량은 −20 kPa에서 다소 높았다. 고추의 수확시기별 품질분석 결과, capsaicin 함량은 첫 번째 수확과와 4번째와 5번째 수확과가 높았으며, ASTA Color 값은 10월 2일 4번째 수확한 열매의 적색소가 가장 높았다. 당 함량은 수확시기에 따라 일정한 경향을 보이지 않았다. 전체 생육기간(5월-10월) 중 −20, −30, −50 kPa 처리구 각각 253.0, 246.7, 204.3 ton/10a의 관수량을 나타내었다.

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43 P–1–①

Growth and Quality of Baby Leaf Vegetables Hydroponically Grown in a Plant Factory with Artificial Lighting as Affected by Composition of Nutrient Solution

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The objective of this study was to investigate the effects of composition of nutrient solution on the growth and quality of baby leaf vegetables (tah tsai, romaine lettuce, beet, and red radish) hydroponically cultivated in a plant factory with artificial lighting (PFAL). Seeds of the four vegetable crops were sown in urethane sponges and cultivated for 14 days in a PFAL. Light intensity and photoperiod were 110 $\mu mol \cdot m^{-2} \cdot s^{-1}$ and 16 $h \cdot d^{-1}$, respectively; and air temperature in photo-/dark periods was maintained at 25/20°C. Tap water was suppied for seven days after sowing, and then tap water (TW) and the nutrient solutions of Korea wonshi (KRWS), Japan enshi (JPES), and Yamazaki solution for lettuce (YMAK) were supplied for seven days. Fourteen days after sowing, the fresh weight of tah tsai and romaine lettuce was greatest in YMZK treatment, while there was no significant difference among nutrient solutions in beet and red radish. When we compared leaf color using Hunter's a value, KRWS and JPES increased green color in baby leaf vegetables, while YMZK increased red color. Total phenolic content of romaine lettuce was greatest in KRWS treatment, but that in tah tsai, beet, and red radish showed no significant difference among nutrient solutions. Results suggest that KRWS enhances the growth and quality of romaine lettuce, while YMZK is appropriate for enhancing the growth and red color of beet and red radish hydroponically grown in a PFAL.

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44 P–1–①

무(*Raphanus sativus* L.)의 F_1과 양친계통의 수용성 당 및 글루코시놀레이트 함량 변화

Variation of Soluble Sugars and Glucosinolate Content from F_1 and Their Parental Lines of Radish Plant (*Raphanus sativus* L.)

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본 연구에서는 무(*Raphanus sativus* L.)의 F_1과 양친 계통의 수용성 당 및 글루코시놀레이트 함량 변화를 비교하였다. 소포자배양을 통해 얻은 반수성배수체 무의 글루코시놀레이트 함량을 조사하여 함량이 낮은 DH 040915 계통(A; 8.4 ± 1.0$mg \cdot g^{-1}$ D.W.)과 함량이 높은 DH 042915 계통(B; 34.4 ± 0.7$mg \cdot g^{-1}$ D.W.)을 선별하였으며, 이를 각 각 모식물체로 하여 교잡 (DH 040915 x DH 042915; AB, DH 042915 x DH 040915; BA) 후 F_1 계통을 확보하였다. F_1 및 양친 계통의 지하부 생체중을 비교했을 때 A와 B에서 각각 655.4, 445.8g으로 조사된 반면, F_1 개체인 AB와 BA에서는 1242.4, 687.3g으로 양친에 비해 지하부 생체중이 크게 증가하였음을 확인할 수 있었다. F_1 및 양친 계통의 지상부 생체중 역시 같은 경향을 보였다. F_1 및 양친 계통의 경도를 비교했을 때, A, B, AB, 그리고 BA에서 각각 37,2, 36,1, 33,9, 그리고 39.2N으로 조사되었다. 무의 수용성 당으로 sucrose, glucose, 그리고 fructose를 조사하였는데, 전체적으로 glucose의 함량이 가장 높게 조사되었으며 그 다음 fructose 그리고 sucrose 순으로 조사되었다. Sucrose의 함량은 A, B, AB, 그리고 BA에서 각각 25.2, 31.5, 22.0, 그리고 31.0$mg \cdot g^{-1}$ D.W. 으로 F_1 계통에서 sucrose 함량이 모계유전됨을 확인할 수 있었다. 반면, F_1과 양친 계통의 glucose 함량을 비교했을 때, A, B, AB, 그리고 BA에서 각각 99.6, 91.3, 112.8, 그리고 103.0$mg \cdot g^{-1}$ D.W. 으로 F_1 계통에서 glucose의 함량이 약간 증가하였으나, 통계적으로 차이를 보이지 않았다. Fructose 함량은 AB 계통에서 90.7$mg \cdot g^{-1}$ D.W.로 가장 높게 조사되었으며, 그 다음 BA(85.9$mg \cdot g^{-1}$ D.W.), B(75,4$mg \cdot g^{-1}$ D.W.), A(65.1m$g \cdot g^{-1}$ D.W.) 순으로 조사되었다.

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45 P–1–①

Physiological Changes of Cucumber Grafted Transplants as Affected by Low-temperature Stress Conditions during Dark Storage

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Lowering temperature during dark storage is the most common and easiest method for maintaining transplant quality. Low-temperature can reduce the deterioration of transplant quality during dark storage, but long-term exposure to low-temperature can induce chilling injury to transplants. In order to investigate physiological responses of transplants to low-temperature stress conditions during dark storage, we examined plant height, SPAD value, MDA content, DPPH-radical scavenging activity, and total soluble sugar content of cucumber transplants stored at low-temperature in darkness for 15 days. In this study, we set two storage temperature regimes; 1) four constant temperature treatments which stored at the constant temperature of 6, 10, 14, and 18°C for 15 days, 2) six non-constant temperature treatments which