

Short communication

Macro and micronutrient removal pattern of different parts of perlette grapes

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Perlette is an important grape cultivar, which is extensively grown in Punjab, Haryana and adjoining areas of Rajasthan. One of the major factor for profitable grape production is the judicious application of fertilizers. However, farmers are not judiciously applying manures and fertilizers as per the recommendations. The information regarding nutrient removal pattern helps in assessing the nutrient requirement of a plant. This further helps in standardization of fertilizer requirement of plants. Very little information is available regarding nutrients removal by grape vines. Hence a field experiment was conducted on uniform eight years old perlette grape vines, to find out the nutrient removal through different parts of the plant. The grape vines were yielding 31 kg/ vine. The soil of the experimental field was sandy loam and calcareous alkaline in reaction (pH 8.4), EC 0.23 dS m⁻¹, low in organic carbon (0.33%), medium in available P (17.60 kg/ha) and was high in available K (374 kg/ha). The vines were pruned to 3-4 buds per cane with a total number of 45 canes/ vine at the time of annual pruning during January, 2005. Cultural practices were followed as per PAU, recommendation (Anonymous 2005). To study the nutrients removal by leaves, all the fallen leaves under the vines were collected between March and October and their weight was recorded in the month of October and sample drawn for the analysis of nutrients. Nutrient removal through berries was studied by collecting all the berries from five bunches of the experimental vines at the time of berry ripening. The berries were washed and were used for analysis. During annual pruning in 2006, pruned wood was collected for analysis after washing it properly with 0.1 N HCL and double distilled water. Nitrogen was estimated by Nessler's reagent method, P by vanadomolybdate phosphate yellow colour method, K by flame photometry and calcium and, manganese, were estimated by versenate methods (Chang and Bray 1951; Jackson 1967 and Piper, 1966)). To determine the micronutrients, plant material was

digested in diacid and micronutrients were determined by using atomic absorption spectrophotometer. Total nutrient removal through wood, leaves and berries was calculated by computing the nutrient concentration and total dry weight.

The data present in Table 1 indicate that among the macronutrients the highest total uptake was observed in case of Potassium (259.00 g/vine) and it was minimum (47.3 g/vine) for Mg content. In total 210.26 g N, 148.61 g Ca and 52.12 P were removed by vines. Magnesium content did not differ significantly among the different plant parts. Nitrogen, Phosphorus and potassium content were removed maximum through berries followed by wood and leaves. The leaves removed higher amount of Ca than berries and pruned wood. This might be due to poor mobility of Ca towards other parts of the plant. The data further revealed that the least amount of N, P and K were removed through leaves. The available literature on nutrient removal pattern is rather confusing and vast differences exist in the reported amount of nutrients removed in different localities. In the present investigation, vines removed maximum potassium from the soil. This might be due to higher amount of availability of potassium in the soil solution. The results are in conformity with the findings of Arora *et al.* (1991)

Among the micronutrient Fe removal was maximum (2405 mg/vine), whereas minimum (204.13 mg/vine) removal was observed in case of Cu (Table 2). The uptake of zinc (215.15 mg/vine) and Fe (972.00 mg/vine) was maximum in case of wood followed by leaves and berries). Copper uptake

Table 1. Uptake of macronutrients by grapevines CV, perlette (g/vine)

	N	P	K	Ca	Mg
Berries	136.31	33.32	208.92	26.33	16.65
Wood	42.95	11.55	26.33	39.13	15.05
Leaves	31.01	7.25	23.75	83.25	15.68
Total	210.37	52.12	259.00	148.61	47.38
C D at 5%	13.11	3.44	26.69	12.07	NS

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Table 2. Uptake of micronutrients by grapevines CV, perlette (mg/vine)

	Zn	Cu	Mn	Fe
Berries	73.63	128.45	476.01	563
Wood	215.15	42.87	546.00	972
Leaves	154.56	32.81	795.77	870
Total	443.34	204.13	1817.00	2405
CD 5%	29.64	23.62	102.69	67.80

was highest in berries (128.45 mg/vine). Manganese uptake by various parts amounted 1817 mg/vine and leaves removed higher amount of Mn than berries and wood. The results are in conformity to the findings of Dehen *et al.* (1988).

It can be concluded from the results that perlette grapevines is heavy feeder of the various nutrients and there is need to supply sufficient amount of nutrients to the soil to obtain the proper yield from the grapevines.

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