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Regularity in Variation of Leaf Color and Nitrogen Distribution in Half-Leaf Blades by Leaf Position on the Stems of Rice Plants : II. Uneven translocation of nitrogen between outside and inside half-leaves
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Abstract:

We have reported in a previous paper that the outside half-leaf had a smaller volume and deeper leaf color than the inside half-leaf. The half-leaf color was not dependent only on the difference in leaf volume but also on the ability of nitrogen absorption. The difference in nitrogen absorption was considered as another factor involved. We, therefore, measured the volumes of nodal roots on both sides of a half-leaf and found that the nodal roots of an outside half-leaf had a larger volume and higher ability of absorption. Considering that the difference in translocation and retranslocation of absorbed nitrogen might be involved as a third factor, we investigated the difference in the distribution of ^{15}N fed to the roots on fixed tillers. It was found that absorbed ^{15}N was translocated only to the side of ^{15}N feeding tillers, and that each nodal root, being related to specific parts of tillers only, played an extremely limited role in distributing nitrogen. We further investigated the translocation of ^{15}N applied to the surface of an outside or inside half-leaf to find how ^{15}N was translocated through the midrib to an opposite half-leaf. It was found that ^{15}N transferred to the top and base of a half-leaf and did not transfer across the midrib. Consequently, it was assumed that an outside half-leaf maintains its deeper leaf color.

Keywords:

Chlorophyll meter value, Distribution, Half-leaf blade, Leaf blade width, ^{15}N , Nitrogen content, Nodal root, Translocation

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