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Alterations in growth of maize seedlings influenced by mixed tetraoxanes

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Application of natural or synthetic substances could increase maize vigor, particularly of seeds with poor viability. The aim of this experiment was to examine the influence of five mixed tetraoxanes (T1–T5) on germination and early growth (seven-day old seedlings) of maize inbred line, from the lot with high germination ability (>90%-G1) and low germination ability (<50%-G2). After soaking in tetraoxanes solution (10^{-6} and 10^{-9} M) for 24h, at room temperature, the seeds were germinated under controlled laboratory conditions on filter paper (BP, 20–30°C, ISTA Rules). Results show diverse effects of applied treatments. The significant increase in germination of 21.3% (10^{-9} M) for G2, as well as in seedlings roots and shoot fresh biomass for both lots, were observed in T1 treatment. The highest increase of seedlings root and shoot dry matter (8.79% and 8.08% for G1, as well as 9.52% and 8.99% for G2, respectively) was obtained by T4 treatment. For G1, increased seedlings root to shoot ratio for fresh matter, was achieved with T4 (10^{-9} M), while for G2, T3 brought the highest values of the ratio for both fresh and dry matter. For G1, increased seedlings root to shoot ratio for dry matter was achieved under T4 (10^{-9} M). All applied treatments increased hydrolysis and biosynthesis. The highest hydrolysis values for G1 was achieved by T2 (0.1640 g) and for G2 by T1 treatment (0.1187 g). The highest values of biosynthesis were achieved under T4 for both G1 and G2 (0.0723 and 0.0426 g, respectively). For G2, interdependence between germination and seedlings root and shoot fresh matter, and between hydrolysis and biosynthesis, implied a significant and negative correlation between germination rate and root fresh matter. Moreover, significant increase in germination rate for G2 was followed by increase in seedlings root and shoot fresh matter, hydrolysis and biosynthesis.