also reported similar findings.

REFERENCES

- Ahmed R, Rafiqul Hoque ATM and Hossain MK 2008. Allelopathic effects of *Leucaena leucocephala* leaf litter on some forest and agricultural crops grown in nursery. *Journal of Forestry Research* **19(4)**: 298-302.
- King KFS and Chandler MT 1978. The wasted lands. International Centre for Research in Agroforestry, Nairobi, Kenya, 85p.
- Kumar V and Rajput PR 2003. Studies on yield and yield components of wheat varieties in open and under poplar (*Populus deltoides* Bartr ex Marsh)-based agro-silviculture system. *Plant Archives* **3(2)**: 183-189.
- Pannu NS and Dhillon MS 1999. Production potential of poplar-wheat-based agroforestry system in relation to wheat varieties and their dates of sowing. *Indian Journal of Forestry* **22(3)**: 257-262.
- Raj AJ, Lal SB, Daniel S and Gowda V 2010. Intercropping of lemon grass (*Cymbopogon flexuosus*) with poplar (*Populus deltoides* Bartr ex Marsh) in eastern Uttar Pradesh. *Indian Journal of Agroforestry* **12(1)**: 13-17.
- Singh G, Singh H and Singh J 1997. Effects of *Populus deltoides* litter on its saplings, associated agricultural crops and the properties of an alkali soil. *Journal of Tropical Forest Science* **9(4)**: 536-545.

Received: 25.11.2016

Accepted: 6.12.2016