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Journal List

Journal/
Society Search

GO

News



Science Links Japan

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The Crop Science Society of Japan [Info](#) [Link](#)[TOP](#) > [Journal List](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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Seasonal Changes in Uptake, Distribution and Redistribution of ^{15}N -Nitrogen in Young Tea (*Camellia sinensis* L.) Plants

Kunio OKANO and Kiyoshi MATSUO

1) National Research Institute of Vegetables, Ornamental Plants and Tea

2) National Research Institute of Vegetables, Ornamental Plants and Tea

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Abstract:

In order to know the seasonal changes in nitrogen requirement of tea plants, hydroponically-grown young plants were pulse-labelled with ^{15}N during each month throughout the year in a glasshouse. Uptake, distribution and redistribution of ^{15}N -nitrogen were investigated every month. Nitrogen uptake was active in April and May, then declined during the summer season. Vigorous nitrogen uptake was restored in October and November, thereafter, it decreased again during the winter season. The considerable uptake of nitrogen, which was observed even in winter, was maybe due to the relatively high temperature in the glasshouse. During the active growing period from April to September, a large amount of nitrogen was partitioned to the leaves, especially to the sprouting shoots. On the contrary, a large part of the absorbed nitrogen stayed in the roots during the dormant period from November to February. After the bud break, the nitrogen temporarily reserved in the roots was translocated to the first flush shoots. Contribution of nitrogen absorbed at each month to the first flush shoots, which was evaluated by the isotope dilution technique, was low during the spring to summer months of the preceding year, then gradually increased during autumn to winter months. The contribution further increased in early spring months of this year. Sum of the contribution from February to March amounted to 60%. Thus, the most recently absorbed nitrogen showed the largest contribution to the nitrogen in the first flush shoots. This means that nitrogen taken up during early spring was most effective for improving the quality of the first flush shoots. Importance of the nitrogen absorbed the year before was also discussed.

Keywords:

Camellia sinensis, First flush shoots, Isotope dilution, ^{15}N , Nitrogen, Seasonal change, Tea, Uptake of nitrogen

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