

Influence of the Herbicides Amitrole and Norflurazon on Greening of Illuminated Potato Microtubers

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Potato microtubers turn green within a few days when kept in the light. The initial phases in this process were observed as early as 12 hours after the onset of illumination. The changes included a pronounced increase in chlorophyll and carotenoid concentrations, accompanied by changes in the protein pattern and in the transformation of amyloplasts and leucoplasts to chloroplasts. The bleaching herbicides amitrole and norflurazon inhibited the synthesis of carotenoids in the illuminated potato microtubers. However, amitrole only delayed greening and an increase in chlorophyll and carotenoid levels became visible as late as four days after the onset of illumination, and the LHC II protein of the photosynthetic membrane was not detected before the seventh day of light exposure. Norflurazon, in contrast, acted as a stronger inhibitor, and microtuber tissues stayed yellowish throughout the experiment. The concentrations of both carotenoids and chlorophylls were very low in tissues treated with this herbicide. The LHC II protein could not be detected after a seven-day light exposure and the plastids were damaged, small in size, without normal thylakoids and with numerous plastoglobules.

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