



Eighth Annual Report

July 2018 - June 2019

PlantLink is a network platform for plant science in Southern Sweden. It was formed in 2011 as an alliance between Lund University (LU) and the Swedish University of Agricultural Sciences in Alnarp (SLU Alnarp) with initial support from the Skåne Regional Council (Region Skåne). Our ambition is to stimulate, unite and promote plant research and higher education in the region.

PlantLink wants to bridge the gap between basic and applied plant research with the objective to provide plants as part of a sustainable plant production for healthy food, future climate, medication, energy and new green materials. PlantLink gathers around 30 research groups and provides a platform for interactions between industry and universities in Southern Sweden as well as in Denmark.

PlantLink strives to increase the interest and competence in plant science through education and information. Our goal is to create an environment that excels plant research and innovation and that leads to dynamic interactions between the universities, private companies and the general public.

Research

PlantLink Focus Areas

- Plant Breeding and engineering
- 'Post-harvest' – quality and new products
- Abiotic stress
- Biotic interactions
- Modelling and informatics
- Plants, People and Society

Major research projects associated with researchers in PlantLink

- Future oil crops (SSF)
- Production of a blood substitute (SSF)
- TC4F Theme 4
- STEPS (Mistra)
- Mistra Biotech (Mistra)
- ScanOats (SSF)
- NordPlant (NordForsk)
- GroGrund
- EMPHASIS
- CropBooster-P
- MSCA-ITN PROTECTA PhD program

PlantLink self-evaluation for 2016-2018

As part of the agreement between Lund University and SLU Alnarp a self-evaluation of PlantLink for the period 2016-2018 was presented. The full 21 page long report is available on PlantLink's homepage. This includes a SWOT analysis and future perspectives.

Three new projects awarded PlantLink seed money!

In 2018 the following three projects were supported by PlantLink:

- Plant genome duplications and the evolution of plant-insect interactions
Magne Friberg LU, Kristina Karlsson-Green SLU, Anna Runemark LU
- Development of a 3D storage-carbon mapping pipeline for Swedish cereal seeds using a multimodal image analysis approach
Mats Hansson LU, Åsa Grimberg/Per Hofvander SLU, Nick Sirijovski/Olof Olsson LTH
- A molecular and phenotypical characterisation of 'touch' responses in cereals
Olivier Van Aken LU, Sung-Yong Kim SLU, Nick Sirijovski LTH

New projects: Pufendorf and CropBooster-P

The **Pufendorf institute**, which supports projects within Lund University (<https://www.pi.lu.se/pufendorfinstitutet>), has granted the Advanced Study Group (ASG) on Species and Invasive Species. The ASG is coordinated by PlantLink assistant director Tina D'Hertefeldt and includes PlantLink researcher Johanna Alkan Olsson. Through the recent attention to Invasive Alien species, plants are now at the center of a new discourse in society. In line with this development, the first Swedish list of Invasive Alien Species was published this year. This transdisciplinary ASG aims to put Invasive Alien plants in a social context. The goal is to discuss invasiveness as a phenomenon and explore how, why and by whom plants are defined as invasive. This includes exploring how public institutions and various experts perceive exotic and indigenous plants in private gardens, public plants as well as in nature. The ASG will be active from September 2019 to June 2020.

CropBooster-P is an EU H2020-funded project led by Wageningen University and with a number of important European actors such as INRA, EPSO, VIB Ghent and University of Copenhagen. PlantLink is part of the stakeholder group and is through that able to give support to this project aiming at identifying priorities and opportunities to adapting and boosting productivity of crops in the light of coming environmental and societal changes. The objective is to produce a quantitative evaluation of the most promising practical approaches to be enacted from 2021 to achieve a sustainable food supply into the future. The project was granted funding in September 2018 and the work was initiated in April 2019 with a stakeholder workshop.

PlantLink supported publications 2018-2019*

Abreha, K. B., Lankinen, Å., Masini, L., Hydbom, S., & Andreasson, E. (2018). Late Blight Resistance Screening of Major Wild Swedish Solanum Species: *S. dulcamara*, *S. nigrum*, and *S. physalifolium*. *Phytopathology*, 108(7), 847-857.

Chawade, A., Armoniené, R., Berg, G., Brazauskas, G., Frostgård, G., Geleta, M., ... & Johansson, E. (2018). A transnational and holistic breeding approach is needed for sustainable wheat production in the Baltic Sea region. *Physiologia plantarum*, 164(4), 442-451.

Dotson BR, Soltan D, Schmidt J, Areskoug M, Rabe K, Swart C, Widell S, Rasmusson AG (2018) The antibiotic peptaibol alamethicin from *Trichoderma permeabilis* Arabidopsis root apical meristem and epidermis but is antagonised by cellulase-induced resistance to alamethicin. *BMC Plant Biol* 18: 165

Gustafsson, C., Willforss, J., Lopes-Pinto, F., Ortiz, R., & Geleta, M. (2018). Identification of genes regulating traits targeted for domestication of field cress (*Lepidium campestre*) as a biennial and

perennial oilseed crop. *BMC Genetics*, 19(1), 36.

Himanen, K., Alexandersson, E., Keinänen, M., & Chawade, A. (2018). Nordic research infrastructures for plant phenotyping. *Agricultural and Food Science*, 27(1), 7-16.

Masini, L., Grenville-Briggs, L. J., Andreasson, E., Råberg, L., & Lankinen, Å. (2019). Tolerance and overcompensation to infection by *Phytophthora infestans* in the wild perennial climber *Solanum dulcamara*. *Ecology and evolution*, 9(8), 4557-4567.

Walker, W. B., Roy, A., Anderson, P., Schlyter, F., Hansson, B. S., & Larsson, M. C. (2019). Transcriptional Analysis of Gene Families Involved in Chemosensory Function in *Spodoptera littoralis* (Lepidoptera: Noctuidae). *BMC genomics*, 20(1), 428.

**Either with seed money or bioinformatics support*

First year with new Nordic university hub NordPlant

Climate change is a global challenge and new plant breeding and protection efforts are urgently needed. Novel methods in plant phenotyping and climate facilities will be central to better understand plant stress responses and to develop advanced and precise methods for rapid screening of plants to identify high-performing ones suitable for the future climate scenarios. Plant phenotyping and future climate form the core of NordPlant, which is one out of a total of six Nordic University Hubs funded by NordForsk. More information at www.nordplant.org.

This university hub for climate and plant phenomics for sustainable agriculture and forest production in future Nordic climates has now been established for a little more than a year. It was kicked-off on the 24-25 October 2018 in Helsinki. Approximately 70 scientists joined the meeting including representatives from all five funding universities as well as industry. During the kick-off meeting four focus groups were established. Read more on this on NordPlant's homepage. In April 2019 a workshop on data standards for plant phenotyping was organised.

Svante Resjö, new coordinator in NordPlant

In December 2018, Svante Resjö became the administrative coordinator of NordPlant. Svante is a researcher at the Department of Plant Protection Biology at SLU Alnarp, using proteomics to study mechanisms of infection and resistance interactions between late blight and potato. Svante devotes one day per week to administration and coordination of NordPlant. Among other things he is the editor of the NordPlant newsletter. Read more about NordPlant in the text above as well as on www.nordplant.org.



Education

PhD Education

During the last year PlantLink supported the NOVA PhD Course „Phenotyping Technologies in Plant-environment Interactions - Image Based Phenotyping“ through Nord-Plant, 10-14 June in Helsinki. as well as the MSc/PhD course „Plant Protection Biology“, 20-31 August in Alnarp.

The cooperation between the LTV faculty and the Post Graduate Courses in Life Science (PCLS) at Lund University is now well established and continued for a sixth time during the autumn 2018, giving PhD students at SLU Alnarp full access to about 15 PhD-courses in molecular biology at Lund University.

Master studies

A master students' summer school within ELLS (Euroleague for Life Sciences), „Genomics for Plant Breeding and Biotechnology“, was held 19-25 August in Warsaw, Poland. Members from the ELLS subject area 'Plant Molecular Breeding and Biotechnology' met in November 2018 in Copenhagen. The subject area „Plant Breeding and Biotechnology“ was formed after an initiative from PlantLink and includes five of the six ELLS universities with Lund University as an associated university. In the beginning of 2018 PlantLink initiated a new ELLS subject area called „Plant Health“. In the summer 2019 a number of courses were supported through these two subject areas.

Danish-Swedish Job Fair in Ystad!

Over 70 participants from University of Copenhagen, SLU Alnarp and Lund University met at the beautiful Ystad Saltsjöbad for two packed sunny days at the end of February. The plenary speaker Sofia Gape from IKEA kicked off the job fair with a personal reflection on her career path from a biology exam in Gothenburg to working with sustainability at IKEA. This inspiring talk was followed by presentations on entrepreneurship

and a panel discussion with university alumni. Day two started with a presentation on science outreach by senior lecturer in Evolutionary Ecology Jessica Abbott from Lund University, well known from her participation in “Fråga Lund”. Throughout the workshop, PhD students and Postdocs met up with participants from industry and researchers on speed dates that they had booked previously. With the help of a speed dating app for

researchers and industry more than 100 one-to-one meetings took place! We thank SPPS, Tuborg Foundation and Danish union JA for their support which made this event possible.



Budget and organization

PlantLink had a budget of 1.8 million SEK over the year, with SLU and LU contributing ca 1 million and 0.5 million SEK each. From July 2017 to June 2018 the total salary costs were 875,000 SEK. Positions funded were one director (30-50%), one assistant director (25%), one NordPlant administrator (20%) and one bioinformatician (25%). Other costs include information and outreach events, seminars, website and travels. From spring 2018 NordForsk funding contribute with 250,000 SEK/year for coordination of the project NordPlant.

PlantLink Personnel 2018-2019

Erik Alexandersson (director)

Tina D'Hertefeldt (assistant director)

Varma Saripella (bioinformatician)

Svante Resjö (NordPlant administrator from 1 December 2018)

Thomas Welwert (economy administrator)

Steering committee, 2018-2019

Marianne Sommarin, Umeå University, chair

Erik Andreasson, SLU

Mariette Andersson, SLU

Jean Yong (SLU)

Leif Bülow, LTH

Rajni Hatti-Kaul, LU

Allan Rasmusson, LU

Annette Olesen, Lantmännen Lantbruk

Jenny Bergsten, Region Skåne

Magnus Carlsson/ Linnea Almqvist, PhD representative, SLU

Gróa Valgerdur Ingimundardottir, PhD representative, LU

Permanent observatory members:

Svend Christensen, University of Copenhagen

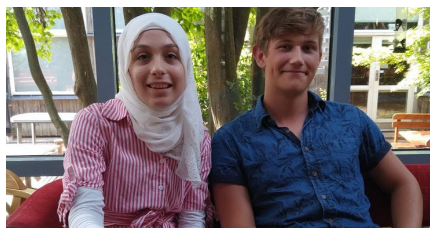
Steering committee meetings

13 September 2018, Lund

12 November 2018, Alnarp

4 March 2019, Lund

27 May, 2019, Alnarp



Ola Kartoumeh and Hjalmar Johansson two high school students with summer internships 2019 related to plant research together with „Forskningsnätet Skåne“, see next page



Outreach

Social media

PlantLink has continued its extensive work with social media for the spreading of plant science news, information, and upcoming events. On Twitter we have more than 1100 followers representing many important organizations in plant science. Over 1900 people like our Facebook page. Nine newsletters are distributed per year and our homepage (www.plantlink.se), which carries information on PlantLink's work and structure, associated researchers, relevant courses etc., was visited on average by over 100 unique visitors per week. Since 2018 we administrate NordPlant's new homepage (www.nordplant.org) and bi-annual newsletter.

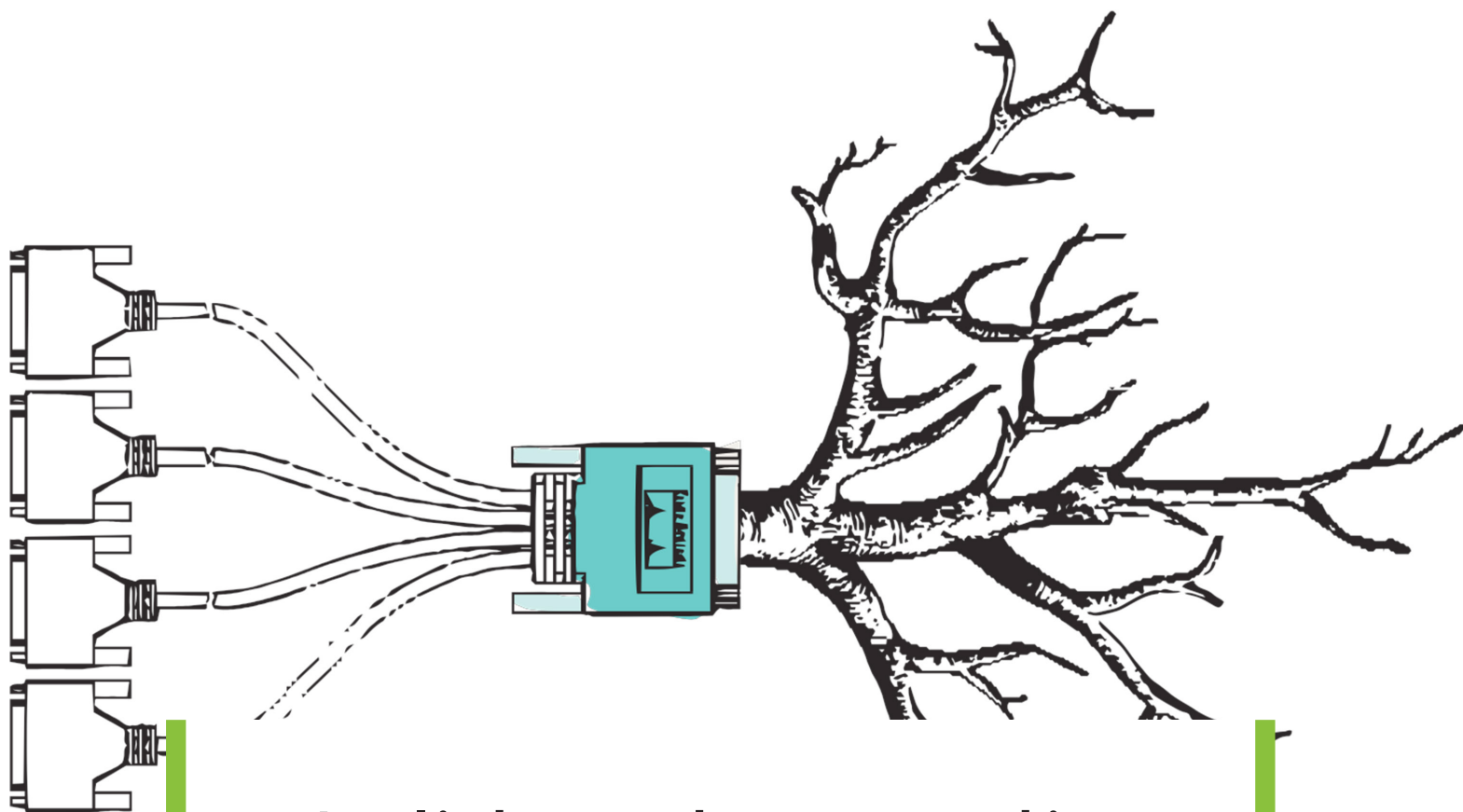
Interactions

PlantLink interacts with several partners. Our collaboration with PLEN at University of Copenhagen continues and led to the Job Fair for Danish and Swedish PhDs and Post Docs in Ystad, see box page 4. We have an active dialogue with The Linnean Centre for Plant Biology, Umeå Plant Science Center, EPSO and Mistra Biotech. In collaboration with "Forskningsnätet Skåne" two high school students did a summer internship related to plant research.

5th Fascination of Plants Day in Lund

PlantLink together with Nordgen celebrated the fifth international Fascination of Plants Day on the 25th of May in the Botanical garden in Lund. This year's theme was "Food and plants in future landscapes". The quizzes from Nordgen captured the interest of many visitors, and they could go on to buy Nordgen seeds and discuss plant matters with all of us. New for this year were the "Walk-and-talks" with Jonatan Leo, SLU and Mikael Hedrén, LU. Their informative presentations of the hidden variation in wild plants and how to domesticate a wild plant were highly appreciated. People were even queuing for the next walk! From PlantLink, we wish to thank the Lund Botanical garden for all their help, and all PlantLink-researchers who participated and made this a great Fascination of Plants Day!





Local industry and entrepreneurship

Several of PlantLinks research activities are in close collaboration with local businesses, for example, in crop protection and plant breeding. One important outcome is the PlantLink PhD/Post Doc Industrial Mentorship Program, which started for the fourth time in 2019. NordPlant will work to engage Nordic tech companies for plant phenotyping and performance prediction of crops in future climates. Our support for SLU Alnarp membership in the Plant Biologicals Network Southern Scandinavian (PBN) also continued (www.plantbiologicals.dk).

PlantLink events 2018 - 2019

(number of attendees in brackets)

- ELLS Master's student summer course „Genomics for Plant Breeding and Biotechnology“, 19-25 August 2018 in Warsaw, Poland
- MSc/PhD course „Plant Protection Biology“, 20-31 August 2018 in Alnarp (28)
- PlantLink Day, 12 September 2018 in Lund (73)
- NordPlant kick-off, 24-25 October 2018 in Helsinki (60)
- Launch of NordPlant newsletter, December 2018
- 4th round of PlantLink Industrial Mentorship, first meeting 18 January, 2019 (10)
- Job Fair for Danish and Swedish PhDs and Post Docs in Ystad, 28 February-1 March 2019 (70)
- Workshop on phenotyping standards, Lund 29-30 April 2019 (20)
- Fascination of Plants Day, 25 May 2019 in Lund Botanical Gardens
- NordPlant mingle during NPPN field day, 25 June 2019 at SLU Alnarp

Upcoming events 2019

- **PlantLink Day**, 3 October in Lund
- **Tech talks for plant phenotyping in the Nordic countries - 1st NordPlant annual meeting**, 20 November in Lund

Contact and more information

Follow us on Facebook and Twitter to get continuous updates from PlantLink.
For more information check our homepage: www.plantlink.se

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