

تأثير مياه المجارى على الأيض والمحصول فى نبات الفول البلى

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EFFECT OF SEWAGE WATER ON GROWTH, METABOLISM AND YIELD OF FABA BEAN PLANTS

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ABSTRACT: Two pot experiments were conducted under greenhouse conditions to study the effect of sewage water on growth analysis, water relations, plant pigments, certain biochemical composition and yield of faba bean plants. This experiment was performed in the Department of Agricultural Botany, Faculty of Agriculture, Minoufiya University, during successive season of 2008/2009. The sewage water was diluted with tap water to give three rates of 25, 50 and 75% used in irrigation. Plant sample was successively taken at random from every treatment starting 45 DAS. The results showed that sewage water increased all growth characters, total protein, total carbohydrates, activity of enzymes and proline as well as yield. The concentration of Zn, Mn, Cd and Pb were increased greatly in the different faba bean organs in response to sewage water application. Photosynthetic pigments, rate of water loss, relative water content were decreased by of sewage water Irrigation.

Key words: Sewage water, Faba bean, Growth, Enzymes activity, Heavy metals, Yield

PROTECTION OF TOMATO PLANTS AGAINST COLD STRESS BY USING ANTIOXIDANTS, CHILLING HARDENING AND JASMONIC ACID.

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ABSTRACT:

Two field experiments were carried out under cold weather conditions of winter seasons of 2008 and 2009, to study the effect of some treatments i.e., chilling, Jasmonic acid, salicylic acid and selenium on growth, relative water content, membrane leakage, biochemical constituents, early yield and its components of tomato plants. All treatments under study significantly increased fresh and dry weight of leaves, stems and roots, leaf area and net assimilation rate. Moreover, these treatments significantly increased RWC, chlorophyll a , b and (a + b) and compatible osmolytes (proline, total sugars, total amino acids and K⁺). Meanwhile, all treatments significantly reduced membrane leakage compared to control plants. Also, the previous treatments significantly increased N and P concentration, early yield, total yield and fruit quality (Vit.C and T.S.S.). The most effective treatments were SA and Se followed by chilling and JA compared with control plants. The data suggest that SA and Se play an important antioxidant role in protecting tomato plants from cold stress condition, and plants showed a better performance which reflected higher early yield and good fruit quality.

Key words: Cold stress, Antioxidants, Selenium, Salicylic acid, Membrane leakage, Catalase, Peroxidase, Phenolo

TOLERANCE OF PEA PLANTS TO DROUGHT STRESS IN RELATION TO ANTIOXIDANT APPLICATION

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ABSTRACT:

Pea plants cv. Master B was grown in pots Experiment to investigate the effect of selenium (Se) and salicylic acid (SA) as antioxidants in relation to drought stress. The experimental treatments included three water regem levels; 100% of field capacity control (W0); 60% of field capacity (W1) and 40% of field capacity (W2) and two antioxidants such as Se (0.6 mM) and SA (0.5 mM). The growth, physiological and chemical composition as well as yield of pea plants were determined. The drought had decreases in plant height, root length, leaf area, root / shoot ratio and produced less dry matter as compared with the control plants (W0). Relative water content (RWC), water use efficiency (WUE), pressure potential, enzymes activity, total soluble sugars, total free amino acid and K were decreased in droughted plants. Supplementary Se and SA ameliorated the negative effect of drought on the previous parameter. Membrane permeability in leaves increased under water stress and this increase was adversed with Se and SA treatments. Total weight of green pods, average number of green pods and weight of seeds / plant were increased in the plants treated with Se and SA than those under drought stress(W1 and W2)

Key words: Drought, Antioxidant, selenium, salicylic acid, , peroxidase, catalase, compatible osmolyte, yield.

ARE ORGANIC WASTES PLAY IMPORTANT ROLE IN REDUCING ROOT-KNOT NEMATODES POPULATION?

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ABSTRACT:

In this research, three organic wastes namely: marjoram (*Majorana hortensis* L.); green tea and black tea (*Camellia sinensis*) were evaluated at three rates 10, 20 and 50 g/plant with two application methods as soil treatment powder and soil drench after soaking in water overnight, to study its effect on the population of root-knot nematodes, *Meloidogyne* spp. under naturally infested field soil cultivated with tomato. Results confirmed that all applied treatments either at the three rates or with the two application methods, significantly reduced all related nematode parameters i.e. number of galls, egg-masses and number of females/root system; number of eggs/egg-mass; number of second stage juveniles/250 g soil as well as the final nematode population (PF) and the reproduction factor (RF) when compared to plants treated with nematode only. Application of green tea at 50 g/plant recorded the highest effect in reducing the nematode population followed by the treatments of black tea at 50g/plant, and green tea at 20g/plant, while the lowest one was showed with marjoram at 10g/plant. The same trend of results were showed with plant growth parameters i.e. fresh and dry shoot & root weights; root length and plant height. Chemical constituent characters i.e. membrane leakage (ML %); total soluble sugars, total amino acids, total phenols as well as the antioxidant enzymes i.e. peroxidase, phenoloxidase and catalase recorded significant enhancement when compared with the positive and negative control. The highest enhancement in all chemical constituents found with the application of green tea as a powder at 50 g/plant. Results also revealed that all applied treatments saved the root cells in normal case and reduced the development of giant cells compared to the plants treated with nematode alone.

Key words: Antioxidant enzymes, Organic wastes, Green tea, Black tea, Marjoram, Root-knot nematodes, Tomato