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## Japanese journal of crop science

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#### Diurnal and Seasonal Changes in the Diffusion Resistance of Potato Leaves and Their Differences between the Adaxial and Abaxial Leaf Surfaces and between Three Leaf Positions on the Stem

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#### Abstract:

Field measurements of the diffusion resistance (DR) of adaxial (upper) and abaxial (lower) leaf surfaces at three leaf positions of the main stem were recorded during the growing seasons of 1993 and 1994 using two potato varieties with different root mass. A diurnal change in DR was also measured two times in 1992 using one variety. The DR was about two to five times higher for the adaxial leaf surface than the abaxial leaf surface, and higher at a lower leaf position throughout the growing seasons. The DRs of both leaf surfaces were the lowest in the morning, increased in the afternoon and became highest in the evening. They also increased according to plant growth. On the measuring days after rainfall, however, the DRs showed low values irrespective of leaf age. DR was also affected by air temperature, being higher in 1994 (high-temperature year) than in 1993 (low-temperature year). Although a varietal difference in DR was found in 1994, it did not correspond to the difference in root mass. These results indicate that water stress occurs in potato growth in Hokkaido under relatively low temperature conditions.

#### Keywords:

Adaxial and abaxial leaf surfaces, Aging, Diffusion resistance, Diurnal change, Leaf position, Potato, Temperature, Water stress

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