

ABSTRACT

Present research work was carried out during 2008 growth season at the Botanic Garden of GC University, Lahore by growing corn (*Zea mays* L.) cultivar 974AW in pots and ascertaining the impact of ethylenediurea (EDU) on its growth, nutritional harmony, and some ecophysiological attributes. Three concentrations of EDU viz., 150 ppm (T₁), 300 ppm (T₂), and 450 ppm (T₃) along with normal tap water as control (T₀) were given to the corn plants as a soil drench after 5 days interval throughout the experimentation. Three major harvests were taken in order to find out any impact of EDU on plants biomass, biochemical aspects, physiological attributes, and on yield.

EDU had a strong positive effect on the above referred to parameters, but it is worth mentioning that only T₂ treatment (300 ppm EDU) proved reliable than rest of the treatments when compared to non control (T₀). For instance, compared with control in T₂ treatment, plant height was increased by 39%; number of green leaves by 63%; chlorophyll a by 81%; chlorophyll b by 60%; total chlorophyll contents by 70%; rate of photosynthetic rate by 98%; transpiration rate by 75%; and stomatal conductance by more than 1500%, demonstrating that EDU ensures plants healthy growth due to the increases in the above parameters.

Data for fresh and dry weight of shoot on the average of two harvests were increased by more than 250%, and 260%, respectively in T₂ treatment plants. Fresh and dry weights of roots also followed the similar pattern. Nitrogen and protein contents in the leaves were higher in EDU-treated plants and the differences were statistically highly significant. Both nitrogen and protein levels were higher in T₂ treated plants than control (around 274% and 147%, respectively). Potassium and phosphorous contents in the leaves of com plants were also appreciably higher (58% and 52%, respectively) in EDU treated plants from T₂ treatment than control.

Reproductive growth of EDU-treated corn plants over control was significantly higher. T₂ treatment especially showed maximum productivity (198% higher number of cobs per plant; 17% higher cob length; 100% higher number of grains per cob; and 70% higher average grain weight).

The study, thus demonstrated that EDU is an antioxidant/antiozonant chemical that protected the plants from ambient air pollution (especially ozone pollution), and the better growth & development of treated plants was mainly due to their improved metabolism that resulted in more nutrients (organic & inorganic) available to plants. Thus, it was established that EDU not only protected the plants from air pollutants but also improved their health through a combination of enhanced biochemical and physiological parameters in treated plants but the exact mechanism of EDU-protection and its influence on plant's health is not yet unveiled.