



Farm scale weather data in plant pest forecasting

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Abstract

Forecasting models for prediction of diseases and pests in plants are helpful tools in decision support systems for crop management. In Norway, a range of decision support systems for diseases, pests and weeds are available through the internet service VIPS (www.vips-landbruk.no). Weather data are collected from a network of 80 weather stations located in agricultural production areas. The reliability of the forecasts depends on robust forecasting models and relevant weather data. Also, the accuracy of forecasts relies on distance and geographical variation from the farm site to the nearest weather station. By use of weather forecasts and radar measured rainfall, forecasts can be tailored to fit the local conditions at a farm site.

The Norwegian Meteorological Institute provide weather forecasts on a 4x4 km spatial resolution in rural areas on a 1 hour timescale, while radar measured rainfall has a 1x1 km spatial resolution on a 15 min time scale. These data are currently connected to the existing weather stations to predict warnings ahead of time. The new approach is to adapt these data to individual farm sites. Previous tests have shown that weather prognosis for rainfall is less accurate than weather prognosis for temperature, wind, air humidity and radiation. Estimated rainfall will therefore be based on radar measurements.

As part of a pilot project, the use of farm scale forecasts to predict development of plant diseases were tested at 35 farms in the Solør-Odal district in Norway in 2010 and 2011. Preliminary results show that potato late-blight forecasts produced on a farm scale often differ from forecasts based on data from the nearest weather station, proving the significance of the local approach in farm scale forecasting. Predictions of DON (deoxynivalenol) concentration in oats at harvest based on farm scale weather data, compared to predictions based on weather data from the nearest weather station will also be studied.

Future aspects will be to work towards an improved system where farmers throughout Norway can register their farm and automatically have access to a range of pest and disease forecasts based on site specific weather data.