



**To achieve** a more complete assessment of seasonal nutrient distribution, below-ground plant parts were considered. Although annual accumulation of N in roots was relatively minor, amounts for P and K were more significant. This is an example of roots for sampling

senesced leaves and harvested fruits can be supplemented by applying appropriate amounts of nutrients. Assuming that two-thirds of accumulated nutrients are derived from fertilizer and using fertilizer N, P, and K use efficiencies of 50%, 40%, and 50%, respectively, the recommended application rate would be 136-55-187 kg N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O/ha. According to the characteristics of nutrient uptake during the growing season, fertilizer N should be split evenly between the three stages of nutrient demand described above. About 50% of this P recommendation should be supplied prior to fruit expansion

and 70% of K recommendation should be applied prior to the flourishing of new shoot growth.

As is indicated, the recommended rates of N, P, and K in this study are significantly lower than those that have been traditionally used, especially in the case of N and P. Although this suggests N and P have been overused for grape production in Shaanxi, it still needs to be confirmed whether this new recommendation, rationalized according to seasonal crop demand, can sustain high yielding grape production and soil nutrient balances. **DC**

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## Conversion Factors for U.S. System and Metric

Because of the diverse readership of *Better Crops with Plant Food*, units of measure are given in U.S. system standards in some articles and in metric units in others...depending on the method commonly used in the region where the information originates. For example, an article reporting on corn yields in Illinois would use units of pounds per acre (lb/A) for fertilizer rates and bushels (bu) for yields; an article on rice production in Southeast Asia would use kilograms (kg), hectares (ha), and other metric units.

Several factors are available to quickly convert units from either system to units more familiar to individual readers. Following are some examples which will be useful in relation to various articles in this issue of *Better Crops with Plant Food*.

To convert Col. 1 into Col. 2, multiply by:	Column 1	Column 2	To convert Col. 2 into Col. 1, multiply by:
Length			
0.621	kilometer, km	mile, mi	1.609
1.094	meter, m	yard, yd	0.914
0.394	centimeter, cm	inch, in.	2.54
Area			
2.471	hectare, ha	acre, A	0.405
Volume			
1.057	liter, L	quart (liquid), qt	0.946
Mass			
1.102	tonne <sup>1</sup> (metric, 1,000 kg)	short ton (U.S. 2,000 lb)	0.9072
0.035	gram, g	ounce	28.35
Yield or Rate			
0.446	tonne/ha	ton/A	2.242
0.891	kg/ha	lb/A	1.12
0.159	kg/ha	bu/A, corn (grain)	62.7
0.149	kg/ha	bu/A, wheat or soybeans	67.2

<sup>1</sup>The spelling as "tonne" indicates metric ton (1,000 kg). Spelling as "ton" indicates the U.S. short ton (2,000 lb). When used as a unit of measure, tonne or ton may be abbreviated, as in 9 t/ha. A metric expression assumes t=tonne; a U.S. expression assumes t=ton.