

When and how to fertilize fruit plants

IT is well known that, in addition to carbon, hydrogen and oxygen, fruit trees require other essential nutrients to grow and produce an abundant harvest, just like vegetables, flowers and other plants. Carbon, hydrogen and oxygen are taken up by the plants from water and air, while all other nutrients are found in the soil in varying amounts depending upon the fertility of soil. While applying the fertilizers in fruit plants we should be very careful about the time, method and dose of fertilizer application. Unless application of nutrients is adequate and timely, the plant growth and fruit quality will be adversely affected.

THE amount of fertilizer to be applied is influenced by the age, soil type, cultural practices and anticipated fruit yield. So, it is very essential to balance the optimum fertilizer dose for maintaining good plant health. While managing the nutrients or applying fertilizers to the fruit plants one must take care of the following points:

- 1. When to fertilize:** To improve the efficiency of applied nutrients, they should be made available at the most required time like vegetative growth phase, just before bud break and fruit growth phase. These timings vary from crop to crop and are influenced by number of factors. For example, in evergreen fruit crops like mango and Litchi, whole of farmyard manure (FYM) and phosphatic fertilizer i.e. Single Super Phosphate (SSP) in December and Nitrogen (Urea) along with potassic fertilizer (Muriate of Potash) should be applied in February. In Litchi, FYM, SSP and muriate of potash (MOP) must be applied in December and half of urea in the middle of February and other half in the middle of April, i.e. after fruit set. Whereas, in Kinnow and other citrus fruits, apply FYM during the month of December. Nitrogen is applied in two splits- the first split should be applied in the month of February and second split in April-May after fruit set. Whole of phosphorus should be applied along with first split of

nitrogen. In case of guava, FYM should be applied in May and half of the inorganic fertilizers should be applied in May-June and remaining half in September – October. Whereas in case of deciduous fruit plants like pear, peach, plum etc. FYM, SSP and MOP should be added in December. Half of urea should be added in early February before flowering and other half in April after fruit set. Apply whole quantity of FYM in the month of May – June to Ber crop. Urea may be applied in two split doses i.e. first dose during July-August and the second dose soon after the fruit set.

- 2. Measure to decide if you need to fertilize:** Not all fruit trees need fertilizer every year and don't need it in the same amounts. Fertilizer requirement of the fruit trees may vary year to year depending upon variety of factors. Application of fertilizer in excess than the requirement will be wasteful in terms of excessive vegetative growth; too rapid growth makes a tree weak structure, and may have harmful effects on both the crop and environment. Whereas, too little fertilizer cause slow growth, poor health and less ability to fight with diseases. Like other crops, fruit plants also show their nutrient needs in the form of deficiency symptoms. Early spring or winter is the best time to



Nitrogen deficiency in citrus

measure the previous year growth as the plant at that time is in dormancy. For measuring previous

year growth, first we have to locate last year growth rings. The growth ring is the point on the branch where the tree started growing in previous season and this new growth is always different in colour. Measure all the rings up to the end of the branch and repeat measurement at several spots around the tree. You will see that same tree of same variety behave differently growth wise and thus have different fertilizer requirements.

3. **Choose the right fertilizer:** Fruit crops are of long duration and deep rooted with high initial investment as compared to other field crops. Fruit plants prefer organic manures. In addition to this, the need of essential macro and micronutrient of the crop is generally fulfilled by applying chemical fertilizers. Therefore, one must be aware of the soil type and its fertility parameters even up to sub-soil layers in order to get better fruit growth and high production. Soil testing is an important, basic and easy tool to understand the fertility status and suitability of the soil for various fruit crops. Leaf analysis is the other most excellent way to know the exact status of nutrients in plants. Based on the fertility status of the soil and nutrient requirements of the fruit plants, orchardists have to decide the right kind of fertilizer to be applied. Fruit growers must be well familiar to deficiency symptoms of various nutrients (Table1) so that they can manage the nutritional aspect of the orchards in a better way.
4. **Calculate how much fertilizer to use:** The amount of fertilizer you will use is calculated based on the age or size of the tree. For example, one to three year old mango needs 5-20 kg FYM /tree and dose of urea, SSP and MOP is around 100-200 g, 250-500 g and 175-350 g respectively. However same tree at the age of 4-6 years need 25-50 Kg FYM and 200-400 g, 500-750 g and 350-700 g urea, SSP and MOP respectively. Similarly fertilizer requirements of various fruit trees are given in Table 2.

- 5 **Methods of fertilizer application:** In order to obtain maximum benefits from fertilizers, it is essential that fertilizers are applied to the fruit plants at a proper time and at a proper place. The time and method of fertilizer application depends upon the nature of fertilizer, soil type and nature of fruit crop. Commercial fertilizers may be applied to the soil in various ways including broadcasting, band placement, perforated (holes) and liquid application. Generally method of fertilizer application to soil depends upon the orchard management practices and type of fertilizer being used. Nitrogen fertilizers are easily soluble in water and move rapidly in all directions from the place of application. Therefore, it may be broadcasted on the soil or applied in narrow band around the periphery of the tree. The fertilizers are applied at least 30 to 60 cm away from the stem and are well mixed in the soil. If the orchard is under grasses, band placement is suggested. Phosphatic and potassic fertilizers move slowly in soil and these should be placed at least 6 inches deep. While making holes/ bands, roots should not be damaged. Besides this, plants also absorb nutrients through leaves and these nutrients so absorbed are easily and freely translocated in the plants. Foliar application of the nutrients is obviously an ideal way to avoid plant nutrient availability and supplementing fertilizers to the soils.



Phosphorous deficiency in guava



Potassium deficiency in guava



Table 1. Identification of deficiency symptoms showing the need of fertilizer in fruit plants

Nutrient	Deficiency symptoms	
Nitrogen (N)	Yellowing appears on lower (older) leaves resulting in stunted growth, poor flowering and fruit set and ultimately smaller fruit size. In case of severe deficiency, the colour of lower leaves turns into red or orange colour in some fruit plants.	 Nitrogen deficiency in kagzi lemon
Phosphorous (P)	Deficiency symptoms first appear on older leaves. The new leaves appear healthy while the older become dull green, lusterless and abscise prematurely. Water soaked and bronze necrotic areas on margins and tips can be seen on some older leaves.	 Phosphorous deficiency in guava
Potassium (K)	Deficiency symptoms first appear on older leaves as N&P. Tips and margins of the leaves become yellow thereafter leaves become red turning reddish brown or brownish grey. The leaves show bronzed necrosis, crinkling and cupping alongwith stunted growth. Deficiency symptoms may start appearing on new leaves also in case of severe deficiency.	 Potassium deficiency in banana

Note: N, P and K deficiencies can be corrected by applying urea, single super phosphate (SSP) / Diammonium phosphate (DAP) and muriate of potash (MOP) respectively.

Table 2. Fertilizer requirements of various fruit plants according to their age

S. No	Name of the Fruit crop	Age of tree (year)	Farm Yard Manure (FYM) Kg per tree	Fertilizer dose per tree (g)		
				Urea	SSP	MOP
1.	Kinnow	1-3	10-30	240-730	-	-
		4-7	40-80	970-1690	1370-2400	-
		8 & above	100	1940	2730	-
2.	Citrus (other than Kinnow)	1-3	5-20	110-330	-	-
		4-6	25-50	440-550	-	-
		7-9	60-90	660-880	-	-
		10 & above	100	880-1760	-	-
3.	Guava	1-3	10-20	150-200	500-1500	100-400
		4-6	25-40	300-600	1500-2000	600-1000
		7-10	40-50	750-1000	2000-2500	1100-1500
		Above 10	50	1000	2500	1500

S. No	Name of the Fruit crop	Age of tree (year)	Farm Yard Manure (FYM) Kg per tree	Fertilizer dose per tree (g)		
				Urea	SSP	MOP
4.	Mango	1-3	5-20	100-200	250-500	175-350
		4-6	25-50	200-400	500-750	350-700
		7-9	60-90	400-500	750-1000	700-1000
		10 & above	100	500	1000	1000
5.	Pear	1-3	10-20	100-300	200-600	150-450
		4-6	25-35	400-600	800-1200	600-900
		7-9	40-50	700-900	1400-1800	1050-1350
		10 & above	50	1000	2000	1500
6.	Ber	1	20	200		
		2	40	400		
		3	60	600		
		4	80	800		
		5 & Above	100	1000		
7.	Litchi	1-3	10-20	150-500	200-600	60-150
		4-6	25-40	500-1000	750-1250	200-300
		7-10	40-50	1000-1500	1500-2000	300-500
		Above 10	60	1600	2250	600
8.	Peach	1-2	10-15	180-360	190-380	150-30
		3-4	20-25	540-1000	570-760	450-830
		5 & Above	25	1000	760	830
9.	Grapes	1	20	400	1500	250
		2	35	500	2500	350
		3	50	600	3500	500
		4	65	800	4000	650
		5 & Above	80	1000	4500	800
10.	Plum	1-2	6-12	60-120	95-190	60-120
		3-4	18-24	180-240	285-380	180-240
		5-6	30-36	300-360	475-570	300-360
		Above 6	36	360	570	360
11.	Sapota	1-3	25	220-660	300-900	75-250
		4-6	50	880-1300	1240-1860	340-500
		7-9	75	1550-2000	2200-2800	600-770
		10 & above	100	2200	3100	850
12.	Loquat	1-2	10-20	150-500	200-500	150-400
		3-6	25-40	600-750	500-1200	600-1000
		7-10	40-50	800-1000	1500-2000	1100-1500
		Above 10	50	1000	2000	1500

While fertilizing the fruit plants, the fruit grower must take into account the cultivation practices, age of plants and all other aspects that affect the performance of the plants. There is need of thorough observation of every part of the orchard to see the desired fruit size, colour, the terminal growth and yield, based upon which future alterations in fertilizer programme

may be made.

For further interaction, please write to:

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