

**신진-01**

## Effect of Daylength Treatment of New Double Cropping Potato Varieties in Hydroponic Cultivation

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### [Introduction]

In the production of hydroponic seed potatoes, day length (light) is a factor that directly affects plant growth and tuber formation along with temperature, pH, culture medium concentration, and nitrogen concentration. The growth response of potatoes to daylength is often different depending on the variety (genetic characteristics). This study was conducted to investigate the physiological growth response of plants and tubers according to different daylength in the production of hydroponic seed potatoes of new double cropping potato varieties.

### [Materials and Methods]

Potato (*Solanum tuberosum* L.) varieties used in this study 'Saebong', 'Goun', and 'Daejima'. Daylength treatment was tested by short-day (12h) and long-day (16h) with supplemental lighting 4 hours after sunset. In spring cultivation (March-June) and autumn cultivation (August-November), the effect of daylength treatment on shoot growth, leaf physiological activity, tuber formation and yield was tested.

### [Results and Discussion]

Crop growth rate (CGR) and biomass increased regardless of variety in long-day treatment with supplemental lighting after sunset, while dry matter rate decreased. The leaf area index (LAI) was as high 5 or more when supplemental lighting was applied, which is considered to be due to the increased biosynthesis of chlorophyll and the continuous growth of the plant. The chlorophyll a/b ratio was significant between varieties, which was high in the 'Saebong' variety, as 4.8, followed by 'Daejima' and 'Goun' varieties. Tuber formation was observed up to 9 days earlier in short-day treatment, but the difference was 1-5 days in autumn cultivation, which was smaller than that in spring cultivation. The number of tubers increased in short-day treatment, especially in spring cultivation, the 'Daejima' variety had the highest number of tubers at 16.7. In autumn cultivation, tuber formation was delayed and yield decreased compared to spring cultivation. However, the tuber weight tended to increase when supplemental lighting was applied. In particular, the tuber weight increased by up to 14% in the 'Goun' and 'Saebong' varieties. Therefore, the effect of daylength treatment of new double cropping potato varieties was significant in spring cultivation, and supplemental lighting treatment increased shoot growth, leaf physiological activity, and tuber weight. Tuber formation and number of tubers were better in short-day conditions.

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