中国工程科技知识中心
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《中国农业发展战略研究》专题快报

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【动态资讯】

1. Overuse of agricultural chemicals on China's small farms harms health and environment

【EurekAlert!】Overuse of agricultural chemicals on China's small farms harms health and environment: new study. The size of farms in China is a key contributor to the overuse of agricultural chemicals, and as a result they may be too small to be environmentally sustainable, a new study has found. The research—conducted by a team from the Universities of Melbourne, Zhejiang, Fudan, Wuhan and Stanford - is published today in the Proceedings of the National Academy of Sciences of the United States of America. The study found agricultural chemicals are often used inefficiently on small farms, leading to financial losses and serious local, regional and global pollution ranging from eutrophication (an excess of nutrients in bodies of water, often caused by run-off from the land) to particle pollution in the air and global warming. University of Melbourne and Zhejiang researcher Baojing Gu said: "China is the world's largest consumer of agricultural chemicals, using more than 30 per cent of global fertilisers and pesticides on only 9 percent of the world's crop land.

链接:

https://www.eurekalert.org/pub_releases/2018-06/uom-ooa061818.php

2. Expansion of agricultural land reduces CO_2 absorption

【Karlsruher Institute of Technology (KIT)】A research group led by Arneth and Dr Benjamin Quesada at IMK-IFU has dealt with the impact of changes in land use on the expected concentration of carbon dioxide - in other words CO_2 projection - in the earth's atmosphere. Their study titled "Potential strong contribution of future anthropogenic land-use and land-cover change to the terrestrial carbon cycle" published in Environmental Research

Letters shows that changes in land use have a significant impact on future CO_2 absorption from the atmosphere. If forests are cut down in favor of arable land and pasture land, it reduces the capacity of plants and soil to take up CO_2. "The wood in a forest can store more CO_2 than corn for example," explains Arneth who in her research deals with the interaction between the atmosphere, plants and soil. If deforestation were to continue, it could even be expected that large parts of the tropics will change from a CO_2 basin - which absorbs more CO_2 than it releases - to a CO_2 source.

链接:

https://www.kit.edu/kit/english/pi_2018_074_expansion-of-agricultural-land-reduces-co2-absorption.php

3. Nitrate in drinking water increases the risk of colorectal cancer

【**EurekAlert!**】The results have just been published in the scientific journal International Journal of Cancer. Nitrate in groundwater and drinking water, which primarily comes from fertilisers used in the agricultural production, has not only been subject to decades of environmental awareness - it has also been suspected of increasing the risk of cancer. The largest epidemiological study ever carried out in this area now shows that there is a correlation - also when the amount of nitrate in the drinking water is far below the current drinking water standard. The researchers have calculated how much nitrate Danes have been exposed to where they lived and compared this to information about cancer diagnoses in Denmark. Researchers have managed to follow a total of 2.7 million Danes during the period 1978-2011 and the study is based on nitrate analyses from more than 200,000 drinking water samples, making the study the largest and most detailed in this area.

链接:

https://www.eurekalert.org/pub_releases/2018-02/au-nid021818.php

4. Widespread uranium contamination found in India's groundwater

【**EurekAlert!**】DURHAM, N.C. - A new Duke University-led study has found widespread uranium contamination in groundwater from aquifers in 16 Indian states. The main source of the uranium contamination is natural, but human factors such as groundwater-table decline and nitrate pollution may be exacerbating the problem. Several studies have linked exposure to uranium in drinking water to chronic kidney disease."Nearly a third of all water wells we tested in one state, Rajasthan, contained uranium levels that exceed the World Health Organization and U.S. Environmental Protection Agency's safe drinking water

standards," said Avner Vengosh, a professor of geochemistry and water quality at Duke's Nicholas School of the Environment.

链接:

https://www.eurekalert.org/pub_releases/2018-06/du-wuc060718.php

5．保护耕地须“质”“量”并举

【中国农业新闻网】自然资源部表示,将继续坚持最严格的耕地保护制度和最严格的节约用地制度,切实提高全民共同关注土地资源、严格保护耕地、建设生态文明的意识。我国土地的后备资源十分有限,有13亿多人口,人均土地面积不到世界平均数的1/3;我国耕地质量水平总体偏低。我国的耕地现状是耕地少,质量低,面对这种现状,保护耕地必须有“质”有“量”,“质”“量”并举。现在,我们对“量”的保护比较重视,截至目前,全国实际划定15.50亿亩永久基本农田。全国有划定任务的2887个县级行政区划定成果100%通过省级验收,成果数据库100%通过质检复核,划定工作成果已广泛应用。同时,地方各级党委、政府坚守耕地红线、节约集约用地的意识明显增强,逐级签订了保护责任书,把保护责任落实到地方各级政府,落实到村组、落实到农户,并设立统一标志,接受社会监督。这样,就为保证耕地的“数量”打造了“铜墙铁壁”,雷打不动,百毒不侵。但是,我们还必须在“质”上进行提升。全国耕地评定为15个等别,一等耕地质量最好,十五等最差,全国耕地质量平均等别为9.96等,优、高、中、低等地面积比例分别为2.90%、26.59%、52.72%、17.79%。这个数据清晰告诉我们,我国耕地质量亟待提高。

链接:

http://www.farmer.com.cn/xwpd/snwp/201806/t20180626_1387098.htm

6．秸秆综合利用试点绩效评价总体良好

【中国农业新闻网】2017年，中央财政安排资金13亿元，在内蒙古、辽宁、吉林、黑龙江、江苏、安徽、山东、四川、陕西等9个省（区）继续开展农作物秸秆综合利用试点。今年3月财政部会同农业农村部成立工作组，对9个试点省（区）开展了绩效评价工作。绩效评价结果显示，试点区内秸秆焚烧情况得到有效控制，各省（区）建立了较为完善的秸秆综合利用体系，提炼形成了县域可复制、可推广的综合利用模式，取得了良好的社会、经济和生态效益，绩效评价结果总体良好。中央财政在安排2018年中央财政农作物秸秆综合利用试点资金时，将把2017年绩效评价结果作为重要因素，有效推进绩效评价结果运用。

链接:

http://www.farmer.com.cn/jjpd/nz/nzdt/201807/t20180712_1390794.htm

7．自费10万元回收5吨废弃农药瓶 乡村医生张传勇的环保之困

【中国农业新闻网】张传勇是山东省济南市历城区彩石街道大龙堂村的一名中医，平时喜欢到郊外爬山。在爬山过程中，他发现了一个问题：路边经常散落着一些废弃的农药瓶和农药袋。考虑到这些废弃物可能带来的污染，他决定做一件事儿，发动乡亲们一起回收这些废弃农药瓶。“当时我考虑如果三毛两毛的话，老百姓没人去捡，所以我定的价格高一点，农药瓶子1块钱一个。”张传勇说，从去年10月底开始，他就自筹资金，从农民手里回收废弃农药瓶和农药袋，农药瓶1元钱一个，农药袋5毛一个。以高于市场废品收购价的价格回收这些农药包装废弃物，极大地调动起了周边村民的积极性。为了方便就近回收废弃的农药瓶，张传勇在大龙堂村、青龙峪村村委会、潘河崖卫生室、南宅科村乡村大院设立了4个回收点，并发动身边的亲戚朋友帮忙做宣传。仅7天时间，张传勇就回收了9万多块钱的废弃农药瓶和农药袋。张传勇回收的废弃农药瓶分两次销毁，第一次销毁4.12吨，第二次销毁近1吨。近5吨的废弃农药瓶，张传勇需要再支付3万元左右的销毁费用。除了前期回收农药瓶支付的9万多元、放置农药瓶的房屋租赁费用5000元，再加上雇人搬运农药瓶的费用，张传勇在这次公益行动中总共支付了十几万元。对于一名月收入仅几千元的乡村医生来说，这笔钱并不是一个小数目。张传勇的公益行动已经过去近半年，而在大龙堂村附近的农田里，依然随处散落着废弃的农药瓶和农药袋。

链接:

http://www.farmer.com.cn/jjpd/nz/nzdt/201807/t20180720_1392762.htm

8．在产业振兴时代画卷上着墨添彩——广西贵港市推进农业转型升级纪实

【中华人民共和国农业农村部】5年前的一次土壤调查，让贵港大地中沉睡已久的硒资源一夜苏醒，所产富硒大米身价倍增，产销两旺。2015年以来，得益于技术创新，贵港的绿色养猪业风生水起，粪污的科学利用创造了高于养猪本身的利润。近两年，荷、藕产业与山水景观联姻，特色农业嫁接风景名胜，贵港农旅的招牌在广西区内外越擦越亮。“贵港有着得天独厚的农业资源优势、交通区位优势和自然景观优势，关键是将这些优势资源整合利用，转化为产业优势和富民优势。”贵港市市长农融说，打好富硒、科技、生态等特色牌，促进农业绿色高质量发展，是贵港市推动乡村产业振兴的关键所在。近日，记者走入荷城贵港，穿水稻田、访养殖场、观荷塘景，感受贵港紧紧围绕农业高质量发展，推进富硒产业、生态养殖和农旅融合的生动实践。以硒为纲，浔郁处处闻稻香。瞄准打造“中国农业富硒之都”标靶久久为功，政府与市场两只手协同发力，上下联动、内建标准、外拓市场，打出富硒产业特色“组合拳”，在差异化中提升农业竞争力，快速释放农业高质量发展“硒”红利。贵港之贵在于：这里是发展农业的天堂，在广西这个“八山一水一分田”的省份，贵港市坐拥浔郁平原，独占水土丰腴的“一分田”；这里的特色

优质农产品众多，北回归线穿境而过，光热资源丰富，无需温室即可实现农产品全年生产，历来是广西“鱼米之乡”；这里有承东启西、通江达海的内陆大港，作为广阔市场的交汇之处，贵港直达粤港澳，畅行大西南，联通东南亚。

链接:

http://www.moa.gov.cn/xw/qg/201807/t20180711_6153937.htm

9．英德：农旅结合成趋势 产业融合助发展

【中华人民共和国农业农村部】乡村从种养拓展到旅游，企业与村民实现合作共赢。最近，清远市英德市浛洸镇安美生态园营销总监叶发南比往日更为忙碌了，园区中的卡丁车、民宿、灯光节等旅游项目正加快建设。叶发南计划在七月中旬让新的游玩项目上线，积极迎接暑假这一“黄金期”。生态园是浛洸镇党委、政府与广州白云区同和街道办共同引进的项目，集种植、休闲、旅游于一身，既是旅游景点，又是扶贫项目。自生态园今年初开园以来，已吸引上万名游客前来游玩，15名贫困户长期入园务工。安美生态园只是英德市发展休闲农业和乡村旅游的一个缩影，近年来，英德已有不少农业龙头企业试图发展休闲旅游，以满足城市人对田园体验的追求。在农业供给侧结构性改革的大背景下，农旅融合是农业农村发展大势所趋，也是城市消费需求的热点，探索一二三产业融合发展显然是现代农业升级的必然之举。近年来，英德市委、市政府以农村综合改革为契机，以农业产业化为抓手，大力发展休闲农业，全面拓展农业的休闲、体验、文化传承等功能，通过农村一二三产业融合发展，积极探索农旅结合、以农兴旅、以旅富农的现代农业发展之路。

链接:

http://www.moa.gov.cn/xw/qg/201807/t20180713_6154071.htm

【统计数据】

1．全球主要农业国家土地利用统计数据

发布源：FAOSTAT

发布时间：2017-11-29

摘要：根据 FAOSTAT 提供的统计数据，拣选了全球主要农业国家（美国、澳大利亚、加拿大、英国、法国、德国、日本、韩国、巴西、阿根廷、中国等）的土地利用面积，包括国土面积、土地面积、农业面积和耕地面积。数据为 FAOSTAT 于 2017-11-29 最终更新的数值，数据截止年份为2015年，2016年数据 FAOSTAT 可能会在2018年底上传，数据的单位为1000ha，即1000万平方米（10平方公里），使用时需要不同单位的请注意换算。（见附件）

链接:

http://agri.ckcest.cn/ass/fce0106f-76e1-4ea1-8579-f578c3c083f1.docx

【科技图书】

1. Sustainable Agriculture and Food Security

发布源：Biotechnology for Sustainable Agriculture Emerging Approaches and Strategies

发布时间：2018-02-20

摘要：Agriculture is both a cause and solution to environmental problems. Agriculture is linked to biodiversity loss and climate change. However, sustainable agriculture also has the unique potential to mitigate climate change and strengthen resilience to the impacts of climate change. Food security is monitored in near-real time by different organizations and initiatives at the international, national, and regional scale. These platforms work by creating the infrastructure for distinct groups of stakeholders to come together and work hand-in-hand to solve the economic, social, and environmental challenges that affect them all. Vision for sustainable food and agriculture is therefore important for the world in which food is nutritious and accessible for everyone and natural resources are managed in a way that maintain ecosystem functions to support current as well as future human needs. The present chapter illustrates effect of climate change and insecurity in agriculture in the view of food security.

链接:

https://www.sciencedirect.com/science/article/pii/B9780128121603000039

【文献速递】

1. Regionalization of water environmental carrying capacity for supporting the sustainable water resources management and development in China

作者：Zimu Jia; Yanpeng Cai; Yan Chen; Weihua Zeng

文献源：Resources, Conservation & Recycling,2018

摘要：With the rapid economic growth and social development in China, conflicts over water resources between human and nature are continuously increasing which is attracting the attention of researchers. At the same time, discharge of water pollutants and exploitation of water resources pose a daunting challenge to the sustainable development of economy and society. China consists of 34 provincial administrative regions having similar or different characteristics in the levels of economic development, water resource endowment, water environmental capacity and water environmental pressure. Among these, it is meaningful to analyze spatial similarities and variations in water environmental carrying capacity (WECC), which contributes to carrying out different and scientific strategies for the management of water environment and for sustainable economic and social development in China. An index system is established to quantify WECC from the

perspectives of carrying capacity, environmental pressure, vulnerability of water environment and exploitation and utilization potential. The k-means clustering method is applied to conduct the similarity combination based on the quantification of 4 integrated indicators using catastrophe progression method. The silhouette coefficient is introduced to measure the quality of clustering and to determine the optimal clustering number. The obtained results indicate that carrying condition of water environment becomes more and more better and exploitation and utilization potential of WECC is decreasing gradually from the east to the west in China, and there are more overload in the north provinces and less in the south. In addition, water environmental vulnerability in the west is higher than that of central and eastern provinces in China. The optimal clustering number is 4 obtained by calculating the silhouette coefficient. Also, 31 provinces are categorized into 4 sub-areas i.e. key protected area, controlled development area, optimized development area and prioritized development area. The suggestions on the corresponding bidirectional regulation to different sub-areas are also put forward to provide a scientific reference to rational distribution of economic development, elaborate management of water environment as well as regional sustainable development in the future.

链接:

http://agri.ckcest.cn/ass/01380d53-3d86-4f49-b647-723f10b0a1bc.pdf

2．Quantification of regional and global sustainability based on combined resource criticality of land and water

作者：Prashant Goswami; Shivnarayan Nishad

文献源：Current Science,2018

摘要：The overall global food sustainability is limited by the simultaneous availability of primary resources at regional scales, although the international trade network can redistribute available (surplus) food. Assessments based on isolated resource (like water) or demand (like food) cannot provide correct estimates of sustainability. We define a novel criticality index on the basis of simultaneous regional availability of arable land and water to quantify sustainability. Analyses at regional and global scale show that while a relatively small fraction of world population is subcritical in terms of food availability, much larger fractions are becoming subcritical in terms of food production. The combined resource criticality implies stronger constraints for sustainability.

链接:

http://agri.ckcest.cn/ass/1c177d57-b02c-4f10-8a18-e674e3b3d99d.pdf

3．Rural development and environmental protection through the use of biofertilizers in agriculture: An alternative for underdeveloped countries?

作者：AlejandroBarragán-Ocaña; María del Carmendel-Valle-Rivera

文献源：Technology in Society,2018

摘要：Economic momentum of underdeveloped countries derived from the generation and application of their endogenous knowledge is an essential factor toward achieving social welfare. Thus, it is important to understand the development of science and technology within these underdeveloped countries, how the application of that development can address problems in agriculture and food needs, and how that development can offer sustainable options for growth and optimization. In addition, many small farmers in underdeveloped countries are already planting crops based on biotechnological products, which is significant in terms of how these activities influence the development of their lives, particularly with respect to the generation of policies aimed at farming areas. This paper is an exploratory study on the perceptions of peasant producers of the effects of biofertilizers on their environment and their lives. This research is based on a study of peasant producers of the State of Morelos, Mexico, who use biofertilizers produced from endogenous technological assets, i.e., that involve private actors and public research centers. The results facilitate understanding the perceptions of these peasants in addition to the challenges and opportunities that rural areas face and the connections between the involvement of business, academia and government in planning and administration with respect to the management of these innovations.

链接:

https://www.sciencedirect.com/science/article/pii/S0160791X1530066X

4．Agricultural pollution and regulation: How to subsidize agriculture?

作者：You-hua Chen; Xiao-wei Wen; Bo Wang

文献源：Journal of Cleaner Production,2018

摘要：Agricultural pollution is extremely serious in China, and agricultural output quantity subsidy makes it even worse. This paper captures the impacts of agricultural subsidy, including quantity subsidy and innovation subsidy, on agricultural pollution. Agriculture output quantity, total pollution or emission, equilibrium price, consumer and producer surplus, government budget, and social welfare are all addressed in this study. The results show that emission-reducing innovation subsidy is better than quantity subsidy because it

reduces the pollution from agriculture and profits for the agricultural firm are higher under innovation subsidy than under quantity subsidy. More importantly, output quantity and consumer surplus under innovation subsidy are also larger than those under quantity subsidy if the subsidy rate is not too high. This study finds that the importance of the environment to the consumer, marginal emission, and pollution tax will decrease output quantity, consumer and producer surplus and social welfare; however, agricultural subsidy increases them. Furthermore, this study indicates that innovation subsidy can alleviate the "food quantity safety and quality of environment" dilemma in agriculture.

链接:

http://agri.ckcest.cn/ass/31e7da31-3d23-4dda-8d77-f5b54c341ca1.pdf

5．Economic development and agriculture: Managing protected areas and safeguarding the environment

作者：Enrica Donia; Angelo Marcello Mineo; Federica Mascali

文献源：Ecological Engineering,2018

摘要：The establishment of protected areas has been one of the most important interventions to protect biodiversity from the threat of human activities and in particular from the agricultural traditional activities where they have been restricted at the expense of the economy of the territory sparking in literature a heated debate between those who argue the these hinder the socio-economic development and on the other hand are those who argue that is able to advance social welfare. On the basis of these considerations, the weight of agricultural sector of a country is highly linked to the percentage of protected areas even though the trend of the weight of agriculture in the overall economy is also due to the "natural" evolution of the characteristics of agricultural systems. Indeed, literature findings indicate that the relative weight of the agricultural sector tends to decrease due to increases in other emergent sectors like industries and services. In Italy the protected areas seems to have had a negative effects on the agricultural sector, unlike Thailand. Adopting a simple linear regression model, using the software package R, considering a 22-year period (1990—2012), the results indicated that in Italy the increase in the percentage of forest areas has occurred at the expense of significant and negative effects on the agricultural sector in terms of added value. In comparison, in Thailand there have been significantly positive effects in terms of employment, largely in relation to the weight of agriculture in its national economy. To corroborate these conclusions, a simple regression model was applied

to seven others countries where it proved equally valid but with different results for countries. Besides, it has been created a multiple regression model considering others emergent sectors of the economy. Even for this case the results are different for countries. Thus, management outcomes for the weight of agricultural sector may differ between countries, depending on both how protected areas are managed overall and from the economical features of the countries.

链接:

http://agri.ckcest.cn/ass/3b893c9a-b1ce-44d0-81a1-b4c131cda138.pdf

6. Use of botanical insecticides for sustainable agriculture: Future perspectives

作者：Estefânia V.R. Campos; Patrícia L.F. Proença; Jhones L. Oliveira

文献源：Ecological Indicators,2018

摘要：Recent decades have witnessed major growth in the use of agrochemicals worldwide, for maximizing the food production for a rapidly growing human population. However, the indiscriminate use of these substances especially the pesticides has led to the accumulation of toxic residues in food, soil, air, and water, as well as the development of resistance in pests. Moreover, pesticides affect soil enzymes, which are essential catalysts that govern soil quality. In order to meet the food security, it is necessary to produce more food, sustainably and safely, in a diminishing area of available arable land and with decreased water resources. Given this situation, there is an increased interest in the use of alternative substances to synthetic agrochemicals that present less risk to the environment and human health while increasing the food safety. Promising results have been obtained using compounds derived from aromatic plants for the control of agricultural pests. Such compounds of botanical origin can be highly effective, with multiple mechanisms of action, while at the same time having low toxicity towards nontarget organisms. However, the large-scale application of these substances for pest control is limited by their poor stability and other technological issues. In this backdrop, the present work discusses perspectives for the use of compounds of botanical origin, as well as strategies employing the encapsulation techniques that can contribute to the development of systems for use in sustainable agricultural practices.

链接:

http://agri.ckcest.cn/ass/bb0d33e3-2fb7-4596-94d2-3a46e6af6e94.pdf

7．A geogrid-based framework of agricultural zoning for planning and management of water & land resources: A case study of northwest arid region of China

作者：Jiang Yun; Zhang Qing-feng; Zhao Xi-ning

文献源：Ecological Indicators,2018

摘要：Agricultural zoning is recognized as an effective approach to utilization of agricultural water & land resources (AWLR), especially in a large-scale region. The main objective of this work is to explore a new zoning method of classifying and dividing the AWLR of a larger area such as the Northwest Arid Region of China (NWAR). In this study, models of AWLR zoning of the NWAR were constructed. Data on 13 selected indicators were gathered from its 394 administrative counties, and processed and imported into 227100 Geogrid files. Then they were analyzed through four contradistinctive zoning approaches. And zoning results were tested and validated. The Geogrid-based PCA − SOFM scheme is the most effective, concise, and applicable. Finally, the NWAR was divided into 5 AWLR zones which were delineated according to the climate and geographic features and the administrative boundaries of counties or county-level districts. This work has established a novel methodological framework for AWLR zoning of a large-scale area.

链接:

http://agri.ckcest.cn/ass/5a70bcda-7c52-4f2d-8246-a1a2d24666cd.pdf

8．中国农产品国际贸易失衡现状及发展策略

作者：王斌; 杨帆

文献源：改革与战略,2018

摘要：农产品国际贸易失衡,指农产品国际贸易出现顺差太大或逆差太大的状况。文章就中国农产品国际贸易失衡状况进行论述,分析造成中国农产品贸易失衡的原因,提出中国农产品国际贸易的发展策略:优化农产品贸易品种结构;调整农产品贸易区域格局;提升农产品质量及创新贸易形式;培育大型农业出口企业。

链接:

http://agri.ckcest.cn/ass/55c7ec81-cb78-4823-b0f3-a1bb3604824a.pdf

9．中国农产品国际贸易对农民收入的影响分析

作者：

文献源：山西师范大学学报(自然科学版),2018

摘要：选用2005年~2014年中国农产品国际贸易与农民收入的相关数据,运用灰色关联法

分析农产品国际贸易对农民收入的影响.结果表明:农产品的进口额、出口额、差额、进口量、出口量基本上是波动增加;农产品国际贸易与农民收入关联度由高到低依次是进口量、进口额、出口额、差额、出口量;农产品进出口贸易对农民收入影响的动力机制主要体现在技术传递效益、市场需求、扩大就业、技术进步和资本积累方面。

链接:

http://agri.ckcest.cn/ass/f263ad47-a8e4-4372-9c23-1f9bb82071af.pdf

10．多时段动态AHP评价方法在农业资源环境预警中的应用

作者：刘志强; 陈丽蓉

文献源：农业系统科学与综合研究,2018

摘要：运用多时段动态定量评价模型,对哈尔滨市的畜牧资源环境与畜牧发展能力进行了多时段动态评价和历史追朔,并对19个县市资源环境变化走势进行了曲线拟合和趋势预警,分析了未来畜牧资源、环境、生产与社会经济发展之间的配置能力,提出了发展畜牧业的相应对策与建议。

链接:

http://agri.ckcest.cn/ass/39614d5a-365a-46c6-9d4c-94fcc032f526.pdf