Comparing Response of Melon (Cucumis melo) to Foliar Spray of Some Different Growth Stimulants under Two Nitrogen Fertilizer Forms

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A field experiment was conducted on melon (Cucumis melo var. reticulatus Naud, cv. Rodin hybrid) grown in a sandy loam soil during the two successive seasons of 2015 and 2016 in a private farm at EL-Sadat City, Minofia Governorate, Egypt to assess the response to foliar spray with four treatments i.e., distilled water (DW), yeast extract (YE), Lithovit® (micronized calcium carbonate) (LV) and Delfan® (amino acids) (DF), and two treatments of nitrogen application i.e., N₁: 50% of the recommended N as mineral-N + 50% of the recommended N as organic manure (compost), and N₂: 100% of the recommended rate as mineral-N. The recommended rate of N is 170 kg N ha⁻¹. Lithovit gave the highest increase in plant length, leaf area, weight of shoots per plant, total chlorophyll, fruit diameter, fruit weight, fresh yield, nutrient uptake, total sugar, and total soluble solids. For some plant traits (fruit diameter, fruit weight, fresh yield, nutrient uptake, total sugar and total soluble solids) YE gave the second highest increase. N₁ treatment was superior to N₂ in nearly all traits. Spraying with both LV or YE gave the highest fresh yield and the best fruit quality. The highest values were obtained when LV was sprayed either with 50% mineral-N + 50% organic-N or 100% mineral-N, or when YE was sprayed with 50% mineral-N + 50% organic-N. These increases for the above mentioned treatments reached 28.78, 27.27 and 26.30% as an average in both seasons for total yield, as compared with plants supplied with 170 kg mineral-N and sprayed with the distilled water (control).

Keywords: Yeast extract, Calcite carbonate, Amino acids, Organic manure, Compost, Nutrient uptake.

Introduction
Melon (Cucumis melo) is an important vegetable crop in temperate, subtropical and tropical regions and has a widespread popularity (Teppner, 2004). It is low in fat and sodium, with no cholesterol and contains essential elements and vitamins (Lester, 1997 and Grubben et al., 2004). Decreasing the use of synthetic fertilizers and chemicals and increasing the use of natural materials to fertilize vegetable crops is preferred for human health (Roy et al., 2006). Yeast extracts are natural substances suggested for spraying edible crops to increase their yield and improve their quality (Abou-El-Nasr et al., 2001, Kabeel et al., 2005 and Fawzy, 2007) since they are rich in minerals, amino acids, enzymes, vitamins and phyto-hormones, especially cytokinins (Barnett et al., 1990, Fathy and Farid, 1996 and Khedr and Farid, 2002). Such extracts stimulate division and enlargement of cells as well as synthesis of proteins, nucleic acid and chlorophyll (Kraig and Haber, 1980, and Castelfranco and Beale, 1983) and participate beneficially against stress conditions due to their contents of cytokinins (Barnett et al., 1990). Increased growth and productivity of vegetable crops upon foliar spraying with yeast extracts were noticed by many researchers; on tomatoes (Fathy et al., 2000), beans (Amer, 2004), peas (El-Desouky et al., 2008), eggplants (El-Tohamy et al., 2006), and potatoes (Ahmed et al., 2011 and Malash et al., 2008).

Amino acids are precursors or activators of phyto-hormones which are fundamentals in protein synthesis (Pratelli and Pilot, 2007 and Marschner, 2012). Their sprays proved beneficial for vegetable crops such as strawberry (Abo-Sedera et al., 2010) and tomatoes (El-Desouky et al., 2011). Amino acids participate in synthesis of compounds including purines, pyrimidines,