

Effect of ultraviolet radiation on plant biochemical properties

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Abstract

Depletion of the ozone layer leads to increased ultraviolet radiation, which affects the growth and functioning of plants and leads to their various physiological, biochemical, morphological and ultrastructural changes. When studying the effect of ultraviolet radiation on seed sowing qualities and biometric indicators of morphological organs of plants of various cultures, scientists did not come to a consensus on the optimal parameters of its effects. For seeds of each plant variety, there is an optimal amount of energy absorbed, resulting in a maximum effect. Ecologically significant low ultraviolet radiation changes the metabolism of reactive oxygen species and plant antioxidant systems by increasing enzyme regulation. The relevance of studies in this direction is obvious, as it allows you to stimulate the germination of seeds with physical influences, increasing their laboratory and field germination. The authors obtained and published new data on comparison of sown, crop and antioxidant properties of seeds and seedlings, seed viability, microzelenium biomass formation and change of total antioxidant activity of vegetable crops after thermodehydration. As a continuation of these studies, the purpose of this work was to study the effect of ultraviolet radiation on the biochemical properties of plants. The total antioxidant activity of sugar beet and nougat sprouts in the experiment increased under the influence of stress ultraviolet radiation. Compared to control samples (germination according to GOST in the dark), under the influence of ultraviolet radiation, antioxidant activity increases by 11.4-17.4% otn. Ultraviolet radiation is damaging factors of plant growth and development, which is manifested at different stages of ontogenesis. Thus, sowing properties are reduced (germination of sugar beet seeds is less than control by 18%, in nougat seeds by 12%), above-ground biomass at the end of the germination period is less by 49.0% in sugar beet and by 16.5% in Abyssinian nougat. Resistance to the damaging effects of ultraviolet radiation depends on the genetic nature of the plant: in the experiment, the sprouts of the Abyssinian nuga turned out to be more resistant.

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