Physiological response of canola plants (Brassica napus L.) to tryptophan or benzyladenine

DAWOOD G. Mona, SADAK Mervat S. - National Research Centre, Egypt

Two pot experiments were conducted at the National Research Centre during two successive seasons to investigate the influence of two foliar treatments -to10 and12 weeks old plants- with tryptophan or benzyladenine at 25,50,75 mg/L on the growth of canola plants (Brassica napus L.var. Pactol) as well as their influence on the yield; photosynthetic pigments; endogenous hormones and the chemical composition of the yielded seeds. Exogenous application of tryptophan or benzyladenine considerably increased plant growth as shoot height; shoot circumference; number of leaves; fresh and dry weight of shoot; leaf area and number of inflorescences/plant. The effect was more pronounced with 75mg/L tryptophan or benzyladenine. Significant increases in the yield parameters were recorded from treatment with 75mg/L tryptophan or benzyladenine. These increases were 8.9% and 15.6% respectively in the number of pods/plant; 5.6% and 17.4% in the number of seeds /pod; 33.2% and 24.5% in the weight of pods/plant; 31.7% and 21.6% in the weight of seeds/ plant. Photosynthetic pigments showed the same tendency with the highest concentration of tryptophan or benzyladenine. The increase percentage reached 52.5% and 43.2% respectively in total chlorophylls; 38.3% and 37.9% in carotenoids. The quantitative amounts of endogenous GA3 and IAA increased concomitant with decrease in ABA in response to all treatments. The contents of oil; protein; total carbohydrates and phenolic compounds of the yielded canola seeds increased gradually with concentrations of tryptophan or benzyladenine. It is worthily to mention that treatment with tryptophan at 75mg/L showed the highest increases in the chemical constituents of the yielded seeds than the other treatments. Total saturated fatty acids decreased while total unsaturated fatty acids and essential fatty acids increased due to all treatments .Special attention was paid to the influence of tryptophan or benzyladenine on the amount of erucic acid in the yielded seeds which was noticeably decreased with the two compounds. The decrease percentage due to tryptophan was 18.8% and 25.9% using 25 or 50mg/L, whereas using benzyladenine with 25 or 50 mg/L decreased the amount of erucic acid to 30.6% and 23.5% respectively. Higher concentration from the two compounds approximately had no effect.