# Nutrients removal pattern by grape vines cv. PERLETTE

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## ABSTRACT

In a field experiment, nutrient removal by the grape vines was studied The results indicated that the highest total uptake was observed in case of Potassium (259.00g/vine) and lowest (47.38g/vine) of Mg. The total removal of nitrogen, calcium and phosphorus were amounted 210.26, 148.61 and 52.12 g/vines, respectively. Among the micronutrients Fe removal was maximum, and minimum of Cu. The uptake of zinc and Fe was maximum in case of wood followed by leaves and berries.

**Key words :** Nutrients removal, Grape vines, Nitrogen, Calcium, Phosphorus, Cu, Zinc, Fe.

**P**erlette 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 fertilizes. However, farmers are not 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, the present study was conducted at Punjab Agricultural University, Regional Station, Bathinda.

## MATERIALS AND METHODS

A field experiment was conducted on eight years old perlette grape vines, to find out the nutrient removal through different parts of the plant. The grape vines were yielding 31kg/ vine. The soil of the experimental field was sandy loam and calcareous alkaline in reaction (pH 8.4), Ec 0.23 dsm$^{-1}$, 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 Nesseler's reagent method, P by vanadomolybdate phosphate yellow colour method, K by flame photometry and calcium and, mangnesium were estimated by versanate methods (Chang and Bray, 1951; Jackson, 1967 and Piper, 1966). To determine the micronutrients, plant material was digested in diacid mixture of $HNO_3 : HClO_4$ (2 : 1) 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.

## RESULTS AND DISCUSSION

The data present in the Table 1 indicate that among the macronutrients the highest total uptake was observed in case of Potassium (259.00g/vine) and minimum of Mg (47.38g/vine). Total amount of 210.26 g N, 148.61 g Ca and 52.12 P were removed by vines. Magnesium contents 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

**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. (P=0.05) | 13.11 | 3.44 | 26.69 | 12.07 | NS |