Abstract:

In identical experimental set-ups two varieties of white cabbage (Brassica oleracea var. capitata) were planted in open field in different densities (37 000 plants /ha and 55 000 plants /ha). After harvest the cabbage heads were stored for 8 months in CA. Carbohydrates of total plants were measured every four weeks during the whole growth season as well as during storage period. In an additional experiment the carbohydrates of 15 different sites within the head of cv. Kalorama were monitored during storage period every 2 weeks. Treatments and planting dates of the first experiment resulted in no differences in carbohydrate content of cabbage heads in spite of significant influences on growth and final head size. Dynamics of carbohydrates are characterized by an increase of contents during growth in open field with constant proportions of hexoses and sucrose. After harvest, glucose and fructose contents rose up to 25 % (of dry matter, dm) whereas sucrose contents dropped to the half of the amount accumulated at harvest (ca. 3 % dm). Plants deriving from all treatments showed similar behaviour even on a base of Julian days (January 8th), although plants were harvested every four weeks. During storage period, contents of hexoses dropped to the level measured at harvest while sucrose showed a continuous increase of up to 10 % (dm) on a total plant base. Treatments during field experiments had no influences on post harvest carbohydrates dynamics. Vernalisation of the biennial white cabbage is discussed as to be responsible for observed dynamics. Some important explanations can be deduced from the detailed head analysis which was part of the second experiment. A characteristic peak in sucrose 6 weeks after harvest could be observed especially in the inner leaves. Stem carbohydrates showed only weak dynamics. Due to low concentrations the increase or at least the inhibition of loss in carbohydrate contents during storage period only partially could be explained on the base of starch. Physiological processes like gluconeogenese and refixation of CO_2 may contribute additionally to the findings.