Invertase is a key factor of using the products of photosynthesis in the production process in plants

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Data about active involvement of cell wall invertase in regulation of leaf export function is presented. It was shown, that labeled assimilates are accumulated in the leaf apoplast and the ratio of labeled sucrose to hexoses is decreased under different conditions, which reduce the export of assimilates from leaves (reduction in illumination, removal of the consuming organs, raising nitrate nutrition of plants, the introduction of NO generator, sodium nitroprusside, solution into the apoplast).

The lowering of the sucrose to hexoses ratio is more pronounced in the apoplast than in the mesophyll cells. Increased hydrolysis of sucrose by invertase in the leaf apoplast leads to greater use of glucose and fructose in the mesophyll cells and an increase in aboveground biomass of plants at the expense of economically important organs

The increase of cell wall invertase activity at lower light or introducing an additional gene of this enzyme in the plant DNA increases the contribution of diffusion (less expensive) component in the export of assimilates from leaves to the sink organs.

The possibility of reducing the activity of cell wall invertase by introducing catalytic amounts of complex compounds $\{[(Cu(NH_3)_n]^+ \bullet A^-\}$ into the leaf apoplast is shown. It was shown on sugar beet that sugar efflux from a leaf to root increased and productivity grew after spraying the plants with ammoniate solution (10^{-5}M).

Enhancement of sugars influx into the roots under the action of ammoniates causes the greater absorption of soil nitrogen and increase of the shoot tillering.

We propose the idea, that there is a possibility to increase the photosynthetic productivity with concurrent reduction of nitrogen fertilizers use by influencing the cell wall invertase (including gene expression).