



Twelfth Annual Report

July 2022 - June 2023

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 40 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

- AdValue (Erasmus+)
- C4F
- ELLS
- EMPHASIS
- ESCAPAdE (Erasmus+)
- NewClim (Erasmus+)
- NordPlant (NordForsk)
- ScanOats (SSF)
- SLU GroGrund
- STEPS (Mistra)
- UPSCALE (NorfForsk)

Research with unlimited funds?

As part of our series "Researcher in the spotlight" we ask what our researchers would do with unlimited funds. Here are examples of captivating responses from last year!

"To develop [...] training programs for students and professionals to learn and apply the tools, methodologies and approaches from systems science." *Deniz Koca*

"To restore and utilize neglected and forgotten traits present in crop wild relatives, landraces, and ancient genetic resources [...]." *Mahbubjon Rahmatov*

"To study the organization of farming activities that may contribute to the alleviation of poverty and hunger through the sustainable transformation of agri-food systems." *Konstantinos Karantininis*

"Academia and the food industry must find strategies to limit the presence of anti-nutrients in plant protein products." *Carolina Östbring*

"To quantify the changes in the genome due to selection for productivity, host plant resistance, quality characters and the extended microbiome phenotype(s) in a tetrasomic polyploid crop such as potato." *Rodomi Ortiz*

"Building high-end natural field facilities to screen crop plants for future climates." *Sajeevan Radha Sivarajan*

PlantLink is looking into the future

In June 2023 our director **Federico Gómez** decided to step down as a leader of PlantLink from mid-September. In the meanwhile, the former director, Erik Alexandersson at SLU step in as acting director of PlantLink.

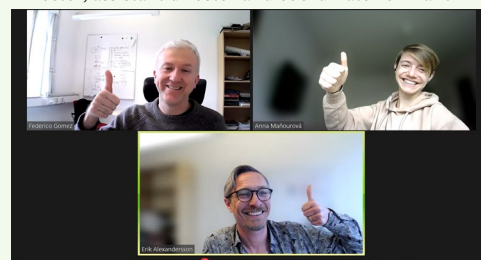
Under Federico's lead PlantLink surveyed the needs to establish a more food oriented network in the region. Several regional, national and international actors have been contacted and an internal workshop around the area took place just before the end of the year. This have given us a good picture of the needs and initiatives ongoing.

During the spring of 2023 we met with the deans of the three faculties funding PlantLink, and three options were outlined for PlantLink's future: 1) join

existing organisations at the universities, 2) find external funding for the future activities or 3) become a center of excellence.

PlantLink's steering committee has since then been working on these three different future scenarios.

Director, assistant director and coordinator of PlantLink



NordPlant and PlantLink supported publications 2022-2023

Abdelghafour, F., Sivarajan, S. R., Abdelmeguid, I., Rycckewaert, M., Roger, J. M., Bendoula, R., & Alexandersson, E. (2023). Including measurement effects and temporal variations in VIS-NIRS models to improve early detection of plant disease: Application to *Alternaria solani* in potatoes. *Computers and Electronics in Agriculture*, 211, 107947.*

Darwish, E., Ghosh, R., Bentzer, J., Renhuldt, N. T., Proux-Wera, E., Kamal, N., ... & Van Aken, O. (2023). The dynamics of touch-responsive gene expression in cereals. *The Plant Journal*.

Jammer, A., S.S. Akhtar, D.B. Amby, C. Pandey, M.F. Mekureyaw, F. Bak, P.M. Roth, and T. Roitsch, Enzyme activity profiling for physiological phenotyping within functional phenomics: plant growth and stress responses. *Journal of Experimental Botany*, 2022. 73(15): p. 5170-5198.*

Qi, C., M. Sandroni, J. Cairo Westergaard, E. Høegh Riis Sundmark, M. Bagge, E. Alexandersson, and J. Gao, In-field classification of the asymptomatic biotrophic phase of potato late blight based on deep learning and proximal hyperspectral imaging. *Computers and Electronics in Agriculture*, 2023. 205: p. 107585.*

Pollari, M., N. Sipari, S. Poque, K. Himanen, and K. Mäkinen Effects of Poty-Potexvirus Synergism on Growth, Photosynthesis and Metabolite Status of *Nicotiana benthamiana*. *Viruses*, 2023. 15, DOI: 10.3390/v15010121.*

Pavicic, M., Mouhu, K., Hautsalo, J., Jacobson, D., Jalli, M., & Himanen, K. (2023). Image-based time series analysis to establish differential disease progression for two *Fusarium* head blight pathogens in oat spikelets with variable resistance. *Frontiers in plant science*, 14, 1126717.*

Pottier, D., Roitsch, T., & Persson, S. (2023). Cell wall regulation by carbon allocation and sugar signaling. *The Cell Surface*, 100096.*

Roitsch, T., K. Himanen, A. Chawade, L. Jaakola, A. Nehe, and E. Alexandersson, Functional phenomics for improved climate resilience in Nordic agriculture. *Journal of Experimental Botany*, 2022. 73(15): p. 5111-5127.*

Sajeevan, R. S., Abdelmeguid, I., Saripella, G. V., Lenman, M., & Alexandersson, E. (2023). Comprehensive transcriptome analysis of different potato cultivars provides insight into early blight disease caused by *Alternaria solani*. *BMC Plant Biology*, 23(1), 1-22.

Trivedi, P., L. Klavins, A.L. Hykkerud, J. Kviesis, D. Elferts, I. Martinussen, M. Klavins, K. Karppinen, H. Häggman, and L. Jaakola, Temperature has a major effect on the cuticular wax composition of bilberry (*Vaccinium myrtillus* L.) fruit. *Frontiers in Plant Science*, 2022. 13.*

*NordPlant supported

New connections and Fascination of Plants Day in a different format!

PlantLink aims to have an increased role as an interdisciplinary platform where different actors of society work to develop sustainable agrifood systems, from farm to fork. As a result, PlantLink began new food sector collaborations with Sweden Food Arena and Good Food Institute, and highlighted innovative food-oriented companies in the region in the Story of Success series.

„What to eat in times of crisis?“ This was the theme that sheltered PlantLink’s celebration of this year’s Fascination of Plants Day. The event was held on the 9th of May in Lund with a crowded audience room (over 80 attendees) and many active online participants. The audience was eager to hear the four panellists: Aakash Chawade (SLU), Lennart Olsson (LUCSUS), Lieselotte Cloetens (LU) and Jun Niimi (RISE). The panelists began with a brief presentation of their perspectives, followed by a lively discussion moderated by science journalist Peter Sylwan. The theme was examined from various perspectives, including plant breeding, the role of perennials, the impact of diet on human health, and consumer behaviour.

NordPlant ‘continues’ as UPSCALE

Just as NordPlant is running towards its end, we received the great news that NordForsk will fund the new project UPSCALE with 10 million Norwegian krona until the end of 2026. UPSCALE is in part based on the work of the NordPlant project. NordPlant has reached all its major goals, producing almost double the number of anticipated scientific publications (currently standing at 35).

Through different field experiments across the Nordic-Baltic region, UPSCALE will determine biosignatures via satellite, drone and proximal phenotyping. The UPSCALE project spans over four years (2023-2026). If you want to receive more information about UPSCALE, please contact the coordinator, Erik Alexandersson.

UPSACLE will keep parts of NordPlant’s network struc-

ture by running online seminar series and taking over the homepage, www.nordplant.org, which is currently re-branded. NordPlant’s last meeting, “The future of plant phenotyping”, will be held in Båstad on 22-23 November.



Education

PhD Education

The Post Graduate Courses in Life Science (PCLS) at Lund University continued during the autumn of 2022, giving PhD students at SLU access to about 15 PhD-courses. The PhD courses were expanded into other Nordic countries, with the NOVA PhD course „High throughput field phenotyping and vegetation mapping“ hosted by NMBU, Norway, in June 2023, being one of the most popular. As part of NordPlant, a NOVA course “Common Data Standards and Integrative Analytic Methods for Plant Phenotyping”, 3 ECTS, was held 28 November – 2 December 2022 at SLU Alnarp.

Master studies

The last period brought many opportunities for master students. SLU Alnarp hosted a summer course “Plant Protection Biology: improving plant health under climate change and other stresses”, August 8-19, 2022. 32 students of >60 applicants were admitted. This course was also a part of Circular Case Studies: Food systems transformation through transdisciplinarily and cooperation (2CS) within ELLS aimed at cooperation through project-based learning. Another great opportunity for students was the ELLS student competition “Grand Challenges in Plant Health. The winners got free attendance to the 12th International Congress on Plant Pathology in Lyon. PlantLink initiated the ELLS subject areas „Plant Breeding and Biotechnology“ and „Plant Health“.

Industrial Mentorship Program is back!

PlantLink hosted the 6th round of Industrial Mentorship Program, with a record of 13 mentor-mentee pairs. The program’s goal is to give PhD students and postdocs the opportunity to get experience outside of academia, share information and skills, and receive practical career development guidance from their mentors. The mentorship program began in May 2023 and will finish in December, with three joint meetings, one excursion,

and individualised interaction between mentee-mentor pairs. Which institutions from outside academia are represented this year? BeSproud, Corteva, Findus, FMC Agricultural Solutions, Husqvarna, In vitro Plant-Tech, Lindesro, Nordgen, Stockholm Environmental Institute (SEI), Swedish International Agriculture Network Initiative (SIANI) and Vultus. We thank our collaborators!



The first physical meeting for the PlantLink Industrial Mentor program, May 2023



Budget and organization

PlantLink had a budget of 1,125 million SEK over the year, with SLU and LU contributing ca 0.5 million SEK each. Salary costs were 1,1 million SEK. Positions funded for PlantLink were one director (25%), one assistant director (15%), one coordinator (50%), and for NordPlant, one coordinator (25%) and one administrator (10%). Other costs include information and outreach events, seminars, website and travels. NordForsk funding contributes 125,000 SEK/year for the coordination of the project NordPlant.

PlantLink Personnel 2022-2023

Federico Gomez (director from 1 July 2022 until 15 September 2023)

Erik Alexandersson (assistant director and acting director from 15 September 2023; NordPlant coordinator)

Anna Maňourová (coordinator)

Svante Resjö (NordPlant administrative coordinator)

Andreas Gustavsson Fredlund (economy administrator)

Steering committee, 2022-2023

Thomas Moritz, University of Copenhagen,
chair of the committee

Karl Magnus Adielsson, Region Skåne (until
May 2023)

Mariette Andersson, SLU

Erik Andreasson, SLU

Leif Bülow, LU

Alf Ceplitis, Lantmännen Lantbruk

Rajni Hatti-Kaul, LU – until October 2022

Carl Jonson, Region Skåne (from May 2023)

Sofia Marmon, LU – from October 2022

Abraham Ontiveros Cisneros, PhD representative, LU

Johanna Osterman, PhD representative, SLU

Allan Rasmusson, LU

Jean Yong, SLU

Permanent observatory member:

Svend Christensen, University of Copenhagen

Steering committee meetings

30 August 2022, Alnarp

5 October 2022, Alnarp

6 December 2022, Lund

7 February 2023, Alnarp

14 June 2023, Alnarp



Outreach

Social media

PlantLink continued its extensive work to spread plant and food science news, information, and upcoming events. We have over 1,700 followers on Twitter (X), representing many key players in plant science. Over 2,600 people follow our Facebook page. The re-established LinkedIn account is gaining popularity in academics and industry, with over 650 followers. Nine newsletters are distributed per year, reaching 670 subscribers. Our webpage offers information on PlantLink's work and organisation, related researchers and their work, relevant courses, and significant events in the life sciences. We are administrating NordPlant's homepage and bi-annual newsletter.

Interactions

PlantLink interacts with several partners from inside and outside of academia. Our relationships within the Öresund region got stronger through collaboration with Copenhagen Plant Science Center and PLEN at the University of Copenhagen. This year's focus was more oriented towards food and agrifood systems approach, resulting in cooperation with Sweden Food Arena and Good Food Institute. The contacts continue with The Linnean Centre for Plant Biology, Umeå Plant Science Center, PBN and EPSO.

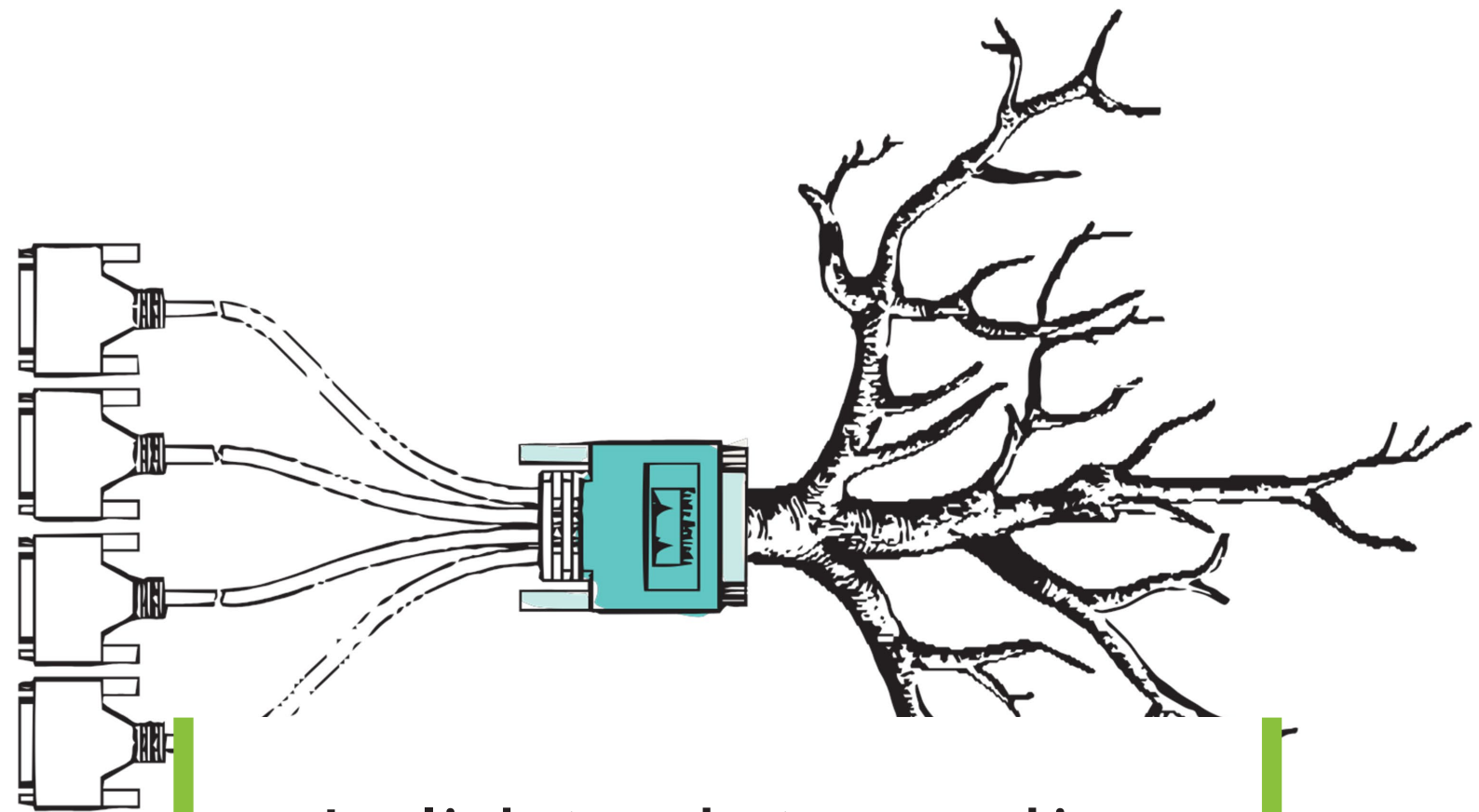
New initiatives within EPSO

EPSO (European Plant Science Organisation) has launched a hugely popular monthly science online meeting. If you have not attended yet we recommend you to take a look at their membership homepage. In the spring of 2023, the new working group for proofing plants for future climates was launched and we are happy to have representatives from both LU and SLU Alnarp in this group.

This year, Ramesh Vetukuri (SLU) represented PlantLink at the EPSO annual general assembly in Düsseldorf 28-30 June. Upon the success of the EPSO Young Plant Scientist Awards (YPSA) 2023 call there will be one more in the fall of 2024.

ESPO continues to follow the European Infrastructure programme related to plant science. There is a possibility for plant scientists to use the many existing ESFRI infrastructure projects for plant scientists. PlantLink is, for example, closely monitoring the development of EMP-HASIS around future infrastructures for plant phenotyping in Europe.

EPSO is gearing up to the Fascination of Plants Day 2024, which as usual is May 18.



Local industry and entrepreneurship

Several of PlantLink's research activities are in close collaboration with local businesses, related to plant science. Spring 2023 a sixth round of the PlantLink industrial mentorship program was initiated. This time with 13 mentor-mentees couples. NordPlant engages Nordic companies by arranging company tech corners during the annual days and through SLU Holding producing a survey of Swedish companies using AI for agriculture. Our support paying the memberships for SLU Alnarp and Lund University in the Plant Biologicals Network Southern Scandinavian (PBN) continues.

PlantLink-supported events 2022 - 2023

(number of attendees in brackets)

- PlantLink Day: New Plant Product; October 2022, Alnarp (>120)
- NordPlant annual meeting "Envirotyping for plant breeding and precision agriculture", 30 November 2022, Lund (60)
- The centennial anniversary of the ecotype concept, the legacy of Göte Turesson, 29 November 2022, Lund (90)
- Start of Story of Success interview series, January 2023
- 6th round of PlantLink Industrial Mentorship Program, May-December 2023 (12 mentor-mentee pairs)
- ELLS MSc student Competition – Plant Health Grand Challenges, May 2023, (39)
- Fascination of Plants Day: What to eat in times of crisis, 9 May 2023, Lund (80)
- SASUF Satellite Event: The status of agricultural biologicals in Southern Africa, March 2023, online (141)
- Swedish Society for Plant Pathology and the Danish Society for Plant Diseases and Pests common event in Alnarp June 28th 2023 (57)

Upcoming events 2023

- **PlantLink Day:** "Biodiversity: the key to resilient agri-food systems", 5 October in Lund
- **NordPlant annual and final meeting:** The future of Plant Phenotyping, 22-23 November in Båstad Sweden

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

Name	E-mail	Telephone
Thomas Moritz Chair	thomas.moritz@sund.ku.dk	
Erik Alexandersson Acting Director Coordinator NordPlant	erik.alexandersson@slu.se	+46 (0)40-41 53 38
Anna Maňourová Coordinator PlantLink	anna.manourova@slu.se	
Svante Resjö Administrative coordinator for NordPlant	svante.resjo@slu.se	
Andreas Gustavsson Fredlund Economy administrator	andreas.fredlund@slu.se	

