Sunday Evening News No.87

Week 26 (2018-06-25 / 07-01)

Selected and edited by ***BGF*** Jany

Sehr geehrte Kollegen und Kolleginnen, liebe Freunde und Mitstreiter,
Dear all,

and again, my selective selection of press releases, media reports, and publications. As always, you will find the daily up-to-date press reports and pictures here:

Press releases

Volker Thoms: **Monsanto-Deal treibt Bayer zur offensiven Auseinandersetzung mit Kritikern**
https://pr-journal.de/nachrichten/unternehmen/21017-monsanto-deal-treibt-bayer-zur-offensiven-auseinandersetzung-mit-kritikern.html

The Conversation
How to show consumers the benefits of genetically modified foods
http://theconversation.com/how-to-show-consumers-the-benefits-of-genetically-modified-foods-97890

Food Insight
Survey: Nearly Half of U.S. Consumers Avoid GMO Foods; Large Majority Primarily Concerned About Human Health Impact
https://www.foodinsight.org/consumer-research-USDA-GMO-labeling

GMWatch: **EFSA GMO expert doesn't agree that GM maize has been shown to be safe**
https://www.gmwatch.org/en/news/latest-news/18328

GMWatch: **Indian newspaper makes false claims about EU GMO studies and Séralini study**
https://www.gmwatch.org/en/news/latest-news/18327

Corporate Europe: **Biosafety in Danger**
How industry, researchers and negotiators collaborate to undermine the UN Biodiversity Convention
https://corporateeurope.org/food-and-agriculture/2018/06/biosafety-danger

Henry Wells: **Viewpoint: Canada GMO wheat mishap shows why biosecurity is important**
https://geneticliteracyproject.org/2018/06/28/viewpoint-canada-gmo-wheat-mishap-shows-why-biosecurity-is-important/

http://edmontonjournal.com/opinion/columnists/paula-simons-bad-seed-the-mystery-of-albertas-rogue-gmo-wheat-puts-our-reputation-at-risk

Informationsdienst Gentechnik: **Monsanto-Gentechnik in kanadischem Weizen aufgetaucht**
https://www.keine-gentechnik.de/nachricht/33267/#gsc.tab=0

Giovanni Tagliabue: **GMO' is a Meaningless, Misleading Term**
https://www.acsh.org/news/2018/06/28/%E2%80%9Cgmo%E2%80%9D-meaningless-misleading-term-13127

Wolfgang Nellen: **How the Green Party-Led Anti-Biotechnology Movement Captured German Policy and Why it Endangers Germany's Future Innovation in Gene Editing**
https://geneticliteracyproject.org/2018/06/27/how-green-party-led-anti-biotechnology-movement-captured-german-policy-endangers-germanys-future-innovation-gene-editing/

Daniel Guéguen:**Science-based policy making: reality or fake news?**
https://www.euractiv.com/section/agriculture-food/opinion/science-based-policy-making-reality-or-fake-news/

Reports

ISAAA: Brief 53: Global Status of Commercialized Biotech/GM Crops: 2017
Biotech Crop Adoption Leads to Greater Sustainability and Socioeconomic Opportunities for Global Farmers and Citizens
http://www.isaaa.org/resources/publications/briefs/53/default.asp

ZKBS: **2. Bericht der ZKBS zur Synthetischen Biologie (in Englisch)**
https://www.bvl.bund.de/ZKBS/DE/01_Aktuelles/01_2_Bericht_der_ZKBS_zur_Synthetischen_Biologie/Fachmeldungen_basepage.html

Hoy A. Q. (2018): **Agricultural advances draw opposition that blunts innovation**. *Science* 29 Vol. 360, Issue 6396, pp. 1413-1414 DOI: 10.1126/science.360.6396.1413
http://science.sciencemag.org/content/360/6396/1413.full

EFSA: Ganzgenomsequenzierung im Bereich der Lebensmittelsicherheit: Stand der Dinge
http://www.efsa.europa.eu/de/press/news/180629

EFSA:
Outcome of EC/EFSA questionnaire (2016) on use of Whole Genome Sequencing (WGS) for food- and waterborne pathogens isolated from animals, food, feed and related environmental samples in EU/EFTA countries. EFSA supporting publication 2018:EN-1432, 49 pp. doi:10.2903/sp.efsa.2018.EN-1432
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/sp.efsa.2018.EN-1432

Scientific publications

Brookes G. and Barfoot P. (2018): **Environmental impacts of genetically modified (GM) Crop use 1996–2016: Impacts on pesticide use and carbon emissions. GM Crops & Food**;
https://doi.org/10.1080/21645698.2018.1476792
This paper updates previous assessments of the environmental impacts associated with using crop biotechnology in global agriculture. It focuses on the environmental impacts associated with changes in pesticide use and greenhouse gas emissions arising from the use of GM crops since their first widespread commercial use over 20 years ago. The adoption of GM insect resistant and herbicide tolerant technology has reduced pesticide spraying by 671.4 million kg (8.2%) and, as a result, decreased the environmental impact associated with herbicide and insecticide use on these crops (as measured by the indicator, the Environmental Impact Quotient (EIQ)) by 18.4%. The technology has also facilitated important cuts in fuel use and tillage changes, resulting in a significant reduction in the release of greenhouse gas emissions from the GM cropping area. In 2016, this was equivalent to removing 16.7 million cars from the roads.
https://www.tandfonline.com/doi/full/10.1080/21645698.2018.1476792

Brookes G. and Barfoot P. (2018): **Farm income and production impacts of using GM crop technology 1996 –2016.** GM Crops & Food, DOI:10.1080/21645698.2018.1464866
This paper estimates the value of using genetically modified (GM) crop technology in agriculture at the farm level. It follows and updates earlier annual studies which examined impacts on yields, key variable costs of production, direct farm (gross) income and impacts on the production base of the four main crops of soybeans, corn, cotton and canola. The commercialisation of GM crops has occurred at a rapid rate since the mid 1990s, with important changes in both the overall level of adoption and impact occurring in 2016. This annual updated analysis shows that there continues to be very significant net economic benefits at the farm level amounting to $18.2 billion in 2016 and $186.1 billion for the period 1996–2016 (in nominal terms). These gains have been divided 48% to farmers in developed countries and 52% to farmers in developing countries. About 65% of the gains have derived from yield and production gains with the remaining 35% coming from cost savings. The technology has also made important contributions to increasing global production levels of the four main crops, having, for example, added 213 million tonnes and 405 million tonnes respectively, to the global production of soybeans and maize since the introduction of the technology in the mid 1990s.
https://www.tandfonline.com/doi/pdf/10.1080/21645698.2018.1464866?needAccess=true

Zou S. et al. (2018): **The food safety of DP-356Ø43 soybeans on SD rats reflected by physiological variables and fecal microbiota during a 90-day feeding study**. Regulatory Toxicology and Pharmacology 97, 144–151; https://doi.org/10.1016/j.yrtph.2018.06.016
Soybean is an important food resource for the eastern countries and herbicide-tolerant genetically modified soybeans (GMS) were widely developed to deal with weeds problems. Unprocessed soybean flour instead of

dehulled and defatted soybean meal was used to reflect the safety of soybean food in whole. Rats were given formulated diets containing DP-356Ø43 or non-GM soybean JACK at an incorporation rate of 7.5%, 15%, or 30% (w/w), respectively for 90 days. Targeted traditional toxicological response variables were measured to reflect the holistic health of animals. No treatment-related adverse or toxic effects were observed based on an examination of the daily clinical signs, body weight, food consumption, hematology, serum biochemistry, and organ weight or based on gross and histopathological examination. The results demonstrate that the soybean DP-356Ø43 is as safe for consumption as conventional soybean JACK. In the current study, the effect of a herbicide-tolerant GMS DP-356043 on identified intestinal microbiota was evaluated in a rodent feeding study compared with its conventional control JACK. Feces samples from rats consuming different diets were collected before the start of the experiment (time 0) and at monthly intervals (at the end of the 1st, 2nd and 3rd months) over the course of 90 days. Six types of bacterias shared by humans and rats were detected with Q-PCR. The results of QPCR indicated that the GMS 356Ø43 had a comparable effect on the abundance of *Bifidobacterium* group, *Clostridium perfringens* subgroup, *Escherichia coli,* and *Bacteroides–Prevotella* group as the non-GMS JACK.
https://www.sciencedirect.com/science/article/pii/S0273230018301727

Rocha-Munive MG, Soberón M, Castañeda S, Niaves E, Scheinvar E, Eguiarte LE, Mota-Sánchez D, Rosales-Robles E, Nava-Camberos U, Martínez-Carrillo JL, Blanco CA, Bravo A and Souza V (2018): **Evaluation of the Impact of Genetically Modified Cotton After 20 Years of Cultivation in Mexico**. Front. Bioeng. Biotechnol. 6:82. doi: 10.3389/fbioe.2018.00082
For more than 20 years cotton has been the most widely sown genetically modified (GM) crop in Mexico. Its cultivation has fulfilled all requirements and has gone through the different regulatory stages. During the last 20 years, both research-institutions and biotech-companies have generated scientific and technical information regarding GM cotton cultivation in Mexico. In this work, we collected data in order to analyze the environmental and agronomic effects of the use of GM cotton in Mexico. In 1996, the introduction of Bt cotton made it possible to reactivate this crop, which in previousyears was greatly reduced due to pest problems, production costs and environmental concerns. Bt cotton is a widely accepted tool for cotton producers and has proven to be efficient for the control of lepidopteran pests. The economic benefits of its use are variable, and depend on factors such as the international cotton-prices and other costs associated with its inputs. So far, the management strategies used to prevent development of insect resistance to GM cotton has been successful, and there are no reports of insect resistance development to Bt cotton in Mexico. In addition, no effects have been observed on non-target organisms. For herbicide tolerant cotton, the prevention of herbicide resistance has also been successful since unlike other countries, the onset of resistance weeds is still slow, apparently due to cultural practices and rotation of different herbicides. Environmental benefits have been achieved with a reduction in chemical insecticide applications and the subsequent decrease in primary pest populations, so that the inclusion of other technologies—e.g., use of non-Bt cotton- can be explored. Nevertheless, control measures need to be implemented during transport of the bolls and fiber to prevent dispersal of volunteer plants and subsequent gene flow to wild relatives distributed outside the GM cotton growing areas. It is still necessary to implement national research programs, so that biotechnology and plant breeding advances can be used in the development of cotton varieties adapted to the Mexican particular environmental conditions and to control insect pests of regional importance.
https://www.frontiersin.org/articles/10.3389/fbioe.2018.00082/full

Ma Z., Castillo-González C., Wang Z., Sun D., Hu X., Shen X., Potok M.E., Zhang X. (2018): **Arabidopsis Serrate Coordinates Histone Methyltransferases ATXR5/6 and RNA Processing Factor RDR6 to Regulate Transposon Expression,** *Developmental Cell* 45 (6), 769–784.e6, https://doi.org/10.1016/j.devcel.2018.05.023
Serrate (SE) is a key component in RNA metabolism. Little is known about whether and how it can regulate epigenetic silencing. Here, we report histone methyltransferases ATXR5 and ATXR6 (ATXR5/6) as novel partners of SE. ATXR5/6 deposit histone 3 lysine 27 monomethylation (H3K27me1) to promote heterochromatin formation, repress transposable elements (TEs), and control genome stability in *Arabidopsis*. SE binds to ATXR5/6-regulated TE loci and promotes H3K27me1 accumulation in these regions. Furthermore, SE directly enhances ATXR5 enzymatic activity *in vitro*. Unexpectedly, *se* mutation suppresses the TE reactivation and DNA re-replication phenotypes in the *atxr5 atxr6* mutant. The suppression of TE expression results from triggering RNA-dependent RNA polymerase 6 (RDR6)-dependent RNA silencing in the *se atxr5 atxr6* mutant. We propose that SE facilitates ATXR5/6-mediated deposition of the H3K27me1 mark while inhibiting RDR6-mediated RNA silencing to protect TE transcripts. Hence, SE coordinates epigenetic silencing and RNA processing machineries to fine-tune the TE expression.
https://www.cell.com/developmental-cell/fulltext/S1534-5807(18)30416-7?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS1534580718304167%3Fshowall%3Dtrue

Texas A&M University
Understanding how to control 'jumping' genes
https://phys.org/news/2018-06-genes.html#jCp

Wu, C.-H., Derevnina, L. and Kamoun, S. (2018) **Receptor networks underpin plant immunity.** Science 360 6395 1300-1301 pp 10.1126/science.aat2623,
http://science.sciencemag.org/content/sci/360/6395/1300.full.pdf
http://www.ask-force.org/web/Genomics/Wu-Receptor-networks-underpin-plant-immunity-2018.pdf
http://www.ask-force.org/web/Genomics/Wu-Receptor-networks-underpin-plant-immunity-Powerpoint-Figure-2018.pptx

Huang, B., Spooner, D. M. and Liang, Q. (2018): Genome diversity of the potato. Proceedings of the National Academy of Sciences
http://www.pnas.org/content/pnas/early/2018/06/20/1805917115.full.pdf and http://www.ask-force.org/web/Potato/Huang-Genome-diversity-of-the-potato-2018.pdf

McMillan V.E., Canning G., Moughan J., White P.P., Gutteridge R.J. & Hammond-Kosack K. E. (2018**): Exploring the resilience of wheat crops grown in short rotations through minimising the build-up of an important soil-borne fungal pathogen**, *Scientific Reports 8, 9550*. DOI: 10.1038/s41598-018-25511-8
Given the increasing demand for wheat which is forecast, cropping of wheat in short rotations will likely remain a common practice. However, in temperate wheat growing regions the soil-borne fungal pathogen Gaeumannomyces tritici becomes a major constraint on productivity. In cultivar rotation field experiments on the Rothamsted Farm (Hertfordshire, UK) we demonstrated a substantial reduction in take-all disease and grain yield increases of up to 2.4 tonnes/ha when a low take-all inoculum building wheat cultivar was grown in the first year of wheat cropping. Phenotyping of 71 modern elite wheat cultivars for the take-all inoculum build-up trait across six diverse trial sites identified a few cultivars which exhibited a consistent lowering of take-all inoculum build-up. However, there was also evidence of a significant interaction effect between trial site and cultivar when a pooled Residual Maximum Likelihood (REML) procedure was conducted. There was no evidence of an unusual rooting phenotype associated with take-all inoculum build-up in two independent field experiments and a sand column experiment. Together our results highlight the complex interactions between wheat genotype, environmental conditions and take-all inoculum build-up. Further work is required to determine the underlying genetic and mechanistic basis of this important phenomeno
https://www.nature.com/articles/s41598-018-25511-8.pdf

Rothamsted Research
First step to lasting wheat health
https://phys.org/news/2018-06-wheat-health.html#jCp

van der Weijden V. A., Veronika L. Flöter V.L. and Ulbrich S.E. (2018): **Gestational oral low-dose estradiol-17β induces altered DNA methylation of CDKN2D and PSAT1 in embryos and adult offspring.** *Scientific Reports* 8, 7494. DOI: 10.1038/s41598-018-25831-9
Endocrine disrupting chemicals (EDC) interfere with the natural hormone balance and may induce epigenetic changes through exposure during sensitive periods of development. In this study, the effects of short-term estradiol-17β (E2) exposure on various tissues of pregnant sows (F_0) and on day 10 blastocysts (F_1) were assessed. Intergenerational effects were investigated in the liver of 1-year old female offspring (F_1). During gestation, sows were orally exposed to two low doses and a high dose of E2 (0.05, 10, and 1000 µg/kg body weight/day). In F_0, perturbed tissue specific mRNA expression of cell cycle regulation and tumour suppressor genes was found at low and high dose exposure, being most pronounced in the endometrium and corpus luteum. The liver showed the most significant DNA hypomethylation in three target genes; *CDKN2D*, *PSAT1*, and *RASSF1*. For *CDKN2D* and *PSAT1*, differential methylation in blastocysts was similar as observed in the F_0 liver. Whereas blastocysts showed hypomethylation, the liver of 1-year old offspring showed subtle, but significant hypermethylation. We show that the level of effect of estrogenic EDC, with the periconceptual period as a sensitive time window, is at much lower concentration than currently presumed and propose epigenetics as a sensitive novel risk assessment parameter.
Peter Rüegg, ETH Zurich
Administering hormones affects DNA
https://phys.org/news/2018-06-hormones-affects-dna.html#jCp

Liu C. and Sathe S.K. (2018): **Food Allergen Epitope Mapping**. *J. Agric. Food Chem.*, Just Accepted Manuscript; **DOI:** 10.1021/acs.jafc.8b01967
With the increased global awareness and rise in food allergies, a multifold interest in food allergens is evident. The presence of undeclared food allergens results in expensive food recalls and increase risks of anaphylaxis for the sensitive individuals. Regardless of the allergenic food, the immunogen needs to be identified and detected before making any efforts to inactivate/eliminate it. In type I food allergies, protein immunogen cross-links IgEs leading to basophil/mast cell degranulation resulting in the symptoms that range from mild irritation to anaphylaxis. A portion/part of the protein, known as the epitope, can interact either with antibodies to elicit allergic reactions or with T-cell receptors to initiate allergic sensitization. Antibody-recognized epitopes can be

either linear sequence of amino acids (linear epitope) or three dimensional motif (conformational epitope) while T-cell receptor-recognized epitopes are exclusively linear peptides. Identifying and characterizing human allergy-relevant epitopes are important for allergy diagnosis/prognosis and immunotherapy, and for developing food processing methods that can reduce/eliminate immunogencity/immunoreactivity of the allergen. https://pubs.acs.org/doi/abs/10.1021/acs.jafc.8b01967

Meetings

The protein crops deficit in the EU: Different perspectives for potential - common solutions
COPA COGECA: ROOM A, Copa-Cogeca,
Rue de Treves 61, Brussels
16th July 2018 14:30-16:30

Symposium
Modern Agriculture without chemicalPesticides?
together with the General Meeting of the German Society of Plant Biotechnology
AlPlanta - Neustadt an der Weinstrasse
03.- 04. September 2018
More information: r.boehm@pflanzen-biotechnologie.de

Wie immer wird für Hinweise und der Zusendung von Publikationen und sonstigen Informationen gedankt. pdf-Dateien können meist direkt aus den links heruntergeladen werden.

Bitte besuchen sie auch die Webseite des Wissenschaftlerkreis Grüne Gentechnik e.V. (WGG): www.wgg-ev.de . Hier finden Sie weitere interessante Informationen.

*As always, I thank you all for hints and for publications. M*ost of the pdf files can be downloaded directly from the links.

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