

Effect of organic, inorganic and biofertilizer on plant growth and chlorophyll content of acid lime (*Citrus aurantifolia* Swingle.)

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ABSTRACT

Field experiment was carried out for two years to find out the feasibility of organics(FYM and pressmud), inorganics(iron pyrites), biofertilizer(VAM) and either alone or in combination with iron pyrites(IP) in acid lime grown in calcareous soils. Among different treatments, application of individual higher dose of FYM @ 50 kg plant⁻¹ and in combination treatments, integrated use of iron pyrites @ 200 g plant⁻¹ along with FYM 25 kg + PM 2 kg plant⁻¹ were found to be more beneficial for obtaining higher plant height, girth, volume and chlorophyll content in Acid lime. The significant increase in plant growth characters is due to better synthesis of chlorophyll and assimilates in the large photosynthetic area.

Key words : Citrus, Acid lime, INM, Plant growth, Chlorophyll.

Citrus is a high priced fruit crop having significant importance in the fruit economy of our country. It is the second fruit crop in India with respect to area and third largest with respect to production after mango and banana. In Andhra Pradesh, the important citrus species are acid lime and sweet orange(Sathgudi). Acid lime is grown in arid and semi-arid regions of many districts. Out of which 50 per cent of the state total area and production come from Nellore district alone. Due to more remunerative price in the district, new acid lime plantations are raised in less suitable soils like calcareous soils, which needs special attention in nutrition other wise the growth and productivity of orchards is reduced (Aariff Khan, 2001). In recent years, citrus farmers in the district are habituated in using the readily and easily available chemical fertilizers regularly with decreased use of organic manures viz., FYM, compost, oil cakes and green leaf manure due to shortage of their availability in bulk quantities as well as transport and labour cost.

Among the organic inputs, press mud as a waste product of sugar factory is a source of many nutrients and organic carbon is largely available in the local area with five sugar factories are operating in and around the Nellore district. Iron pyrite a waste product of iron and coal mines is very useful for calcareous soils as it is a cheap source of both iron and Sulphur and it could be effectively utilized for improving the citrus productivity under calcareous soils. Vesicular arbuscular mycorrhizae (VAM) is most important biofertilizer suitable for citrus orchards as it has strong affinity with citrus roots, In view

of the increased availability of press mud and dwindling supply of FYM, investigations have become imperative to assess their combinations and dosage levels of all possible organic, bio fertilizer inputs with and with out iron pyrites as inorganic input.

MATERIALS AND METHODS

A field experiment was conducted on 3 year old acid lime seedlings cultivar kagzi lime for 2 consecutive years in 1997-98 and 1998-99 at citrus research station, Petlur, Nellore district, Andhra Pradesh. The experiment was laid out with 19 treatments replicated thrice by following randomized block design. Well decomposed farm yard manure at 2 levels @ 25 and 50 kg plant⁻¹, press mud at 2 levels @ 4 and 8 kg plant⁻¹ as organic source, iron pyrites as inorganic source at 3 levels @ 100, 200 and 300 g plant⁻¹ and VAM as biofertilizer @ 150 g plant⁻¹ was used for the study. In addition to a recommended dose of N, P₂O₅, K₂O(1125-450-600 g plant⁻¹ for three year aged and 1500-600-800 g plant⁻¹ for four year old) in 2 split doses i.e. in January and July were applied uniformly to all plants. Out of the recommended dose of nitrogen, 50% was supplied through urea and the remaining through organic manure i.e. 25% N each through FYM and neem cake. Where as entire dose of P₂O₅ and K₂O were supplied by super phosphate and muriate of potash respectively.

The experimental surface and sub soil was slightly alkaline reaction (8.25-8.69), non-saline (0.24-0.32 d S m⁻¹) and calcareous nature (CaCO₃ 16.5-20.5%) with very low organic carbon content (0.28-0.12%). The plant growth parameters such as height, girth and volume were recorded at the beginning of the experiment and at end