中国工程科技知识中心
China Knowledge Centre for Engineering Sciences and Technology

《农业水土资源监控研究》专题快报

2020年第13期（总第26期）

中国工程科技知识中心农业分中心

中国农业科学院农业信息研究所　　2020年7月5日

【政策法规】

1．河北省大数据产业创新发展提升行动计划（2020-2022年）

发布源：河北省工业和信息化厅

发布时间：2020-07-03

摘要：大数据产业是战略性新兴产业，具有高渗透性和高融合性特点，对提升政府治理能力、优化民生公共服务、促进经济转型和创新发展具有重大意义。为贯彻国家大数据发展战略，落实《河北省数字经济发展规划（2020-2025年）》，加快我省大数据产业创新发展，打造数字经济新优势，制定本行动计划。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B4dKASnd5AAlyGz71Xfo105.pdf

【动态资讯】

1．区块链加持 农业产业到处“神仙打架”

【数字农业观察】10年之前，我们很难将生物识别、人工智能、区块链等前沿科技和传统农业联合起来，但如今，在社会各界的共同努力下，农业互联网的概念正逐步地应用到农业产业的各个环节中。并且，包含农业在内的传统行业响应和应用新技术的周期明显缩短。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B4j2AZlVOAA9c5G9fjzw096.pdf

2．BASF Digital Farming to launch AI-based digital crop optimization platform with Zen-noh in Japan

【BASF Agriculture】BASF Digital Farming GmbH, a wholly owned subsidiary of BASF, has

agreed with Zen-noh to start a new collaboration for xarvio® FIELD MANAGER, an AI-based digital crop optimization platform, to be launched in Japan in April 2021. xarvio FIELD MANAGER offers field- and field-zone-specific real-time information and recommendations, which will support farmers to make better-informed field management decisions. Farmers will see a simulation of growth stages of crops and risk of diseases and weeds that are derived from robust data backbones such as weather data and satellite data and get notifications about “recommended tasks”. The AI-based digital platform will be available on PCs, tablets, and smartphones.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B3wKASfNxABMzjfBkpjs076.pdf

3．Time to go for innovative technology to improve Indian farming

【Rural Marketing】Farming is one of the ancient works human beings have undertaken and continue till date. However, with time, some processes followed have become dated and a need to replace them with better and innovative ideas arises. Much of it took place to increase production so that the demand can be fulfilled.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B4SaAX8bnABAdxehNayQ247.pdf

4．阿里数字农业广西产地仓亮相 今年在全国建五大农产品集运枢纽

【中国农网】6月30日，阿里巴巴宣布位于广西、云南的数字农业集运加工中心（以下简称：产地仓）已全面运转。今年之内，阿里巴巴数字农业还将在四川、陕西、山东建设三个产地仓，形成全国农产品五大集运枢纽，并在多个省会城市打造20余个销地仓。一个“产地仓+销地仓”模式的数字化农产品流通网络将初步成形，一年可支撑100万吨生鲜农产品新鲜送往全国餐桌。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B3WWAPJHnAAnMZjv7Sbo863.pdf

5．FMC Corporation Collaborates with Cyclica to Improve Research Efficiency Using Artificial Intelligence

【FMC News Release】FMC Corporation (NYSE: FMC) has entered into a collaboration with Cyclica Inc, a leading biotechnology company specializing in artificial intelligence (AI) and computational biophysics, to accelerate and improve the efficiency of discovering new crop

protection chemistry. This is among the first of several new technology collaborations and approaches that FMC is pursuing to expand its research of novel active ingredients that protect crops from diseases and destructive pests.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B4KCAf3uyAArpGF1Kk5Q278.pdf

6．India first nation to control locusts through drones: Agriculture Ministry

【Hindustantimes】The Union Ministry of Agriculture on Saturday said that India is the first country to control locusts by using drones. “India is the first country to control locust by using drones after finalising the protocols and getting all statutory approvals. Major operations are concentrated in Rajasthan where maximum resources are committed,” the Agriculture Ministry said in a release.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B35eAJ127ACwEgiO1-LU851.pdf

7．《中国农业生产风险区划地图册》发布

【中国农网】日前，在中国农业科学院农业信息研究所主办的第十期中国农业保险论坛（CAIF）上，《中国农业生产风险区划地图册》（简称《地图册》）发布。这是我国第一部全面反映各省市县主要农作物生产风险空间差异的大型图册。《地图册》编制依据的数据主要来源于国家统计局农业统计数据、农业农村部中国县级农业农村经济统计数据、银保监会农业保险业务数据、典型农户调查数据和一些典型案例研究数据。评估技术采用了国际上通用的基于风险损失评估方法。地图制作方面，风险等级划分采用了分位数分级法，并针对每一种农作物采用了国际上通行的配色标准。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B3cmAew68AAfpP3RV36Q766.pdf

8．农业农村部与阿里巴巴战略合作 共同推进乡村治理、农民合作社、农业社会化服务高质量发展

【中国农网】近日，农业农村部农村合作经济指导司与阿里巴巴集团签署战略合作协议，共同推进数字化在提高乡村治理水平、壮大农民合作社队伍、提升农业社会化服务能力方面的应用与发展，助力乡村振兴战略深入实施。根据战略合作协议，双方将围绕电子商务平台对接、普惠金融服务创新和数字化乡村治理等领域开展合作，重点推进数字农业、乡村治理平台和县域金融服务等项目建设，共同推进乡村治理、农民合作社和农业

社会化服务组织的数字化应用实践。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B3M-AZ0tvAAhMU8Ez0hI715.pdf

9．风“云”际会 共话智能农业创新发展——第四届世界智能大会智能农业高峰论坛在津召开

【中国农网】6月24日，由天津市农业农村委员会和国家农业信息化工程技术研究中心联合主办的“智能农业高峰论坛”在北京、天津和英国三个会场同时在线举行。该论坛将推动智能农业创新开启加速器，京津协同发展迈开新步伐。作为第四届世界智能大会重要专题活动之一，该论坛以“创新智能科技 助力乡村振兴”为主题，通过5G技术实时连线，共话智能农业创新发展之路。会上国内外智能农业领域顶尖专家、学者，以及政府有关领导共聚网络云端，就智能农业的前沿技术发展与实践等问题进行深入解析与探讨。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B3liAUInUAAiKLwYI_Fk691.pdf

【文献速递】

1．Mitigation of emerging implications of climate change on food production systems

文献源：Food Research International,2020-08-05

摘要：Crops, livestock and seafood are major contributors to global economy. Agriculture and fisheries are especially dependent on climate. Thus, elevated temperatures and carbon dioxide levels can have large impacts on appropriate nutrient levels, soil moisture, water availability and various other critical performance conditions. Changes in drought and flood frequency and severity can pose severe challenges to farmers and threaten food safety. In addition, increasingly warmer water temperatures are likely to shift the habitat ranges of many fish and shellfish species, ultimately disrupting ecosystems. In general, climate change will probably have negative implications for farming, animal husbandry and fishing. The effects of climate change must be taken into account as a key aspect along with other evolving factors with a potential impact on agricultural production, such as changes in agricultural practices and technology; all of them with a serious impact on food availability and price. This review is intended to provide critical and timely information on climate change and its implications in the food production/consumption system, paying special attention to the available mitigation strategies.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B5a2AJHROAAV_FknMxM4175.pdf

2 .Agroview: Cloud-based application to process, analyze and visualize UAV-collected data for precision agriculture applications utilizing artificial intelligence

文献源：Computers and Electronics in Agriculture,2020-07-05

摘要：Traditional sensing technologies in specialty crops production, for pest and disease detection and field phenotyping, rely on manual sampling and are time consuming and labor intensive. Since availability of personnel trained for field scouting is a major problem, small Unmanned Aerial Vehicles (UAVs) equipped with various sensors can simplify the surveying procedure, decrease data collection time, and reduce cost. To accurate and rapidly process, analyze and visualize data collected from UAVs and other platforms (e.g. small airplanes, satellites, ground platforms), a cloud and artificial intelligence (AI) based application (named Agroview) was developed. This interactive and user-friendly application can: (i) detect, count and geo-locate plants and plant gaps (locations with dead or no plants); (ii) measure plant height and canopy size (plant inventory); (iii) develop plant health (or stress) maps. In this study, the use of this Agroview application to evaluate phenotypic characteristics of citrus trees (as a case study) is presented. It was found, that this emerging technology detected citrus trees with mean absolute percentage error (MAPE) of 2.3% in a commercial citrus orchard with 175,977 trees (1,871 acres; 39 normal and high-density spacing blocks). Furthermore, it accurately estimated tree height with 4.5% and 12.93% MAPE for normal and high-density spacing respectively, and canopy size with MAPE of 12.9% and 34.6% for normal and high-density spacing respectively. It provides a consistent, more direct, cost-effective and rapid method for field survey and plant phenotyping.

链接:

https://doi.org/10.1016/j.compag.2020.105457

3．河南省秋季作物空间分布“一张图”遥感制作

文献源：农业大数据学报,2020-03-26

摘要：作物空间分布“一张图”是我国农情遥感监测业务的重要工作，监测结果可为农业生产定量化、科学化管理提供基础数据。本研究在多年农作物种植面积遥感监测的基础上，根据河南省地形地貌特征和作物种植特点，优选不同区域的遥感数据和分类方法，采用Sentinel-2、Landsat 8-OLI、GF-6 WFV等中高分辨率遥感数据，制作了2019年河南省

玉米、花生、水稻和大豆等秋季主要作物空间分布“一张图”，并基于地面调查数据进行了监测精度分析。河南省秋季作物主要包括玉米、花生、水稻和大豆，玉米种植面积最大，花生次之，秋季作物种植结构比较复杂，主要包括玉米单作、玉米-花生-大豆混作、水稻单作等种植模式。“一张图”总体精度和Kapaa系数分别为86.13%和0.83，基本符合省级尺度作物种植面积监测业务工作要求。本研究从遥感数据源优选方案、作物分类方法、地面调查和精度评价等方面进行了深入的探讨，将小尺度作物种植结构遥感监测从技术研究层面拓展到大尺度业务应用层面，为我国大尺度作物空间分布“一张图”业务化遥感制作提供技术支撑。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B5yCAVEG9ABAxmr28gWo981.pdf

4．大数据在黑龙江省数字农业中的应用现状与展望

文献源：农业大数据学报,2020-03-26

摘要：进入21世纪,数字农业成为未来农业的发展方向,促使传统农业的生产方式由粗放型向集约化、智能化、科学化发展。目前,世界各国将推进数字化作为实现农业创新发展的重要动能,在前沿技术研发、数据开放共享、人才培养等方面进行了前瞻性部署。美国、欧洲等世界发达国家都在大力发展大数据来推动现代农业变革,使其农业发展处于领先地位;我国政府高度重视大数据在经济社会发展中的作用,自2014年以来,在国家战略部署、863计划、国家自然基金等政策和项目支持下,农业基础数据、科研数据、单品种全产业链数据以及农产品监测预警平台建设方面均取得了较大的成绩。大数据作为数字农业的核心、关键要素和驱动力,是目前国内外研究的热点。黑龙江省是全国重要的商品粮基地,粮食产量和商品率均居全国首位,对国家粮食安全起到至关重要的作用,为更好发挥国家粮食"压舱石"和现代农业基地的优势,黑龙江省积极开展大数据在数字农业运用和示范,在大数据平台建设、农业监测预警、物联网建设、电商集群等方面取得了显著成效。本文结合数字农业和大数据的内涵,总结国内外大数据在数字农业中的应用现状,分析黑龙江省大数据在数字农业中应用存在的问题,并对大数据在数字农业中的应用进行展望,为大数据的在数字农业中的应用提供参考。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B5oiAVQI2AAifGiDCinw471.pdf

5．Internet of Things (IoT) and Agricultural Unmanned Aerial Vehicles (UAVs) in smart farming: A comprehensive review

文献源：Internet of Things,2020-03-07

摘要：Internet of Things (IoT) and Unmanned Aerial Vehicles (UAVs) are two hot technologies utilized in cultivation fields, which transform traditional farming practices into a new era of precision agriculture. In this paper, we perform a survey of the last research on IoT and UAV technology applied in agriculture. We describe the main principles of IoT technology, including intelligent sensors, IoT sensor types, networks and protocols used in agriculture, as well as IoT applications and solutions in smart farming. Moreover, we present the role of UAV technology in smart agriculture, by analyzing the applications of UAVs in various scenarios, including irrigation, fertilization, use of pesticides, weed management, plant growth monitoring, crop disease management, and field-level phenotyping. Furthermore, the utilization of UAV systems in complex agricultural environments is also analyzed. Our conclusion is that IoT and UAV are two of the most important technologies that transform traditional cultivation practices into a new perspective of intelligence in precision agriculture.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B48OALSA9AB-wtRGpI64077.pdf

6．Agri-food 4.0: A survey of the supply chains and technologies for the future agriculture

文献源：Computers in Industry,2020-03-05

摘要：The term “Agri-Food 4.0” is an analogy to the term "Industry 4.0", coming from the concept “agriculture 4.0”. Since the origins of the industrial revolution, where the steam engines started the concept of Industry 1.0 and later the use of electricity upgraded the concept to Industry 2.0, the use of technologies generated a milestone in the industry revolution by addressing the Industry 3.0 concept. Hence, Industry 4.0, it is about including and integrating the latest developments based on digital technologies as well as the interoperability process across them. This allows enterprises to transmit real-time information in terms behaviour and performance. Therefore, the challenge is to maintain these complex networked structures efficiently linked and organised within the use of such technologies, especially to identify and satisfy supply chain stakeholders dynamic requirements. In this context, the agriculture domain is not an exception although it possesses some specialities depending from the domain. In fact, all agricultural machinery incorporates electronic controls and has entered to the digital age, enhancing their current performance. In addition, electronics, using sensors and drones, support the data collection of several agriculture key aspects, such as weather, geographical spatialization, animals and

crops behaviours, as well as the entire farm life cycle. However, the use of the right methods and methodologies for enhancing agriculture supply chains performance is still a challenge, thus the concept of Industry 4.0 has evolved and adapted to agriculture 4.0 in order analyse the behaviours and performance in this specific domain. Thus, the question mark on how agriculture 4.0 support a better supply chain decision-making process, or how can help to save time to farmer to make effective decision based on objective data, remains open. Therefore, in this survey, a review of more than hundred papers on new technologies and the new available supply chains methods are analysed and contrasted to understand the future paths of the Agri-Food domain.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B5SaAB9CuABw57COVZCc740.pdf

7．Internet of Things in arable farming: Implementation, applications, challenges and potential

文献源：Biosystems Engineering,2020-03-05

摘要：The Internet of Things is allowing agriculture, here specifically arable farming, to become data-driven, leading to more timely and cost-effective production and management of farms, and at the same time reducing their environmental impact. This review is addressing an analytical survey of the current and potential application of Internet of Things in arable farming, where spatial data, highly varying environments, task diversity and mobile devices pose unique challenges to be overcome compared to other agricultural systems. The review contributes an overview of the state of the art of technologies deployed. It provides an outline of the current and potential applications, and discusses the challenges and possible solutions and implementations. Lastly, it presents some future directions for the Internet of Things in arable farming. Current issues such as smart phones, intelligent management of Wireless Sensor Networks, middleware platforms, integrated Farm Management Information Systems across the supply chain, or autonomous vehicles and robotics stand out because of their potential to lead arable farming to smart arable farming. During the implementation, different challenges are encountered, and here interoperability is a key major hurdle throughout all the layers in the architecture of an Internet of Things system, which can be addressed by shared standards and protocols. Challenges such as affordability, device power consumption, network latency, Big Data analysis, data privacy and security, among others, have been identified by the articles reviewed and are discussed

in detail. Different solutions to all identified challenges are presented addressing technologies such as machine learning, middleware platforms, or intelligent data management.

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B43KAbD73ABDl-CShTzI126.pdf

【专业会议】

1．2020第九届中国安徽国际现代农业博览会

发布源：安徽农博会

发布时间：2020-09-10

摘要：智慧农业展区：无土栽培技术、农业高新技术设备、农业信息通讯服务、农业物联网智能管控技术、全智能温室控制器、相关技术及设备等。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B61OABtisAJrdVwYYCrY707.pdf

2．深圳国际物联网与智慧中国博览会

发布源：IOTE

发布时间：2020-07-29

摘要：IOTE 2020第十四届物联网展·深圳站，是一个关于物联网完整产业链，覆盖物联网感知层、网络层、运算与平台层、应用层，涉及RFID（无线射频识别）技术、传感网技术、物联网通信技术、金融消费移动支付技术、中间件的精确控制技术、大数据处理、AIoT、云计算、边缘计算、实时定位技术等物联网技术在交通、工业、智能电网、智能家居、物流、防伪、人员、车辆、资产管理、服饰、图书、智慧城市、环境监测等领域的全面解决方案和成功应用展示的高级别国际盛会。展会为中国乃至国际的物联网行业企业提供了一个涉及物联网整个行业链的厂家、供应商、经销商、应用集成商聚合、展示、交流与洽谈合作的完善平台。同时，展会也通过广泛而有影响力的宣传，邀请了大量的物联网各大应用行业的终端客户、信息化服务提供商、软件开发集成商亲临现场，实现供需双方的近距离相互了解和商务合作。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B6JiAdr9rAA182fATctw339.pdf

3．AST 2020中国设施农业、智慧农业展览会(昆明)

发布源：中国农业机械网

发布时间：2020-02-24

摘要：为提高农业生产效率，推动农业高效、精准、环保、绿色发展.2020中国设施农业、智慧农业及农用塑料展览会（简称：AST）于8月25-26日在昆明国际会展中心举行。中国设施农业、智慧农业及农用塑料展览会（简称：AST）是国家乡村振兴战略攻坚之年，原（WSIGE）西南节水灌溉及温室展览会的升级展会。自2011年创立依始，历经10年，AST致力于推广全球先进农业技术、科技、信息、产品，创新农业发展方向，将高效、精准、绿色、环保的农业生产方式分享给行业人士。为国内外农业从业者、行业主管单位搭建展览展示、品牌推广、贸易洽谈、技术交流、经验分享为一体的全产业链交流平台。“AST2020”从农村环保、育种到餐桌贯穿农业全产业链，聚焦行业热点、难点，为国内外企业和采购商提供一站式采购平台。欢迎国内外优秀企业和农业主管机构、农业商（协）会、经销商、科研院所、种植企业、媒体等组团参加。充分利用云南自由贸易实验区的政策和优势，共同打造成为国际性的农业科技、农村环保行业盛会。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B6qSAZ4_dAAOOYw8mtvM178.pdf

4．第33届撒哈拉埃及国际农业展

发布源：Informa Exhibitions

发布时间：2019-11-26

摘要：第33届撒哈拉埃及国际农业展（Sahara）将于2020年9月13至16日在埃及开罗的埃及国际展览中心（EIEC）载誉归来。展会云集来自全球各地逾600品牌，20,000名高质量专业观众，为当地及国际农业生产企业及贸易商提供建立商业网络、促进贸易合作独一无二的良机，是您开拓非洲及中东广阔的农业市场不容错过的重要平台。埃及是非洲及中东地区举足轻重的农业大国，而撒哈拉是其重要的商业中心及农业产区。撒哈拉为整个埃及农业市场提供最新的农业技术及解决方案，小到农场主，大到农业部的大宗农业贸易。

链接:

http://agri.ckcest.cn/file1/M00/00/FF/Csgk0V8B59uAKX9aAAeZNFDIaQs483.pdf

主编：赵瑞雪　　本期编辑：陈亚东
地址：北京市海淀区中关村南大街12号　　邮编：100081
电话：010-82106649　　邮件地址：agri@ckcest.cn