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Analysis of Plant Characteristics Determining Ear Weight Increase during the Ripening Period in Rice (*Oryza sativa* L.) : II. The role of the reserved carbohydrate at heading stage upon the receptive efficiency of assimilation products in spikelets

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Abstract:

The large variations of sink capacity of spikelets (S_W), the assimilate reserved in the culm/leaf sheath of rice plant until the heading stage (C) and the assimilate produced during the ripening period (ΔW) were promoted by using several varieties from panicle number to panicle weight types, and by combining top dressing, cutting leaf and thinning treatments. From the above experiments, the influencing forms of $\Delta W/S_W$, and C/S_W upon the ratio of ear weight increase (ΔE) to S_W ($\Delta E/S_W$) were discussed. The percentage of fertile grains (1-p; p, the percentage of sterile grains) was connected more closely with C/S_W than with $\Delta W/S_W$. C seemed to function as buffer stock to maintain the sink activity of spikelets, when ΔW is not equal to the demand of spikelets for assimilation products (sink potential). $\Delta W/S_W$ contributed chiefly to the increase in $\Delta E/S_W$ through ΔE per fertile S_W ($\Delta E/[(1-p) \cdot S_W]$). From the above results, it was estimated that not only ΔW but also C is very important to improve $\Delta E/S_W$.

Keywords:

Buffer stock, Ear weight increase, Hull weight, Paddy rice, Percentage of fertile grains, Produced assimilate during the ripening period, Reserved carbohydrate until heading stage, Sink potential

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