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Analysis of the Factors of High Yielding Ability for a Japonica Type Rice Line, 9004, Bred in China : II. The determining process of 1000 kernel weight

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Abstract:

Using the materials in the previous report, factors determining winnowed hulled 1000 kernel weight (WHTKW) of the primary (PRB) and secondary rachis branch (SRB) at different parts on an ear in line 9004 (L9), which is bred in China, as well as high yielding japonica type glutinous rice, were analyzed in comparison with a Japanese non-glutinous rice var. Koganemasari (KM). 1) For WHTKW of each part on an ear, it was generally shown that grains on both PRB and SRB of the top part in KM were heavier than those of the bottom part, however, the reverse pattern was shown in L9. Moreover, L9 had less difference in WHTKW between PRB and SRB than that of KM. Although WHTKW of each part on an ear was heavier in L9 than in KM, regardless of PRB and SRB, the degree of difference on an ear between the two varied according to the part in the order bottom>middle>top parts and SRB greater than in PRB, in spite of little difference in hull weight. 2) Volume and specific weight of hulled grains of both PRB and SRB on each part on an ear were L9>KNI, KM>L9, respectively. Volume was significantly correlated with WHTKW in KM and L9, when compared separately or together. 3) The ripening period of grains on PRB or SRB of each part on an ear in L9 was the same or shorter than in KM, but L9 had a faster dry matter accumulation rate per grain than KM in the first half of ripening period (until 16 days after full heading time) due to the high moisture content in the ear. 4) The results mentioned above suggested that L9 had a faster dry matter accumulation rate for a grain viz. sink activity during the first half of the ripening period due to a higher moisture content in the ear compared with that of KM, resulting in superior WHTKW of L9 in both PRB and SRB of each part on an ear to KM.

Keywords:

Dry matter accumulation rate for a grain, Grains on primary rachis, Grains on secondary rachis, Moisture content in ear, Part on an ear, Ripening period, Winnowed hulled 1000 kernel weight, IN JAPANESE

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