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Dry-Matter Partitioning and Accumulation of Carbon and Nitrogen during Ripening in a Female-Sterile Line of Rice

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Abstract: To evaluate the effect of sink restriction on dry-matter partitioning to rice plant organs during ripening, we observed the dry-weight partitioning and accumulation of carbon and nitrogen in a female-sterile line, FS1, which has intact panicles with only a few fertile grains, in comparison with those in a normal counterpart, Fujisaka 5. In spite of the loss of sink function in the panicles, FS1 produced a larger amount of dry-matter than Fujisaka 5. Without a change of panicle dry weight throughout the ripening period, FS1 increased dry weights of culms and leaf sheaths at the early stage and of late tillers at the late stage. The amounts of dry-matter partitioned to panicles, culms plus leaf sheaths and late tillers in FS1 were comparable to those amounts in Fujisaka 5 at maturity, indicating that the latter two organs function as a sink of dry matter to substitute for panicles. Carbon partitioning to plant organs was basically similar to the dry-matter partitioning. Since the amount of nitrogen in a plant hardly increased during the ripening period in FS1 and Fujisaka 5, nitrogen partitioning to plant organs was different from the partitioning of dry matter and that of carbon. Culms, leaf sheaths and late tillers function as a sink of nitrogen partly to substitute for panicles, but the sum of nitrogen partitioned to these organs and panicles in FS1 was markedly smaller than in Fujisaka 5 at maturity, suggesting that other organs do not substitute for panicles in the sink function for nitrogen partitioning. FS1 developed late tillers rapidly at the late stage and had a carbon-nitrogen ratio in the stems different from that in Fujisaka 5.

Keywords: [Carbon](#), [C-N ratio](#), [Dry-matter partitioning](#), [Female sterility](#), [Nitrogen](#), [Panicle](#), [Rice](#)

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