Thesis Title	Quality and Production Cost of Celery and 4 Lettuces under Controlled Environment in Hydroponic Culture
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Abstract

The study of celery and 4 lettuces productions under controlled environment was conducted into 3 parts which were to study on investment expenditure of celery and 4 lettuces in hydroponic culture , to study suitable nutrient solution for growing celery, and to study the quality change after harvesting celery. The study on investment expenditure of celery and 4 lettuces; red-oak, green-oak, butter-head, and asconia, in hydroponic culture from the farmer growing as economical production in Rajburi Province was found that the investment expenditure were 8.70, 14.93, 14.93, 8.53, and 11.06 baht per kilogram, respectively. Although, the expenditure of the butter-head production was the lowest, the marginal return was the highest. However, it was also found that the beneficial return of the celery produced in the hydroponic was higher than those in the soil eventhough the cost of the production in the hydroponic was higher than in the soil. In the second part , the study of the suitable solution for growing celery was done by using 9 different nutrient solutions which modifying from 3 standard solutions, Knop's 1865, Hoagland's, and Shive's. Calcium nitrate ($Ca(NO_3)_2$) were added at 3 levels which were 0, 25, and 50 percent of the standard solutions. Using the design of the Randomized Complete Block Design (RCBD), it was found that the celery in the modified Knop's 1865 added 50 percent calcium nitrate had the highest shoot growth both in shoot growth curve and shoot growth rate. In addition, it was also found that the celery in the modified Knop's 1865 added 50 percent calcium nitrate had the highest crop growth rate (CGR), relative growth rate (RGR), leaf area index (LAI), specific leaf area (SLA), net assimilation rate (NAR),

fresh weight, dry weight, leaf area, and total soluble solid. Using scoring test of 9 semi-trained panelists in the study of the quality change after harvesting celery from 9 nutrients solutions, the result showed that the celery in the modified Knop's 1865 adding 50 % calcium nitrate had the highest quality score . Furthermore, the celery kept in both room temperature and refrigerating condition for 3 and 5 days after harvesting did not show the different score. However the trend of the acceptable of the panelists was lower when the time after harvesting was increasing.

Keywords: Hydroponic / Celery / Expenditure and quality / Calcium nitrate / Growth