Unified Model의 식물병 예측모형 적용을 위한 기상 단기예보 자료 검증

김효석[1], 도기석[2], 박주현[3], 강위수[3], 박은우[1,4*]

[1]서울대학교 농생명공학부, [2]국가농림기상센터, [3]㈜에피넷, [4]서울대학교 협동과정 농림기상학전공

Evaluation of Short-term Weather Prediction Data from the Unified Model for Plant Disease Forecast.

Hyo-suk Kim[1] , Ki Seok Do[2], Joo Hyeon Park[3], Wee Soo Kang[3] and Eun Woo Park[1,4]

[1]*Department of Agricultural Biotechnology, Seoul National University, Seoul, 08826, Korea,*

[2]*National Center for Agro-Meteorology, Seoul National University, Seoul 08826, Korea,*

[3]*R&D Center, EPINET Co. Ltd., Anyang 14056, Korea,*

[4]*Interdisciplinary Program in Agricultural & Forest Meteorology, Seoul National University, Seoul, 08826, Korea*

Using weather prediction data in plant disease forecasts would be possible to provide crop growers with increased time windows and better management options to protect their crops against diseases. This research is aimed to evaluate suitability of numerical weather prediction data from the Unified Model (UM) as input for the plant disease forecasting system by using UM-data extraction and evaluation system (U2ES) developed in this study. The UM is currently operated in Korea Meteorological Administration (KMA), that can produce 36-hour weather forecast data consisted of 136 elements released at 03:00, 09:00, 15:00 and 21:00 (KTC) a day at the resolution of 1.5km. The U2ES is an integrated set of three subsystems for User data collection (UDC), UM-data extraction (UDEX), and UM-data evaluation (UDEV). The UDEX extracts weather elements for tomorrow including hourly air temperature (℃), relative humidity (%) and rainfall (mm) of locations and periods that user request for. The UDEV evaluates weather data processed by UDEX in comparison with the observed data from the nearest automated weather stations (AWS). Daily UM-data released at 15:00, KTC (UM 15) for 30 locations during the period from Jul. 1 to Oct. 31, 2014, was automatically extracted and evaluated by using U2ES. Evaluation tests showed that the average prediction of daily mean air temperature by UM 15 (20.97 ± 3.98) was similar to observed values (20.80 ± 4.21) across the 3690 data points. The performance of the estimations for the daily mean relative humidity by UM resulted in relatively poor than the case of air temperature. Relative humidity generated by UM 15 accounted for 51.2% in the observed data. The validation test for rain events forecast indicated that the probability of detection and false alarm ratio in rain event forecasts were 79.54% and 28.93%, respectively. These results suggested that UM-data would be applicable to the system for plant disease forecast in order to allow crop growers a longer time span for pesticide spray after disease warning.

* Correspondence to : ewpark@snu.ac.kr

POSTER 15

Acknowledgements