

Plants could use light even more effectively for food production

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(Phys.org) -- Scientists from Wageningen University have concluded that it is possible to develop plants that produce even more food by reducing the level of pigments which make no contribution to photosynthesis. The conclusion is based on research into the effectiveness of photosynthesis in various light conditions, which was carried out in cooperation with the VU University in Amsterdam. The scientists discovered that leaf pigments not directly involved in photosynthesis 'dissipate' light by absorption rather than using it effectively. Their findings were published in the scientific magazine *Plant Cell*.

Scientists around the world have been studying issues related to how [plants](#) use light colours for [photosynthesis](#) for over 70 years. Now research into the effectiveness of photosynthesis in various light conditions has answered some of the most important questions. It has shown that plants efficiently adapt their leaves to the light colours present where they grow. In this way they use the available light as effectively as possible. The research also demonstrated how specific combinations of various light colours result in more photosynthesis than the sum of the individual light colours. This insight is relevant, among other things, for minimising energy consumption in the lighting of horticultural greenhouses.

Moreover, the scientists discovered that leaf [pigments](#) not directly involved in photosynthesis 'dissipate' light. While these non-photosynthetic pigments do absorb light, they do not use it for

photosynthesis. This discovery could lead to the development of plants that produce more food by reducing the amount of these non-photosynthetic pigments. This mainly applies to ‘protected’ cultivation, such as in greenhouses, as at least some of the non-photosynthetic pigments have a protective function, for instance against too much UV [light](#) or insect damage. These factors are less relevant in indoor cultivation than in open fields.

Scientists from Wageningen UR and research agency Plant Lighting of first author Sander Hogewoning are currently working on translating the new knowledge into applicable innovations.

The research was supported by STW, NWO, Philips, Plant Dynamics BV, VU University Amsterdam, the Product Board for Horticulture, and the Dutch Ministry of Economic Affairs, Agriculture and Innovation.

Provided by Wageningen University

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