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Mladen Čučak, PhD

EDUCATION

2016 - 2020	PhD	Plant Pathology/Epidemiology. Maynooth University/Teagasc; Ireland
2012 - 2015	MSc	Biomolecular Techniques and Plant Protection. University of Maribor; Slovenia
2006 - 2011	BSc	Plant Production - Plant Protection. University of Banja Luka; Bosnia&Herz.

AREAS OF EXPERTISE

Crop Protection	Statistical analysis	Data Science
General plant pathology	Statistical programming	Agricultural development
Integrated Pest Management	R language	Collaborative research
Epidemiology of Plant Diseases	Trial design	Agrometeorology

PROFESSIONL APPOINTMENTS

Date: February 2021 – till now

Position: Postdoctoral researcher

Employer: Department of Plant Pathology and Environmental Microbiology, Pennsylvania State University, 219 Buckhout Lab (office), University Park, PA 16802. USA.

Main tasks:

- Development, practical application and field validation of the "new age" decision support tools in crop protection based on big data, machine learning and open science;
- Development of plant disease epidemiology educational materials and course delivery
- Supervision of the under-/post-graduate students,
- International collaboration.

Date: September - October 2020

Position: Surveyor

Employer: Bod Bia, Clanwilliam Court, Lower Mount Street, Dublin 2, The Republic of Ireland.

Main tasks:

- Surveying potato fields for estimating yield quality and quantity
- Data collection, analyses, and submission of reports to funding agency

Date: February 2016 - May 2020

Position: Doctoral researcher

Employer: Teagasc, Crops Research Centre, Oak Park, Carlow R93 XE12, Republic of Ireland

Main achievement: Development of potato late blight risk prediction models, analytic and field evaluation, and integration in practical crop disease management tools in the Republic of Ireland

Main tasks:

- Design, implementation and analysis of the crop protection *in vivo* and *in vitro* trials (including all relevant agricultural operations from planting to storage)
- Collection, curation and analysis of database with historical and forecasted hourly weather observations and implementation of an automated decision support system to guide pesticide applications
- Sampling, isolation and molecular characterization of *Phytophthora infestans*

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- Presentation of results of IPM tools to producers and industry; national and international scientific meetings from different fields (agronomy, plant pathology, epidemiology, meteorology)
- Supervision of lab interns (six three- and six-months placements)
- Initiated, led and tutored data analysis and R programing language group at the institute
- Intensive collaboration with European and international groups.

Date: December 2014 – December 2015

Position: Senior Research Technician.

Employer: Plant Pathology department, Plant Protection Division, NIBIO Norwegian Institute of Bioeconomy Research; Høgskoleveien 7, 1430 Ås, Norway.

Main tasks:

- Assisting project coordinator in project management
- Monitoring pest and disease population and modelling risk of harmful organisms in agriculture
- Work on the development and international promotion of decision support systems in agriculture
- Facilitating international collaboration Norway – Balkans
- Development of an automated insect trap.

Internships:

01.06.2013 - 01.07.2013	Plant protection department; Agricultural Institute of Slovenia, Kmetijsko gozdarska zbornica Slovenije; Vinarska ulica 14, 2000 Maribor, Slovenia
01.04.2009 - 15.04.2009	Phytopharmacy store. Trznica A.D. Jedinica: Poljoprivredna apoteka, Banja Luka, Bosnia and Herzegovina
01.04.2008 - 15.04.2008	Apple fruit orchard (200 Ha); Agroimpex, Laktasi, Gradiska, Bosnia and Herzegovina

TEACHING AND MENTORING:

2021	APS workshop: Intro to data visualisation with R. https://kelseyandersen.github.io/DataVizR/index.html
2018 - 2019	GY310B – Tutoring group of 16 students writing Bachelor thesis.
2019	Intro to R workshop for colleagues from the institute (weekly sessions for 2 months).
2017 - 2019	Supervision of lab interns (six three- and six-months placements);

GRANTS (Total: $36486.38)

2021-22	Washington Blueberry Commission ($20,766).
	Project Title: Optimizing the management of mummy berry using an online decision support tool
	PI: DeVetter LW; Co-PIs: **Cucak, M**, Mattupalli C, Harteveld, D, Brown DJ, Peever T
2020	Potato yield survey for the Republic of Ireland in 2021 (7000€)
2019	Teagasc Walsh Fellowship Travel Award for three-month research stay at UC Davis (5000€)
2011	Ministry of Agriculture of Serb Republic grant for development of online plant disease compendium (1000€)

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AWARDS AND SCHOLARSHIPS (Total: $96000)

2016	Student travel award for participation on EAPR Pathology and Pests section meeting (500€)
2016 - 2020	Doctoral fellowship at Maynooth University and Teagasc (48000€)
2014	EEA grant for an internship at Norwegian Institute for Bioeconomy Research (3000€)
2012 - 2014	Erasmus Mundus scholarship for Master studies (28000€)

SERVICE TO PROFFESION

Synergistic Activities

- Early career associate editor *Phytopathology* (APS)
- Reviewer for *Plant Disease* (APS), Plant Pathology (BSPP) and *Agronomy* (MDPI)

Membership in Professional Associations:

- The American Phytopathological Society (APS)(2015- present)
- The societies of Agronomy (ASA), Crop (CSSA), and Soil (SSSA) sciences (2020-present)
- EuroBlight group (2016-present),
- Open Plant Pathology (2018-present)

SCIENTIFIC OUTPUTS

Peer reviewed publications

In preparation:

Cucak, M., Cunniffe, N. 2021. Possibilities for the reduction of field assessments of potato late blight disease progress using modelling approaches. To be submitted to *Phytopathology*

Under review:

Cucak, M., Esker, P., Kildea, S., Downes, P., Fealy, R. BlightR: a new potato late blight risk prediction model and approach. Submitted to *Plant Disease*.

Code repository: https://github.com/mladencucak/BlightR

Kildea, S., Sheppard, L., **Cucak, M.** and Hutton, F., 2020. Detection of virulence to septoria tritici blotch (STB) resistance conferred by the winter wheat cultivar Cougar in the Irish *Zymoseptoria tritici* population and potential implications for STB control. Submitted to *Plant Pathology*.

Published

Cucak, M., Moral, R., Fealy, R., Downes, P., Kildea, S. 2021. Opportunities for an improved potato late blight management in the Republic of Ireland: Field evaluation of the modified Irish Rules crop disease risk prediction model. *Phytopathology*

Website and supplementary material: https://mladencucak.github.io/AnalysisPLBIreland/

Kildea, S., Byrne, J., **Cucak, M.** and Hutton, F., 2020. First report of virulence to the *septoria tritici* blotch resistance gene Stb16q in the Irish *Zymoseptoria tritici* population. New Dis. Rep, 41:132044-0588.

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Cucak, M., Sparks, A. H., Moral, R., Kildea, S., Lambkin, K., Fealy, R. 2019. Evaluation of Irish Rules, the potato late blight forecasting model and its operational use in the Republic of Ireland. *Agronomy* . 9: 515

Website and supplementary material: https://mladencucak.github.io/PLBFieldTrial/index.html

Hansen, J.G., Lassen, P., Hjelkrem, A.-G.R., Eikemo, H., Cucak, M., Lees, A., Gaucher, D., Chatot, C., Kessel, G. (2017) Integration of pathogen and host resistance information in existing DSSs - introducing the IPMBlight2.0 approach. In: Proc. Sixt. Euroblight Workshop December 2017. PAGV Special Report No. 18: 147–158.

Available at: http://euroblight.net/fileadmin/euroblight/Workshops/AArhus/Proceedings/20._Jens_Hansen-p147-158.pdf

PRESENTATIONS

Oral presentations

Cucak, M., Sparks, A. H., Fealy, R., Griffin, D., Lambkin, K., Kildea, S. (2018) Potato late blight risk forecasting in the Republic of Ireland: Field validation. Society of Irish plant pathologists (SIP) Meeting. Dublin, 26-27 November 2018

Cucak, M., Sparks, A. H., Fealy, R., Griffin, D., Lambkin, K., Kildea, S. (2018) Revision of potato late blight risk forecasting in the Republic of Ireland. IEW12- 12th International Epidemiology Workshop. Lillehammer, 10-14th June 2018

Cucak, M., Sparks, A. H., Fealy, R., Griffin, D., Lambkin, K., Kildea, S. (2017) Potato late blight risk forecasting in the Republic Of Ireland. Society of Irish plant pathologists (SIP) Meeting. Dublin, 5-6th December 2017

Cucak, M., Fealy, R., Griffin, D., Lambkin, K., Kildea, S. (2017) The use of agrometeorological data for crop disease risk forecasting in Ireland: a case of potato late blight. 17th EMS Annual Meeting: European

Conference for Applied Meteorology and Climatology 2017. Dublin, 4-8th September 2017

T-E. Skog, M. Cucak, B. Nordskog, H. Eikemo, H. Hole, A. F. Schjøll, J. Netland, N. Trandem, T. Rafoss, R. Meadow. (2015) VIPS – an Open Source technology platform for prognosis and decision support and its implementation in Bosnia and Herzegovina. IV International Symposium and XX Scientific Conference of agronomists of the Republic of Srpska. Bijeljina, Bosnia and Herzegovina.

Poster presentations

Cucak, M., Dalla Lana, F., Ojiambo, P., De Wolf, D., Shah, E., Paul, P., Esker, P. (2020) Using Advanced Statistical Methods, Big Data and Open Science to Upgrade Current Crop Disease Management Decision Support Approaches. ASA, CSSA and SSSA International Annual Meeting, 9-13 November 2020

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Cucak, M., Dalla Lana, F., Ojiambo, P., De Wolf, E., Paul, P., Esker, P. (2020) Into the new era of decision support in crop protection: Multifaceted disease management advisors based on machine learning and open science. APS Meeting, 10-14 August 2020

Cucak, M., Sparks, A. H., Fealy, R., Griffin, D., Lambkin, K., Kildea, S. (2017) Lowering thresholds of qualitative plant risk prediction algorithms: sensitivity versus specificity of Irish Rules for potato blight development. Arhus, Denmark. E In: Proc. Sixth Euroblight Workshop December 2017. PAGV Special Report No. 18: 231-232.

Available at:
http://euroblight.net/fileadmin/euroblight/Workshops/AArhus/Proceedings/Special_Report_18_Totaal.pdf (accessed 29 January 2019)

Cucak, M., Fealy, R., Griffin, D., Lambkin, K., Kildea, S. (2016) Can We Still Use Irish Rules to Forecast Potato Late Blight In Ireland? 7 - 11 August 2016, Dundee, Scotland, Meeting of Pest and Pathology Group of European Potato Research Society.

T-E. Skog, M. Cucak, B. Nordskog, H. Eikemo, H. Hole, A. F. Schjøll, J. Netland, N. Trandem, T. Rafoss, R. Meadow. (2015) VIPS – an Open Source technology platform for prognosis and decision support. Plant health for sustainable agriculture. Ljubljana, Slovenia.

Other

Master thesis:

Cucak, M. (2015) Analysis of possibilities for peach (*Prunus persica L.*) disease control without the use of copper-based pesticides. University of Maribor, Maribor, Slovenia.

Available at: https://dk.um.si/Dokument.php?id=70634&lang=eng)

Volunteering:

2010	Youth engagement project: *Global exchange.* Three-month stays in Egypt and the UK
1998-2012	Youth and development organisations such as Scout club, IAESTE (International Organisation of Agronomy Students) and “Rada” (Society Of Agronomists And Tourism Workers)