



2024年第2期总404期

粮食和食物安全专题

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3. 尽管近期降雨不断，巴西大豆产量前景仍有所下降
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1. 国际合作：用农业创新战胜埃及的高温

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➤ 前沿资讯

1 . When Not Farming is the Best Use of Land (何时不耕种才是土地的最佳利用方式)

简介: Asking a farmer to “uncrop” their land is a big ask. There’s a lot at stake, not the least of which are the economic losses unproductive land may cost the grower. Sometimes, though, it’s the best and only option for the land and its long-term productivity. “Not all farmland is created equal,” says Jesse Womack, a conservation policy specialist with the National Sustainable Agriculture Coalition (NSAC). “Some acreages are inherently less productive than others.” The soil quality may not support crops or the land may not have appropriate water drainage. The cost of trying to create viable conditions for growing can be enormous and may not be worth the expense or the crop it might produce. For many farmers, the answer is to enroll in the Conservation Reserve Program (CRP). Created by Congress in 1985, the CRP asks agricultural producers to voluntarily take environmentally sensitive land out of active production and conserve it. In return, they are paid a yearly rental rate per acre of land enrolled in CRP programs. In 2023, the USDA Farm Service Agency made more than \$1.77 billion in payments to agricultural producers and landowners enrolled in all CRP programs, and more than 23 million acres of private land in the US was being conserved.

来源: modern farmer

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全文链接:

<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgAaSAVG4QAKfudtmI4Ls036.pdf>

2 . Agricultural financing – from a broader perspective (农业融资——从更广阔的视角看)

简介: Efforts to enhance rural financial inclusion in Sub-Saharan Africa is of great importance. The digitalisation of agricultural financing presents a promising path, hindered, however, by the limited expertise of certain financial institutions (FIs). The pan-African Community of Practice (CoP) plays a pivotal role in supporting these institutions. A large proportion of agricultural production in sub-Saharan Africa is produced by smallholder farmers in rural areas. These farmers are threatened by extreme poverty in 70 per cent of cases. One way to combat poverty and hunger is to endeavour to integrate agri-based entrepreneurs more closely into the formal financial system. However, financial institutions (FIs) are still largely focused on urban centres and often view the integration of rural areas in terms of high costs and risks. Digitalisation offers an effective solution to enable FI to focus more on the inclusion of the agricultural sector and smallholder farmers. Processes can, for example, be organised more efficiently, less cost-intensively and with fewer risks. FIs around the world are looking for ways to digitise their operations. While some have been successful, others have found this to be a complex, costly endeavour where success is far from guaranteed. The pan-African Community of Practice (CoP) has the potential to be a valuable tool to enable cross-country learning in a cost-effective way through exchange

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among like-minded financial service providers.

来源: rural 21

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<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2t7-Aa6GbAA2gKGnxNtw146.pdf>

3 . Pathways towards lower emissions (实现低排放的途径)

简介: This report aims to enable the livestock sector to contribute its share to the efforts to limit the global temperature increase to well below two degrees Celsius. The report Pathways towards lower emissions A global assessment of the greenhouse gas emissions and mitigation options from livestock agrifood systems, published by the Food and Agriculture Organization of the United Nations (FAO) in December 2023, provides a comprehensive assessment of greenhouse gas (GHG) emissions from livestock agrifood systems, comprising farm gate, land-use change (LUC) and supply chain processes. It offers estimations of future emissions under scenarios of increased production and outlines pathways to reduce emissions through the application of well-established best practices in animal management. While there is no universal solution and more work is needed to understand the barriers to implementing and upscaling these interventions, enhancing productivity and production efficiency across the entire value chain is the most promising way to mitigate and reduce livestock emissions. Options to produce more with lower emission levels are available for all regions and production systems. To maximise the mitigation potential, it is crucial to facilitate farmers' access to services and invest in enabling their ability to implement tailored interventions.

来源: rural 21

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<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2usqAYTUaAAs6ocdUtl0587.pdf>

4 . Cultivating Profits in a Compact Crop (在紧凑的作物中培养利润)

简介: "Microgreens" is a term used to describe the tender, edible seedlings of various herbs, vegetables and grains typically seeded in shallow, soil-filled trays, grown under natural or artificial light, then harvested within two weeks of germination. Packed with vivid colors, a fresh crunch and intense flavors that can range from sweet to peppery, San Francisco chefs popularized them in the 1980s to liven up fancy dishes. Although the specialty greens have maintained their trendy reputation, research has also shed light on their health benefits, finding that the nutrient density of sprouts is often higher than that of mature plants. And because they grow quickly with minimal resources—and without herbicides or pesticides—scientists point to their potential to help bolster nutritional security, hedge against disruptions in the food supply chain and even generate fresh produce on long-term space missions. Retired army veteran Gerry Mateo started farming microgreens in the garage of his Bakersfield, California home as a way to combat anxiety and depression. It's proven to be a calming and grounding endeavor, he says, and it has also helped improve his

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diet. When he launched FilAm Vets Hydroponics Farm in 2021, Mateo was overweight and suffering from high blood pressure and diabetes, he says. But a daily dose of his own fresh produce has made him much healthier and lowered his cholesterol. “You can only eat lettuce in a salad or sandwich,” he says. Microgreens are highly versatile, pairing well with—but not overpowering—various dishes and blending easily into smoothies.

来源: modern farmer

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2so0AayvSALQfi0c0qRA444.pdf>

5. 聚焦共同利益：美中两国应携手应对粮食安全和气候变化挑战

简介: 要应对农业面临的全球性挑战,当然绕不开世界上最大的两个经济体——美国和中国,而农业对这两个国家也至关重要。作为美国的重要产业,农业产值大约占美国国内生产总值(GDP)的5%。在中国,农业产值占2021年国内生产总值的7.3%。中国政府每年出台的“一号文件”就是国家制定的当年农业发展的蓝图,这印证着我从中国朋友那里反复听到的一句永不过时的成语——民以食为天。我的大部分职业生涯都奉献给了艾奥瓦州的农业。艾奥瓦州以农产品高产著称,玉米、猪肉和鸡蛋的产量均居美国首位,而大豆即使每年收成有变化,产量也总是稳居前两名。因此,国际农业界人士访美时,最常来的州之一就是艾奥瓦,这也使我有机会遇到很多中国同仁。

来源: 中国新闻发布(实务版)

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2v-uADm7-AC0tyXbmiDI543.pdf>

6 . Rising storms – climate change effects exacerbating conflict and hunger crisis (风暴不断上升——气候变化影响加剧冲突和饥饿危机)

简介: A report released in late 2023 by the international aid agency World Vision reveals the opinions of people living in affected regions on the links between climate change, conflict, hunger and displacement. This research uses field data from a survey of almost 3,000 people in nine countries (Burkina Faso, the Democratic Republic of Congo, Nicaragua, Guatemala, Honduras, El Salvador, Iraq, Papua New Guinea and Sri Lanka) to hear from them how climate hazards are fuelling conflict, displacement and food insecurity in a wider range of contexts than commonly thought. Some of the key findings of the report are: 86 per cent of people in the nine low- and middle-income countries surveyed say climate change is a serious problem for their communities. 60 per cent thought climate change was worsening conflict in their communities already, especially through water shortages, corruption and displacement. 57 per cent completely agreed that climate change increased the risk of hunger and food insecurity. 99 per cent of respondents agreed that climate change was leading to displacement either to or from their community.

来源: rural 21

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<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgBp0Acb01AAq90XbUkdo283.pdf>

➤ 学术文献

1. 全球粮食危机与中国应对策略

简介: 粮食安全是实现全球安全与可持续发展的重要基础,当前多重风险挑战叠加共振,削弱了国际社会抵御和应对粮食危机的能力。从全球粮食安全治理体系来看,粮食危机的生成因素涉及器物、制度与政策三个向度。世界经济增长放缓、地缘冲突频发、气候变化加剧削弱了全球粮食系统的器物基础,机制碎片化趋势降低了国际制度的治理效能,贸易保护主义和新自由主义粮农政策扩张致使诸多国家忽视粮食安全困境下必要的国际合作与共同利益。面对当前全球粮食危机,中国作为全球粮食安全治理的重要参与者,宜在全球发展倡议框架下,深入推进各项粮食安全行动,动员各方加大资金、技术等器物资源投入;加速全球粮食安全治理体系转型,维护联合国粮农三机构的中心作用;倡导普惠包容的粮农政策,引领塑造互利共赢的全球粮食安全合作氛围。

来源: 中国知网

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<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgEVWAQcrTABWTUU0QyP4198.pdf>

2. 新世纪中美谷物成本收益演化比较及中国粮食安全政策启示

简介: 谷物成本是影响谷物供给安全和效率的核心议题。通过对新世纪以来中美谷物成本收益演化比较发现,中国谷物生产成本持续攀升,其中人工成本和土地成本变化是其重要因素。谷物生产成本攀升推动中国粮食成本高企,深刻影响国家粮食安全。分品种看,中国小麦生产成本始终高于美国,玉米和稻谷生产成本分别于2010年、2012年超过美国。持续升高的谷物生产成本引致中国谷物利润持续下滑,对中国谷物产业竞争力造成负面约束。面对当前不断深刻演化的全球粮食市场体系,中国粮食安全体系构建需要在深刻分析谷物生产成本演化特征基础上,建立节本增效为核心的谷物产业政策取向,切实提升谷物产业竞争力,实现国家粮食安全。

来源: 中国知网

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2wuaAEuXsAC30VHe9C850.pdf>

3. 大食物安全观下粮食增产政策的逻辑反思

简介: 在系列政策扶持下,粮食生产连年获得丰收。然而,在高粮食自给率得以维持的背后,却是食物自给率的不断下降。本文梳理了政策推进粮食增产的诸多做法,并在大食物安全观下反思了这些政策带来的后果。分析发现,在达成一定粮食自给率水平下,强化资源“趋粮化”配置的做法会加剧食物自给率缺口。而且,在粮食比较收益相对偏低情况下,引导资源进入粮食生产领域的做法不仅会降低农业资源的整体产出效率,还会加剧农业发展对政策扶持的依赖程度。而这又会受到WTO框架和财政预算的制约。为确保食物自给率基础上的粮食安全,需转换粮食安全的分析视角,立足食物安全统筹国

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内资源。同时，也要在效率提升，尤其是非口粮市场的竞争力提升方面做文章。

来源：中国知网

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全文链接:

<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgEFiALj9nAB21033HBPI396.pdf>

4. 西南地区粮食安全评价研究

简介: 粮食安全事关国计民生，是国家安全的重要基础。基于2001-2020年西南地区及42个地市单元的面板数据，从粮食供给能力、可获得性、稳定性以及可持续性4个维度构建了粮食安全评价指标体系，对西南地区粮食安全状态进行了评估。结果表明：(1)西南地区粮食安全水平总体呈上升趋势，经历了波动下降与稳步上升2个阶段。(2)4个子系统中，粮食可获得性水平上升速度最快、幅度最大，是西南地区粮食安全水平上升的主要贡献者，其次是粮食稳定性、供给能力和可持续性，各子系统在不同时段呈现不同的演变特点。(3)粮食安全在不同地市之间分异大，差别明显，粮食安全综合水平高且增长较快的地市主要分布在四川盆地内。2001-2020年间西南地区各地市粮食安全类型由粮食安全性低和极低为主向粮食安全性中等以上转变，粮食安全性高和极高的类型主要集中在四川盆地，粮食安全性中等的类型主要分布在粮食安全级别高类型的外围。未来应从加大耕地保护、提高耕地质量、加强农业基础设施建设、提高居民收入、增加食物供给来源、降低化肥使用量以及促进农业技术更新等方面保障西南地区粮食安全。

来源：中国知网

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2wf6AZGWWAB2IQsgvugM056.pdf>

5. 农村劳动力老龄化对粮食生产的影响及作用机制

简介: 基于全国农村固定观察点数据，采用双向固定效应模型，实证分析农村劳动力老龄化对粮食生产的影响及作用机制。结果表明：农村劳动力老龄化对粮食生产起负向作用，该结论在使用多种稳健性检验方法后依旧成立。农村劳动力老龄化降低了农户的身体素质以及对粮食生产新技术的接受度，这会削弱粮食生产劳动力供给，不利于粮食生产新技术的采用；社会化服务、农业技术推广以及农业保险能够在一定程度上缓解农村劳动力老龄化对粮食生产的负面影响，有助于保障粮食产量；农村劳动力老龄化对粮食生产的负面影响在非粮食主产区、农业基础设施较差的农村地区以及兼业化程度较低、农业细碎化程度较高的农户和稻谷生产中更为明显。据此，建议强化农业技术推广、健全社会化服务体系、完善农业保险保障体系并加快农业基础设施现代化建设，以应对农村劳动力老龄化对粮食生产的不利影响。

来源：中国知网

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<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgDOWAQ1XRAAz3W4V2GSk828.pdf>

6. 印度农业现代化：动因分析、现状特征及发展前景

简介: 近年来，在印度政府农业改革政策的大力推动下，印度农业的发展迎来了新的局

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面。为了进一步实现农业的现代化发展，以实现农民收入翻番为基准，印度通过实施第二次“绿色革命”、扩大农产品出口、提高农业部门预算和修订农业改革法案等方式，为21世纪的农民提供全面的生计保障。在各项农业改革政策的持续推动下，印度农业突破了传统模式，呈现出系统有机化、生产机械化、平台数字化及合作国际化的四重特征，基本符合农业现代化发展的需要，体现出鲜明的印度特色。就其前景而言，印度农业的可持续发展较为可观，农民收入和福利待遇也将得到更为有力的保障。不过，改革不可一蹴而就，印度农业的未来道路也绝非坦途。在具备良好发展机遇的同时，该国农业现代化的深入推进仍将面临一定的现实挑战。此外，印度农业现代化对探索中国特色农业现代化发展之路也有一定的启示和借鉴意义。

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http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2wOuABqD9ABa3ao2_Mg4561.pdf

7. 进口扩大背景下中国玉米市场格局与议价能力演变

简介：随着中国玉米供需缺口逐渐加大和国际外部环境不确定性的增加，如何提升中国在国际玉米市场上的议价能力具有重要现实意义。为测度中国在国际玉米市场上的议价能力，本文基于双边随机前沿模型，从理论和实证两个方面对中国在国际玉米市场上的议价能力进行定性与定量分析。研究发现：(1)中国玉米进口数量上涨明显，对外依存度提高，且进口来源集中度较高；(2)中国在玉米国际市场上的议价能力长期低于玉米主要出口国，玉米进口价格高于理论进口价格；(3)长期以来，中国在与美国的玉米贸易中处于弱势地位，尤其是当中国进口来源过度集中于美国时，这种议价差距将进一步被放大。推动中国进口来源多元化，加快农业“走出去”步伐，建立可持续的粮食供应体系对提升中国在国际玉米市场的谈判能力和抵御风险能力大有裨益。

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<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgD1WASYoqABifwRIy4Hc646.pdf>

8. 中国粮食体系韧性：水平测度及动态演进

简介：分析粮食体系韧性理论内涵的基础上，从风险抵抗能力、适应调整能力和创新转型能力三个维度构建粮食体系韧性综合评价指标体系，基于2011—2021年中国31个省份数据，采用熵值法、Moran's I指数、Kernel核密度、空间Markov链、Dagum基尼系数等方法对中国粮食体系韧性进行测度与评价。研究发现：中国粮食体系韧性提升明显，但整体水平较低，粮食主销区粮食体系韧性较高；中国粮食体系韧性分维度指数值从高到低依次是风险抵抗能力、创新转型能力和适应调整能力。中国粮食体系韧性具有显著的空间正相关性，多数省份位于高一高集聚区和低—低集聚区，空间集聚程度逐渐降低。中国粮食体系韧性水平在波动中上升，具有一定的梯度效应，但极化效应较弱；相邻地区空间滞后水平的提升能够增加本地区向上转移的概率。中国粮食体系韧性的区域差异明显但存在一定的收敛趋势，组间差异及超变密度是粮食体系韧性发展不平衡不充分的主要原因。

来源：中国知网

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<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgDN-ASJWpABj94RJuBeU679.pdf>

9. 建国以来中国粮食生产多元要素驱动定量研究

简介: 粮食安全事关国家安全与社会稳定, 该文基于1949—2020年中国31个省级行政区(不含香港、澳门特别行政区和台湾省)的数据, 采用Cobb-Douglas函数, 按照不同的地域范围划分方式构建了区域粮食生产模型, 量化解析了不同时段内的第一产业从业人员数、机械动力强度、有效灌溉面积、化肥折纯量、受灾面积和复种指数对粮食产量的作用。结果表明, 有效灌溉面积和化肥折纯量对中国粮食生产的贡献度不断提升, 第一产业从业人员数和复种指数的贡献度显著下降, 机械动力强度的贡献度先提升再下降, 受灾面积对粮食的减产效用先增强再减弱; 各要素对粮食生产的驱动作用趋于均衡化, 未来粮食安全需依靠以有效灌溉面积为基础的多要素协同保障; 有效灌溉面积的北移和人口重心的南移共同驱动了中国粮食调运格局的转变, 这种“北粮南运”的格局仍将持续并可能呈现扩大态势。保障中国粮食安全需充分发挥国家水网的水资源调配功能, 通过增加有效灌溉面积驱动多要素协同促进粮食增产。

来源: 中国知网

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2vk2AcbdpACKAZJar8AA590.pdf>

➤ 相关成果

1 . Egypt's Wheat Supplies Tighten as Imports Head for Fourth Year of Decline (埃及小麦供应趋紧, 进口量连续第四年下降)

简介: The North African country, which in most years is the world's biggest wheat importer, is forecasted to import 11 million tonnes of the grain in 2023/24, down 2% year on year. The projected decline comes as domestic wheat stocks in Egypt, the most populous country in North Africa and the Middle East, are expected to drop to the lowest level in 20 years. The Egyptian pound has lost nearly half its value against the US dollar in the past two years. Egypt's wheat import prices are currently close to the highs that followed Russia's invasion of Ukraine in 2022. (See chart below.) By contrast, Egypt's wheat import costs expressed in US dollars are down 21% over the past year — and down 28% over two years — according to the Gro Food Security Tracker: Africa.

来源: Gro intelligence

发布日期:2024-01-20

全文链接:

<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgCxSAM0B3AA4Vj4R6TCk534.pdf>

2 .USDA Increases 2023 US Corn and Soybean Production Estimates (美国农业部上调2023年美国玉米和大豆产量预估)

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简介: In its January WASDE report, the USDA projected corn yields of 177.3 bushels per acre, up 1.4% from last month's estimate. That in turn boosted forecasted production by 0.7% to a record 15.342 billion bushels (389.7 million tonnes). Corn harvested acres were cut slightly. US corn ending stocks for 2023/24 are projected to be the highest in five years. The soybean yield estimate also was raised, by 1.4% to 50.6 bu/acre, and production is seen at 4.165 billion bushels (113.4 million tonnes). With the projected uptick in supplies, soybean ending stocks are now seen at 280 million bushels, a 14.3% jump from last month. The USDA's revisions bring the agency's estimates significantly closer to Gro's own final estimates, which Gro's machine learning-based Corn and Soybean Yield Forecast models projected four months ago. The USDA's new corn yield estimate is now 2.8% below Gro's final estimate of 182.45 bu/acre issued in September. The agency's soybean yield estimate is now just 0.4% below Gro's final estimate of 50.8 bu/acre made in September.

来源: Gro intelligence

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2vGGAbYmPAA2jUMPy960072.pdf>

3 .Brazil's Soybean Outlook Declines Despite Recent Rains (尽管近期降雨不断，巴西大豆产量前景仍有所下降)

简介: Gro's Brazil Soybean Yield Forecast Model has declined steadily since the start of the year. The machine learning-based model currently indicates that Brazil's soybean production will fall short of last year's record output. Erratic rainfall early in the soybean season — too much rain in the south and too little in the country's center — delayed planting and hurt crop yields. The daily updating Gro forecast model is included with Gro's Brazil Soybean Monitor, which also includes drought readings, a supply and demand balance sheet, and other features. In Mato Grosso, cooler temperatures and widespread rains have brought some relief to drought conditions. The Gro Drought Index, weighted for the state's soybean growing areas, declined from "severe" drought readings in mid-December to "moderate" drought level currently, according to Gro's Climate Risk Navigator for Agriculture.

来源: Gro intelligence

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全文链接:

<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgCZSAZly1AAvf7hT3huk072.pdf>

4 . Plant diversity stabilises soil temperature (植物多样性可以稳定土壤温度)

简介: Extreme weather events are occurring more frequently. A recent study has shown that plant diversity can help mitigate the impacts of climate change by increasing plant productivity and ecosystem stability. A new study has revealed a natural solution to mitigate the effects of climate change, such as extreme weather events. Researchers from German research institutes — Leipzig University, Friedrich Schiller University Jena, the German Centre

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for Integrative Biodiversity Research Halle-Jena-Leipzig (iDiv) and others have discovered that high plant diversity acts as a buffer against fluctuations in soil temperature. This buffer can then be of vital importance to ecosystem processes. They published their new findings in the journal Nature Geoscience in December 2023. "Soil temperature plays a central role in controlling important ecosystem processes related to water, carbon and nutrient dynamics, microbial activity and agricultural productivity," explains the lead author of the study, Dr Yuanyuan Huang. Despite its importance, no study has yet investigated whether plant diversity in particular acts as a buffer against fluctuations in soil temperature during long-term plant community development. In their study, Huang and her colleagues present the results of a comprehensive data set collected from 2004 to 2021 in a large-scale grassland biodiversity experiment – the Jena Experiment. The experimental site consists of 80 plots with a variety of plants ranging from one to 60 species. In addition, four plots of unplanted soil and two plots of uncontrolled vegetation provided important reference points. Soil temperature was automatically recorded at depths of five and 15 centimetres at one-minute intervals over a period of 18 years, which spanned considerable climate variability.

来源: rural 21

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全文链接:

<http://agri.nais.net.cn/file1/M00/03/64/Csgk0WW2tXuAQsRJAA5ti8-ntGw510.pdf>

► 科研项目

1 . International cooperation: Defying Egypt's heat with agricultural innovation (国际合作: 用农业创新战胜埃及的高温)

简介: With 2023 being the hottest year on record, it was most timely to launch the Agriculture Innovation Project in Egypt. This initiative aims to foster the adaptation and assure the resilience of farmers most affected by climate change. The project got kicked off via an expert meeting including GIZ, ICARDA, the Ministry of Agriculture and Land Reclamation and the Swiss Office for International Cooperation in Egypt. Egypt is at risk from climate change that is over-proportionally affecting the poor. Climate change studies suggest that extreme climate events such as heat waves and spread of arid zones will reduce crop productivity by 15 to 50 per cent by 2050, affecting the most vulnerable rural communities and adding to Egypt's food security risk. Egyptian agriculture is an important economic sector with multi-dimensional challenges. It accounts for 11.7 per cent of GDP, absorbs 25.8 per cent of the working population, and is particularly important for the livelihood of poorer families. Five million smallholders and their families are already suffering from decreased production means, increasing input prices and high inflationary pressures. These combined challenges are exacerbated by limited access to financial services and limited means to deal with the dawning climate change effects, while prices of energy increase and water resources diminish: Egypt faces a classical water, energy, and food nexus challenge. In this context, the "Agriculture Innovation Project (AIP) II", (implementation 2023-2028) funded by Swiss

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Development Cooperation (SDC) and the German Federal Ministry of Economic Cooperation and Development (BMZ) and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), will focus on climate adaptation and poverty alleviation. It aims to improve income and job opportunities of rural communities in Upper Egypt through the promotion of climate smart and green innovation.

来源: rural 21

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<http://agri.nais.net.cn/file1/M00/10/37/Csgk0EFgBFGANqktAA3pt3YdQbA700.pdf>