



## Foliar area maintenance and usage of light for dry matter production in potato

One of the main functions of the photosynthetic system in potatoes is to capture light and harness it for the production of dry matter. As long as the foliar area is active, photosynthesis will occur, leading to greater yield and higher tuber quality.

Assimilation rates will reach 100 percent when the soil surface is completely covered by the foliage. The gross potato assimilation in a fully sunny day (50.000 lux) at 18 to 20° C is of 1,92 g CO<sub>2</sub> per m<sup>2</sup> of foliar area per hour, at a concentration of 0,03 percent of CO<sub>2</sub> in the air (Contreras, 2002).

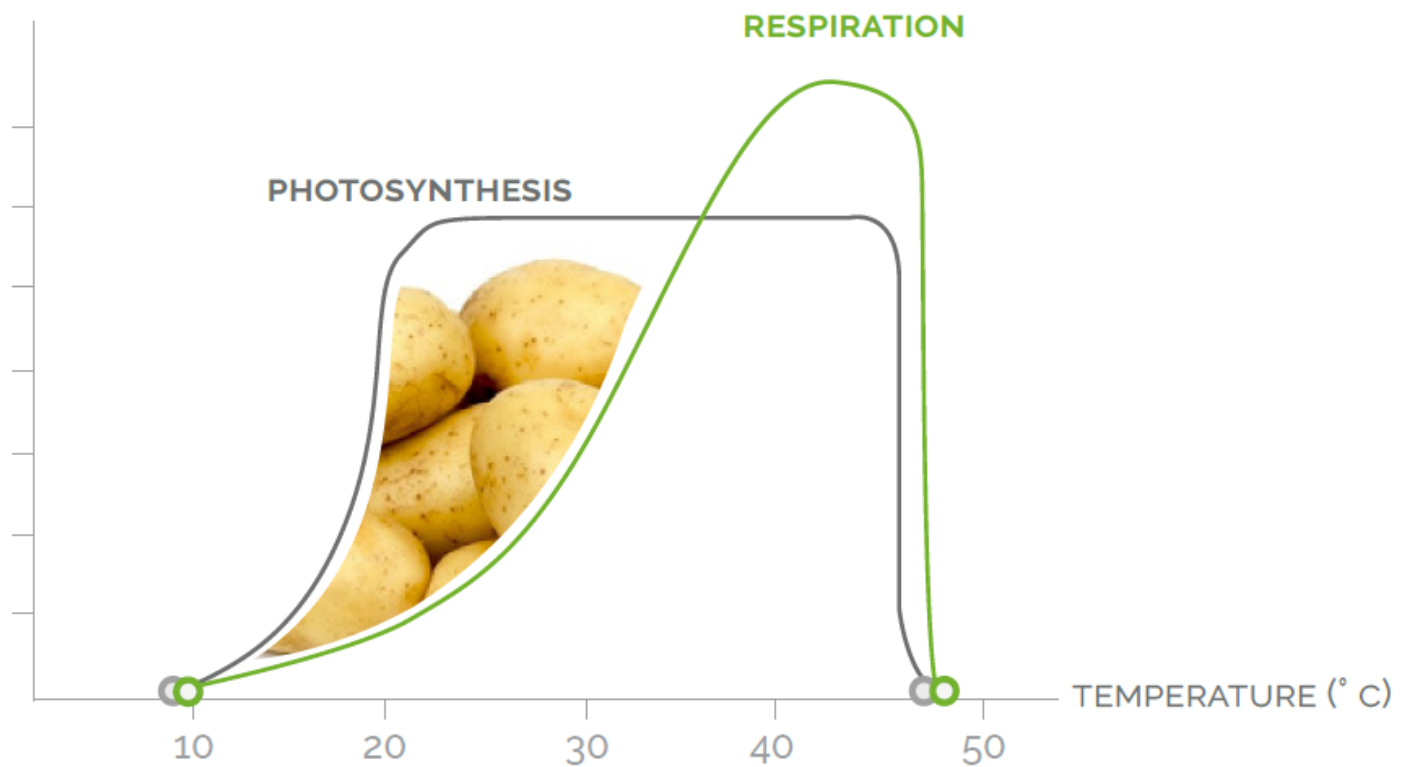
Maximum yield is directly related to net daily photosynthesis, and obtaining maximum yield can take a prolonged time. The ideal situation is to have 3 m<sup>2</sup> of foliar area per each square meter of crop surface (Contreras, 2002).

To determine net photosynthesis, the carbohydrates consumed in the respiration process have to be subtracted from the carbohydrates produced in the photosynthesis process. As shown in the figure below, increased temperatures cause respiration to increase, leaving less carbohydrates available for growing and accumulation in the tubers. Increased respiration also occurs under stressful conditions, such as drought and salinity.



Time of active  
foliar area

Photosynthesis



Under stressful conditions, respiration increases leaving less carbohydrates for plant and tuber growth. Longer active foliar area duration results in a larger production potential.