



Henna (*Lawsonia intermis* L.) base agro forestry system with vegetable crops under vege-medicinal cropping system in Uttar Pradesh.

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Abstract

The innovative field study was laid out during autumn season/summer season of 2000-01 to 2002-03 on farmers' fields. The pilot villages are located on diara land of *Ganga* and *Kali* rivers. The soil of experimental site was sandy loam to light loam in texture, having low fertility status. The treatment comprised, henna + potato, henna + carrot, henna + radish and henna + potato-onion. Henna was already planted by farmers themselves at the distance of 5X5 m² in row under agro-forestry system. The potato was planted at the distance of 50 cm apart in 8 rows between two rows of henna and adjusted 80% plant stand. The carrot and radish each planted in 10 rows at 40 cm apart in the inter spaces of two rows of henna and adjusted 90% plant stand of both crops. The onion was planted in 26 rows at 15 cm apart after harvesting of potato and adjusted 78% plant stand in the inter spaces of henna. The plant stands of selected filler crops were adjusted after leaving the 0.50 m place vacant in both side of henna row for facilitating to the cultural practices. The average yield of henna flowers was found 52.00 q/ha. Among the different agro-forestry system, henna + potato-onion displayed slightly higher flowers yield. The filler crops of potato, carrot, radish and potato yielded by 215.00 q/ha, 155.00 q/ha, 180.00 q/ha and 211.00 q/ha, respectively. The onion planted after digging of potato gave yield by 250.00 q/ha bulbs. Therefore, henna + potato – onion gave system productivity by 513.00 q/ha without any reduction of flowers yield of henna (52.00 q/ha).

Keywords: Agro-forestry, Henna flowers, Interspaces, Filler crops, System productivity.

Introduction

The henna or mehendi is an important medicinal and aromatic plant. It is African shrub, spread in the several part of India. Chiefly in the drier part of the peninsula, but is usually cultivated in hedges. It is also cultivated for commerce in Surat

and Nagaur of Rajasthan, Gurugram and Faridabad of Haryana, Madhya Pradesh and Punjab. In U.P. it is cultivated on diara land of Kannauj, Farrukhabad, Hardoi, Unnao and Kanpur districts in the catchments area of Gangetic river as an aromatic and medicinal plant. Henna leaves have certain medicinal properties.

They are astringent and are used as prophylactic against skin diseases. They are applied locally on boils, burn and skin diseases. A decoction of leaves is used as gargle in sore throat. The paste of leaves is largely used in Indian homes in headache, burning sensation in feet, etc. The leaves have also been shown to have some action against tubercular and other bacteria and typhoid and haemorrhagia. The bark and seeds of the plant are also reported to be used in Ayurvedic and Unani medicine. The chief use of henna plant is as a pleasant organic dye for colouring palms, nails, feet, hair beard even tail and limbs of animals. Henna mixed with other natural dyes, is largely used as hair dye and even for textiles. But the most important use of henna is the preparation of perfumery through its flowers oil.

There is certain drawback in the cultivation of henna in the adjoining area of Kannauj, situated in the catchments area of *Gangetic* river. The farmers do not using the recommended agronomic package of practices and they do not want to shift their entire fields in the cultivation of henna, resulting in, the products, obtain from the plants have low quantity and poor quality. With the consideration of above point, the innovative adaptive trial was planned and carried out on the farmers fields at Kannauj district.

Materials and Methods

The innovative field study was undertaken during autumn season/ summer season of 2000-01 to 2002-03 on farmers fields. The study was undertaken in henna growing tract in the vicinity of Kannauj, where potato, carrot, radish and onion were the major vegetables grown due to heavy market demand. The henna is also growing under farm forestry system. The site of pilot villages is located on diara land of *Ganga* and *Kali* rivers. The soil of experimental site was sandy loam to light loam in texture, having pH 8.3, organic carbon 0.22%, total nitrogen 0.02%, available phosphorus 9.45 kg/ha and available potash 248 kg/ha, therefore, the fertility status of experimental area was low. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was

determined by colorimetric method (Datta, et al., 1962). Total nitrogen was analysed by Kjeldahl's method as discussed by Piper (1950). The available P_2O_5 and K_2O were determined by Olsen's method (Olsen et al., 1954) and Flam photometric method (Singh, 1971), respectively. The treatment comprised, henna + potato, henna + carrot, henna + radish and henna + potato-onion. Henna was already planted by farmers themselves at the distance of $5 \times 5 \text{ m}^2$ in row under agro-forestry system. The potato was planted at the distance of 50 cm apart in 8 rows between two rows of henna and adjusted 80% plant stand. The carrot and radish each planted in 10 rows at 40 cm apart in the inter spaces of two rows of henna and adjusted 90% plant stand of both crops. The onion was planted in 26 rows at 15 cm apart after harvesting of potato and adjusted 78% plant stand in the inter spaces of henna. The plant stands of selected filler crops were adjusted after leaving the 0.50 m place vacant in both side of henna row for facilitating to the intercultural operations, water management and plucking of leaves and flowers and pruning of old branches. The planting of henna was done in July while potato, carrot and radish were planted in the mid of October in inter spaces of henna. The onion was planted after harvesting of potato in mid February. The potato tubers were dug out after 110 days of planting, while carrot and radish pulled out at edible and marketable size of roots. The onion was harvested after 120 days of planting. The recommended dose of fertilizers was given to main and filler crops. The cultural operations were done in each crop as and when required. The irrigations were also given to main and filler crops as and when required.

Results and Discussion

The pooled data of three years are given in Table-1 and discussed here under appropriate heads.

(A) Yield of enterprises: Results displayed that not much variation was found in the flowers yield of henna under different tested agro-forestry system. The average yield of flowers of henna was plucked by 52.00 q/ha. In agro-forestry system of henna + potato and henna + potato –

onion, the slightly higher flowers yield of henna was found; this was due to higher application of plant nutrients in filler crops and more inter-cultural operation.

The filler crops of potato, carrot radish and potato were given by 215.00 q/ha, 155.00 q/ha, 180.00 q/ha and 211.00 q/ha, respectively. The onion planted after harvesting potato yielded 250.00 q/ha bulbs, which was increased the system productivity under agro-forestry system. These

results are in agreement with those reported by Singh (2005).

(B) System productivity: The growing of two filler crop between rows of henna i.e., potato-onion gave system productivity by 513.00 q/ha which was highest as compared to other three tested agro-forestry system Henna + potato, henna + carrot and henna + radish reduced productivity by 244.00 q/ha, 307.00 q/ha and 282.00 q/ha, respectively. This reduction was due to vacant space of henna rows during summer season.

Table-1 : Yield of main and filler crops and system productivity under agro-forestry system.

(Pooled data of three years)

Sl. No.	Treatment	Yield (q/ha)			System productivity (q/ha)	Reduction in productivity in comparison to sequential filler crops (q/ha)
		Flowers yield of Henna	Filler Crop-I	Filler Crop-II		
1.	Henna + Potato	54.00	215.00	-	269.00	(-) 244.00
2.	Henna + Carrot	51.00	155.00	-	206.00	(-) 307.00
3.	Henna + Radish	51.00	180.00	-	231.00	(-) 282.00
4.	Henna + Potato - Onion	52.00	211.00	250.00	513.00	-
	Mean	52.00	-	-	-	-

Conclusion and Recommendation

The henna + potato - onion agro-forestry system gave highest system productivity, therefore, the farm families of henna growing tract may be suggested for adoption of this system and harvest the fruits of newly generated technology.

References

Datta, N.P., Khera, M.S. and Saini, T.R. 1962. A rapid calorimetric procedure for determination of organic carbon in soils. *Journal of Indian Society of Soil Sciences* , 10: 67-74.

Olsen, S.R., Cole, C.V., Watanable, F.S. and Dean, L.A. 1954. Estimation of available phosphorus in soil by extraction with sodium bicarbonate. *U.S.D.A. Circ 939* (Washington): 19.

Piper, C.S. 1950. Soil and Plant Analysis. *Univ. Adelaida Aust.*

Singh, R.A. 2005. Henna (*Lawsonia intermis* L.) cultivation under vege- medicinal cropping system in Central Plain Zone of Uttar Pradesh. *Recent Advances Medicinal & Aromatic Plants*, 15-17 February: 37-38.

Singh, T.A. 1971. A laboratory manual for soil fertility and fertilizer. *U.P. Agril. Univ. Pantnagar, (Nainital)* : 71-74.

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