



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

- The perennials are different from annuals in their nutritive requirements.
- The annuals require fewer nutrients when gradually falls as the crop matures.
- Whereas, in perennials there are often two or three peak periods of uptake owing to the occurrence of more than one vegetative flush and crop.
- Manure requirement of perennials gradually increases with the age of the tree till the trees reach their full growth and thereafter remains constant.
- Depending upon the requirements, we may have to supplement by applying manures and fertilizers at the appropriate time.
- **Fertilizers**
Industrially manufactured chemicals.
- Contains higher nutrient than organic manures.
- Nutrient input is lost through leaching, runoff, volatilization, fixation by soil or consumption by weeds etc.

Organic fertilizers

- These are plant and animal wastes that are used as nutrients after decomposition.
- Improves the soil tilth, aeration, water holding capacity and activity of micro-organisms.

Where to apply manures ?

- In fully grown trees, the manures and fertilizers should be given over the area, where their active roots are spread.
- Fertilizer should be given in restricted area i.e., in the surrounding area of about 1 to 1.5 m away from the trunk of the trees.

Time of Fertilizer Application

- It must be applied when the plants need it.
- Timing depends on the type of fertilizer and climate.
- Fruit trees require more nutrients at the emergence of new flushes and differentiations of floral buds.
- Utilized more during the course of fruit development.
- Nutrients should be available to them in February –March.
- So, it would be better to apply them in October-November to be available to the trees in February to March.

Nutrient Contents of Organic Manures

Organic Manure	N %	P ₂ O ₅ %	K ₂ O %
Bulky organic manures			
Cattle dung	0.40	0.20	0.17
Poultry manure	3.03	0.63	1.40

Farmyard manure	0.50	0.25	0.50
Rural compost	0.75	0.20	0.50
Urban compost	1.75	1.00	1.50
Vermicompost	3.00	1.00	1.50
Concentrated organic manure			
Castor cake	4.37	1.85	1.39
Coconut cake	3.00	1.80	1.90
Neem cake	5.22	1.08	1.48
Blood meal	12.00	2.00	1.00
Groundnut cake	7.30	1.50	1.30
Pressmud	2.10	4.40	0.80

Nutrient Contents of Organic Manures

Fertilizer	Composition %		
	N	P ₂ O ₅	K ₂ O
Sodium nitrate	16	-	-
Calcium nitrate	15.5	-	-
Potassium nitrate	13.8	-	-
Anhydrous ammonia	82	-	-
Urea	46	-	-
SSP	-	16	-
Double SP	-	32	-
Triple SP	-	46-48	-

Methods of Fertilizer Application

Broadcasting

- Fertilizer in solid state or granular or dust are spread uniformly over the entire field.
- Leaching loss may be more.

Disadvantages

- Some of the elements like phosphorous and potash do not readily move in the soil. Therefore, surface application may not be available to the trees especially in drier tracks.
- Leads to accumulation of potassium in surface soil beyond detrimental levels causing injury to plants.
- Surface application always stimulates weed growth.

Band placement

- Application of fertilizer on the sides of rows.
- Fertilizer in solid and liquid forms can be applied.
- Quantity of fertilizer may be economised.

Ring Plancement

- Commonly followed in fruit trees.
- Fertilizers are applied in a ring encircling the trunk of the trees extending the entire canopy.
- It is more labour intensive and costly.

Foliar Application

- Fertilizers are applied in liquid form as foliar sprays.
- They are easily absorbed by leaves.
- Fertilizers are applied in a very low concentration tolerable to the leaves.
- Recommended when the nutrients are required in small quantity.

Starter Solution

- Liquid form of fertilizer application.
- Seedlings and propagules are kept emerged up to their root system for varying duration in starter solution.
- The starter solution is prepared either by dissolving concentrated fertilizer mixture at a concentration not exceeding 1%.

Fertigation

- Application of fertilizers in irrigation water in either open or closed systems.
- Nitrogen and sulphur are the principal nutrients applied.
- Phosphorous fertigation is less common because of formation of precipitates takes place with high Ca and Mg containing water.

Advantages

- Nutrients especially nitrogen can b applied in seveal split doses at the time of greatest need of the plant.
- Nutrient is mixed with water and applied directly near the root zone, as such higher use efficiency.
- Cost on labour is saved.

Best results of fertigation are noticed when the fertilizer is applied towards the middle of the irrigation period and applied towards the middle of the irrigation period and their application terminated shortly before completion of irrigation. Use of soluble fertilizer improves use efficiency.

Note: The grower must consider the economics and advantages before deciding for using fertigation.

Tree Injection and Tree Feeding

Tree Injection

- Direct injection of essential nutrients into the tree trunk.
- Iron salts are injected into chlorotic trees that are known to suffer from iron deficiency.

Feeding Needles

- Several types of feeding needles or guns are available.
- With these fertilizers either in dry form or in water solution placed in holes.

Factors favouring nutrients absorption and transport

- High humidity, proper temperature and incident radiation.
- Good CHO supply and vigorous growth.
- Chemical and physical properties of nutrient spray solution.
- Leaf characters like leaf thickness, hairyness and wax coating on the leaf.
- Generally more vigorous plant and young growing leaves have good capacity to absorb nutrients.
- Nitrogen- applied in the form of urea (1%) is readily absorbed.
- Sodium and potassium (KCl) - readily absorbed by leaves and they are among the highly mobile Elements.

Note

- *Foliar application proves to be most effective where problems of nutrient fixation in soil exists. So far the most important use of foliar sprays is in application of micronutrients.*
- *Foliar sprays should be applied either with pressure sprayer or with specially designed spray guns. The trees should be sprayed until the nutrient solution begins to drip from the leaves.*
- *Foliar application of urea has been found effective in many fruit crops like citrus, guava ,apple, etc.*
- *Potassium spray (3-5g/lit)- Papaya, Pineapple, Citrus and Guava.*

Precautions

- *While applying foliar sprays, care should be taken to ensure correct concentration of spray solution.*
- *Apply in the morning or evening hours on a clear sky day.*