2021-01-20

PlantLink bibliometric evaluation

Performed by Sofia Marmon, Tina d'Hertefeldt and Erik Alexanderson from PlantLink and Fredrik Åström from Lund University Library in December 2020

Introduction:

PlantLink has supported many plant researchers, either through seed money grants, or through the assistance of a bioinformatician. This support has resulted in at least 52 peer-reviewed articles. Of these 47 were included in the bibliometric evaluation performed in December 2020, see list in appendix 1. One of the 52 was not covered in Scopus, the search engine used for the evaluation, and four were reported after the bibliometric evaluation was performed. Of the articles, 21 results from the seed-money projects and 31 from the bioinformatic support. Seventeen of the articles had authors from both Lund University (LU) and the Swedish University of Agriculture, campus Alnarp (SLU Alnarp), but two of these were incorrectly grouped during the evaluation (marked in appendix 1). The bibliometric evaluation was done as part of an overall self-evaluation of PlantLink.

How the evaluation was done:

The bibliometric evaluation was performed using SciVal (www.scival.com), a web-based analytics tool provided by Elsevier, coupled to the scientific search engine Scopus (www.scopus.com). Initially all known PlantLink publications was identified in Scopus. One known per-reviewed publication was excluded, as the journal was not indexed by this search engine. As one purpose of the evaluation was to investigate the impact of PlantLink's support on the collaboration between LU and SLU Alnarp, the publications were divided into two groups. One group with publications with authors from both LU and SLU Alnarp and one group with authors from one of the universities.

For comparison to the PlantLink publications, two different reference sets of publications were made. The first reference set one includes all publications found with authors affiliated to both LU and to SLU Alnarp, with no limitation to subject area. The second reference set we tried to build to get an overall view of publications within PlantLink's focus areas. In this set search strings for each of PlantLink's focus area was made, for full search strings see appendix 2 at the end of the report. The newest focus area "Plant, people and society" was excluded from the set, as the area is very broad and difficult to set up a general search string for. Moreover, this focus area has not been part of any seed-money grant or bioinformatic support and is therefore less relevant to include in the comparison. This second reference set was further limited to have at least one author affiliated to Sweden. This second reference set cannot be seen to completely cover all the research of the focus areas, in that the search strings are too limited. Still, it can be useful as a type of field-based comparison.

In time, PlantLink publications was limited to 2012-2020 (first publication- year of evaluation), and for the reference sets we choose to look at the years 2000-2020, to add about an equal timeframe before PlantLink started as with PlantLink.

The following bibliometric parameters were chosen for investigation:

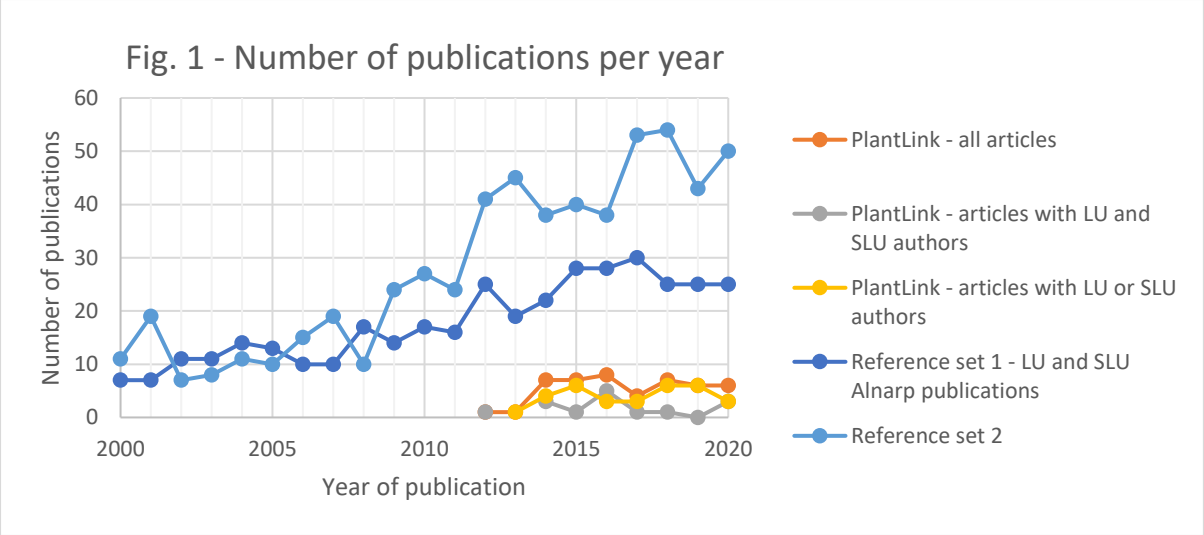
Number of publications
Citations per publications

Field-weighted citation impact (FWCI)
Output in Top 10% Citation Percentiles (field-weighted%)
Publications in Top 10% Journal Percentiles by Scientific Journal Rankings (SJR) (%)

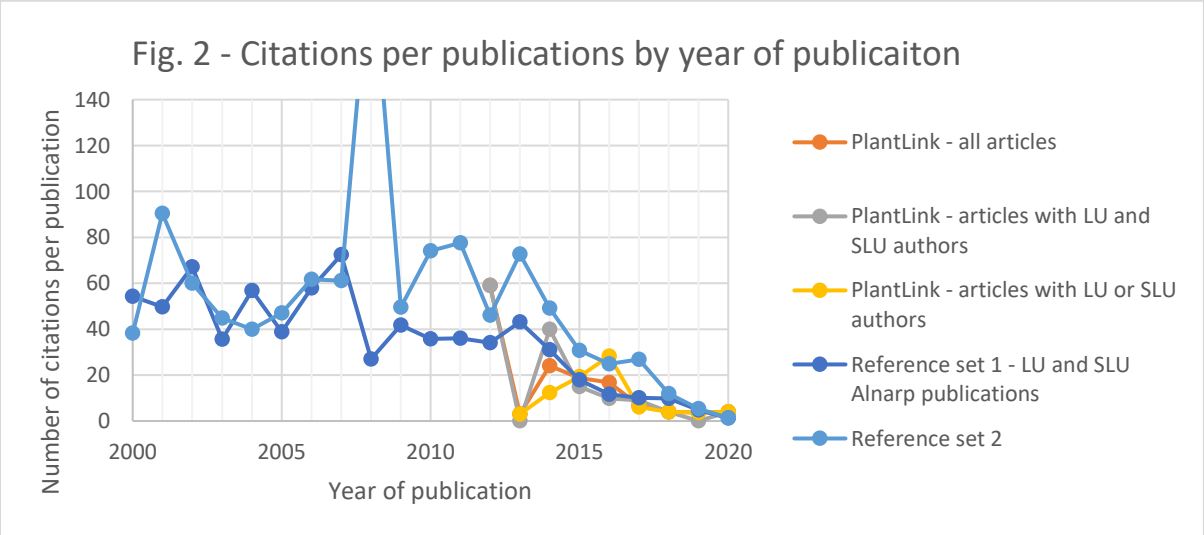
In all cases this was divided by year of publication.

Results:

In Figure 1 the number of publications per year is shown. A general trend of increased publications is seen in both reference sets, and the PlantLink supported publications is contributing to this.



In figure 2 one can see a downward trend in citations per publication by year of publication. This is expected, as older publications have had longer time to accumulate citations. PlantLink publications perform similar to reference set 1, and a little lower than reference set 2.



In figure 3 the Field-Weighted Citation impact (FWCI) is shown. Regarding the FWCI, it can be noted that the average value is one. A number higher than one is better than average for the field. Both reference sets mostly differ between 1 and 2,5, whereas the variation for the PlantLink supported publications is higher. The larger variation is partly due to the PlantLink publications being fewer, thus more extreme values are seen. This reflects more individual articles than the average of a group. What can be seen is that some PlantLink supported publications thus perform very well, but that the variation is big. This larger variation is also seen for "Output in Top 10% Citation Percentiles (field-weighted%)" (Figure 4) and "Publications in Top 10% Journal Percentiles by (SJR) (%)" (Figure 5).

Fig. 3 - Field-Weighted Citation Impact per year of publication

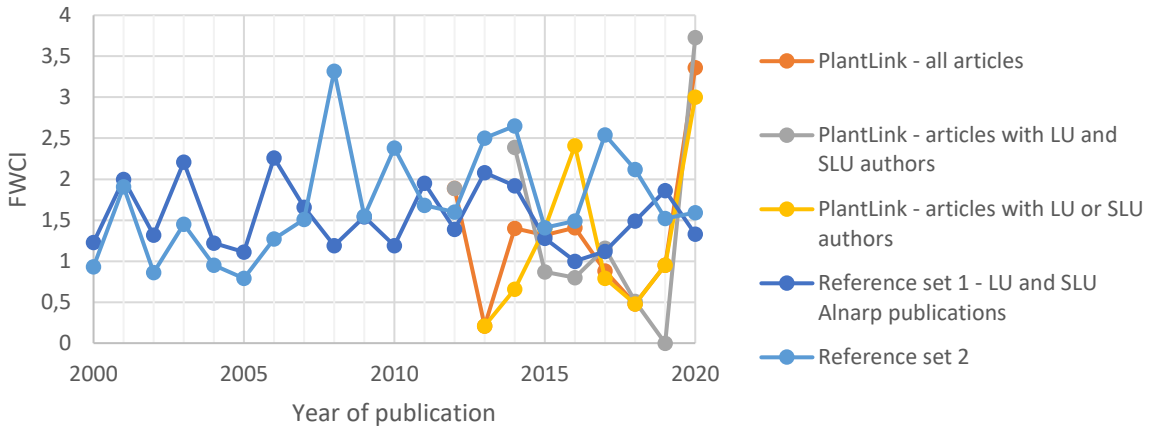
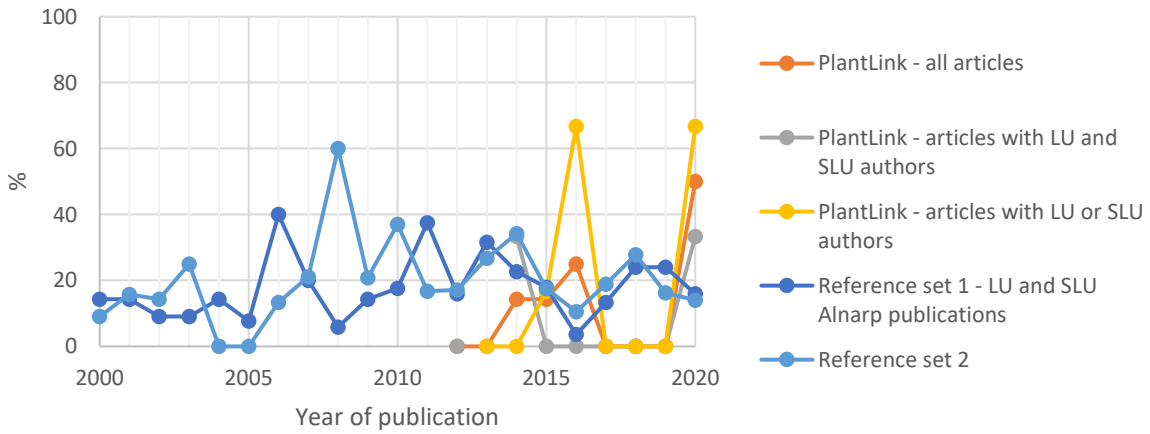
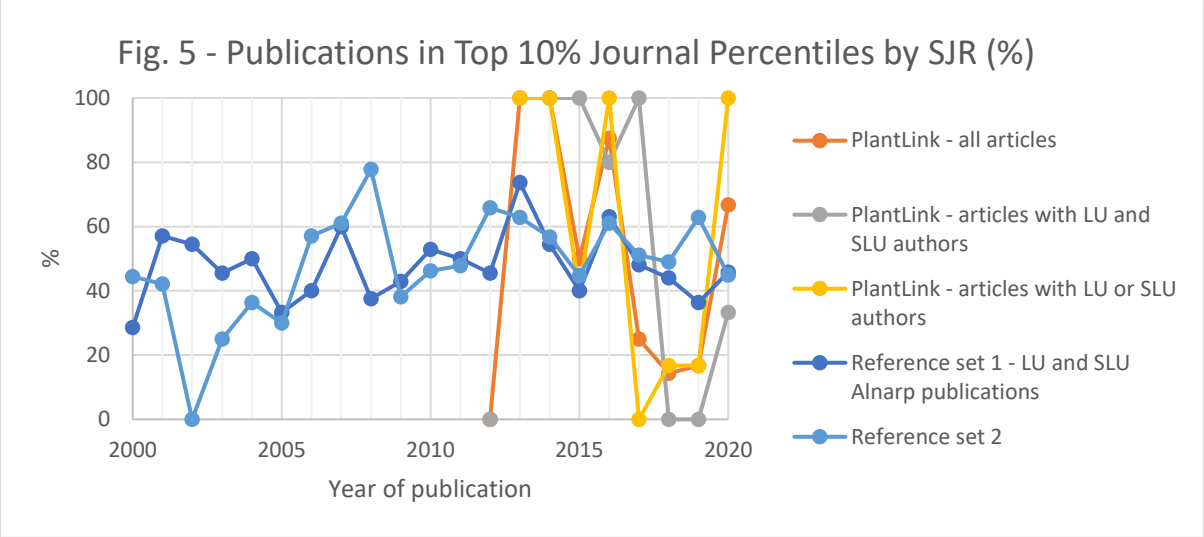


Fig. 4 - Output in Top 10% Citation Percentiles (field-weighted%)





Overall, the bibliometric evaluation indicates that PlantLink have had a positive role when it comes to the publication outcome for the researcher PlantLink has supported. The number of publications in general and also co-publications between LU and SLU Alnarp has increased during the time period of PlantLink. The supported publications are in the case of the seed-money projects results from new and innovative research, and that there is a large spread in the bibliometric output from such projects, is to be expected. The bibliometric evaluation shows that several of the publications have been published in high ranked journals, both overall and field-weighted, and thus performed extremely well in terms of bibliometric output.

Appendix 1:
List of publications included in the bibliometric evaluation

Publications supported through seed money grants are marked with *. The other publications have had bioinformatic support sponsored by PlantLink.

Publications with authors affiliated with both LU and SLU Alnarp are marked with ǂ.

2012

Witzgall P, Proffit M, Rozpedowska E, Becher PG, Andreadis S, Coracini M, et al. "This is not an apple"-yeast mutualism in codling moth. J Chem Ecol. 2012;38(8):949-57.* ǂ

2013

Kaki SS, Adlercreutz P. Quantitative analysis of enzymatic fractionation of multiple substrate mixtures. Biotechnol Bioeng. 2013;110(1):78-86.*

2014

Amar D, Frades I, Danek A, Goldberg T, Sharma SK, Hedley PE, et al. Evaluation and integration of functional annotation pipelines for newly sequenced organisms: The potato genome as a test case. BMC Plant Biology. 2014;14(1).

Bengtsson T, Weighill D, Proux-Wéra E, Levander F, Resjö S, Burra DD, et al. Proteomics and transcriptomics of the BABA-induced resistance response in potato using a novel functional annotation approach. BMC Genomics. 2014;15(1). ǂ

Burra DD, Berkowitz O, Hedley PE, Morris J, Resjö S, Levander F, et al. Phosphite-induced changes of the transcriptome and secretome in Solanum tuberosum leading to resistance against Phytophthora infestans. BMC Plant Biology. 2014;14(1). ǂ

Crespo-Herrera LA, Akhunov E, Garkava-Gustavsson L, Jordan KW, Smith CM, Singh RP, et al. Mapping resistance to the bird cherry-oat aphid and the greenbug in wheat using sequence-based genotyping. Theoretical and Applied Genetics. 2014;127(9):1963-73.

Ding BJ, Hofvander P, Wang HL, Durrett TP, Stymne S, Löfstedt C. A plant factory for moth pheromone production. Nat Commun. 2014;5.* ǂ

Leiva-Eriksson N, Pin PA, Kraft T, Dohm JC, Minoche AE, Himmelbauer H, et al. Differential expression patterns of non-symbiotic hemoglobins in sugar beet (Beta vulgaris ssp. vulgaris). Plant and Cell Physiology. 2014;55(4):834-44.*

Turesson H, Andersson M, Marttila S, Thulin I, Hofvander P. Starch biosynthetic genes and enzymes are expressed and active in the absence of starch accumulation in sugar beet tap-root. BMC Plant Biology. 2014;14(1).

2015

Amar D, Frades I, Diels T, Zaltzman D, Ghatan N, Hedley PE, et al. The MORPH-R web server and software tool for predicting missing genes in biological pathways. Physiol Plant. 2015;155(1):12-20.

Andreadis SS, Witzgall P, Becher PG. Survey of arthropod assemblages responding to live yeasts in an organic apple orchard. Front ecol evol. 2015;3(OCT).*

Burra DD, Mühlenbock P, Andreasson E. Salicylic and jasmonic acid pathways are necessary for defence against Dickeya solani as revealed by a novel method for Blackleg disease screening of in vitro grown potato. Plant Biol. 2015;17(5):1030-8.

Frades I, Abreha KB, Proux-WÉra E, Lankinen Å, Andreasson E, Alexandersson E. A novel workflow correlating RNA-seq data to Phythophthora infestans resistance levels in wild Solanum species and potato clones. Frontiers in Plant Science. 2015;6(September).

Lager I, Glab B, Eriksson L, Chen G, Banas A, Stymne S. Novel reactions in acyl editing of phosphatidylcholine by lysophosphatidylcholine transacylase (LPCT) and acyl-CoA:glycerophosphocholine acyltransferase (GPCAT) activities in microsomal preparations of plant tissues. Planta. 2015;241(2):347-58.*

Manoharan L, Kushwaha SK, Hedlund K, Ahrén D. Captured metagenomics: Large-scale targeting of genes based on 'sequence capture' reveals functional diversity in soils. DNA Res. 2015;22(6):451-60. ǂ

Nicolia A, Proux-Wéra E, Åhman I, Onkokesung N, Andersson M, Andreasson E, et al. Targeted gene mutation in tetraploid potato through transient TALEN expression in protoplasts. J Biotechnol. 2015;204:17-24.

2016

Ding BJ, Lager I, Bansal S, Durrett TP, Stymne S, Löfstedt C. The Yeast ATF1 Acetyltransferase Efficiently Acetylates Insect Pheromone Alcohols: Implications for the Biological Production of Moth Pheromones. Lipids. 2016;51(4):469-75.* ǂ

Głab B, Beganovic M, Anaokar S, Hao MS, Rasmusson AG, Patton-Vogt J, et al. Cloning of glycerophosphocholine acyltransferase (GPCAT) from fungi and plants: A novel enzyme in phosphatidylcholine synthesis. Journal of Biological Chemistry. 2016;291(48):25066-76.* ǂ

Hofvander P, Ischebeck T, Turesson H, Kushwaha SK, Feussner I, Carlsson AS, et al. Potato tuber expression of Arabidopsis WRINKLED1 increase triacylglycerol and membrane lipids while affecting central carbohydrate metabolism. Plant Biotechnology Journal. 2016;14(9):1883-98.

Kuktaite R, Newson WR, Rasheed F, Plivelic TS, Hedenqvist MS, Gällstedt M, et al. Monitoring Nanostructure Dynamics and Polymerization in Glycerol Plasticized Wheat Gliadin and Glutenin Films: Relation to Mechanical Properties. ACS Sustainable Chem Eng. 2016;4(6):2998-3007.* ǂ

Kushwaha SK, Chauhan P, Hedlund K, Ahren D. NBSPred: A support vector machine-based high-throughput pipeline for plant resistance protein NBSLRR prediction. Bioinformatics. 2016;32(8):1223-5. ǂ

Lankinen A, Abreha KB, Alexandersson E, Andersson S, Andreasson E. Nongenetic inheritance of induced resistance in a wild annual plant. Phytopathology. 2016;106(8):877-83.* ǂ

Lenman M, Ali A, Mühlenbock P, Carlson-Nilsson U, Liljeroth E, Champouret N, et al. Effector-driven marker development and cloning of resistance genes against Phytophthora infestans in potato breeding clone SW93-1015. Theoretical and Applied Genetics. 2016;129(1):105-15.

Roy A, Walker WB, Vogel H, Chattington S, Larsson MC, Anderson P, et al. Diet dependent metabolic responses in three generalist insect herbivores Spodoptera spp. Insect Biochem Mol Biol. 2016;71:91-105.

2017

Ivarson E, Iven T, Sturtevant D, Ahlman A, Cai Y, Chapman K, et al. Production of wax esters in the wild oil species Lepidium campestre. Industrial Crops and Products. 2017;108:535-42.*

Ivarson E, Leiva-Eriksson N, Ahlman A, Kanagarajan S, Bülow L, Zhu LH. Effects of overexpression of WRI1 and hemoglobin genes on the seed oil content of Lepidium campestre. Frontiers in Plant Science. 2017;7.* ǂ

Zhang K, Zhou T, Ye L, Bülow L. Characterization of protein-protein interactions in recombinant hemoglobin producing escherichia coli cells using molecularly imprinted polymers. Adv Exp Med Biol: Springer New York LLC; 2017. p. 367-73.*

Zhao M, Jones CM, Meijer J, Lundquist PO, Fransson P, Carlsson G, et al. Intercropping affects genetic potential for inorganic nitrogen cycling by root-associated microorganisms in Medicago sativa and Dactylis glomerata. Appl Soil Ecol. 2017;119:260-6.*

2018

Abreha KB, Lankinen Å, Masini L, Hydbom S, Andreasson E. Late blight resistance screening of major wild swedish solanum species: S. dulcamara, S. nigrum, and S. physalifolium. Phytopathology. 2018;108(7):847-57.* ǂ (incorrectly grouped as only authors from one university during the bibliometric evaluation)

Ahmadi-Afzadi M, Orsel M, Pelletier S, Bruneau M, Proux-Wéra E, Nybom H, et al. Genome-wide expression analysis suggests a role for jasmonates in the resistance to blue mold in apple. Plant Growth Regul. 2018;85(3):375-87.

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

Burra DD, Lenman M, Levander F, Resjö S, Andreasson E. Comparative membrane-associated proteomics of three different immune reactions in potato. Int J Mol Sci. 2018;19(2). ǂ

Chawade A, Armonienė R, Berg G, Brazauskas G, Frostgård G, Geleta M, et al. A transnational and holistic breeding approach is needed for sustainable wheat production in the Baltic Sea region. Physiol Plant. 2018;164(4):442-51.

Gustafsson C, Willforss J, Lopes-Pinto F, Ortiz R, Geleta M. Identification of genes regulating traits targeted for domestication of field cress (Lepidium campestre) as a biennial and perennial oilseed crop. BMC Genet. 2018;19(1).

Walter AJ, Willforss J, Lenman M, Alexandersson E, Andreasson E. RNA seq analysis of potato cyst nematode interactions with resistant and susceptible potato roots. Eur J Plant Pathol. 2018;152(2):531-9.

2019

Anaokar S, Kodali R, Jonik B, Renne MF, Brouwers JFHM, Lager I, et al. The glycerophosphocholine acyltransferase Gpc1 is part of a phosphatidylcholine (PC)-remodeling pathway that alters PC species in yeast. Journal of Biological Chemistry. 2019;294(4):1189-201.*

Eriksson NL, Reeder BJ, Wilson MT, Bülow L. Sugar beet hemoglobins: Reactions with nitric oxide and nitrite reveal differential roles for nitrogen metabolism. BIOCHEM J. 2019;476(14):2111-25.*

Masini L, Grenville-Briggs LJ, Andreasson E, Råberg L, Lankinen Å. Tolerance and overcompensation to infection by Phytophthora infestans in the wild perennial climber Solanum dulcamara. Ecology and Evolution. 2019;9(8):4557-67.* ǂ (incorrectly grouped as only authors from one university during the bibliometric evaluation)

Odilbekov F, Armoniené R, Koc A, Svensson J, Chawade A. GWAS-Assisted Genomic Prediction to Predict Resistance to Septoria Tritici Blotch in Nordic Winter Wheat at Seedling Stage. Front Genet. 2019;10.

Odilbekov F, He X, Armoniené R, Saripella GV, Henriksson T, Singh PK, et al. QTL mapping and transcriptome analysis to identify differentially expressed genes induced by Septoria tritici blotch disease of wheat. Agronomy. 2019;9(9).

Walker WB, III, Roy A, Anderson P, Schlyter F, Hansson BS, Larsson MC. Transcriptome Analysis of Gene Families Involved in Chemosensory Function in Spodoptera littoralis (Lepidoptera: Noctuidae). BMC Genomics. 2019;20(1).

2020

Alexandersson E, Kushwaha S, Subedi A, Weighill D, Climer S, Jacobson D, et al. Linking crop traits to transcriptome differences in a progeny population of tetraploid potato. BMC Plant Biology. 2020;20(1).

Becher PG, Verschut V, Bibb MJ, Bush MJ, Molnár BP, Barane E, et al. Developmentally regulated volatiles geosmin and 2-methylisoborneol attract a soil arthropod to Streptomyces bacteria promoting spore dispersal. Nat Microbiol. 2020;5(6):821-9.* ǂ

Geleta M, Gustafsson C, Glaubitz JC, Ortiz R. High-Density Genetic Linkage Mapping of Lepidium Based on Genotyping-by-Sequencing SNPs and Segregating Contig Tag Haplotypes. Frontiers in Plant Science. 2020;11.

Møller IM, Igamberdiev AU, Bykova NV, Finkemeier I, Rasmusson AG, Schwarzländer M. Matrix redox physiology governs the regulation of plant mitochondrial metabolism through posttranslational protein modifications. Plant Cell. 2020;32(3):573-94.*

Schmidt J, Dotson BR, Schmiderer L, van Tour A, Kumar B, Marttila S, et al. Substrate and plant genotype strongly influence the growth and gene expression response to trichoderma afroharzianum T22 in sugar beet. Plants. 2020;9(8):1-14. ǂ

Willforss J, Leonova S, Tillander J, Andreasson E, Marttila S, Olsson O, et al. Interactive proteogenomic exploration of response to Fusarium head blight in oat varieties with different resistance. Journal of Proteomics. 2020;218. ǂ

Appendix 2:

Search strings for reference sets

Reference set 1: LU and SLU Alnarp co-publications

Search string:

AF-ID ("Lunds Universitet") AND (AF-ID ("Sveriges lantbruksuniversitet") AND (AFFILCITY (Alnarp)) AND PY=2000-2020

Reference set 2: Focus areas publication overview

Search string:

TITLE-ABS-KEY (("plant breeding" OR "plant engineering") OR (("Post harvest") AND (plants OR agriculture OR crop OR forestry) AND (quality OR product)) OR ("abiotic stress") OR ("biotic interaction*" AND (plants OR agriculture OR crop OR forestry)) OR ("plant bioinformatic*")) AND PUBYEAR > 1999 AND (LIMIT-TO (AFFILCOUNTRY , "Sweden"))

Plant Link focus areas:

1 - Plant breeding and engineering
2 - 'Post-harvest' -quality and new products
3 - Abiotic stress
4 - Biotic interactions
5 - Modelling and informatics
6 - Plants, people and society