Nitrogen (N) application level for the forcing culture of leaf perilla (*Perilla frutescens*) was not established. This study was conducted to determine the in-season N application level for cultivation of leaf perilla in a plastic film house. Six levels of nitrogen treatment such as 0, 50%, 100%, 150% and 200% of N, and a conventional fertilization were treated on two plastic film house soils located in Gumsan-gun and Milyang-city. The plots of N 100% were applied with urea-N 150 (40+110) kg ha⁻¹. Soil and plant samples were periodically collected and analyzed. On-site soil nitrate-N concentrations on wet soil samples were conducted with a nitrate test strip and compared with the nitrate-N concentrations analyzed by the standard analysis method. Growth duration was 9 months and the final nodes were 18 (Gumsan-gun) and 20 (Milyang-city). Optimal N content in leaves and SPAD-502 Chlorophyll meter reading were ranged 3.5~5.0% and 30~35 respectively. N requirement for growth of each node was calculated 17.4~21.6 kg ha⁻¹. Nitrate-N content by the test strip showed good correlation with that of the standard analysis method (\( R^2=0.7741 \)). Lower limit of soil nitrate-N concentration was evaluated 20 mg kg⁻¹. Consequently, N requirement for growth of each node, lower limit of soil nitrate-N, and on-farm nitrate-N test result could be used to decide the amount of in-season N application rate.
Fig 1. Seasonal change in N content in leaves (Left; Gunsan-gun, Right; Milyang-city).

Fig 2. Seasonal change in soil nitrate-N content by test strip method (Left; Gunsan-gun, Right; Milyang-city).