2019年第13期总126期

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前沿资讯

1．Vietnam bans import of glyphosate herbicides after US cancer trial verdict(越南即日起禁止草甘膦进口 未来将彻底禁用草甘膦)

简介：Vietnam has announced that it has banned the import of all glyphosate -based herbicides with immediate effect following the latest cancer trial verdict from San Francisco, in a move which has shaken Bayer's Asian market for its top-selling product.Hoang Trung, Director of the Plant Protection Department under the Ministry of Agriculture and Rural Development, stated Saturday to Tuoi Tre newspaper that the import and trans-national trading of herbicides containing glyphosate would be banned immediately. Glyphosate herbicides are currently widely used in Vietnam."As soon as there was information that the second trial in the U.S. ruled that glyphosate was related to cancer, we put a ban on the import of new herbicides containing the active ingredient. And the removal of this substance from the list of pesticides allowed to be used in Vietnam will be done in the near future," Trung said.Trung added that to prohibit a certain substance that has been circulated his department must proceed with the correct legal procedures.. The new Plant Protection Department has prohibited the import of new shipments of glyphosate-based herbicides, while the consignments of glyphosate-based herbicides currently in circulation in Vietnam will still trade normally.Vietnam's move comes less than a week after a California federal jury foundthat Monsanto's Roundup weedkiller was likely a substantial factor in causing a man's cancer, delivering a major blow to the Bayer AG unit in the first such federal bellwether trial and setting the stage for a second phase to determine damages.Five women and one man reached their unanimous verdict in favor of plaintiff Ed Hardeman after deliberating for a week. In reaching its decision, the jury effectively rejected Monsanto's argument that there is no way to know what caused Hardeman's Non-Hodgkin lymphoma.The verdict marked the end of the first phase of the closely watched two-part trial that began Feb. 25. In the initial phase, the jury was tasked with deciding whether science supports the conclusion that Roundup and its active ingredient, glyphosate, can generally cause Non-Hodgkin lymphoma and whether it specifically caused Hardeman's cancer, leaving damages and other claims to be decided in the second phase.In 2017 the Vietnamese government also officially announced a ban on Syngenta's paraquat, a highly hazardous pesticide (HHP) and Dow Chemicals' 2,4-Dichlorophenoxyacetic acid (2,4-D), an organic compound found in Agent Orange, which was heavily used during the Vietnam War.

来源：AgroNews

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全文链接:

http://news.agropages.com/News/NewsDetail---29855.htm

2．中国研发转基因种子首次在国际上获得种植许可

简介：2月28日，北京大北农科技集团股份有限公司发布公告称，其研发的转基因大豆转化事件DBN-09004-6获得阿根廷政府的正式种植许可，该转基因大豆产品具备草甘膦和草铵膦两种除草剂抗性。这是中国公司研发的转基因种子首次在国际上获得种植许

可。中科院遗传与发育研究所生物学研究中心高级工程师姜韬告诉科技日报记者：“大北农的这个转基因大豆产品针对性强，属于差异性竞争策略的研发成果，有很强的竞争力。在南美被广泛种植的跨国公司的抗除草剂草甘膦转基因大豆是当前大豆国际贸易中占绝对优势的产品，阿根廷种植的转基因大豆主要出口我国，长期单品种种植，农田杂草具有出现抗草甘膦突变的可能。大北农的转基因大豆产品具备草甘膦和草铵膦两种除草剂抗性，能够有效解决南美大豆生产的控草难题，为应对草甘膦抗性杂草和玉米自生苗提供更加灵活和便利的技术手段。”姜韬告诉科技日报记者。大北农在公告中表示，该产品在阿根廷规模化商业推广还需要获得中国进口许可，公司将立即启动该产品的中国进口法规申报程序；同时该产品正在申请乌拉圭种植许可，还将申请巴西种植许可及欧盟、日本、韩国等其他大豆主要进口市场的进口许可。

来源：转基因ABC公众号

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全文链接:

https://mp.weixin.qq.com/s/A6xXsMSXEpH5DAxODDVxIw

3．世卫将制定人类基因编辑国际治理框架

简介：世界卫生组织19日在日内瓦宣布，将在未来两年内与相关利益攸关方广泛协商，制定一个强有力的人类基因编辑国际治理框架。经过两天的审查和密集磋商，世卫组织新成立的人类基因编辑全球治理和监督标准咨询委员会得出结论，现阶段开展人类生殖细胞系基因编辑的临床应用是“不负责任的”。世卫组织总干事谭德塞在一份声明中说：“基因编辑为改善人类健康带来了新的前景，但同时也伴随着一些伦理和医学上的风险……（世卫组织）希望汇集一些世界最优秀的专家，就这一复杂问题提供指导。”按计划，委员会未来两年内将与包括患者群体、民间团体、伦理学家、社会学家等在内的利益攸关方进行一系列面对面和网络磋商，就制定人类基因编辑国际治理框架咨询意见。世卫组织强调，这一框架应具备可扩展、可持续的特点，并适用于国际、地区、国家及地方各个层面。委员会还一致同意，应创建人类基因编辑研究的“中央登记体系”，以便为正在开展的工作建立一个开放、透明的数据库。委员会要求世卫组织立即着手开展这一工作。此外，委员会还邀请所有参与人类基因编辑研究的人员展开讨论，以便更好地了解技术环境和当前的治理安排，并为相关科研工作提供帮助以确保其符合当前科学和伦理的最佳做法。

来源：中国生物技术网公众号

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全文链接:

https://mp.weixin.qq.com/s/D1OU4ISOg_cIblHMFJcTAw

4．中国科学家完成“奇葩”光合物种硅藻首个光合膜蛋白结构解析研究

简介：记者从中国科学院植物研究所获悉，被戏称为“奇葩”光合物种——硅藻的第一个光合膜蛋白结构解析研究工作，已由该所沈建仁和匡廷云研究团队完成。北京时间2月8日，中国科学家这一突破性的研究成果“硅藻捕光天线蛋白(FCP)捕获蓝绿光和淬灭过剩激发能的结构基础”，获国际著名学术期刊《科学》以长文形式发表。这项研究工作为揭示光合作用光反应拓展捕光截面和高效捕获传递光能机理，以及硅藻超强的光保

护机制提供了坚实的结构基础，也为实现光合作用宽幅捕获和快速传递光能的理论计算提供了可能，为人工模拟光合作用机理提供了新理论依据。同时，该研究成果为指导设计新型作物、提高植物的捕光和光保护能力提供了新思路和新策略，有望基于该成果设计出能够利用绿光波段、具有高效捕光和光保护能力的新型作物，也可为现代化智能植物工厂的发展提供新的方向。据介绍，研究表明硅藻特有的FCP具有出色的蓝绿光捕获能力和极强的光保护能力，是硅藻能够在海洋中繁盛的重要原因之一。同时，FCP结合的岩藻黄素和硅甲藻黄素等色素参与形成了强大的光保护机制，有助于硅藻将过剩的光能转化为热量，以适应海水表面快速变化的光环境。然而硅藻光合膜蛋白的结构长期没有得到解析，极大限制了硅藻光合作用的研究。中科院植物所沈建仁和匡廷云研究团队一直致力于高等植物和藻类捕光天线复合物(LHC)的研究工作，发现高等植物和绿藻的LHC模型无法完全解释硅藻FCP蛋白中的色素结合、能量捕获传递和光保护机制，亟待通过结构研究而获得新的实验模型。该团队完成的硅藻第一个光合膜蛋白结构解析研究工作，首次描绘叶绿素c和岩藻黄素在光合膜蛋白中的结合细节，阐明叶绿素和岩藻黄素在FCP复合体中的空间排布，并揭示叶绿素c和岩藻黄素捕获蓝绿光并高效传递能量的结构基础。该研究首次揭示FCP二聚体的结合方式，对几十年来硅藻主要捕光天线蛋白聚合状态研究提供了第一个明确的实验证据。这一高分辨率FCP结构模型为研究硅藻的光能捕获、利用和光保护机制提供重要的结构基础。据了解，中国科学家这项突破性研究成果的论文在投稿过程中，《科学》编辑部和4名审稿人都对此高分辨率海洋硅藻捕光天线蛋白工作给予高度评价，建议将投稿的论文报告拓展为长文形式发表。

来源：中国新闻网

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全文链接:

https://www.chinanews.com/sh/2019/02-08/8749254.shtml

学术文献

1．专家点评 Nature Plants ：遗传所储成才组揭示氮磷协同利用实现植物营养平衡的分子机制

简介：储成才课题组前期的工作发现硝酸盐转运蛋白NRT1.1B的自然变异是导致水稻籼粳亚群间（indica和japonica）氮利用效率差异的重要原因（Hu et al., Nat Genet, 2015）。NRT1.1B的自然变异不仅导致籼稻硝酸盐吸收及转运的增强，同时触发更强的硝酸盐信号反应。在这项最新的研究中，储成才课题组发现，细胞膜定位的NRT1.1B可以与细胞质定位的抑制蛋白SPX4发生互作，NRT1.1B结合硝酸盐后可增强两者的结合，并促进SPX4蛋白发生降解。作为抑制蛋白SPX4可以阻止硝酸盐信号核心转录因子NLP3进入细胞核，而NRT1.1B介导的SPX4降解使NLP3得以释放，进而激活下游基因表达触发硝酸盐应答反应。因此，NRT1.1B-SPX4-NLP3组成的调控模块完成了将硝酸盐信号从细胞膜至细胞核的完整传导过程。有意思的是，SPX4长期以来被认为是磷信号传导的关键调控组分，负责调控磷信号核心转录因子PHR2的核质穿梭。研究人员发现NRT1.1B介导SPX4蛋白降解也会促进PHR2进入细胞核，进而触发磷应答基因的表达。因此，硝酸盐信号可通过NRT1.1B-SPX4同时实现对硝酸盐应答基因和磷应答基因的协同激活，从而实现氮磷营养平衡。为了进一步回答NRT1.1B介导SPX4发生蛋白降解的原因，研究人员鉴定到了一个NRT1.1B的互作蛋白——NBIP1（NRT1.1B interacting protein 1，一个泛素

连接酶E3）。研究发现，NRT1.1B可以招募NBIP1及SPX4形成复合体，以促进SPX4的泛素化及蛋白降解。

来源：BioArt公众号

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全文链接:

https://mp.weixin.qq.com/s/OTD-NvGblZbA8FKLwVOb1Q

2．An efficient DNA- and selectable-marker-free genome-editing system using zygotes in rice(用于水稻中的受精卵的一种有效的DNA和可选择标记的基因组编辑系统)

简介：Technology involving the targeted mutagenesis of plants using programmable nucleases has been developing rapidly and has enormous potential in next-generation plant breeding. Notably, the clustered regularly interspaced short palindromic repeats (CRISPR)CRISPR-associated protein-9 nuclease (Cas9) (CRISPRCas9) system has paved the way for the development of rapid and cost-effective procedures to create new mutant populations in plants1,2. Although genome-edited plants from multiple species have been produced successfully using a method in which a Cas9guide RNA (gRNA) expression cassette and selectable marker are integrated into the genomic DNA by Agrobacterium tumefaciens-mediated transformation or particle bombardment3, CRISPRCas9 integration increases the chance of off-target modifications4, and foreign DNA sequences cause legislative concerns about genetically modified organisms5. Therefore, DNA-free genome editing has been developed, involving the delivery of preassembled Cas9gRNA ribonucleoproteins (RNPs) into protoplasts derived from somatic tissues by polyethylene glycolcalcium (PEGCa2+)-mediated transfection in tobacco, Arabidopsis, lettuce, rice6, Petunia7, grapevine, apple8 and potato9, or into embryo cells by biolistic bombardment in maize10 and wheat11. However, the isolation and culture of protoplasts is not feasible in most plant species and the frequency of obtaining genome-edited plants through biolistic bombardment is relatively low. Here, we report a genome-editing system via direct delivery of Cas9gRNA RNPs into plant zygotes. Cas9gRNA RNPs were transfected into rice zygotes produced by in vitro fertilization of isolated gametes12 and the zygotes were cultured into mature plants in the absence of selection agents, resulting in the regeneration of rice plants with targeted mutations in around 1464% of plants. This efficient plant-genome-editing system has enormous potential for the improvement of rice as well as other important crop species.

来源：Nature Plants期刊

发布日期:2019-03-25

全文链接:

http://agri.ckcest.cn/file1/M00/06/61/CsgkOFyaAI6ATiy_AB5hxLsyay4332.pdf

3．Inducible overexpression of Ideal Plant Architecture1 improves both yield and disease resistance in rice(植物结构的诱导性过度表达提高了水稻的产量和抗病性)

简介：Breeding crops with resistance is an efficient way to control diseases. However, increased resistance often has a fitness penalty. Thus, simultaneously increasing disease resistance and yield potential is a challenge in crop breeding. In this study, we found that downregulation of microRNA-156 (miR-156) and overexpression of Ideal Plant Architecture1 (IPA1) and OsSPL7, two target genes of miR-156, enhanced disease resistance against bacterial blight caused by Xanthomonas oryzae pv. oryzae (Xoo), but reduced rice yield. We discovered that gibberellin signalling might be partially responsible for the disease resistance and developmental defects in IPA1 overexpressors. We then generated transgenic rice plants expressing IPA1 with the pathogen-inducible promoter of OsHEN1; these plants had both enhanced disease resistance and enhanced yield-related traits. Thus, we have identified miR-156IPA1 as a novel regulator of the crosstalk between growth and defence, and we have established a new strategy for obtaining both high disease resistance and high yield.

来源：Nature Plants 期刊

发布日期:2018-03-18

全文链接:

http://agri.ckcest.cn/file1/M00/06/61/CsgkOFyZ_ziAGZEVACgUOPf8uyE169.pdf

相关专利

1．Method and composition for gene expression in plants(用于在植物中进行基因表达的方法和组合物)

简介：本发明提供了用于在转基因植物中提供有效的蛋白质表达的重组DNA分子，以及使用所述重组DNA分子的组合物和方法。在特定实施方案中，本发明提供了包含编码转运肽的序列和赋予除草剂耐受性的可操作连接序列的重组DNA分子和构建体。

来源：国家知识产权局

发布日期:2019-03-15

全文链接:

http://agri.ckcest.cn/file1/M00/06/63/CsgkOFycLliAArdZAiAJEYOWYqA843.pdf