中国工程科技知识中心
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《农业水土资源监控研究》专题快报

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中国农业科学院农业信息研究所　　　　　　　　　　2021年11月5日

【动态资讯】

1．山东"十四五"自然资源保护和利用规划出台

【新华网】11月1日，山东省政府新闻办举行新闻发布会，介绍《山东省"十四五"自然资源保护和利用规划》相关情况。《规划》明确，山东省将以黄河流域生态保护和高质量发展国家战略为引领，打造黄河流域生态保护和高质量发展先行区；坚决遏制耕地"非农化"，确保耕地总量不减少，质量不降低。

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGA1zSANImuAApT47XgksU030.pdf

2．良田粮用　稳粮增效

【农民日报】硬化道路和灌溉水渠直通田间地头，在群山绵延起伏的山脚下，平整的农田连片成带。深秋时节，收割机在丰收的稻田忙碌起来。收割水稻后，大大小小的田块又迎来冬小麦和油菜的播种季。地处秦巴山区南麓，有"川北粮仓"之称的四川省广元市剑阁县，是全国粮食生产大县，粮食产量稳居广元市第一、四川省前列。全县耕地保有量130万亩，基本农田保护面积104万亩。近年来，为确保粮食生产，该县认真贯彻落实中央有关要求，划定粮食生产功能区和特色农产品保护区面积71万亩，其中粮食生产功能区水稻26万亩、玉米45万亩、小麦43万亩、油菜生产保护区20万亩（复种与重叠面积63万亩）。完成划定后，剑阁县持续加强"两区"建设和管理，建机制、抓落实、保质量，将高标准农田建设、绿色高质高效创建等作为实现"藏粮于地、藏粮于技"保障粮食安全的重要举措，探索丘陵山区粮食生产发展的新路子。

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAzDmAQ_tRAG5VJRntQ6w676.pdf

3．节水减排　节水增效　节水惠民

【农民日报】浙江省地处江南水乡，全省多年平均水资源总量955亿立方米，单位面积产水量列全国第4位，但人均水资源量不足1800立方米，比全国平均水平低8％左右。如何解决水资源空间分布与经济布局不匹配的痛点？浙江全面落实最严格水资源管理，高位推动"五水共治"抓节水，加速从"节水为先"向"节水优先"转变，以治水倒逼经济转型升级，探索出了一条具有浙江特色的丰水地区节水实践之路。"浙江城市和乡村的节水工作思路和理念是一样的，即节水减排、节水增效、节水惠民，实现城乡同治。"浙江省水利厅副厅长冯强说。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAzOmADke_ADkkNGSFTg0896.pdf

4．黑龙江"七级田长"保护黑土地?

【农民日报】近日，中共黑龙江省委办公厅、黑龙江省人民政府办公厅印发《黑龙江省黑土耕地保护利用"田长制"工作方案（试行）》，全面实施"田长制"，切实加强黑土耕地保护利用。《方案》以习近平新时代中国特色社会主义思想为指导，强调采取"长牙齿"的硬措施，落实最严格的耕地保护制度，坚决遏制耕地"非农化"、防止"非粮化"；明确落实黑土耕地保护利用责任到人头、到部门、到地块；要求激励发挥农民主体作用，推动形成统筹组织、属地管理、分工负责、合力推进、齐抓共管的工作机制。《方案》立足黑土耕地数量要稳、质量要提、生态要改善、管护要全覆盖的要求，明确提出了稳定黑土耕地数量、提升黑土耕地质量、改善黑土耕地生态和建立黑土耕地管护机制4项工作目标。

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAzfKAdTy6AC2BqqZB_eE113.pdf

5．玉米"藏粮于技"助力稳粮增收

【中国农业科学院】近日，由中国农业科学院作物科学研究所主办的玉米"藏粮于技"现场观摩会暨玉米高质量发展论坛在内蒙古通辽市召开。"藏粮于技"重大科研任务自启动以来，各攻关团队紧紧围绕"深化基础研究、创新关键技术、研制重大产品、创建丰产模式"总体思路，以破解玉米生产问题为导向，以提升产量和质量为目标，聚焦全产业科技创新链联合攻关。项目实施2年来，在优异基因挖掘、育种技术创新、新种质创制、重大产品研制、精准栽培与绿色防控技术研发、丰产绿色机械化模式创建等方面取得了明显进展，形成"新基因、新技术、新品种、新产品、新模式"技术储备。

【文献速递】

1．Estimating potential yield and change in water budget for wheat and maize across Huang-Huai-Hai Plain in the future

文献源：ScienceDirect,2021-11-02

摘要：Climate change impacts crop productivity as atmospheric conditions and water supply change, particularly in intensive cropping areas. This study used the validated AquaCrop Model, which was run with downscaled daily climate data produced by SDSM and CanESM2. The changes in the potential grain yield of winter wheat and summer maize and water budget during the cropping seasons were estimated for the Huang-Huai-Hai Plain (3H Plain) under RCP4.5 and RCP8.5 scenarios. The results show that the potential yield of winter wheat is increasing with similar spatial patterns in the 2030s, 2050s, and 2080s, with much of the increase is distributed in Shandong and northeastern parts of Henan. During the winter wheat growth period, the water budget deficit will likely improve from − 210 mm in the 2030s to − 202 mm in 2080s under RCP4.5 and from − 206 mm in the 2030s to − 191 mm in 2080s under RCP8.5 across the 3H Plain. The water budget during the winter wheat period will continue to be in deficit in the north 3H Plain and improvements are estimated mostly in the lower southern areas of the Plain. The summer maize potential yield is estimated to increase from the baseline period, but yields will decrease by 0.81%, 1.19%, and 2.10% in the 2030s, 2050s, and 2080s, respectively, under RCP8.5 compared to RCP4.5. During the summer maize growth period, the water budget is also estimated to improve from 109 mm in 2030s to 126 mm in 2080s under RCP4.5 and 107 mm in the 2030s to 163 mm in 2080s under RCP8.5. This increase is mainly estimated in the central and south of the 3H Plain. The estimated ETc of winter wheat shows no significant decrease, while the reduction of 6 mm and 13 mm for summer maize is observed under RCP4.5 and RCP8.5, respectively. The study provides scientific evidence to devise adaptation and mitigation climate change strategies for agricultural productivity and water resource management.

2．Regional mapping of soil organic matter content using multitemporal synthetic Landsat

8 images in Google Earth Engine

文献源：ScienceDirect,2021-10-25

摘要：Accurate assessment of the spatial distribution of soil organic matter (SOM) is of great significance for regional sustainable development, especially in fertile black soil areas. The present study proposed a regional-scale high spatial resolution (30 m) SOM mapping method based on multitemporal synthetic images. The study area is located on the Songnen Plain of Northeast China. First, all available Landsat 8 surface reflectance (SR) data during the bare soil period (April and May) from 2014 to 2019 in the study area were screened in the Google Earth Engine (GEE), and the cloud mask was constructed. The median, average, maximum, and minimum values of the image set were synthesized according to single-year multimonth, multiyear single-month and multiyear multimonth time ranges, and the spectral index of the synthesized image was constructed. Second, the bands and spectral indices of different synthetic images were used as input to establish a random forest (RF) model of SOM prediction, and the accuracies of different spatial prediction models of SOM were compared to evaluate the optimal regional remote sensing prediction model of SOM. The following results were show. 1) The use of the spectral index combined with the image band as input had a greater improvement in the accuracy of SOM prediction than the use of only the image band. 2) Compared to the average, maximum and minimum synthesized images, the median synthesized image had higher accuracy in SOM prediction. 3) More years of synthesized images provided more robust SOM prediction results. 4) May was the best time window for SOM mapping on the Songnen Plain. This study presents a large-scale and high spatial resolution SOM mapping method that is suitable for black soil areas in Northeast China and extends the application of GEE in digital soil mapping.

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAyVOADNA8AMcRlbwUbJY356.pdf

3．Evaluating the effects of agricultural inputs on the soil quality of smallholdings using improved indices

文献源：ScienceDirect ,2021-10-24

摘要：Soil quality on smallholder farms is progressively declining due to inappropriate land management and agricultural inputs. Assessing soil quality at the field scale and evaluating the contributions of agricultural inputs to soil quality is therefore important in the formulation of policies and technologies for improving the land management practices of

smallholders. The objectives of this study were to analyze the effects of smallholder agricultural inputs (fertilizer input, agrochemical input, organic fertilization and straw incorporation) on soil quality under three dominant planting patterns (wheat-maize, vegetable and cotton) in Quzhou County on the North China Plain. Six soil indicators (soil organic carbon, available zinc, fungal species richness, carbon pool activity, total chromium content and acid phosphatase activity) were identified as the minimum dataset (MDS). The SQI calculated using nonlinear weighted additive integration (SQI-NLWA) had the best discrimination under different planting patterns. The SQIs in the wheat-maize and vegetable systems were significantly higher than those in the cotton system. The overall spatial pattern of soil quality was related to the distribution of the planting patterns throughout the county. Organic fertilization, fertilizer input and straw incorporation increased the SQI, while agrochemical input decreased the SQI. Our study provides a quantitative tool for assessing soil quality at the field-scale and creatively analyzes the effects of smallholder agricultural inputs on soil quality. Our findings suggest that resource input and allocation determine soil quality and agricultural sustainability in smallholder-dominated agricultural systems.

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAyHGAEszvAClEK2K_uIU274.pdf

4．棉秆还田不同年限对土壤有机碳及其矿化特征的影响_唐鹏飞

文献源：干旱区资源与环境,2021-10-14

摘要：通过长期定位田间试验和室内培养试验,研究了棉秆还田0年（0y）、5年（5y）、10年（10y）、15年（15y）、20年（20y）对土壤有机碳含量、矿化动态和官能团的影响。结果表明:棉秆还田显著提高土壤有机碳的含量,与0y相比,棉秆还田5y、10y、15y、20y土壤有机碳含量提高了42.45%、47.88%、33.40%和63.38%。与0y相比,还田5y、10y、15y、20y土壤有机碳累积矿化量均显著降低。棉秆还田5y、10y土壤有机碳脂族性增强,结构趋于简单,而棉秆还田20y土壤有机碳芳香性增强,结构趋于复杂。总体来看,棉秆还田促进土壤有机碳积累,降低其累积矿化率,增强土壤固碳能力。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAo9iAZgdSAE7e3vSNaQ0261.pdf

5．基于人工智能算法的CYGNSS数据土壤水分反演

文献源：南京信息工程大学学报(自然科学版),2021-10-12

摘要：利用CYGNSS数据估计地表土壤水分（SM）近年来获得了极大的关注，但效率和精度有待进一步提升。本文提出了一种预分类策略，结合人工智能算法（AI），利用CYGNSS数据预测土壤水分。此策略能够在人工智能算法的基础上进一步的提高土壤水分预测的精确度，具有较好的普适性和易用性。本文使用了2018全年中国地区的实地土壤水分数据作为地面真实参考数据进行建模以及预测。结果证实预测土壤水分与参考真实数据具有良好的一致性。基于CYGNSS数据预测的土壤水分与实地土壤水参考数据比对，其相关系数高达0.8，平均均方根误差（RMSE）和平均无偏均方根误差（ubRMSE）分别为0.059 cm^3/cm^3和0.050 cm^3/cm^3。研究结果表明，预分类策略的人工智能算法可明显提高CYGNSS预测土壤水分的精确度，其简单易操作性也使其可广泛应用于其他回归和预测研究领域，具有较好的泛化性和拓展性。

链接：

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAo4uAJBhDAA7blIGI_vA729.pdf

6．长期施肥对黄土丘陵坡地农田土壤质量和谷子产量的影响_高小峰

文献源：干旱地区农业研究,2021-09-10

摘要：以坡地农田生态系统长期定位试验（1995—2019年）为基础,选取裸地（LD）、对照（CK,不施肥）、单施氮肥(N1、N2处理分别为:尿素55.2、110.4 kg·hm^{-2})、氮磷肥配施(N1P、N2P处理分别为:尿素+过磷酸钙55.2+90、110.4+90 kg·hm^{-2})6个处理,研究长期施肥对土壤质量、谷子产量的影响。结果表明:（1）与CK相比,长期单施氮肥土壤碱解氮含量提高了24.81%～39.92%;长期氮磷肥配施土壤有机碳、全磷、碱解氮和有效磷含量分别提高了7.82%～16.81%、58.18%、21.59%～22.89%、450.5%～660.3%,土壤pH值降低了0.04～0.08。（2）与CK相比,长期单施氮肥碱性磷酸酶（AP）活性提高了13.34%～19.43%;长期氮磷平衡施肥土壤的β-1,4-N-乙酰氨基葡萄糖苷酶与亮氨酸氨基肽酶（NAG+LAP）、葡萄糖苷酶（βG）活性分别显著提高了16.76%～71.01%、47.12%～59.94%。与裸地相比,长期轮作种植作物使βG、LAP+NAG、AP活性显著提高了68.74%～342.42%,N1P处理下酶化学计量比最接近1：1：1稳态。（3）与CK相比,N1P处理谷子生物量和产量增加了105.25%～230.05%。谷子产量与土壤全磷、有效磷呈极显著正相关,而与土壤pH值呈显著负相关。总之,长期施肥能显著提高黄土丘陵区坡耕地土壤质量和谷子产量,低氮磷配施（N1P）效果最好。

链接：

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGApHOAfEWeABNeQApBuik562.pdf

7．中国森林土壤有机碳活性组分及其影响因素

文献源：世界林业研究,2021-08-16

摘要：森林土壤碳库在调节全球碳循环和碳平衡、降低大气CO2浓度等方面产生重要影响。作为陆地生态系统最重要的碳库，森林土壤有机碳对于土壤物理、化学和生物特性具有良好的调节作用。为了研究森林土壤有机碳及其组分，为森林经营和土壤管理提供参考，文中从全球、全国和区域尺度上综述了森林土壤有机碳储量的研究进展，阐述了森林土壤有机碳各活性组分的定义和划分标准，并对土壤有机碳活性组分分布的重要影响因素（如土地利用、植被类型、气候和人为干扰等）进行分析，基于森林土壤有机碳储量及活性组分的研究现状与存在的问题对未来研究做出展望。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGApNOAFM98AAhD2ptKDm0390.pdf

8．长期撂荒对黑土土壤有机碳组分的影响

文献源：中国土壤与肥料,2021-08-10

摘要：为明确长期撂荒对黑土不同土层土壤有机碳及其组分的影响,以吉林公主岭黑土长期定位试验为对象,选取不施肥和撂荒2个处理,采用改良的Walkley-Black土壤有机碳分组方法,研究不同层次（0～0.2、0.2～0.4和0.4～0.6 m）土壤有机碳及其组分的变化。结果表明:（1）0～0.6 m土壤剖面中,撂荒处理下土壤有机碳储量和固存量分别提高了17.1%和10倍;其中0～0.2和0.2～0.4 m土壤有机碳储量分别提高了27.3%和33.4%,固存量分别提高了8和7倍;而在0.4～0.6 m土层,有机碳储量和固存量则分别降低了26.2%和118%。（2）整体来看,2个处理的组分储量均表现为高活性有机碳（VLC）>惰性有机碳（NLC）>中活性有机碳（LC）>低活性有机碳（LLC）;在0～0.2和0.2～0.4 m土层,撂荒能显著提高VLC、LLC、NLC的储量,而对LC没有显著影响;在0.4～0.6 m土层,撂荒显著提高VLC和NLC的储量,而对LC和LLC没有显著影响。（3）在0～0.2和0.2～0.4 m土层,撂荒处理下活性有机碳库（AC）和惰性有机碳库（PC）的碳储量分别显著提高了14.3%、26.5%和39.3%、42.7%,而在0.4～0.6 m土层,AC和PC的碳储量则分别显著降低26.5%和24.7%。同时,相较于AC,撂荒提高了PC所占比例,并且在0～0.2和0.2～0.4 m土层,PC提高的比例相对较大。（4）土壤有机碳与VLC、NLC、LC和LLC的储量呈极显著的正相关关系（P?0.01）,VLC与土壤有机碳相关性更为紧密（r=0.998）。上述结果表明:长期撂荒利于表层碳积累和稳定,而较深土层的碳固持能力会变弱;VLC对撂荒的响应较为敏感,可作为撂荒农田土壤有机碳动态的一个敏感性指标。

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGEkDuAJwFZAB5JpLdGbxk852.pdf

9．Optimizing irrigation and nitrogen management strategy to trade off yield, crop water productivity, nitrogen use efficiency and fruit quality of greenhouse grown tomato

文献源：ScienceDirect,2021-02-28

摘要：Water and nitrogen are two main factors affecting crop yield and quality, and their optimization is crucial for sustainable agriculture production. In this study, the results of a three-year (20172019) experiment were presented to reveal the effects of irrigation and nitrogen rate on yield, crop water productivity (WP), nitrogen use efficiency (Partial Factor Productivity Nitrogen, PFPn) and fruit quality. Irrigation was applied based on the cumulative evaporation (Epan) measured with a standard 20-cm pan with its amounts set as 50% (I1), 70% (I2), 90% (I3) of Epan, while the nitrogen rates were designed as 0 (N0), 150 (N1), 300 (N2) and 450 (N3) kg ha^{-1} . Averaging across nitrogen rates and years, I2 decreased tomato yield and PFPn by 4.00% and 4.07%, respectively, when compared with I3, while significantly increased WP, vitamin C (Vc), total soluble solid (TSS), soluble sugar content (SSC) and organic acids (OA) by 7.68%, 8.64%, 5.42%, 7.15% and 7.15%, respectively. Averaging across irrigation amounts and years, applying nitrogen rates more than 300 kg ha^{-1} not only failed to increase yield, but also reduced WP, Vc, SSC, sugar-acid ratio (SAR) and PFPn. Compared with N2, the yield, WP and fruit quality decreased slightly in N1, whereas the nitrogen rate decreased by 50%. Both the principal component analysis and gray relational analysis were identified as suitable models for assessing comprehensive fruit quality. The relative value of TSS had a highly positive relationship with comprehensive quality score, indicating that TSS could be used as an index representing comprehensive fruit quality. TOPSIS (technique for order preference by similarity to ideal solution) revealed that N1I2 was the optimal irrigation and nitrogen rate for greenhouse grown tomato.

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAqBSAXExvAB_kaEiW5ms992.pdf

【会议论文】

1．Relationships Between Land Degradation and Climate Change Vulnerability of Agricultural Water Resources

发布源：IEEE

发布时间：2021-10-12

摘要：According to the methodology for determining land degradation adopted by the UN for the calculation of the sustainable development goal's (SDG) indicator 15.3.1, land productivity on the basis of remote sensing data is one of the three sub -indicators. At the

same time, the process of land degradation is very complex and it has not yet been studied how it is affected by climate changes. This task is complicated by the fact that climate change has consequences in the future. However, satellite data have a long history of observations and therefore we can see, how climate indicators affect the process of land degradation in historical terms. In this paper, we used MODIS satellite data to calculate land productivity and estimated the relationship between land productivity and climate change vulnerability of agricultural water resources (CCV) obtained by SWAT model for Ukraine. Correlation and regression analysis show that the climate change vulnerability of agricultural water resources is one of the indicators of land degradation.

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGA45yAUjWCAAYJ3XDOCTI861.pdf

2．Soil Moisture Retrieval using a Time-Series Ratio Algorithm for the Nisar Mission

发布源：IEEE

发布时间：2021-10-12

摘要：The NASA ISRO Synthetic Aperture Radar (NISAR) mission is currently under development and is scheduled for launch in 2022. The NISAR mission will provide global data sets of Earth land surface dynamics that are critical for multiple Earth Science disciplines including observations of ecosystem carbon and water cycles. Global L -band radar observations at high spatial resolution will be helpful for soil moisture applications. One of the goal s of the NISAR mission is to provide a global soil moisture product at 200 m resolution with a global revisit frequency of 6 days. A time - series ratio algorithm was implemented using NISAR simulated SMAPVEX12 UAVSAR data, which is an L -band airborne radar backscatter measurement . For a NISAR -like configuration, backscatte r at incidence angles from 30 to 50 degrees was considered in this study. The initial retrieval statistics following comparisons with in -situ ground truth show correlation coefficients (R) to be about 0.81 , and the unbiased RMSE to be about 0.06 � ! / � !. Results from dual co -polarization and/or cross -polarization modes were evaluated and considered for performance improvement.

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGEj_eAFf0gAA8eegAeBeU354.pdf

3．Analyzing the Radio Frequency Interference Environment at Cal/Val Site Locations for

the Soil Moisture Active/Passive (SMAP) Mission

发布源：IEEE

发布时间：2021-10-12

摘要：The Soil Moisture Active/Passive satellite was launched in 2015 to provide global and continuous maps of land surface soil moisture and freeze -thaw using L -Band microwave radiometry. Even though the 1400 -1427 MHz frequency used by SMAP is a protected portion of the spectrum, Radio Frequency Interference (RFI) isstill observed that can corrupt the radiometer's measurements. Nine distinct algorithms are implemented as part of SMAP's level 1 processing to detect and filter out RFI contributions. However, any remaining undetected RFI are major concern especially at the locations of cal/val sit e s used for evaluating soil moisture retrieval performance. This paper presents an analysis of the RFI environment at SMAP cal/val site locations and assesses the impact of RFI on soil moisture retrievals at those locations.

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGA3PqAALafACGmX7XOT7Q349.pdf

4．Soil Moisture Estimation Over Cereal Fields Based on Sar ALOS-2 Data

发布源：IEEE

发布时间：2021-10-12

摘要：In this paper, we discuss the potential of L -band Advanced Land Observing Satellite -2 (ALOS -2) images for retrieving soil moisture over cereal fields in a semi -arid area (Merguellil -Tunisia). SAR signal sensitivity was studied as function of in -situ measurements: roughness and soil moisture. Sensitivity to soil moisture was illustrated for three classes of Normalized Difference Vegetation Index (NDVI) . Results reveal the impact of soil moisture on L - band data even in dense vegetation class (NDVI > 0.6). High correlation s characterize linear relationships between radar signal and vegetation biophysical properties (Leaf Area Index, vegetation height and Vegetation Water Content). Signal modeling over bare soils was evaluated through empirical equation, modified Dubois model (Dubois -B) and modified Integral Equation Model (IEM -B). For covered fields, Water Cloud Model (WCM) was parametrized for HH and HV polarizations (with and without soil -vegetation interactions component) coupled with the best accuracy bare soil backscattering models: IEM -B for co -polarization and empirical models for the entire dataset. WCM coupled to IEM -B illustrates the best performance to estimate soil water content in HH polarization. The integration of

soil - vegetation interaction component provides a stable accuracy of soil moisture estimation in HH polarization and improve soil moisture accuracy in HV polarization mode.

链接:

5．Sensor-Specific Adversarial Network for Transferable Land-Cover Classification

发布源：IEEE

发布时间：2021-10-12

摘要：As the multi-source high-spatial-resolution (HSR) images are being daily acquired from different sensors, it brings the challenge of transferring the recognition model from labeled images to new unlabelled images obtained from other sensors. Existing deep transfer learning methods encode the land-cover features in the same architecture, which ignores the sensor divergence. In this paper, we tackle this problem by proposing a sensor-specific adversarial network for HSR land-cover classification. Specifically, the sensor-specific normalization (SN) is designed for decoupling the sensor divergence in different normalization weights. Moreover, the transferable adversarial optimization is proposed for effectively optimizing the source-related, target-related, and discriminator weights. Considering the sensor-specific characteristics, our proposed method improves the transferability of deep learning models between airborne and spaceborne sensors. The mutual transferability experiments on a selfconstructed cross-sensor land-cover dataset demonstrate that the proposed method outperforms the state-of-the-art deep transfer learning methods.

链接:

【相关专利】

1．一种管情控制智能灌溉方法

发布源：中国专利

发布时间：2021-10-22

摘要：本发明所述管情控制智能灌溉方法,其电动阀开度控制装置接收所述管情检测传感器传来的管内流体信息后,根据预设流体信息驱动电动阀的阀芯旋转到合适的阀门开度,精准控制水带软管内的水量、压力和流速,实现精准水肥灌溉,且能避免因压力差异而致使的脱管或爆管、水锤现象、水肥浪费和水肥腐蚀管壁等问题,方便建立区块链农业

管理系统,使得全国范围内的智能农业管理成为可能。且所述管情检测传感器的传感元件通过探头保护结构伸入到水带软管内；结构简单且可靠,安装方便,在有效获取管内流体信息的基础上,保护传感元件不受撞击破坏,极大地降低了智能灌溉系统的检测成本,方便大面积的推广应用。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAovuARdkmAAqS-cw13B4780.pdf

2．基于神经网络预测的大棚灌溉系统及方法

发布源：中国专利

发布时间：2021-10-22

摘要：本发明公开了一种基于神经网络预测的大棚灌溉系统及方法,包括:若干大棚监测区,所述大棚监测区设于大棚内,所述大棚监测区内设有监测模块,所述监测模块包括湿度监测系统、温度监测系统、土壤墒情监测系统；神经网络预测模块,所述神经网络预测模块与所述监测模块连接,所述神经网络预测模块用于大棚内作物的腾发量；模糊控制决策模块,所述与所述神经网络预测模块连接,所述模糊控制决策模块采用模糊PID控制方式；灌溉模块,所述灌溉模块与所述大棚以及模糊控制决策模块连接。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAoKqAB2GuAAe01xV_XLA682.pdf