Sunday Evening News No 362

2024-01-29 – 2024-02-04

Compiled and edited by ***BGF*** Jany

Aufgabe der Naturwissenschaft ist es nicht nur, die Erfahrungen zu erweitern, sondern in diese Erfahrung eine Ordnung zu bringen

Niels Bohr (1885 – 1962)

The task of natural science is not only to expand experience, but also to bring order to this experience

Niels Bohr (1885 – 1962)

Meetings – Conferences / Veranstaltungen - Konferenzen

Die Pressestelle des Bistums Regensburg lädt zu einer Veranstaltung unter dem Thema: **„Die Welt wartet nicht bis wir bereit sind - Verantwortungsbewußter Umgang mit der Gentechnik“** für den 20.02.2024 ein
https://www.biopark-regensburg.de/de/veranstaltungen/netzwerkveranstaltungen/details/verantwortungsbewusster-umgang-mit-gentechnik

Press Releases -Media / Presse- und Medienberichte

EU-Parliament: **New Genomic Techniques: debate and vote on new EU rules**
Parliament will decide on its position for negotiations with EU countries on EU rules on new genomic techniques to make our food system more sustainable and resilient.
https://www.europarl.europa.eu/news/lv/agenda/briefing/2024-02-05/2/new-genomic-techniques-debate-and-vote-on-new-eu-rules

AMENDMENTS 001-084 by the Committee on the Environment, Public Health and Food Safety | **Report: Jessica Polfjärd A9-0014/2024 - Plants obtained by certain new genomic techniques and their food and feed**
https://www.europarl.europa.eu/doceo/document/A-9-2024-0014-AM-001-084_EN.pdf

European Scientist: **“NGT: a vote in favor of agricultural biotechnological progress” Catherine Regnault Roger (Interview)**
https://www.europeanscientist.com/en/features/ngt-a-vote-in-favor-of-agricultural-biotechnological-progress-catherine-regnault-roger-interview/

Meshaka D.: **Deregulation of GMOs: 13 organisations call for it to be rejected**
https://www.infogm.org/7967-deregulation-of-gmos-13-organisations-call-for-it-to-be-rejected?lang=fr

Porterfield A., Entine J.: **Viewpoint: Whitewash — How four obstructionist journals and their academic enablers are corrupting reporting on the science of chemicals and crop biotechnology.** https://geneticliteracyproject.org/2024/01/30/viewpoint-whitewash-the-corruption-of-reporting-on-the-science-of-chemicals-and-crop-biotechnology-by-four-obstructionist-journals-and-their-academic-enablers/?mc_cid=697bdf5feb&mc_eid=214af8a3b7

SPD-Wirtschaftsforum: **Biotechnologie als Schlüsselindustrie: Chancen jetzt ergreifen**
https://www.spd-wirtschaftsforum.de/presse/biotechnologie-als-schluesselindustrie-standort-deutschland-muss-chancen-jetzt-ergreifen/

Innovationen für Deutschland: Zukunfts- und Innovationsbranche - Biotechnologie entwickeln und stärken
https://www.spd-wirtschaftsforum.de/wp-content/uploads/2024/01/Positionspapier-Biotechnologie_SPD-Wirtschaftsforum_202401.pdf

GeN: **Neue Gentechnik - neue Möglichkeiten - Was uns an gentechnisch veränderten Pflanzen wirklich erwartet**
https://www.gen-ethisches-netzwerk.de/januar-2024/neue-gentechnik-neue-moeglichkeiten

VLOG-Newsletter 01/24 .:. Januar
https://www.ohnegentechnik.org/newsletter-1/vlog-newsletter-januar-2024

POINT NEWSLETTER NR. 259 – JANUAR 2024 - **Aktuelle Biotechnologie**
https://www.scienceindustries.ch/_file/35372/point-2024-01-259-d.pdf?utm_source=POINT+Newsletter&utm_campaign=10dfefa678-POINT_Januar_2024&utm_medium=email&utm_term=0_19eef28c92-10dfefa678-1210937714

Only some selected press releases or media reports are listed here. The daily up-date of the press releases and media reports are ▶here: January/February week 05-2024

Publications – Publikationen

Ahmad A., Hoffman N.E., Jones M.G.K. , Zhang B. (2024:) **Editorial: Frontiers in global regulatory landscape of CRISPR-edited plants.** Front. Plant Sci. 15:1367698 | doi: 10.3389/fpls.2024.1367698
https://www.frontiersin.org/articles/10.3389/fpls.2024.1367698/full

Jack Kloppenburg J., Calderón C.I., Ané J-M. (2024): **The Nagoya Protocol and nitrogen-fixing maize: Close encounters between Indigenous Oaxacans and the men from Mars (Inc.)** . Elementa: Science of the Anthropocene 12 (1): 00115 | https://doi.org/10.1525/elementa.2023.00115
In this article, we discuss the Nagoya Protocol and its implications for access and benefit-sharing (ABS) agreements related to genetic resources and biodiversity. We analyze a case study of the appropriation of *olotón*, a maize variety with an unusual nitrogen-fixing trait grown in many communities throughout Oaxaca and probably beyond that region. Samples of *olotón* were acquired by scientists affiliated with Mars, Inc., the University of California-Davis, and the University of Wisconsin-Madison. The article unpacks how the *olotón* ABS agreement with the single Oaxacan community of Totontepec became a topic of controversy despite its approval by the Mexican government under the auspices of the Nagoya Protocol. We pose the question: Is the *olotón* ABS agreement to be considered "fair and equitable" or could it be an example of the unjust appropriation of genetic resources known as "biopiracy"? To answer that question, we proceed to analyze the "procedural," "distributive," "commutative," and "representational" forms of justice as they apply to the acquisition of *olotón*. The Nagoya Protocol was created in part to impede biopiracy by providing a framework for acquiring and using biodiversity in a "fair and equitable" way, but the Nagoya Protocol's provisions are ambiguous and allow for confidentiality clauses that favor the acquisition of genetic materials in ways that we do not consider fair and equitable. We join other researchers and academics who cite the need for an improved approach for ethically accessing, using, and sharing genetic resources and knowledge.
https://online.ucpress.edu/elementa/article/12/1/00115/199751/The-Nagoya-Protocol-and-nitrogen-fixing-maize

Toomey A.H: (2023): **Why facts don't change minds: Insights from cognitive science for the improved communication of conservation research.** Biological Conservation 278, 109886| https://doi.org/10.1016/j.biocon.2022.109886
Conservation scientists increasingly seek to find ways to implement their research for improved policy and practice. However, such efforts may be ineffective, or even counterproductive, if they are based on outdated models of science communication and behavioral change. Insights from fields that study how information is processed in the brain, how and why humans make decisions and take action, and how change spreads across social networks can support and improve existing efforts to translate conservation research into practice and policy. However, little of this research has made its way into the conservation science literature, thus limiting the power of these ideas to influence how research is communicated and how impact is understood. This paper seeks to address this gap by discussing four common myths about how to best communicate science for decision-making, namely, that facts change minds, scientific literacy will lead to enhanced research uptake, individual attitude change will shift collective behaviors, and broad dissemination is best. The article provides four alternative insights that can support effective science communication and impact: engaging the social mind for optimal decision-making, understanding the power of values, emotions, and experience in swaying minds, changing collective behavior, and thinking strategically for biggest impact. If we can understand how people process information, we can design interventions based on the best possible evidence of how humans make decisions for conservation management and policy.
https://www.sciencedirect.com/science/article/pii/S0006320722004396

Chen X., Palli S. (2024): **Genome editing in pests: basic science to applications.** Journal of Pest Science | DOI:10.1007/s10340-023-01736-z
Recent developments in sequencing technologies produced enormous data on gene sequences and the identity of genes in many pest insects and disease vectors. However, the function of many of these genes is unknown. Functional genomics studies to uncover gene function in pest insects are urgently needed. RNA interference methods could be used in some insects but not most due to their variable efficiency among insect pests. Recently developed clustered regularly interspaced short palindromic repeats (CRISPR)/CRISPR-associated

protein 9 (Cas9) system of genome editing method is being developed for use in many insect pests. This technology has already been demonstrated to function in more than 40 insect pest species from seven orders and has contributed to advances in pest biology and the development of improved pest management methods. This review summarizes recent results of CRISPR/Cas9 technology developments and their contributions to advancing the basic and applied science of insect pests and disease vectors.
https://www.researchgate.net/publication/377661795_Genome_editing_in_pests_basic_science_to_applications

Jordon M.W. Buffet J.-C., Dungait J.A.J, Galdos M.et al. (2024): **A restatement of the natural science evidence base concerning grassland management, grazing livestock and soil carbon storage**. Proc. R. Soc. B 291: 20232669 | https://doi.org/10.1098/rspb.2023.2669
Approximately a third of all annual greenhouse gas emissions globally are directly or indirectly associated with the food system, and over a half of these are linked to livestock production. In temperate oceanic regions, such as the UK, most meat and dairy is produced in extensive systems based on pasture. There is much interest in the extent to which such grassland may be able to sequester and store more carbon to partially or completely mitigate other greenhouse gas emissions in the system. However, answering this question is difficult due to context-specificity and a complex and sometimes inconsistent evidence base. This paper describes a project that set out to summarize the natural science evidence base relevant to grassland management, grazing livestock and soil carbon storage potential in as policy-neutral terms as possible. It is based on expert appraisal of a systematically assembled evidence base, followed by a wide stakeholders engagement. A series of evidence statements (in the appendix of this paper) are listed and categorized according to the nature of the underlying information, and an annotated bibliography is provided in the electronic supplementary material.
https://royalsocietypublishing.org/doi/10.1098/rspb.2023.2669

Mallikarjuna R. Puli M.R., Muchoki P., Yaaran A., +10 , and Yalovsky (2024): **Null mutants of a tomato Rho of plants exhibit enhanced water use efficiency without a penalty to yield.** PNAS 121 (4) e2309006120 | https://doi.org/10.1073/pnas.2309006120
Improving water use efficiency in crops is a significant challenge as it involves balancing water transpiration and CO_2 uptake through stomatal pores. This study investigates the role of SlROP9, a tomato Rho of Plants protein, in guard cells and its impact on plant transpiration. The results reveal that SlROP9 null mutants exhibit reduced stomatal conductance while photosynthetic CO_2 assimilation remains largely unaffected. Notably, there is a notable decrease in whole-plant transpiration in the *rop9* mutants compared to the wild type, especially during noon hours when the water pressure deficit is high. The elevated stomatal closure observed in *rop9* mutants is linked to an increase in reactive oxygen species formation. This is very likely dependent on the respiratory burst oxidase homolog (RBOH) NADPH oxidase and is not influenced by abscisic acid (ABA). Consistently, activated ROP9 can interact with RBOHB in both yeast and plants. In diverse tomato accessions, drought stress represses *ROP9* expression, and in *Arabidopsis* stomatal guard cells, ABA suppresses ROP signaling. Therefore, the phenotype of the *rop9* mutants may arise from a disruption in ROP9-regulated RBOH activity. Remarkably, large-scale field experiments demonstrate that the *rop9* mutants display improved water use efficiency without compromising fruit yield. These findings provide insights into the role of ROPs in guard cells and their potential as targets for enhancing water use efficiency in crops.
https://www.pnas.org/doi/10.1073/pnas.2309006120

Calik A., Emami M.K., White M.B,, Dalloul R.A. (2024): **Fate of transgenic soybean DNA and immune response of broilers fed genetically modified DP-3Ø5423–1 soybean.** Poultry Science | https://doi.org/10.1016/j.psj.2024.103499
Increased use of genetically modified (GM) plants in the food and feed industry has raised several concerns about the presence of unwanted genes in the food chain and potential associated health risks. In recent years, several studies have compared the nutrient contents of GM crops to conventional counterparts, and some have also tracked the fate of novel DNA fragments and proteins in the gastrointestinal (GIT) and their presence in several tissues. This study was conducted to investigate the fate of transgenic PHP19340A DNA fragment containing *gm-fad2-1* (Soybean Event DP-3Ø5423-1) gene in digestive tract contents, blood, internal organs, and muscle tissues. The effects of feeding DP-3Ø5423-1 full-fat soybean meal (FFSBM) to broiler chickens on immune response and blood profiles were also evaluated on d 35. Day-old Ross 308 birds (n=480) were randomly allocated to 24 floor pens in a 2×2 factorial arrangement with diet and gender as main factors. Birds were fed diets containing 20% of either DP-3Ø5423-1 or non-GM FFSBM for 35 days. Data were subjected to a 2-way ANOVA using the GLM procedure of JMP (Pro13). Based on PCR analysis, transgenic PHP19340A DNA fragment containing *gm-fad2-1* gene was degraded throughout the digestive system to reach undetectable level in the cecal digesta. Moreover, there was no transgenic gene translocation to blood, organs or muscle tissue. Feeding DP-3Ø5423-1 FFSBM to broilers had no effect on mRNA abundance of IL-1β, IL-2, IL-6, IL-12B, IL-17A, IFNγ, TNFα, and NF-κB in the spleen or blood. In conclusion, these findings indicate that the examined transgenic fragment in DP-3Ø5423-1 FFSBM progressively degraded in the GIT and did not translocate into blood or tissues. Along with the immune response and blood profile findings, it can be assumed that DP-3Ø5423-1 soybean is safe and unlikely to pose any health risks to broilers or consumers.
https://www.sciencedirect.com/science/article/pii/S0032579124000786

Sultana S., Azlan A., Desa M.N.D, Mahyudin N.A. , Anburaj A. (2024): **A review of CRISPR-Cas and PCR-based methods for the detection of animal species in the food chain-current challenges and future prospects**, Food Additives & Contaminants: Part A, DOI: 10.1080/19440049.2024.2304577

Regular testing and systematic investigation play a vital role to ensure product safety. Until now, the existing food authentication techniques have been based on proteins, lipids, and nucleic acid-based assays. Among various deoxyribonucleic acid (DNA)-based methods, the recently developed Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) based bio-sensing is an innovative and fast-expanding technology. The CRISPR/Cas-9 is known as Clustered Regularly Interspaced Short Palindromic Repeats due to the flexibility and simplicity of the CRISPR/Cas9 site-specific editing tool has been applied in many biological research areas such as Gene therapy, cell line development, discovering mechanisms of disease, and drug discovery. Nowadays, the CRISPR-Cas system has also been introduced into food authentication *via* detecting DNA barcodes of poultry and livestock both in processed and unprocessed food samples. This review documents various DNA based approaches, in an accessible format. Future CRISPR technologies are forecast while challenges are outlined.
https://doi.org/10.1080/19440049.2024.2304577

Maier A., Knaus T., Mutti F.G., Tischler D. (2024): **Unlocking Catalytic Diversity of a Formate Dehydrogenase: Formamide Activity for NADPH Regeneration and Amine Supply for Asymmetric Reductive Amination**, ACS Catalysis. 14, XXX, 2207–2215, | https://doi.org/10.1021/acscatal.3c05409

The formate dehydrogenase (FDH) from *Candida boidinii* is a well-studied and applied enzyme for NADH regeneration in various reactions. As many oxidoreductases require NADPH, FDH mutants were created with shifted cofactor specificity toward $NADP^+$. However, less effort was made to elucidate the substrate specificity for the hydride donors. Here, we report the FDH-catalyzed cleavage of formamide (F) and derivatives thereof into CO_2 and amines, while regenerating the cofactors NADH and NADPH. Wild-type FDH and the $NADP^+$-accepting variant FDH C23S/D195Q/Y196R/Q197N (FDH M5) showed both activity with 10% (v/v) F, *N*-methylformamide (MF), and *N*,*N*-dimethylformamide of 80, 67, and 4.5 mU/mg, and 4.9, 4.7, and 0.5 mU/mg, respectively. In silico docking and molecular dynamics simulation gave insights into substrate binding, indicating an altered binding conformation. $NADP^+$-accepting variants were utilized in a cascade set up for the reductive amination of cyclohexanone by means of reductive aminase from *Aspergillus oryzae* with MF as hydride and amine donor, thereby reaching conversion rates of 72% in a whole cell approach. This work broadens the applicability of FDHs in biocatalysis.
https://pubs.acs.org/doi/10.1021/acscatal.3c05409

EFSA

CEP Panel (2024): Safety evaluation of the food enzyme protein–glutamine γ-glutamyltransferase from the non-genetically modified *Streptomyces mobaraensis* strain M 2020197. *EFSA Journal*, 22(1), e8509. https://doi.org/10.2903/j.efsa.2024.8509
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2024.8509

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