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SHORT COMMUNICATION

Leaf sampling technique of wood apple (*Feronia limonia*)

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The wood apple (*Feronia limonia* Swingle) is a theory deciduous underutilized fruit tree, belonging to family Rutaceae, found mainly in the forest and as individual 'stray plant' in unused neglected area. The ripe fruit contains sweet aromatic pulp which has high neuceutrical properties. Its leaves, roots and bark posses medicinal properties. The trees are grown without much care and application of manures and futilities are sorely applied. At present, necessity of nutrient-feeding in underutilized fruit trees through organic manures and chemical fertilizers for sustainable production of quality fruits has been well recognized (Ghosh, 2014, Ghosh and Bera, 2014, Sharath and Ghosh, S.N. 2015). NPK are the major nutrients required by any fruit crop in a larger amount which vary according to age, soil status and climatic conditions prevailing in the area. To study the nutritional status of a plant, leaf analysis is considered as one of the realistic tool or method (Bhargava, 1999) where foliar N, P, K values could indicate the status of plant health and productivity (Ghosh, 2014). For knowing values of N, P and K in leaves, time of its collection, i.e. maturity of leaves, is very important. Besides maturity, position of leaves in the plant from where it will be collected, is another aspect of leaf collection. No such data is available in these aspects and therefore an investigation was made in this direction.

The experiment was conducted at the Horticultural Research Station, Mondouri, Bidhan Chandra Krishi Viswavidyalaya, Nadia, West Bengal on 7 year old mature trees of wood apple during 2014-2015. The soil of the experimental orchard was collected before starting of the experiment and analyzed. The soil was sandy loam having surface soil pH 6.80 and available N, P and K were 230.00, 35.20 and 86.0 kg/ha respectively.

For estimation of N, P and K, the newly emergent leaves were tagged randomly in selected 4 trees for monthly collection. The leaves emerged in April that collected in May, was considered as one month old and thus, age of leaves was calculated. In each time 40 leaves/tree in four direction was collected for estimation of N, P and K. After knowing the results of the first year, the leaves were collected from the tagged branches of bottom, middle and top portion of the plant on the basis of plant height in the month of August and September (4-5 month old leaves) during the next year. Leaf N was estimated using micro-kjeldahl method, P by vandomolybdophosphoric acid method and K by flame photometer.

Time of leaf collection

The data in Table 1 indicated that the nitrogen content in leaves varied from 0.74% to 1.18% in different months with different age of leaves. The youngest leaves i.e. one month old (collected in the month of May) had the highest level of nitrogen (1.18%) and the N value decreased with the increase in age of the leaves which reached at minimum level (0.74%) in the month of December. The N value again increased with the peak of 1.10% in the month of March when the leaves were 11 month old. It was noted that foliar N content did not very so much in the month of August-September (1.11 to 1.10%) when age of the leaves was 4 to 5 month and considered as the best time of leaf sampling for estimation of foliar nitrogen. Similar trend of foliar N values in different months was noted in Bael (Ghosh, 2014), another underutilized fruit crops.

Foliar P content also varied with aging of leaves (Table 1). Highest P content (0.24%) was estimated from youngest leaves (one month old) followed by a continuous decreasing trend and lowest P (0.10%) was estimated from the oldest leaves (11 month old). The P content in leaves during August-September (4-5 month old) was found to be stable (0.19 %) and considered as the best time for P estimation.

The K content in leaves of wood apple in different months varied and followed the same pattern as in case of P (Table 1). Highest K (0.96%) was estimated from youngest leaves (one month old leaves) and lowest (0.64%) from the oldest leaves (11 month old). The foliar K value was noted stable in the month of August-September (0.85-0.84%) and considered the best time of leaf sampling for estimation of K.

Position of leaf collection

N, P, K status of leaves collected from different height of the plant has been presented in Table 2. N, P and K values in leaves has been progressively decreased from top to bottom irrespective of month of sampling. It was noted that values of N and P in leaves of top and middle portion did not vary so much as compared to leaves of bottom portion. Considering convenience, the leaves from branches of middle portion should be considered for leave collection for estimation of N & P.

In case of values of foliar K, the difference between the top and middle position of leaves is similar when the value was compared with the middle and bottom position of leaves, irrespective of month of sampling. It was farther noted that values of K of bottom leaves is comparatively very low with the top portion. Keeping parity of work of N and P estimation, the leaves from middle position of branches of tree should also be considered for K estimation also.

Table 1. N,P and K content in leaves of wood apple at different months

Month	Leaf age	Nitrogen (% on dry weight basis)	Phosphorus (% on dry weight basis)	Potassium (% on dry weight basis)
April	Emergence of leaves started	–	–	–
May	1	1.18	0.24	0.96
June	2	1.16	0.22	0.92
July	3	1.14	0.20	0.90
August	4	1.11	0.19	0.85
September	5	1.10	0.19	0.84
October	6	0.82	0.17	0.80
November	7	0.77	0.16	0.76
December	8	0.74	0.14	0.74
January	9	1.00	0.12	0.70
February	10	1.05	0.11	0.66
March	11	1.10	0.10	0.64

Table 2. N, P and K values (%) of leaves of wood apple at different height of the plant

Month	Top Portion			Middle portion			Bottom portion		
	N	P	K	N	P	K	N	P	K
August	1.12	0.19	0.86	1.10	0.17	0.82	1.05	0.14	0.78
September	1.11	0.18	0.84	1.09	0.16	0.80	1.00	0.12	0.76

References

Bhargava, B.S. 1999. Leaf analysis for diagnosing nutrients need in fruit crops. *Indian Horticulture,* 43(4): 6-8.

Ghosh, S.N. 2014. Studies on effect of levels of nitrogen on yield, fruit quality and foliar NPK status of bael. *Indian Journal of Fertilizers*, 10 (4): 14-17.

Ghosh, S.N. and Bera, B. 2014. Effect of differential nitrogen doses on yield, fruit quality and foliar nutrient concentration of water apple (*Syzygium javanica*). *Indian Journal of Agricultural Sciences*, 84 (7): 889-901.

Sharath, A.A. and Ghosh, S.N. 2015. Effect of organic and inorganic nutrition on plant and soil of karonda orchard (*Carissa Carandas*), a semi-wild fruits in India. *Acta Horticulturae.,* 1074: 73-76.