

Research Paper :

Calibration of fertilizer tank

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ABSTRACT

Fertigation is the application of water-soluble fertilizer through irrigation. It is simple in construction and easy to handle than other equipment. Fertilizer tank should be calibrated for time required for application of one batch of fertilizer. Advantages of fertigation are to save fertilizer and application of fertilizer to the crop root zone in required quantity and at required time. Fertilizer tank is simple in operation and need not require any external power. Supply of nutrients increases their availability, the waste of there being leached out to below rooting depth and consequently improves efficient usage in comparison with other methods of application. In present study, twelve plots were selected in the experimental plot with varying concentration of fertilizer. Then samples were tested with the help of flame photometer for determining distribution efficiency. From this the fertilizers were uniformly distributed all over the field.

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Fertigation is the application of water-soluble fertilizer through drip irrigation system. Drip irrigation offers the opportunity for precise application of fertilizer to soil because root develops extensively in the restricted volume of soil wetted by drip irrigation. Application of fertilizer through the irrigation system can efficiently place the nutrients in that zone in which roots are of highest concentration.

Fertilizing through irrigation water in drip irrigation is called so far, for two reasons: one is the continuous or almost continuous water supply, directly to the root zone of plant which makes the application of minerals when necessary (and only then), where it is required and in correct quantity this means a saving in materials work prevention of harmful accumulation of minerals in the soil and no plant stress.

Fertilizer can be injected into drip irrigation system by selecting appropriate equipment from a wide variety of available pumps, valves, timers, equipments having inherent merits and demerits. Suction of fertilizer through the intake of pump is a common method of application. However, corrosive fertilizer material will cause pump to deteriorate. In some cases, water pressure on suction side is such that it does not allow the fertilizer solution to flow in to the pump.

Fertilizer tank is another method of injecting fertilizer into drip irrigation systems. The PD units take advantage of systems pressure head differences. Pressure differences can be developed by valves, venturies, elbows or pipe friction. The main advantage of fertilizer tank is absence of moving parts. They are simple in operation

and require no external power. They can operate whenever water is flowing and pressure drop is present. The primary disadvantage of fertilizer tank is that the rate of application is not constant and changes continuously with time, thus a uniform concentration of nutrient can not be maintained. Also this system is not portable. However among the available devices of fertigation, fertilizer tank are easy to operate, less costly, requires less maintenance, very little information is available on mode of operation of fertilizer tank, especially as to how the chemical concentration varies with time and period required to flush all the fertilizers into the drip system. Keeping this in view, an experiment was planned to be conducted.

METHODOLOGY

Selection of field and fertilizer: Before starting calibration of fertilizer tank, a plot having four years old citrus (Sweet orange) plants was chosen. In all there were 655 plants located at spacing of 5.5x5.5m. The soil was 1 meter deep categorized as medium black, having almost of uniform slope.

Location:

The experimental plot was located at village Tattu Jawala, Tq. and district Parbhani (M.S.), 10 km from Parbhani and the name of farmer was Vijay Bapusaheb Adkine.

Experimental details:

The experiment was laid for the sweet orange and