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#### Studies on Matter Production of Edible Canna (*Canna edulis* Ker.) : IV. Leaf unrolling and changes in leaf photosynthetic rates with growth under field conditions

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#### Abstract:

Edible canna was grown from late April to November at either 0.5m×1m or 3m×3m spacing in the experimental field of the University of Tsukuba to clarify leaf area development and changes in leaf photosynthesis with leaf age and growth as a basis of high productivity. The leaves unrolled during a 6-9 day interval. In the middle growth stage, individual leaf area in the upper layers was larger than in the lower layers. On July 23 and August 16 when LAI attained 7 and 9, respectively, about 70% of the leaf area was occupied by the upper 4 leaves. The maximum net photosynthetic rate was  $19.1 \mu\text{mol m}^{-2} \text{s}^{-1}$  (June 9) and the photosynthesis of the upper leaves did not become saturated at  $1,000 \mu\text{mol m}^{-2} \text{s}^{-1}$  PPFD. The maximum rate, however, tended to decrease gradually with growth. After July, when plants began rapid growth, net photosynthetic rates of leaves in the canopy decreased rapidly with a decrease in light by mutual shading. Judging from the leaf area and net photosynthesis at each leaf position, the upper 4 leaves in the canopy substantially contributed to the dry matter production of this crop after the middle growth stage.

#### Keywords:

*Canna edulis* Ker., Edible canna, Field conditions, Leaf age, Leaf area, Leaf unrolling, Net photosynthetic rate

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