Journal of Horticulture
ISSN: 2376-0354

Extended Abstract

Impact of Compost, Humic Acid and Mineral Fertilizers on Growth and Fruiting of Guava Trees

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Abstract

Response of Guava (*Psidium guajava* L.) trees of six years old planted on clay loam soil to farm residues compost , Humic acid or Humic either alone or together and supplemented with the half dose of traditional chemical fertilizers was studied during 2010 and 2011 seasons. The obtained results indicated that organic fertilizers supplemented with the half dose of traditional chemical fertilizers (1.75 kg ammonium sulphate 20.6% N, 0.75kg Potassium sulphate 48% K_2O and 0.75 kg calcium super phosphate 15.5% P_2O_5 per tree) significantly increased tree fruiting and improved fruit physical and chemical quality characteristics. Also, leaf area, dry weight and NPK content of leaves were increased, as well as shoot length and thickness. The treatment of 4 kg compost associated with 20 gm Humic acid in combination with the half dose of traditional chemical fertilizers per tree was superior to other treatments, while organic fertilizers without chemical fertilizers exerted low effect.

Key words: Guava- compost- Humic acid- fruiting – fruit quality – leaf area- dry weight- NPK content of leaves – shoot length- shoot thickness.

Introduction

Guava (Psidium guajava L.) is one of the most popular fruit in Egypt, characterized by it is high nutritive value and considered a reach source of vitamin C and several nutrients that are needed for human nutrition and improving their health condition. Besides, guava can be used for manufacturing some food products such as jam, jelly or juice [1].Guava *[2]* is used not only as food but also as folk medicine in subtropical areas around the world because of its pharmacologic activities. In particular, the leaf extract of guava has traditionally been used for the treatment of diabetes in East Asia and other countries.

Many pharmacological studies have demonstrated the ability of this plant to exhibit antioxidant, hepatoprotective, anti-allergy, antimicrobial, antigenotoxic, antiplasmodial, cytotoxic, antispasmodic, cardioactive, anticough, antidiabetic, antiinflamatory and antinociceptive activities, supporting its traditional uses. Suggesting a wide range of clinical applications for the treatment of infantile rotaviral enteritis, diarrhoea and diabetes [3].In addition, guava is successfully grown in various types of soil because it can tolerate drought and salinity conditions as compared to many fruit trees under the same condition **[3]**

In recent years, the intensive used of chemical fertilizers led to pollution problems which harmfully affected human and animal health **[4]**. In addition to its high costs, there was no doubt that reducing the use of chemical fertilizers led to an advantages that save human and animal health and environment balance **[5].**

Humic substances (HS) have been widely recognized as a plant growth promoter mainly by changes on root architecture and growth dynamics, which result in increased root size, branching and/or greater density of root hair with larger surface area. Stimulation of the H+-ATP ase activity in cell membrane suggests that modifications brought about by HS are not only restricted to root structure, but are also extended to the major biochemical pathways since the driving force for most nutrient uptake is the electrochemical gradient across the plasma membrane. Changes on root exudation profile, as well as primary and secondary metabolism were also observed, though strongly dependent on environment conditions, type of plant and its ontogeny. Proteomics and genomic approaches with diverse plant species subjected to HS treatment had often shown controversial patterns of protein and gene expression. This is a clear indication that HS effects of plants are complex

and involve non-linear, cross-interrelated and dynamic processes that need be treated with an interdisciplinary view.

Being the humic associations recalcitrant to microbiological attack, their use as vehicle to introduce beneficial selected microorganism's crops has been proposed. This represents a perspective for a sort of new bio fertilizer designed for a sustainable agriculture, where by plants treated with HS become more susceptible to interact with bio inoculants, while HS may concomitantly modify the structure/activity of the microbial community in the rhizosphere compartment. An enhanced knowledge of the effects on plants physiology and biochemistry and interaction with rhizosphere and endophytic microbes should lead to achieve increased crop productivity through a better use of HS inputs in Agriculture [6].

Organic fertilizers (especially, those gets from natural and clean sources) were found to increase growth, fruiting and fruit quality of many horticultural crops and at the same time, they are safe for human, animal and environment. The beneficial effect of humic acid on growth, fruiting and fruit quality of many horticultural crops were studied by several workers.This investigation was carried out by the aim of studying the response of guava trees to organic fertilizers (i.e. compost or Humic acid) in a trial to reduce the amount of chemical fertilizers used in guava fertilization.

Material and Methods

This investigation was carried out during two successive seasons of 2010 and 2011 in a private orchard at Abo-Zabal, Qalubia Governorate investigate the effect of farm residues compost , Humic acid (potassium humate) either alone or together and supplemented with the half dose of traditional chemical fertilizers on growth, fruiting and fruit quality of late maturity clone of guava.

Selected trees were six years old, planted on clay loam soil, subjected to flood irrigation and received regularly the same cultural practices. In the previous season of the study (2009), the trees used under this study were selected to be similar in growth vigor, flowering time, fruit physical characteristics and maturity time. Flowering take place on late June and maturity started on late October.

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