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Short Communication

Assessment of Potential and Utilization Pattern of By-product Foliage in Eastern Uttar Pradesh

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Vegetables appear to be playing a prominent role in prevention of several diseases such as heart disease, cancer, cataract, osteoporosis, diabetes etc..Vegetables are grown for their edible part viz. leafy green, tubers, root, curd, corms etc. After harvesting the crop large amount of leafy foliage is left in the field unutilized itself. It has been reported that leaves of vegetable such as cauliflower, turnip, beet root, and radish are usually discarded after harvest. These by product foliage (leaves) are used sparingly in human nutrition and/or animal feed and largely wasted in the field, vegetable market or home[1, 2]. This kind of by product foliage contains nutritionally important substances.

Main product and by product foliage (leaves) were collected from six vegetables grown at the different farmer's field in the district Kushinagar. Material collected in the morning was brought to the Krishi Vigyan Kendra in plastic bags for analysis and processing**.**

Sample collected manually from four different corner's from the crop field to form representative samples. Harvest was conducted by using a 2x5 meter sampling frame. All plants within the frame were harvested and leafy foliage was manually separated from the main crop harvest (root ,tuber, curd, corms etc.) and weighed to extrapolate foliage yield/ha.

One hundred g of by product foliage was dried in an Oven at 100 degree centigrade till constant weight of dry matter was pulverized/analyzed for N%, crude protein, crude fibre, total ash content. Multistage purposive random sampling design was adopted for the study. District Kushinagar was purposively selected, four blocks namely Doodah, Seorahi, Tamkuhi Raj & Kasia were purposively selected. Villagers i.e. Gauri Sri ram from Dudahi, Gazipur from Seorahi, Barwa raja pakar from Tamkuhi Raj and Laxmipur from Kasia were selected randomly. 30 women from each village were selected randomly and total 120 respondents were selected for the study. A structured interview schedule was prepared and used to collect data and data were statistically analyzed

Data on the yield of main product and by product foliage of the six vegetables crops under study is presented in table-1. The average yield of main product varied from 242.3 q/ha to 480.2 q/ha. Highest yield of total produce was obtained in cabbage crop (I480.2 q/ha) followed by beet root (431.4 q/ha) and carrot crop (414.6 q/ha) Potato crop yielded lowest quantity of main product (242.3q/ha).The yield of by product foliage obtainable from the six crops

varied from 81.8 q/ha to 221 q/ha. Highest quantity of by product foliage was obtained in cabbage crops (221 q/ha) followed by cauliflower (155.7 q/ha), carrot (142.6 q/ha).Potato yielded lowest quantity of by product foliage 81.8 q/ha.

Table 1 Yield of main product and by product foliage

Name of Crop	Total Crop Yield (q/ha)	By product foliage (q/ha)
Cauliflower	264.7	155.7
Cabbage	480.2	221
Radish	259.71	122.4
Potato	242.3	81.8
Beet Root	431.9	137.4
Carrot	414.6	142.6

Data presented in fig. 1 indicate that the dry matter content of by product foliage varied from 9.24 % to 13.6%. Highest dry matter content was observed in the best root by product foliage followed by carrot by product foliage and cauliflower by product foliage. Dry matter content ranged from 18 to 24 % in by product foliage from vegetable crops.

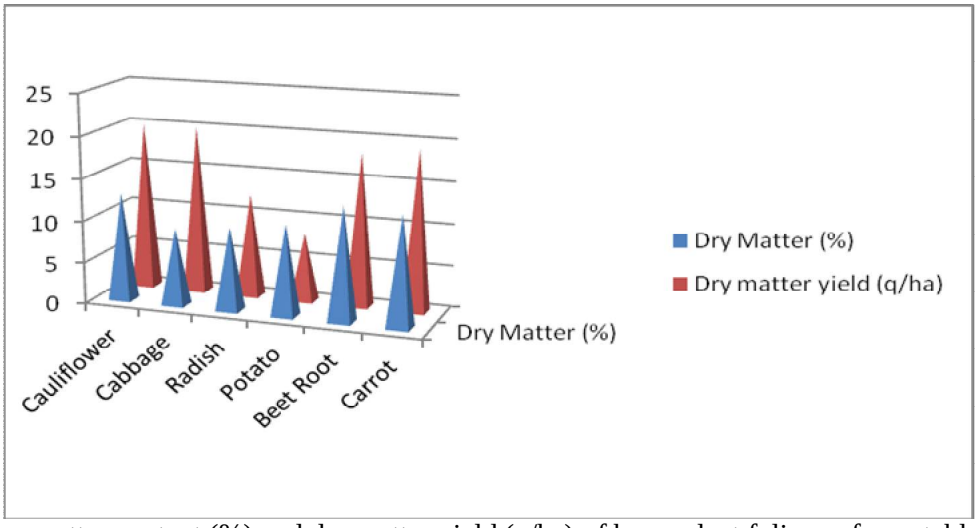

Fig.1 Dry matter content (%) and dry matter yield (q/ha) of by product foliage of vegetables crops

Data pertaining to N% crude protein, crude fiber and ash content of by product foliage of six vegetable crops presented in table 2 indicates that total Nitrogen % (in foliage dry matter) varied from 1.96 to 4.85 %. Highest N% was observed in cauliflower crop (4.85%) followed by radish (4.18%) beet root (3.25%) potato (3.24%). The data indicate that by product foliage of all the six crops contained at least 12.26% crude protein which is higher than protein present in cereals(6-12%). Although protein content was higher in cauliflower foliage (30.34%) carrot foliage was found to have very low protein (12.26%).The crude fiber content varied from 9.10% in carrot to 29.92% in beet root. The ash content in by product foliage was varied from6.36% in radish to 17.29% in cauliflower.

Table 2 Nitrogen%, Crude Protein, Crude Fibre and Ash content in by product foliage of vegetable crops

Sr. No.	Name of Crop	Nitrogen %	Crude Protein%	Crude Fibre %	Total Ash %
1	Cauliflower	4.85	30.34	10.60	17.29
2.	Cabbage	2.31	14.44	12.20	11.51
3.	Radish	4.18	26.12	16.0	6.36
4.	Potato	3.24	20.25	11.30	13.63
5.	Beet root	3.25	20.31	29.92	9.52
6.	Carrot	1.96	12.26	9.10	10.46

The data pertaining to utilization pattern of by product foliage presented in Table-3 indicated the significant consumption of by product foliage of cauliflower, cabbage, radish and beetroot while the by product foliage consumption of potato and carrot was found non significant. Data also revealed that only the consumption of by product foliage of radish was most prevalent among rural families in Eastern Uttar Pradesh i.e., 58.33 percent respondents consumed by product foliage of radish. The by product foliage of potato, carrot and beet root crop were least prevalent (1.67 per cent) and rarely utilized for human consumption. The by product foliage of cauliflower, cabbage was cent percent used for animal feed (100 per cent) while the by product foliage of carrot was least prevalent even for animal feed (1.67 percent). By product foliage of potato was also not consumed by animal as 96.67 percent respondent reported that it was not suitable for animal feed.

Table 3 Utilization pattern of by product foliage

S. No.	Name of Crop	Use for human consumption				Use for Animal consumption				χ^2
		N=120		%		N=120		%		
		Yes	No	Yes	No	Yes	No	Yes	No	
1.	Cauliflower	4	116	3.33	96.7	120	-	100	-	224.516***
2.	Cabbage	-	120	-	100.00	120	-	100	-	240.000***
3.	Radish	70	50	58.33	41.67	30	90	25.0	75.00	27.429***
4.	Potato	2	118	1.67	98.33	4	116	3.33	96.67	0.684
5.	Beetroot	2	118	1.67	98.33	110	10	91.67	8.33	195.268***
6.	Carrot	2	118	1.67	98.33	2	118	1.67	98.33	0.000

(*** significant at 0.1% level of significance)

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