PHOTOSYNTHETIC ACTIVITY OF DIFFERENT ORGANS OF RAPE (BRASSICA NAPUS OLEIFERA) AND THEIR CONTRIBUTION TO SEED YIELD

Nalborczyk E., Ważyńska Z., Nalborczyk T., Wawrzonowska B.
Institute of Plant Biology, Warsaw Agriculture University

Rape (Brassica napus oleifera) belongs to a group of plants which produce their seed yield when contribution of leaves to the overall assimilation area is slight. Most leaves of the main shoot and of the lateral ones fall down just after flowering. Therefore, one would expect that following anthesis the loss of leaf area should be recompensated by other assimilatory organs such as intensively green shoots and silique. We used $^{14}CO_2$ to study the contribution of photosynthesis of various assimilatory organs to the gross assimilation of rape plants (varieties Tower and Mazowiecki) at two phases of development: at the initial stage of silique development and at the stage of the intensive seed growth. In addition, a flow of ^{14}C-assimilates from different organs to seeds was determined.

It has been observed that, at the initial phase of silique formation, leaves and shoots are the main assimilatory organs, contributing about 60 and 30% respectively, to the overall $^{14}CO_2$ fixation. On the other hand, at the stage of seed yield formation, the highest contribution was by silique and shoots (40 and 35%, respectively). Rape plants lose a large portion of assimilates produced at the initial phase of silique formation (up to 50%), but at the later stages the assimilates are effectively utilized (in 80%) in the formation of silique and seeds. The Tower variety is characterized by a better use of assimilates in forming seed yield when compared to the Mazowiecki variety.

The results presented in this study indicate that the photosynthetic activity of silique and shoots play a significant role in seed yield of rape plants and need to be considered during breeding of these cultivars.