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FERTIGATION : AN EFFECTIVE TOOL FOR ENHANCING WATER AND NUTRIENT USE EFFICIENCY IN FRUIT CROPS

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Fertigation has great potential for the enhancing the efficient use of water and fertilizers. Application of water and nutrients through drip irrigation promotes maximum water and nutrient efficiency by reaching the active root zone of plants and thus minimizing the wetting area and therefore reducing various losses pertaining to nutrients and water. Fertigation minimizes the losses of nutrients through leaching. Additionally, application of fertilizer along with drip irrigation water also reduces the costs associated with irrigation and fertilizer application. Through fertigation, water use efficiency could be achieved as high as 90% as compared to 30-40% in comparison to other conventional methods of application.

What is Fertigation?

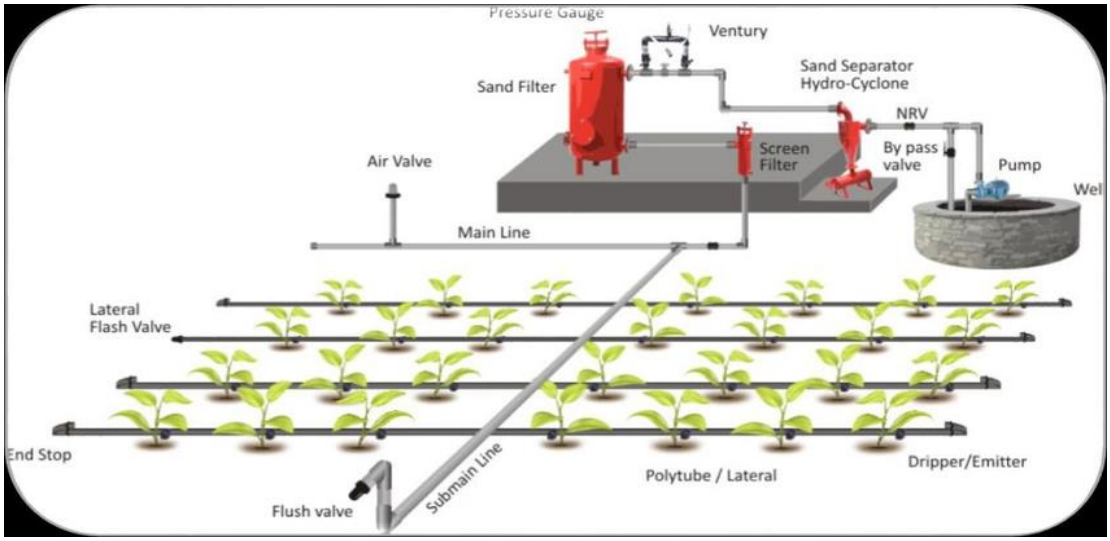
The technique of fertigation was first observed in late 1960s in Israel. Fertigation is a process that combines fertilization and irrigation. Fertilizer is added to an irrigation system. It is most commonly used by commercial growers. Fertigation rather than traditional fertilization approaches is purported to target the plant's nutrient deficiencies more effectively. It also reduces soil erosion and water consumption, reduces the amount of fertilizer utilized, and controls the time and rate it is released. But does fertigation work in the home garden?

Why Fertigation?

- Higher yields and better quality crops:
- Increased efficiency of nutrients:
- Reduction of groundwater pollution:
- Greater convenience and economy:
- Efficient application of microelements:

Fertilizer Used in Fertigation

Urea, potash and highly water soluble fertilizers are available for applying through fertigation. Application of super phosphorus through fertigation must be avoided as it makes precipitation of phosphate salts. Thus phosphoric acid is more suitable for fertigation as it is available in liquid form. Special fertilizers like mono ammonium phosphate (Nitrogen and Phosphorus), poly feed (Nitrogen, Phosphorus and Potassium), Multi K (Nitrogen and Potassium), Potassium sulphate (Potassium and Sulphur) are highly suitable for fertigation purpose as they are highly soluble in water. Fe, Mn, Zn, Cu, B, Mo are also supplied along with special fertilizers.



Effect of Fertigation on Soil Nutrient Status

Sustainability of any production system requires optimal utilization of resources. Fertilizers are one of the most important farm inputs, which need to be utilized most judiciously and efficiently. It is well known fact that nitrogen (N) is the most required nutrient in nitrate (NO_3^-) form. However, nitrate form of N does not adsorbed on the exchange sites of soils and is loosely held in the soils and therefore vulnerable to various losses. Whereas, Nitrate fertilizers applied through drip irrigation system as per the requirement of the plants' following the uptake of nutrients has positive effects on reducing leaching losses. Potassium, however, is less mobile than nitrate, but its distribution in the wetted soil volume may be more uniform due to interaction with soil's binding sites. Phosphorus, in contrast to K, is readily fixed in many soils although movement of applied P differs with soil texture. Potassium fertigation of prune trees resulted in better K movement to a depth of 60-70 cm where the soil was wet and roots were abundant, thus enhancing K uptake.

Conclusion

Fertigation has greater impact on enhancing fertilizers use efficiency over conventional fertilization methods besides saving about 30% in irrigation water. Higher initial installation cost and comparatively low technical skills of Indian farmers are some of the major constraints limiting the

large scale adoption of drip fertigation technology in the country. But, with increasing concerns of water scarcity and escalating fertilizer prices may lead to greater adoption of the technology especially in high return fruit crops.