

《农业水土资源监控研究》专题快报

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中国工程科技知识中心农业分中心

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【动态资讯】

1. 康绍忠院士：贯彻落实国家节水行动方案，推动农业适水发展与绿色高效节水

【中国水利】我国以占全球6%的淡水资源、9%的耕地养活了全球21%的人口，农业灌溉功不可没。但我国水资源紧缺，年人均水资源量2100m³，仅占世界平均水平的28%；每公顷耕地水资源占有量21000m³，仅占世界平均水平的50%。另一方面，2017年我国农业用水占总用水量的62.3%，而世界发达国家农业用水比例多在50%以下；我国灌溉水有效利用系数仅为0.548，低于节水先进国家0.7~0.8的水平。缓解水资源短缺和区域灌溉用水增加导致的生态环境问题，迫切需要降低农业灌溉用水量。然而盲目减少灌溉用水量将导致农业生产能力下降，威胁国家食物安全和农产品有效供给。如何根据水资源承载力发展适水农业，大力提高农业用水效率，成为破解农业用水短缺与食物持续稳产高产矛盾的关键。

链接:

<http://www.tlmicronano.com/article/item-381.html>

2. Corn is America's Largest Crop in 2019

【USDA】Despite an unusually wet spring followed by an unusually cool June, America's corn farmers planted even more than they did last year. U.S. farmers have planted 91.7 million acres of corn in 2019, according to the National Agricultural Statistics Service (NASS). That's about 69 million football fields of corn and 3 percent more corn than last year, far more acres than the next largest crop, soybeans. USDA's Economic Research Service (ERS) publishes a monthly Feed Outlook report that analyzes supply and demand data to provide information on expected prices, production, exports, and feed uses for corn and other feed grains. The following is just some of the information available.

链接:

<https://www.usda.gov/media/blog/2019/07/29/corn-americas-largest-crop-2019>

3. 何为颠覆性农业科技？专家给出答案

【科技日报】什么是颠覆性农业科技？颠覆性农业科技是如何诞生的？颠覆性农业科技未来发展趋势如何？7月23日，在由果酒产业技术创新战略联盟和中国科学技术出版社等联合举办的颠覆性农业科技论坛上，来自农业科技界的专家学者对此进行了深入研讨。本次论坛以“普及农业知识 启发科学思维”为主题，以2019年3月正式出版的《颠覆性农业科技》一书中的62项颠覆性农业科技成果为主线，采取走进颠覆性农业科技原创地的方式，来到中国农业科学院农业环境与可持续发展研究所，邀请专家对植物数字工厂、马铃薯主食化等几项颠覆性农业科技进行了介绍和科普。

链接:

http://www.stdaily.com/cxzg80/guonei/2019-07/26/content_778779.shtml

4. 福建首个农业科技创新联盟成立

【科技日报】中国科技网·科技日报讯（刘宇峰 记者 谢开飞）7月20日，福建省农业农村厅、福建省农科院、福建农林大学三家共同发起成立福建省农业科技创新联盟。该联盟是由农业行政管理部门、农业科研机构、农业院校、农业技术推广机构、农业企业以及农民合作社、家庭农场等新型农业经营主体共同组成的非法人联盟组织，系全省首个农业科技创新联盟，由福建省农业科学院院长翁启勇担任联盟理事长。目前，首批联盟成员单位共126家，计划成立全省性产业技术创新专业联盟15个。

链接:

http://www.stdaily.com/02/fujian/2019-07/22/content_778121.shtml

5. 黄秉信：夏粮生产喜获丰收 农业结构不断优化

【经济日报-中国经济网】上半年，各地区各部门认真贯彻落实中央关于农业农村优先发展的重大决策部署，坚持稳中求进工作总基调，深入实施乡村振兴战略，积极推进农业供给侧结构性改革，认真抓好粮食生产，夏粮生产喜获丰收，农业种植结构进一步调整优化，生猪生产下降，牛羊禽稳定增长。

链接:

http://www.cqn.com.cn/cj/content/2019-07/17/content_7321200.htm

6. 人工智能正成为遥感大数据的“解译侠”

【科技日报】“基于人工智能的信息自动获取、加工与提取技术，遥感信息能够更加快速广泛地应用于不同领域。”中国资源卫星应用中心主任徐文在7月9日至10日于北京召开的全球地理信息开发者大会（WGDC 2019）上表示，人工智能与大数据技术，激发了遥感应用创新。“国产遥感卫星数据已呈现大数据特征。”徐文说。徐文介绍，1999年我国成功发射第一颗民用国产陆地观测卫星，填补了我国自主遥感卫星数据的空白。经过20年发展，国产陆地观测卫星已实现高、中、低分辨率全覆盖，最高分辨率达0.5米。与此同时，陆地观测卫星的数据分发服务急剧增长。徐文介绍，截至目前，中国资源卫星应用中心共分发遥感卫星数据3000余万景，其中分辨率优于2.5米的数据分发量为2100余万景。2007年至2018年间，中国资源卫星应用中心陆地遥感数据存档量从0.18PB增长到35PB，增长了194倍。

链接:

http://www.stdaily.com/kjrb/kjrbbm/2019-07/11/content_776740.shtml

7. 河南将新建155万亩高标准农田

【新华网】新华社郑州7月28日电（记者张浩然）记者日前从河南省发展改革委获悉，根据《国家发展改革委关于下达农业生产发展专项2019年中央预算内投资计划的通知》，河南省26个项目总投资20.26亿多元，将用于新建155万亩高标准农田。据了解，该批计划共安排河南省2019年农业生产发展项目26个，总投资202608万元，资金来源为：中央预算内投资162086万元，省财政专项23045万元、市投资7350万元、县（市、区）投资10127万元。该批计划的总体绩效目标是：在开封、濮阳、商丘、周口、驻马店5市26县（区），新建高标准农田155万亩，2020年建成后，有效改善项目区农田基础设施条件，提升耕地质量，提高农业综合生产能力。通知指出，各地发展改革部门要会同农业农村部门组织实施中央预算内投资项目的日常调度、在线监测和检查督促。国家发展改革委将会同农业农村部重点检查投资计划执行进度和效果、项目管理、资金使用、施工进度、工程质量等。对于执行不力的投资计划和管理不善的项目，将按照有关规定，对有关单位和相关责任人员实施处罚。

链接:

http://www.cqn.com.cn/cj/content/2019-07/28/content_7360352.htm

8. 青海省农垦国有土地确权成果数据汇交工作顺利完成

【农业网】近日，省农业农村厅在西宁市举办了青海省农垦国有土地使用权确权登记发证成果建库上图实操培训班，同步完成我省农垦国有土地确权成果数据汇交工作。各相关属地县市农业农村主管部门及相关技术公司人员、农垦各集团公司负责农垦国有土地

确权人员，各国有农牧场填报人员共50余人参加了培训。省农业农村厅乡村产业发展处（农垦局）王晓英副处长出席开班式。她指出，做好农垦国有土地使用权确权登记成果入库上图工作，是贯彻落实中央农垦改革发展文件精神 and 巩固完善农垦改革“两个三年”任务的重要内容，是管好用好保护好农垦国有土地的基础保障，是实现对农垦经济发展进行全面监管的重要基础，农垦农牧场和各级农业农村主管部门要坚定政治站位，提高认识，高质量完成好入库上图和成果数据汇交工作。培训期间，中国农垦经济发展中心鲁翔宇老师就建库上图工作提出了总体要求，就主要数据指标来源及含义、成果报送工作任务分解方法、excel模板填写要求、权证扫描件处理方法等内容作了详细讲解，并就超图软件进行了现场示范操作，指导参训人员完成成果数据excel模板填报、权证扫描件处理、检查及错误修改等，全面完成了我省农垦国有土地确权成果数据汇交工作任务。

链接:

<http://www.agronet.com.cn/News/1304407.html>

9. 我国水土流失面积持续减少

【自然资源部网站】6月28日，记者从2018年全国水土流失动态监测新闻发布会上获悉，根据1985年、1999年、2011年、2018年4次监测结果，我国水土流失面积持续减少。2018年全国水土流失面积273.69万平方公里，占全国国土面积（不含港澳台）的28.6%。与2011年相比，水土流失面积减少了21.23万平方公里，相当于一个湖南省的面积，减幅为7.2%。据水利部相关负责人介绍，2018年，水利部采用卫星遥感技术结合野外现场调查，组织开展了全国水土流失年度动态监测工作，首次实现了国土面积全覆盖，全面掌握了全国、各省级以及国家关注重点区域的水土流失面积和强度变化状况。从水土流失类型来看，水土流失主要分为水力侵蚀和风力侵蚀两种，其中水力侵蚀面积115.09万平方公里，占水土流失总面积的42%，占国土面积的12%；风力侵蚀面积158.60万平方公里，占水土流失总面积的58%，占国土面积的16.6%。

链接:

http://www.cqn.com.cn/pp/content/2019-07/02/content_7272293.htm

【文献速递】

1. Following temporal patterns assessment in rainfed agricultural areas based on NDVI time series autocorrelation values

文献源：International Journal of Applied Earth Observation and Geoinformation, 2019

摘要：Following is a common practice in Mediterranean areas where water scarcity

becomes a limiting factor, affecting soil productivity, crop yield and biodiversity. In mainland Spain, fallow lands expand across three million hectares every year, constituting around 30% of rainfed arable lands and 6% of the national surface. There is a need of monitoring fallow lands to better map land use intensity and therefore achieve a sustainable expansion and intensification of agriculture. However, most of current land use classification systems do not include lands under fallowing practices as a specific class. In this research, a new and highly operative methodology based on NDVI time series autocorrelation values to assess fallowing temporal patterns across rainfed agricultural areas is proposed. This approach was tested in mainland Spain, using the autocorrelation function of MODIS NDVI time series from 2001 to 2012 at 250 m spatial resolution. The field observational database from the Spanish Ministry of Agriculture, Fisheries and Food was used for validation purposes. The dataset used includes 338 pixels with annual information about the cultivated and fallowed surface within the entire study period. It was demonstrated that specific autocorrelation values at lags corresponding to one, two, and three years contained relevant information to identify lands under fallowing practices and assess their temporal pattern. Integrating autocorrelation variables in a random forest model made it possible to improve the assessment. The classification results were in agreement with the field dataset with an overall accuracy higher than 80%. Results revealed that approximately half of rainfed agricultural areas were regularly cultivated and distributed mainly in the northwestern Spain. The other half mainly located across northeast, center and south of Spain, showed crop-fallow rotation patterns. This methodology is a promising technique to map land management intensity using the entire time series in a highly operative manner. It is expected that in the near future the availability of remote sensing time series with better spatial resolution will make it possible to improve the assessment of agricultural intensification.

链接:

<http://agri.ckcest.cn/file1/M00/06/8E/Csgk0F1FkO-ABVIDAIVc1Hi8ihs084.pdf>

2 .Optimization of pollutant reduction system for controlling agricultural non-point-source pollution based on grey relational analysis combined with analytic hierarchy process

文献源 : Journal of Environmental Management,2019

摘要 : Many technologies have been developed to control agricultural non-point-source pollution (ANPSP). However, most reduce pollution from only a single source instead of

considering an entire region with multiple pollution sources as a control unit. A pollutant reduction system for controlling ANPSP at a regional scale could be built by integrating technologies and the reuse of treated wastewater (TWR) and nutrients (NR) to protect the environment and achieve agricultural sustainability. The present study proposes four systematic schemes involving TWR for irrigation and NR in a region with three sources of ANPSP (crop farming, livestock and aquaculture). Subsequently, a multi-objective evaluation model is established based on the analytical hierarchy process (AHP) combined with grey relational analysis (GRA) to identify the optimal scheme considering six indices, namely, pollutant reductions (total nitrogen, TN; total phosphorous, TP; ammonium-nitrogen, $\text{NH}_4^+\text{-N}$; and chemical oxygen demand, COD) and costs (construction and operational costs). The Taihu Lake Basin suffers from some of the worst ANPSP in China, and a case study was conducted in a town with three ANPSP sources. Four systems were developed on the basis of suggested technologies and the scenarios of TWR and NR (Scenario I: no reuse, Scenario II: reuse of all livestock wastewater and manure, Scenario III: reuse of some aquaculture wastewater, and Scenario IV: reuse of all livestock wastewater and manure and some aquaculture wastewater). Pollutant reductions were calculated based on removal efficiency and pollutant loads, which were estimated from the local pollutant export coefficients and agricultural information (crop farming, livestock, and aquaculture). The costs were determined on the basis of the total pollutant reductions and unit cost. The results showed that the optimal system was the Scenario IV because it had the highest grey correlation degree among the four proposed systems. The optimal system met the irrigation water demand in Xinjian. In the optimal system, the removal efficiencies of the pollutants TN, TP, $\text{NH}_4^+\text{-N}$, and COD were 84.3%, 94.2%, 89.6% and 94.0%, respectively. In addition, the implementation of NR in the optimal system reduced the use of chemical fertilizers by nearly $81.7 \text{ kg N ha}^{-1}$ and $39.9 \text{ kg P ha}^{-1}$. The proposed methods provide a reference for the construction of a pollutant reduction system for controlling ANPSP in a multi-source region.

链接:

<http://agri.ckcest.cn/file1/M00/06/8E/Csgk0F1FkseALeyKACBgVCEPztk343.pdf>

3 . Water quality monitoring method based on feedback self correcting dense connected convolution network

文献源 : Neurocomputing,2019

摘要 : This paper presents a method of water quality monitoring using a Feedback self

correcting system combined with a Densely Connected Convolution Network. We find an effective method to correct the model output and innovate the method of biological water quality monitoring. Fish movement trajectory is a comprehensive expression of various water quality classification characteristics used in all the literature, and it is an important basis for classification of biological water quality. In this paper, we use the image segmentation method of Mask-RCNN to obtain the centroid coordinates of the fish and draw the trajectory image of the fish in a certain period of time. The trajectory image data sets are divided into normal and abnormal water quality. Densely connected convolution network(DenseNet) is used to classify the quality of water. The experiment is based on normal and abnormal water quality image data, and the model correction system with deviation feedback can be designed by the output of softmax. The learning ability of the classification model in practical application is greatly improved and enhance the stability of the detection system. The experimental results show that the water quality identification rate of the model reaches 99.38%, which is far higher than that of all previous water quality classification models.

链接:

<http://agri.ckcest.cn/file1/M00/06/8E/Csgk0F1FkcGAN-kGAEHnNkvJW94534.pdf>

4 . Effects of the Chinese arable land fallow system and land-use change on agricultural production and on the economy

文献源 : Economic Modelling,2019

摘要 : This study focuses on economic effects of arable land fallow system and land-use change in China using a dynamic single-country, multi-regional computable general equilibrium model. Land supply is adjusted endogenously in our model. Land use in each of 31 provinces is tracked by a land-use change module, which is calibrated with satellite data. Our results reveal that the expansion of real output can be attributed to the increase in capital stock as a result of the growth of investment due to the imposition of the arable land fallow system in China. And the growth of investment is caused by the release of labor from agriculture. The reduced supply of arable land in agricultural land contraction regions is partially offset by the increasing arable land in agricultural land expansion regions. Rural households benefit more than urban households from the arable land fallow policy due to relatively higher income and lower rural CPI.

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FkHqAXjN6AA9qTy75fWw072.pdf>

5 . “一带一路”沿线国家水资源禀赋及开发利用分析

文献源：自然资源学报,2019

摘要：水资源是基础性的战略资源,开展“一带一路”沿线国家水资源研究对于促进“一带一路”的科学建设具有重要意义。基于世界银行与联合国粮农组织水资源数据库,从水资源开发利用角度入手,分析“一带一路”沿线国家水资源自然禀赋、利用状况,在此基础上进一步分析水资源开发潜力。结果表明：(1)从水资源禀赋来看,“一带一路”沿线国家地表水、地下水和水资源总量均以俄罗斯、中国、东南亚和南亚地区相对较高,中亚、西亚等地区相对较低;人均水资源量则以中东欧、俄罗斯和东南亚地区较高,西亚、南亚地区较低;“一带一路”沿线国家外来水依赖率整体表现为跨境河流下游高,上游及海岛国家低。(2)就水资源利用而言,“一带一路”沿线国家用水量整体呈现“东多西少”的格局,人均用水量表现为“中亚最高,周边较低”的特点;用水结构亚洲国家多以农业用水为主,中东欧国家则多以工业用水为主。(3)水资源开发潜力分析发现,阿拉伯半岛地区各国水资源开发潜力很低,中东欧及东南亚地区水资源开发潜力很高。

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1Fb72AMhr0AEAYCIOR9o432.pdf>

6 . Integrated analysis of urbanization-triggered land use change trajectory and implications for ecological land management: A case study in Fuyang, China

文献源：Science of The Total Environment,2019

摘要：Land use change under rapid urbanization can drastically change terrestrial ecological conditions. This study presents an integrated analysis of land use dynamics and the resultant ecological impacts on sustainable development over the past 25 years (1990-2015) in response to urban development. Remote sensing and geographic information system techniques were employed to examine the spatiotemporal trajectory of land use changes. Based on the analysis of the equivalent factor table for land use types and ecosystem services value (ESV), the value of ecosystem services was calculated in the case study of Fuyang, China. Correlations were identified between ESV and a family of landscape fragmentation metrics. The results showed that the area affected by land use changes represented 33.35% of the total study area and caused a 31.74 million US\$·a⁻¹ decrease in ESV from 1990 to 2015. The ESV was spatially imbalanced and generally low in urban areas. Ecological plans for cropland reforestation and urban green projects were effective in

slowing ESV losses while urban areas rapidly developed. In addition, total ESV was negatively correlated with edge density (ED), patch density (PD), landscape shape index (LSI), and Shannon's diversity index (SHDI) but positively correlated with aggregation index (AI), suggesting that landscape fragmentation had an adverse impact on the overall ESV in Fuyang. Therefore, sustainable land use planning must be integrated with landscape patterns to provide useful guidance regarding the spatial regulation of a given area to protect and improve ecosystem services.

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FeCqALz4WADge9MxXINU884.pdf>

7 . Land use change in an agricultural landscape causing degradation of soil based ecosystem services

文献源 : Science of The Total Environment,2019

摘要 : Landscape structure and ecosystem service (ES) provision in Central Europe have changed fundamentally and some ES have been irreversibly degraded over the last 250 years. The land use change analysis of a typical agricultural landscape near Leipzig (Germany) uses digitized historical GIS-data, serial cadastral maps and documents in time steps 1750, 1850, 1950 and 2005. Arable land area increased from 73.4% (1750) to 87.2% (2005) and grassland decreased from 22.1% to 4.2%. ES provision change analysis has resulted e.g. in a significant increase of winter wheat production comparing the decades 1990-1999 to 2000-2009. However, natural soil production capacity has degraded based on the interpretation of historical soil assessment maps (1864, 1937) and the actual erosion risk hazard has increased strongly in the same period. Caused by the Prussian agricultural revolution between 1750 and 1850 a high biodiversity level is found, followed by a slight decrease during the industrialization in the second half of the 19th century. By industrialized production and collectivization since 1960 devastation of vegetation structures has brought habitat degradation and a dramatic biodiversity loss. Driving forces analysis shows that significant drivers of land use and ES changes since 1750 are socioeconomic, political and technical drivers. It clarifies the impact of landscape changes by Prussian agrarian reforms, industrialization, technical and land management innovations, Kolkhoz system and Common Agricultural Policy on ES degradation based on the indicators crop production, natural soil production capacity, soil degradation caused by erosion hazards and biodiversity.

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FeT-AMzljACetrD-0bu8001.pdf>

8 . 中国粮食自给率研究——粮食、谷物和口粮自给率分析

文献源：自然资源学报,2019

摘要：青藏高原是中国粮食短缺地区之一，提高其粮食自给能力和确保粮食安全一直受到中央和地方政府的高度重视。在修订牧业区和半农半牧地区人均粮食消费需求量的基础上，利用1985-2015年青藏高原县级行政单元粮食产量和消费数据，采用波动系数法、分级法、重心模型以及粮食短缺指数模型，分析青藏高原粮食生产和消费的时空变化特征，并评估114个县市的粮食安全风险状况。结果表明：青藏高原粮食生产与消费空间分布不均衡，粮食生产呈环形分布在青藏高原东部湟黄谷地、藏东和藏南沿江河谷地带，中部和西部粮食产量较低，粮食消费呈东高西低格局；本地粮食生产不能满足居民消费需求，区域粮食缺口量达21.04万~121.69万t，相当于粮食消费需求的8.22%~40.11%，考虑旅游人口的影响，2015年区域粮食缺口达132.92万t；青藏高原粮食安全风险较高的地区广泛分布在藏北高原、青南高原、祁连山地以及城市化水平较高的拉萨市辖区和西宁市辖区，旅游业发展对林芝市的粮食安全风险影响显著；单纯依靠粮食增产不能解决区域粮食问题，建立完善的粮食储备和交通物流体系、加强与内地及周边国家的粮食贸易合作，是保障青藏高原粮食安全的关键。

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FbyWAeC8bABkxWawdHE368.pdf>

【研究报告】

1 . The Global Innovation Index (GII) 2019

发布源：The Global Innovation Index

发布时间：2019-07-24

摘要：The GI is a source of insight into the multidimensional facets of innovation-driven growth. Providing 80 detailed metrics for 129 economies in 2019, the GI has become one of the leading references for measuring an economy's innovation performance. Moving into its 12th edition this year, the GI has evolved into a valuable benchmarking tool that can facilitate public-private dialogue and where policy-makers, business leaders, and other stakeholders can evaluate innovation progress on an annual basis. Each year the GI presents a thematic component that tracks global innovation. In this year's edition, it analyzes the medical innovation landscape of the next decade, looking at how technological and non-technological medical innovation will transform the delivery of healthcare

worldwide. It also explores the role and dynamics of medical innovation as it shapes the future of healthcare, and the potential influence this may have on economic growth.

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FdZGAXWpLAQvoGtozZmE541.pdf>

2. 《地下水动态月报》2019年6期

发布源：水利部

发布时间：2019-07-12

摘要：本月报根据分布在全国主要平原区 2721 个地下水监测站获取的 2019 年 6 月 1 日监测信息编制。涉及 19 个省（自治区、直辖市），其中松辽平原 546 站，黄淮海平原 1467 站，山西及西北地区盆地和平原 699 站，江汉平原 9 站。监测的平原区面积合计约 71 万 km²。

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FYrWAZtzHADM1X8CEBoo330.pdf>

3. 2018年中国水资源公报

发布源：水利部

发布时间：2019-07-12

摘要：近日，水利部发布了2018年度《中国水资源公报》，2018年水资源总量与多年平均值基本持平，全国用水总量比2017年略有减少，用水效率进一步提升，供用水结构不断优化。2018年，全国水资源总量27462.5亿m³，与多年平均值基本持平。其中，地表水资源量26323.2亿m³，地下水资源量8246.5亿m³，地下水与地表水资源不重复量为1139.3亿m³。2018年，全国用水总量6015.5亿m³，较2017年减少27.9亿m³。其中，生活用水859.9亿m³，占用水总量的14.3%；工业用水1261.6亿m³，占用水总量的21.0%；农业用水3693.1亿m³，占用水总量的61.4%；人工生态环境补水200.9亿m³，占用水总量的3.3%。地表水源供水4952.7亿m³，占供水总量的82.3%；地下水源供水976.4亿m³，占供水总量的16.2%；其他水源供水86.4亿m³，占供水总量的1.5%。全国人均综合用水量432m³，万元国内生产总值（当年价）用水量66.8m³。耕地实际灌溉亩均用水量365m³，农田灌溉水有效利用系数0.554，万元工业增加值（当年价）用水量41.3m³，城镇人均生活用水量（含公共用水）225L/d，农村居民人均生活用水量89L/d。按可比价计算，万元国内生产总值用水量和万元工业增加值用水量分别比2017年下降6.6%和6.9%。

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FYhqAlZnEAAhSt0sHE0Q105.pdf>

4 . Global Agriculture Genomics Market Insights, Forecast To 2025

发布源：AGreport

发布时间：2019-03-12

摘要：Agriculture genomics is the application of genomics in agriculture to improve the productivity and sustainability in crop and livestock production. With the combination of traditional and high through put sequencing platforms, there has been a tremendous increase in genomic resources available, including expressed sequence tags (ESTs), BAC end sequence, genetic sequence polymorphisms, gene expression profiling, whole-genome (re)sequencing, and genome-wide association studies. Given the emergence of genomic sequencing and expansion of bioinformatic tools, we are shifting from single gene study to whole-genome analysis, which offers a broader view of how all genes work together. The global Agriculture Genomics market is valued at xx million US\$ in 2018 and will reach xx million US\$ by the end of 2025, growing at a CAGR of xx% during 2019-2025. The objectives of this study are to define, segment, and project the size of the Agriculture Genomics market based on company, product type, end user and key regions.

链接:

<http://agri.ckcest.cn/file1/M00/06/8D/Csgk0F1FbkWAKakQAACoGYH6mGM820.pdf>

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