

## The Nordic Network for pathogen informed control of oomycete diseases in forestry and agriculture

**Our core activities are Nordic research collaborations for sustainable control of diseases in crops and trees caused by fungal-like organisms.**

This network brings together researchers, policy makers, stakeholders and other interested parties to work towards finding ways to study and control oomycete diseases in our agricultural systems and managed woodlands or horticultural nurseries. The network supports sharing of protocols and data across the sectors that we work in, and the development of inter-sectoral multidisciplinary research funding applications.

Oomycetes are Eukaryotic organisms that look like fungi and occupy similar ecological niches, however they are genetically more similar to marine brown algae. Thus conventional fungicides are not usually effective against these organisms. Oomycetes are devastating pathogens in agriculture, horticulture, aquaculture and the natural environment. For example potato late blight (caused by the oomycete *Phytophthora infestans*) is a major global problem, and in Sweden although potatoes occupy less than 1% of our agricultural land, pesticide applications against late blight account for 30-40% of all fungicide applications used in agriculture. Sudden oak death, caused by the oomycete *Phytophthora ramorum*, has decimated oak trees across California and more recently Europe. Oomycetes are able to rapidly generate genetic variability particularly under the Nordic climate conditions; this variability allows them to overcome host resistance or fungicides used to treat them. Thus new control strategies are timely and necessary particularly in the Nordic countries where there is higher pathogen variability and therefore more aggressive pathogens that overcome fungicides and resistance genes faster. Potatoes and commercial tree crops are of high importance from a Nordic perspective, but often forest ecologists and molecular plant pathologists do not interact enough at a scientific level. Thus a Nordic network to promote intersectoral and multidisciplinary research and networking is highly important. Timber production is a highly important sector for Nordic economies, and there are new oomycete species threatening Nordic trees.

A well-attended network meeting in 2016, linked to the larger Oomycete Molecular Genetics Network conference hosted by the network coordinator, Laura Grenville-Briggs allowed face-to-face discussions with many of the network participants. Further email discussion groups have allowed us to identify common problems and common solutions across the multiple sectors affected by oomycete diseases.

The network facilitated the development of a successful EU Marie Curie Actions Innovation Training Network Grant (PROTECTA: Pathogen Informed Resistance to Oomycete Diseases in Ecosystems, Agriculture and Aquaculture) which was awarded from the 2017 call and is scheduled to start late 2018. PROTECTA will train 15 PhD students across the Nordic Countries and other parts of Europe in disease control, environmental protection and plant breeding for resistance to oomycete diseases.

Thus the network will be maintained for many years to come, and we anticipate a greater collaborative environment for Nordic research in protection against oomycete diseases in the future.

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