PROBLEMATIKA DOLOČEVANJA TRAJANJA OMOČENOSTI LISTA

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IZVLEČEK

Med vremenskimi spremenljivkami, ki najbolj vplivajo na pojav in razvoj rastlinskih bolezni in škodljivcev ter tudi na učinkovitost sredstev za varstvo rastlin, je trajanje omočenosti lista (TOL), ki je posledica padavin, rose ali megle. Vse več fitopatoloških modelov upošteva TOL v kombinaciji z drugimi pomembnimi dejavniki pri napovedi za splošno nevarnost pojava rastlinskih bolezni in škodljivcev. TOL lahko neposredno merimo ali pa jo računamo s simulacijskimi modeli. Obstaja več tehnik merjenja, kjer uporabljamo elektronske senzorje, ki po obliki in dimenzijah posnemajo liste rastlin. Za daljinsko zaznavanje TOL uporabljajo tudi meteorološke radarje oz. urne vrednosti izmerjenih padavin. Elekronska merjenja TOL so osnova za razvoj in kalibracijo simulacijskih modelov za računanje TOL. Osnovni fizikalni princip teh modelov sloni na izračunu energijske bilance lista. Računa se tudi vodna bilanca lista, ki upošteva padavine, roso ter izhlapevanje vode z lista. Modele za TOL delimo glede na tip rastlin v dve skupini. Pri nizkih rastlinah upoštevamo tudi vlažnost tal in intercepcijo padavin, medtem ko pri višjih rastlinah modeliramo le procese na vrhu rastlinske odeje. Vhodni podatki za simulacijske modele so različne meteorološke spremenljivke, najpogosteje v urni časovni skali in sicer: dolgovalovno in globalno sevanje, relativna vlaga, količina padavin, temperatura zraka, hitrost vetra in oblačnost. V modele za TOL lahko vnesemo tudi vrednosti omenjenih spremenljivk, ki jih daje vremenska napoved za nekaj dni vnaprej.

Ključne besede: meteorologija, omočenost listja, napovedovanje bolezni

ABSTRACT

ASSESSMENT OF LEAF WETNESS DURATION

Weather plays a key role in plant epidemiology. In particular, leaf wetness dutarion (LWD) produced by dew, fog or precipitation is one of the most significant meteorological pest-promoting factors that trigger fungal and bacterial plant diseases and activities of insects, and that influence the effectiveness of pesticides and the uptake mechanism for gases deposited onto vegetation. Many phytopathological models use the LW parameter in combination with other factors to assess the infection risk and pest severity, and to manage disease control activities in an efficient way. A great number of measuring principles and construction techniques are available for the monitoring of LWD. Some techniques use artificial surfaces that are representative of the shape or dimension of the leaves. Other techniques use electronic grid elements which can be mounted directly on the leaf surface. In order to obtain higher spatial resolution LW can be estimated also by using hourly radar measurements of rainfall. LWD is also assessed by microclimate models calibrated by electronic LW measurements in or above canopies. Calculation is based on physical principles of the energy balance and energy transfer Models act as a water budget for a plant surface, where water is added by precipitation or condensation from dew and lost by evaporation. A surface energy balance model can describe these physical processes as a balance of energies. During a dew event radiant energy is lost from the plant surface and is converted into latent and sensible heat. LW models distinguish between low crops and canopies with foliage-free bottom. In low crops LWD is modelled by taking the soil moisture, canopy interception and the crop-dependent radiative transfer into consideration. For orchards it is assumed that the soil has no effect on the LWD and the calculation is restricted on the top leaf of an orchard. The leaf can form and evaporate dew according to its energy balance and the flow state. LWD caused by rain is given by the duration of the rain period itself and, during the following rainless hours, by the lifetime of a water drop settled on the top leaf. LW models need as an input predominantly meteorological data such as longwave and global radiation, relative humidity, precipitation amount, air temperature, windspeed and cloud cover. Weather forecast data can be included in most models, as well.
Key words: meteorology, assessment, leaf wetness duration, deasease prognose

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