

MOVEMENT AND DISTRIBUTION OF MOISTURE, PHOSPHORUS AND POTASSIUM UNDER DRIP FERTIGATION IN ROSE

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ABSTRACT

Field experiment was conducted to study the distribution pattern of moisture, P and K under drip fertigation at Coimbatore in rose crop. Soil samples were collected at 0, 15, 45 and 75 cm distance horizontally away from the emitting point and at 0-15 and 15-30 cm depth using core sampler. These samples were analysed for moisture, available P and K content. From the results it was inferred that drip fertigation provides the most effective way of supplying water to the plant roots. Drip fertigation can also be used to supply any water soluble fertilizer in precise amounts, as and when required to match the plant needs or any other agronomic management thereby enhancing the nutrient use efficiency. Thus, fertigation proved a promising technique for increasing the water and nutrient use efficiency in the crop production.

Key words : Fertigation, Moisture, Phosphorus,
Potassium, Rose.

Development of pressurized irrigation systems in the form of drip and sprinkler systems marked the era of precise water application in small quantities which was not feasible with the traditional surface methods. These pressurized irrigation systems are very useful particularly in undulating difficult to level, very coarse textured soils and where, water is either very expensive or scarce or of poor quality. Irrigation development and fertilizer use have always gone hand in hand and played a key role in enhancing the overall productivity of a region. In addition, nitrogen, phosphorus and potassium are also essential for crop production. In general the phosphorus status of our soil is low and potash, a nutrient considered adequate in soils all over the world has now been reported to be deficient in vast areas in recent years. Hence, there is always a compelling need to develop the suitable management strategies to increase the P and K use efficiency. Applying fertilizers through irrigation water particularly through drip system, termed as fertigation, also provides the most effective way of supplying nutrient to the plant roots. Considerable number of experiment have been conducted on drip irrigation in recent years. However, studies on the distribution of moisture, phosphorus and potassium under drip fertigation in rose are very few. Hence a study was conducted to investigate the moisture, phosphorus and potassium distribution pattern under drip fertigation.

MATERIALS AND METHODS

A field experiment was carried out in farmers field at Vellakinar village, Coimbatore district with rose variety Andhra red. The soil is clay loam in texture having pH 7.78 and EC 0.14 dS m⁻¹. The available nitrogen, phosphorus and potassium status of the soil was low (263 kg ha⁻¹), low (9.16 kg ha⁻¹) and high (670 kg ha⁻¹), respectively. Characteristics of the irrigation water used in the field were pH 7.18, EC 0.88 dS m⁻¹, Residual Sodium Carbonate -14 and Sodium Adsorption Ratio 1.46. Based on these parameters irrigation water was classified as medium saline water. Rose was planted at 150 x 150 cm distance. Fertilizers were applied as per the fertigation schedule given in Table 1.

Soil samples were collected at 0, 15, 45 and 75 cm distance horizontally away from the emitting point and at 0-15 and 15-30 cm depth using core sampler. Based on the spacing between two crops horizontal distance between 2 samples was fixed. Soil samples were collected for six times around the crop in two directions which is mentioned as x and y. Moisture content of the soil was recorded by gravimetric method. Soil samples were analysed for available phosphorus (Olsen *et al.*, 1954) and potassium (Stanford and English, 1949).

RESULTS AND DISCUSSION

Soil moisture distribution :

Under the conventional method of irrigation one dimensional downward flow of water from the entire soil surface takes place. Whereas, under trickle irrigation