# Tárgytematika / Course Description

## Effects of macro-and microclimate on crop production

**N_DMA13**

**Tárgyfelelős neve / Teacher's name:** dr. Varga Zoltán

**Félév / Semester:** 2023/24/1

**Beszámolási forma / Assesment:** Vizsga

**Tárgy heti óraszáma / Teaching hours(week):** 0/0/0

**Tárgy féléves óraszáma / Teaching hours(sem.):** 30/0/0

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### OKTATÁS CÉLJA / AIM OF THE COURSE

The aim of the course is to teach the PhD students how meteorological factors influence plant life, which methods are available to examine these effects, and finally, how to use this knowledge in practice. In this course we demonstrate the theoretical basis for examining the impact of meteorological factors on plants and we show how these impacts prevail. Sensitivity analyses show the most relevant periods of time and meteorological elements in the case of different crops. In addition to describing the general climate-plant relationships this course focuses on agrometeorological impacts during the growing season of four important crops (winter wheat, winter barley, maize and potato). Finally the use of agrometeorological information is demonstrated using the DSSAT (Decision Support System for Agrotechnology Transfer) and the CGMS (Crop Growth Monitoring System) models.

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### TANTÁRGY TARTALMA / DESCRIPTION

The principles of climate-crop relationship studies.
Modelling of the climate-crop relationships.
The climate of soils (soil temperature, the water balance of soils).
The climate of plant stands: solar radiation and plants.
The climate of plant stands: temperature and plants.
The climate of plant stands: water balance and plants.
The climate of plant stands: wind and plants.
The effect of the relief on the microclimate.
The phenoclimatological characteristics of plants.
The relationship between climate and plant productivity.
The relationship between climate and some of the most important crops.
The use of agrometeorological information.

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### SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

Meeting the conditions set by the supervisor.

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### KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

**Allen, R.G., Pereira, L.S., Raes, D., Smith, M.** (1998): Crop Evapotranspiration (guidelines for

computing water requirements). FAO Irrigation and Drainage Paper. No. 56. Rome.
**Campbell, G.S., Norman, J.M.** (1998): An Introduction to Environmental Biophysics. Second Edition. Spriger Verlag. Berlin.
**Geiger,R., R.H., Todhunter, A.P.** (2003): The Climate Near the Ground. Sixth Edition. Rowman & Littlefield Publisher, Inc. Lanham, Boulder.
**van Keulen, H., Wolf, J**. (1986): Modelling of agricultural production: weather, soils and crops. Pudoc, Wageningen.
**Larcher, W.** (2003): Physiological Plant Ecology. Springer Verlag, Berlin.
**Mavi, H.S., Tupper, G.J.** (2004): Agrometeorology. Priciples and Applications of Climate Studies in Agriculture. Food Product Press. New York.
**Steduto,P., Hsiao, T.C., Fereres, E., Raes, D.** (2012): Crop Yield Response to Water. FAO, Rome.
**Supit, L., van der Groot, N.** (2013): Description of WOFOST crop growth simulation model. Supit.net. Wageningen.
**Varga-Haszonits Z., Varga Z., Lantos Zs., Vámos O., Schmidt R.** (2000): Magyarország éghajlati erőforrásainak agroklimatológiai elemzése. Lóriprint. Mosonmagyaróvár..
**Varga-Haszonits Z., Varga Z., Lantos Zs.** (2004): Az éghajlati változékonyság és az extrém jelenségek agroklimatológiai elemzése. Monocopy Kft., Mosonmagyaróvár.
**Varga-Haszonits Z., Varga Z., Lantos Zs., Enzsölné Gerencsér E.** (2006): Az éghajlati változékonyság és az agroökoszisztémák. Monocopy Kft. Mosonmagyaróvár.