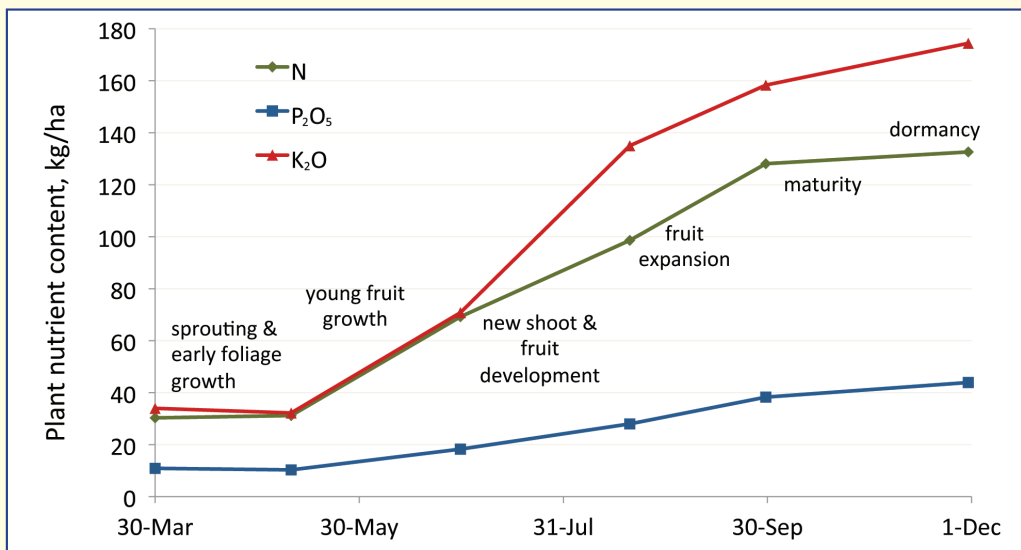


### Module 5.1-3 Patterns of uptake for nitrogen, phosphorus, and potassium by grape plants in Shaanxi, China affect recommendations for application timing.

A study was conducted in Fufeng County, located on the western reaches of the Guanzhong Plain in Shaanxi of China, to identify nutrient uptake by 7-year old grape plants according to plant development stage. The figure below shows the increase in N, P, and K content in grape plants during the growing season. Between March 30 and November 30, grape plants accumulated an average of over 102 kg N/ha, 33 kg P<sub>2</sub>O<sub>5</sub>/ha, and 140 kg K<sub>2</sub>O/ha mainly in three distinct stages: 1) the period between sprouting/early foliage growth and new shoot/fruit development; 2) the period between early fruit development and fruit expansion; and 3) the period after fruit expansion up to fruit maturity. These respective periods saw 38%, 29%, and 29% of the total N accumulation, 22%, 29%, and 31% of P accumulation, and 26%, 46%, and 17% of K accumulation. 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 the 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. **Source:** Tong, Y., et al. 2010, Better Crops with Plant Food, Vol. 94, No. 2, 29-31.



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### Module 5.1-4 Splitting the dose makes calcium more available to peanuts.

Calcium uptake by plants is closely related to transpiration. Peanut plants have difficulty redistributing Ca from roots, stems and leaves to the developing pods, and thus more than 90% of the Ca required by the pod is taken up directly from the soil by the pod. Thus, adequate levels of available Ca after flowering are needed in the soil zone where peanut pods are developing. A pot experiment was conducted to determine the effect of time of Ca fertilizer application on peanut yield and Ca uptake. The table below shows that a single basal Ca application increased peanut yield by 10 to 24%. Split application of either gypsum or calcium nitrate produced 3 to 7% more yield and 11 to 30% more Ca recovery than basal application alone. Based on this work, pre-bloom applications of soluble Ca are necessary for high yield of peanuts. **Source:** Lin, B. et al. 1997. Chinese Journal of Soil Science, 28(4): 172-174.

Treatments	100% basal		50% basal + 50% topdressing at flowering	
	Yield, g/pot	Ca recovery, %	Yield, g/pot	Ca recovery, %
NPK	26	-	26	-
NPK+CaSO <sub>4</sub>	29	9	30	10
NPK + Ca(NO <sub>3</sub> ) <sub>2</sub>	30	10	32	13

Submitted by S. Li, IPNI, China, December 2011.