# Sunday Evening News

Week 20 (2018-05-14 / 05-20)

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

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Sehr geehrte Kollegen und Kolleginnen, liebe Freunde und Mitstreiter,

auch diese Woche gab es für die deutschsprachigen Medien im Bereich der Grüne Gentechnik nichts worüber etwas Besonderes zu berichten gewesen. Es war auch keiner Meldung wert, dass im Berufungsausschuss wieder keine qualifizierte Mehrheit für oder gegen die Ablehnung der Zulassung von Mais GA21 und Mais 1507 × 59122 × MON 810 × NK603 sowie seiner Subgruppen erreicht werden konnte. Gemeinsam mit der Zuckerrübe H7-1 wird demnächst die Kommission die Zulassung dieser Pflanzen zum Import aussprechen.

Dear all,
Also, this week there was nothing to report for the German-speaking media in the field of green genetic engineering. Nor was it worth reporting that the Appeals Committee was again unable to obtain a qualified majority for or against rejecting the approval of maize GA21 and maize 1507 × 59122 × MON 810 × NK603 and its subclasses. Together with sugar beet H7-1, the Commission will soon announce the approval of these plants for import.

**Press releases – media reports**

EFSA: **Experts named for EFSA scientific panels**
https://www.efsa.europa.eu/en/press/news/180515

Jean-Paul Oury: **Yes, new media can help with scientific information**
https://www.europeanscientist.com/en/editors-corner/yes-new-media-can-help-with-scientific-information/

Claire Stam - EURACTIV.com: **Glyphosate has adverse health effects from doses considered safe, study shows**
https://www.euractiv.com/section/agriculture-food/news/glyphosate-has-adverse-health-effects-from-doses-considered-safe-study-shows/

The Ramazzini Institute: **Global Glyphosate Study Pilot Phase Shows Adverse Health Effects at 'Safe' Doses**
https://glyphosatestudy.org/press-release/global-glyphosate-study-pilot-phase-shows-adverse-health-effects-at-safe-doses/ The papers will published at June 29.
But have also a look EFSA below

Stefan Winterbauer: **Trinkwasserpreis, Glyphosat & Co. – der manchmal problematische Umgang der Grünen mit der Wahrheit**
http://meedia.de/2018/05/17/trinkwasserpreis-glyphosat-co-der-manchmal-problematische-umgang-der-gruenen-mit-der-wahrheit/

Starr M.: **GM Potato Can Help Cut Pesticide Use by Up to 90 Percent, Study Shows**
https://www.sciencealert.com/genetically-modified-potato-reduces-fungicide-desiree-cisgenesis-ipm2-0

Julian Little: **Scratching the surface: why mandatory GMO feeding studies just do not make sense**
https://www.theparliamentmagazine.eu/articles/partner_article/europabio/scratching-surface-why-mandatory-gmo-feeding-studies-just-do-not

Kate Barlow: **To regulate or not to regulate: Current legal status for gene-edited crops**
http://www.global-engage.com/agricultural-biotechnology/to-regulate-or-not-to-regulate-current-legal-status-for-gene-edited-crops/?utm_content=70989050&utm_medium=social&utm_source=twitter

Mute Schimpf - Friends of the Earth Europe: **The EU needs to speak up to avoid 'backdoor' GMOs on our plates**
https://www.euractiv.com/section/agriculture-food/opinion/the-eu-needs-to-speak-up-to-avoid-backdoor-gmos-on-our-plates/

siehe hier für Neue Züchtungsmethoden auch:
https://www.wgg-ev.de/aktuelles/impulspapier-wiewaswarum/
https://www.wgg-ev.de/aktuelles/regulation-standpunkte/ und folgende Beiträge dort. (all contributions are in German, only)

more press releases or media reports: https://www.biotech-gm-food.com/presse

**Scientific papers**

Jansson S. (2018): **Gene-edited plants on the plate – the "CRISPR cabbage story".** Physiologia Plantarum; https://doi.org/10.1111/ppl.12754
https://onlinelibrary.wiley.com/doi/pdf/10.1111/ppl.12754 preprint available

Maclean, A. E., Hertle, A. P., Ligas, J., Bock, R., Balk, J. and Meyer, E. H. (2018): **Absence of Complex I Is Associated with Diminished Respiratory Chain Function in European Mistletoe.** Current Biology 28; http://dx.doi.org/10.1016/j.cub.2018.03.036 AND press http://www.mpimp-golm.mpg.de/2217110/mistletoe
Parasitism is a life history strategy found across all domains of life whereby nutrition is obtained from a host. It is often associated with reductive evolution of the genome, including loss of genes from the organellar genomes [1, 2]. In some unicellular parasites, the mitochondrial genome (mitogenome) has been lost entirely, with far-reaching consequences for the physiology of the organism [3, 4]. Recently, mitogenome sequences of several species of the hemiparasitic plant mistletoe (Viscum sp.) have been reported [5, 6], revealing a striking loss of genes not seen in any other multicellular eukaryotes. In particular, the nad genes encoding subunits of respiratory complex I are all absent and other protein-coding genes are also lost or highly diverged in sequence, raising the question what remains of the respiratory complexes and mitochondrial functions. Here we show that oxidative phosphorylation (OXPHOS) in European mistletoe, Viscum album, is highly diminished. Complex I activity and protein subunits of complex I could not be detected. The levels of complex IV and ATP synthase were at least5-fold lower than in the non-parasitic model plant Arabidopsis thaliana, whereas alternative dehydrogenases and oxidases were higher in abundance. Carbon flux analysis indicates that cytosolic reactions including glycolysis are greater contributors to ATP synthesis than the mitochondrial tricarboxylic acid (TCA) cycle. Our results describe the extreme adjustments in mitochondrial functions of the first reported multicellular eukaryote without complex I.
http://www.ask-force.org/web/Genomics/Mclean-Absence-Complex-I-Is-Associated-Diminished-Respiratory-Chain-Function-European-Mistletoe-2018.pdf open source

Kessel G.J.T. et al. (2018): **Development and validation of IPM strategies for the cultivation of cisgenically modified late blight resistant potato.** European Journal of Agronomy 96, 146-155; https://doi.org/10.1016/j.eja.2018.01.012
Potato late blight disease remains the primary stressor of commercial potato production across the EU, typically requiring >10 fungicide applications per growing season to offset crop losses. In response, the goal of this study was to test and validate a novel, more durable, control strategy for potato late blight. This IPM2.0 strategy is based on the principles of Integrated Pest Management (IPM) which sees the deployment of a late blight resistant potato genotype, a cisgenically modified, Desiree based resistant potato line here, in conjunction with pathogen population monitoring for virulence to the resistance genes (R genes) deployed and a "do not spray unless", low input fungicide spray strategy. Field evaluations were completed in the Netherlands and in Ireland in 2013, 2014 and in Ireland in 2015. Comparators used in this study included the original but susceptible potato variety Desiree and the conventional but highly resistant variety Sarpo Mira. The novel IPM2.0 strategy was compared to local common practice (fungicide applications on a near weekly basis) and an untreated control. Overall, the IPM2.0 control strategy validated here reduced the average fungicide input by 80–90% without compromising control efficacy. Corresponding environmental side-effects were reduced proportionally. The results underline the pragmatic role host resistance can provide to commercial potato production systems and to society at large if employed as part of an integrated late blight control system.
https://www.sciencedirect.com/science/article/pii/S1161030118300327

Shah T., Andleeb T., Lateef S. Noor M.A. (2018): **Genome editing in plants: Advancing crop transformation and overview of tools.** Plant Physiology and Biochemistry: https://doi.org/10.1016/j.plaphy.2018.05.009

Genome manipulation technology is one of emerging field which brings real revolution in genetic engineering and biotechnology. Targeted editing of genomes pave path to address a wide range of goals not only to improve quality and productivity of crops but also permit to investigate the fundamental roots of biological systems. These goals includes creation of plants with valued compositional properties and with characters that confer resistance to numerous biotic and abiotic stresses. Numerous novel genome editing systems have been introduced during the past few years; these comprise zinc finger nucleases (ZFNs), transcription activator-like effector nucleases (TALENs), and clustered regularly interspaced short palindromic repeats/Cas9 (CRISPR/Cas9). Genome editing technique is consistent for improving average yield to achieve the growing demands of the world's existing food famine and to launch a feasible and environmentally safe agriculture scheme, to more specific, productive, cost-effective and eco-friendly. These exciting novel methods, concisely reviewed herein, have verified themselves as efficient and reliable tools for the genetic improvement of plants.
https://www.sciencedirect.com/science/article/pii/S0981942818302092

Yunusa U.M., Maimuna H.M.,and Yunusa I. (2018**): Genetically modified foods: challenges for the future**. Nigerian Journal of Nutritional Sciences 38, (1)
Genetically modified (GM) foods are produced from organisms that have had changes introduced into their DNA via genetic engineering, a technique of biotechnology. Transformation, phage introduction, and nonbacterial transformation are the processes of genome manipulation employed in the production of GM foods. The ability of scientific knowledge to contribute to public debate about societal risks of GM foods depends on how the public assimilates information resulting from the scientific community. Factors used to explain the attitudes of citizens include perceived risk and/or benefit, consumer trust, autonomy and labelling, knowledge, role of science and technology in agriculture, naturalness, as well as other moral concerns. Scientific consensus proved available foods derived from GM crops poses no greater risk to human health than conventional foods, but that each GM food needs to be tested on a case-by-case basis before introduction. Currently, GM crops approved for cultivation are all products with improved agronomic traits so-called first-generation traits that mainly benefit farmers in the developed and developing world, rather than consumers. Since their first commercialization in 1996, the popularity of GM foods is growing by the day, with increased yearly area of cultivation.It therefore will depend upon government approval and market uptake, as well as the extent to which the public accepts or rejects either side of the debate. Labeling is mandatory to avoid unintended commingling of GM and non-GM crops, thus providing assurance to the consumer.
https://www.ajol.info/index.php/njns/article/view/170740

Parrott W. (2018): **Outlaws, old laws & no laws: the prospects of gene editing for agriculture in the USA. Physiologia Plantarium**, https://doi.org/10.1111/ppl.12756
The advent of genome-edited products that are nearing commercialization in agriculture has highlighted that the USA biotechnology regulatory system has not kept pace with technological advances. Of the three agencies that regulate engineered crops and animals for agriculture, only one has indicated how it will regulate edited plants. The Food and Drug Administration can regulate any plant, but has not indicated if it will single out edited plants. The United States Department of Agriculture currently has no authority over edited plants when the edit is a deletion or does not contain any added DNA from a plant pest. Depending on how the statutes are interpreted, the Environmental Protection Agency might be able to regulate plants edited to tolerate pests and diseases. Labeling requirements also remain undefined. Regardless, sectors of the industry and some consumer groups are uneasy over editing technology, and may be the ultimate arbiters of whether edited products make it to market.
https://onlinelibrary.wiley.com/doi/pdf/10.1111/ppl.12756

Lu H.-P. et al.(2018): **Resistance of rice to insect pests mediated by suppression of serotonin biosynthesis,** *Nature Plants* DOI: 10.1038/s41477-018-0152-7
Rice is one of the world's most important foods, but its production suffers from insect pests, causing losses of billions of dollars, and extensive use of environmentally damaging pesticides for their control[1,2]. However, the molecular mechanisms of insect resistance remain elusive. Although a few resistance genes for planthopper have been cloned, no rice germplasm is resistant to stem borers. Here, we report that biosynthesis of serotonin, a neurotransmitter in mammals[3], is induced by insect infestation in rice, and its suppression confers resistance to planthoppers and stem borers, the two most destructive pests of rice[2]. Serotonin and salicylic acid derive from chorismate[4]. In rice, the cytochrome P450 gene *CYP71A1* encodes tryptamine 5-hydroxylase, which catalyses conversion of tryptamine to serotonin[5]. In susceptible wild-type rice, planthopper feeding induces biosynthesis of serotonin and salicylic acid, whereas in mutants with an inactivated *CYP71A1* gene, no serotonin is produced, salicylic acid levels are higher and plants are more insect resistant. The addition of serotonin to the resistant rice mutant and other brown planthopper-resistant genotypes results in a loss of insect resistance. Similarly, serotonin supplementation in artificial diet enhances the performance of both insects. These insights demonstrate that regulation of serotonin biosynthesis plays an important role in defence, and may prove valuable for breeding insect-resistant cultivars of rice and other cereal crops.
and
Newcastle University

Lack of 'happiness' hormone makes rice plants less attractive to insects
https://phys.org/news/2018-05-lack-happiness-hormone-rice-insects.html#jCp

Larsson D.G.J. et al. (2018): **Critical knowledge gaps and research needs related to the environmental dimensions of antibiotic resistance.** Environment International 117, 132–138, https://doi.org/10.1016/j.envint.2018.04.041
There is growing understanding that the environment plays an important role both in the transmission of antibiotic resistant pathogens and in their evolution. Accordingly, researchers and stakeholders world-wide seek to further explore the mechanisms and drivers involved, quantify risks and identify suitable interventions. There is a clear value in establishing research needs and coordinating efforts within and across nations in order to best tackle this global challenge. At an international workshop in late September 2017, scientists from 14 countries with expertise on the environmental dimensions of antibiotic resistance gathered to define critical knowledge gaps. Four key areas were identified where research is urgently needed: 1) the relative contributions of different sources of antibiotics and antibiotic resistant bacteria into the environment; 2) the role of the environment, and particularly anthropogenic inputs, in the evolution of resistance; 3) the overall human and animal health impacts caused by exposure to environmental resistant bacteria; and 4) the efficacy and feasibility of different technological, social, economic and behavioral interventions to mitigate environmental antibiotic resistance.
https://www.sciencedirect.com/science/article/pii/S0160412018300989?via%3Dihub
pdf-file:
https://reader.elsevier.com/reader/sd/6B434252FB42658176CCA6B05D320596761D357FB503A35BCAECC97AA4CB5DE28292D1DBD7A7E4BE30945A2DF969D106

Zimmerman H. & Eddens A. (2018): **Governing the liberal self in a 'post-truth' era: science, class and the debate over GMOs.** Cultural Studies;
https://doi.org/10.1080/09502386.2018.1431301
This essay examines four case studies in which prominent commentators in media sites that target the liberal-leaning, educated class – *The Daily Show*, *Slate* magazine, the *New York Times*, and *Real Time with Bill Maher* – announced that they had changed their minds on the issue of genetically modified foods (GMOs). Though each had previously been sceptical of the technology, they now embraced it in the name of science and humanitarianism, and urged audiences to do the same. These cases were flashpoints in a broader shift in which the liberal, educated middle class – a formation historically critical of GMOs–has increasingly denounced scepticism about biotechnology as a pernicious 'anti-science' conservatism. This liberal pro-GMO discourse posits itself as a matter of truth versus lies. We argue, however, that the manner in which it framed GMO opposition as irrational and immoral threatened attachments that have long been central to liberal, educated middle class selfhood and capital – attachments to being a caring and rational self. Moreover, this discourse intensified as this class was experiencing heightened cultural and economic instability under neoliberalism, the post-industrial labour economy, and the aftermath of the Great Recession. Through their narratives of coming to believe in GMOs, our case studies provide their audiences with technologies, in the Foucauldian sense, for making classed selves and shoring up this class' claims to authority under these conditions. We suggest that this swell of cultural technologies aiming to cultivate liberal support for GMOs has a great deal to teach us about the class dynamics of the so-called 'post-truth' era.
https://www.tandfonline.com/doi/abs/10.1080/09502386.2018.1431301?journalCode=rcus20#.Wv86Jrb--YU.twitter

Pettitt, S. J., et al. (2018): **Genome-wide and high-density CRISPR-Cas9 screens identify point mutations in PARP1 causing PARP inhibitor resistance.** Nature Communications 9, 1 1849 pp ISBN/2041-1723 https://doi.org/10.1038/s41467-018-03917-2
Although PARP inhibitors (PARPi) target homologous recombination defective tumours, drug resistance frequently emerges, often via poorly understood mechanisms. Here, using genome-wide and high-density CRISPR-Cas9 "tag-mutate-enrich" mutagenesis screens, we identify close to full-length mutant forms of PARP1 that cause in vitro and in vivo PARPi resistance. Mutations both within and outside of the PARP1 DNA-binding zinc-finger domains cause PARPi resistance and alter PARP1 trapping, as does a PARP1 mutation found in a clinical case of PARPi resistance. This reinforces the importance of trapped PARP1 as a cytotoxic DNA lesion and suggests that PARP1 intramolecular interactions might in fluence PARPi-mediated cytotoxicity. PARP1 mutations are also tolerated in cells with a pathogenic BRCA1 mutation where they result in distinct sensitivities to chemotherapeutic drugs compared to other mechanisms of PARPi resistance (BRCA1 reversion, 53BP1, REV7 (MAD2L2) mutation), suggesting that the underlying mechanism of PARPi resistance that emerges could in fluence the success of subsequent therapies.
http://www.ask-force.org/web/Genomics/Pettit-Genome-wide-and-high-density-CRISPR-Cas9-screens-point-mutations-2018.pdf

Sun, Y. and Dinneny, J. R. (2018): **Q&A: How do gene regulatory networks control environmental responses in plants?** BMC Biology 16 (1), 38 https://doi.org/10.1186/s12915-018-0506-7

A gene regulatory network (GRN) describes the hierarchical relationship between transcription factors, associated proteins, and their target genes. Studying GRNs allows us to understand how a plant's genotype and environment are integrated to regulate downstream physiological responses. Current efforts in plants have focused on defining the GRNs that regulate functions such as development and stress response and have been performed primarily in genetically tractable model plant species such as *Arabidopsis thaliana*. Future studies will likely focus on how GRNs function in non-model plants and change over evolutionary time to allow for adaptation to extreme environments. This broader understanding will inform efforts to engineer GRNs to create tailored crop traits.
http://www.ask-force.org/web/Genomics/Sun-Q-A-How-do-gene-regulatory-networks-control-environmental-responses-plants-2018.pdf (open source)

## Glyphosate

EFSA (European Food Safety Authority), 2018. **Reasoned Opinion on the review of the existing maximum residue levels for glyphosate according to Article 12 of Regulation (EC) No 396/2005.** EFSA Journal 2018;16(5):5263, 230 pp.
https://doi.org/10.2903/j.efsa.2018.5263

According to Article 12 of Regulation (EC) No 396/2005, EFSA has reviewed the maximum residue levels (MRLs) currently established at European level for the pesticide active substance glyphosate. To assess the occurrence of glyphosate residues in plants, processed commodities, rotational crops and livestock, EFSA considered the conclusions derived under Commission Regulation (EU) No 1141/2010 as amended by Commission Implementing Regulation (EU) No 380/2013, the MRLs established by the Codex Alimentarius Commission as well as the import tolerances and European authorisations reported by Member States (including the supporting residues data). Based on the assessment of the available data, MRL proposals were derived and a consumer risk assessment was carried out. Although no apparent risk to consumers was identified, some information required by the regulatory framework was missing. Hence, the consumer risk assessment is considered indicative only and some MRL proposals derived by EFSA still require further consideration by risk managers
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5263

EFSA (European Food Safety Authority), 2018. **Scientific Report on evaluation of the impact of glyphosate and its residues in feed on animal health**. EFSA Journal 2018;16(5): 5283, 22 pp. https://doi.org/10.2903/j.efsa.2018.528
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5283

reminder:
Larsson, M. O., Sloth Nielsen, V., Bjerre, N., Laporte, F. and Cedergreen, N. (2018**): Refined assessment and perspectives on the cumulative risk resulting from the dietary exposure to pesticide residues in the Danish population**. Food and Chemical Toxicology 111, 207-267
http://www.sciencedirect.com/science/article/pii/S0278691517306877

Relatively few studies are available on realistic cumulative risk assessments for dietary pesticide exposure. Despite available studies showing low risk, public concern remains. A method to estimate realistic residue levels based on information from spraying journals and supervised residue trials was described in a previous publication. The present article proposes a new method to estimate average residue levels in imported foods based on residue monitoring data and knowledge about agronomic practices. The two methods were used in combination to estimate average pesticide residue levels in 47 commodities on the Danish market. The chronic consumer exposure was estimated in six Danish diets. The Hazard Index (HI) method was used to assess consumer risk. Despite the conservative (cautious) risk assessment approach, low HI values where obtained. The HI was 16% for adults and 44% for children, combining the risk of all pesticides in the diet. Conclusion: the present study adds support to the evidence showing that adverse health effects of chronic pesticide residue exposure in the Danish population are very unlikely. The HI for pesticides for a Danish adult was on level with that of alcohol for a person consuming the equivalent of 1 glass of wine every seventh year.
and http://www.ask-force.org/web/HerbizideTol/Larsson-Refined-assessment-perspectives-cumulative-risk-dietary-exposure-pesticide-residues-Danish-population-2018.pdf

Li T., Zhang C., Yang K.-L. and He J. (2018): **Unique genetic cassettes in a *Thermoanaerobacterium* contribute to simultaneous conversion of cellulose and monosugars into butanol.** *Science Advances* 4 (3), e1701475 DOI: 10.1126/sciadv.1701475
The demand for cellulosic biofuels is on the rise because of the anticipation for sustainable energy and less greenhouse gas emissions in the future. However, production of cellulosic biofuels, especially cellulosic butanol, has been hampered by the lack of potent microbes that are capable of converting cellulosic biomass into biofuels. We report a wild-type *Thermoanaerobacterium thermosaccharolyticum* strain TG57, which is capable of using microcrystalline cellulose directly to produce butanol (1.93 g/liter) as the only final product (without any acetone or ethanol produced), comparable to that of engineered microbes thus far. Strain TG57 exhibits significant advances including unique genes responsible for a new butyrate synthesis pathway, no carbon catabolite repression, and the absence of genes responsible for acetone synthesis (which is observed as the main by-product in most *Clostridium* strains known today). Furthermore, the use of glucose analog 2-deoxyglucose posed a selection pressure to facilitate isolation of strain TG57 with deletion/silencing of carbon catabolite repressor genes—the *ccr* and *xylR* genes—and thus is able to simultaneously ferment glucose, xylose, and arabinose to produce butanol (7.33 g/liter) as the sole solvent. Combined analysis of genomic and transcriptomic data revealed unusual aspects of genome organization, numerous determinants for unique bioconversions, regulation of central metabolic pathways, and distinct transcriptomic profiles. This study provides a genome-level understanding of how cellulose is metabolized by *T. thermosaccharolyticum* and sheds light on the potential of competitive and sustainable biofuel production.
http://advances.sciencemag.org/content/4/3/e1701475

Buhr D. and Stehnken T. (2018): INDUSTRY 4.0 AND EUROPEAN INNOVATION POLICY. Big plans, small steps. WISO DISKURS 12/2018
http://library.fes.de/pdf-files/wiso/14455.pdf

Panoz-Brown, D. et al. (2018): **Replay of Episodic Memories in the Rat**. Current Biology, ISBN/0960-9822 10.1016/j.cub.2018.04.006
https://www.cell.com/current-biology/pdf/S0960-9822(18)30434-2.pdf
and http://www.ask-force.org/web/Genomics/Panoz-Brown-Replay-Episodic-Memories-in-Rat-preprint-2018.pdf
and summary https://phys.org/news/2018-05-neuroscientists-evidence-animals-mentally-replay.html?utm_source=nwletter&utm_medium=email&utm_campaign=daily-nwletter (open source)

Tarkeshian, R., Vay, J. L., Lehe, R., Schroeder, C. B., Esarey, E. H., Feurer, T. and Leemans, W. P. (2018): **Transverse Space-Charge Field-Induced Plasma Dynamics for Ultraintense Electron-Beam Characterization.** Physical Review X 8, 2 021039 pp
https://link.aps.org/doi/10.1103/PhysRevX.8.021039
and https://journals.aps.org/prx/pdf/10.1103/PhysRevX.8.021039
and http://www.ask-force.org/web/Genomics/Tarkeshian-Transverse-Space-Charge-Field-Induced-Plasma-Dynamics-2018.pdf

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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