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Effect of Nitrogen Application and Leaf Removal on the Metabolism of Carbohydrate in Leaves and Stems of Rice Plants at Ripening Stage

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Abstract:

Nitrogen topdressing and leaf removal were carried out on the rice variety Hitomebore immediately after heading and on Akitakomachi before heading, respectively.In the nitrogen topdressing(+N)plot, compared with the control plot (CON), the increasing rate of both total dry weight and panicle weight was initially slower and then became faster reaching an approximate 30% increase in total dry weight at last.The content of sucrose in the leaf blades changed little in the +N plot during ripening in contrast to the CON, in which it decreased from the middle to late ripening stages.The amount of sucrose in the stems was initially smaller in the +N plot than in the CON but it became increased after the middle ripening stage.The amount of starch in the stems decreased from the begining of ripening in the CON, whereas in the +N plot, the amount of starch decreased little at the beginning of ripening and then largely increased during middle ripening stage.The removal of lower leaves other than flag leaf, and flag and second leaves, respectively, affected panicle weight with only about a 10% decrease, but the dry weight of the lower part of the stems decreased considerably.The nitrogen content in both leaf blades and stems was increased, but the sucrosecontent was decreased by leaf removal.Sucrose content inthe neck internode of the panicles was specifically smaller than that in other internodes and leaf blades.The contents of non-structural carbohydrate and starch in both leaf blades and the neck internode of the panicles were significantly smaller than those in the lower part of the stems, which were markedly decreased by leaf removal.

Keywords:

Carbohydrate metabolism, Leaf clipping treatment, Neck internade of panicle, Nitrogen top dressing, Rice, Ripening stage

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