
Development of methods for determining the absorption spectrum of biological systems by an example of plants

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The purpose of the article is to study the optical characteristics of plants to create optimal lighting sources. We examined the method of measuring the spectral characteristics of biological systems on the example of cultivated plants. It has been established, that the absorption coefficient is significantly reduced when developing. As a result of constructing an average weighted absorption spectrum of a crop plant leaf, it was revealed that the absorption maxima belong to the region at wavelengths of 670 nm and 485 nm. Maximal changes in the absorption coefficient between the samples of the first cotyledons and mature second sheet at wavelengths of 485 nm and 670 nm were respectively equal to $24,786 \text{ cm}^{-1}$ and 25.7 cm^{-1} . We estimated measurement results and test methods, and made conclusions about how to measure the absorption spectrum of cultivated plants. On the bases of the measured absorption spectra of the selected leaf crop we expect to develop an adaptive illuminator for crop production.

Keywords: *adaptive, absorption spectrum, the spectral characteristics, absorption coefficient.*

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