

PlantLink Researcher in the spotlight

Therése Bengtsson

December 2017

Therése Bengtsson is a researcher at the Department of Plant Breeding, SLU, Alnarp. She works on pre-breeding in barley with the focus on the identification of genes involved in abiotic and biotic stress responses. Since 2014 she is part of a Nordic Public-Private Partnership (PPP) for pre-breeding in barley financed by the Nordic Council of Ministers and administered by NordGen.



-Can you shortly describe what you received a Formas grant for?

I and my co-applicants Sandeep Kumar Kushwaha and Inger Åhman, will use the exome capture technique to capture, sequence and quantify Resistance-gene (R-gene) and R-gene-like sequences in barley (*Hordeum vulgare* L.), using genotypes with known levels of resistance to the bird cherry-oat aphid, *Rhopalosiphum padi* (L.). Our hope is to identify one or several R-genes effective against *R. padi*, since this aphid is the most severe pest of barley. Our goal is also to make all the R-gene sequences captured available to others.

-What would the dream outcome of your Formas grant be?

Breeding for resistance against aphids is difficult due to limited resistant germplasm available, but also due to difficulties related to the phenotyping of aphid resistance. The dream outcome of the Formas grant would therefore be to identify DNA markers for one or several resistance genes in barley against the bird cherry-oat aphid that will enable marker-assisted selection for aphid resistance in barley breeding programs.

-What are the implications of your research for the society?

R. padi is a wide-spread pest in cereals and also serves as a vector for the *barley yellow dwarf virus* (BYDV) which together can reduce the yield by over 60% in cereals. Furthermore aphid incidents are expected to increase due to climate change. Identification of resistance genes and markers for detection thereof would make it possible to breed for resistance and cultivars with *R. padi* resistance would be an environmentally friendly and economically sound alternative to pesticides.

-Tell us about your latest publication?

In our latest publication "A novel QTL for Powdery Mildew Resistance in Nordic Spring Barley (*Hordeum vulgare* L. ssp. *vulgare*) Revealed by Genome-Wide Association Study" in *Frontiers in Plant Science*, we reported four QTLs (quantitative trait loci), one of them novel. The top NCBI BLASTn hit for one of the SNP markers within the novel QTL is predicted to be the protein 26S proteasome regulatory subunit, RPN1, a protein that previously has been shown to be required for innate immunity and mildew-induced cell death in *Arabidopsis*.