【动态资讯】

1．龙里：节水灌溉保丰收

【新华网】作为龙里县粮食和蔬菜的主产区，湾滩河镇强化水利基础设施建设和日常维护管理。镇上成立防汛抗旱指挥部。每个村社区有一名指定责任人负责水库塘坝日常管理，重点检查溢洪道处有无拦网、筑坝、查看水库内外坡有无渗漏现象；责任人在非汛期每月巡查一次，汛期每天巡查一次；进入主汛期对水库塘坝进行全天候不间断巡查，做到24小时通讯畅通，遇到情况随时上报，确保各处水利工程能安全、高效的服务于全镇农业生产。为了倡导合理取水、节约用水，湾滩河镇实施了农业水价综合改革，给各村社区和农业产业种植养殖大户装上了"灌溉水桩"，配发专用水卡，刷卡取水。湾滩河镇促进高效节水灌溉，优化农业种植结构，保障粮食安全，成为农业现代化水利配套的一个示范点。水利建设直接影响粮食产量，近年来，龙里县狠抓农业水利基础设施建设，兴修水库，河道治理，充分发挥水利工程的调节作用，做到雨季蓄水，旱季灌溉，确保农业丰收得到充分保证。2021年省级下达龙里县高标准农田建设任务面积2.5万亩，其中高效节水灌溉面积0.37万亩，涉及中央及省级资金3750万元。实际规划高标准农田建设面积2.5385万亩，其中高效节水灌溉面积0.372万亩，分6个项目分别在19个行政村实施。

链接:

http://agri.ckcest.cn/file1/M00/02/FD/Csgk0WFuN32ATRBZACj20qh7Tyg027.pdf

2．破解耕地细碎化　助力乡村产业发展

【农民日报】耕地细碎化问题是当前造成耕作成本高、生产效益低的主要问题，对土地适度规模化经营、农民增收有较大制约，也不利于新型机械、信息技术的应用。破解耕地细碎化问题是推进乡村振兴战略、实现产业兴旺的重要举措。近年来，国家法律政策

层面出台相关政策鼓励在实践中探索破解耕地细碎化问题的解决。2013年中央一号文件明确提出"鼓励农民采取互利互换方式，解决承包地块细碎化问题"；2014年，中办、国办印发《关于引导农村土地经营权有序流转发展农业适度规模经营的意见》，明确提出鼓励农民在自愿前提下采取互换并地方式解决承包地细碎化问题；2015年，原农业部、中央农办、原国土资源部、原国家工商行政管理总局印发《关于加强对工商资本租赁农地监管和风险防范的意见》，为工商资本给农业带来资金和现代生产要素以及保障农民权益提供政策保障和依据；2018年第十三届全国人大常委会第七次会议表决通过新修改的《中华人民共和国农村土地承包法》，从法理上充分保障农民的合法权益；2021年农业农村部发布《农村土地经营权流转管理办法》，重点关注防止流转土地"非粮化"、保障流转双方权益以及规范工商资本流转耕地。相关政策出台确立了农村承包地"三权分置"框架，规范了农村土地经营权流转，赋予土地经营权融资担保等权能，建立工商企业等社会资本流转土地经营权准入监管制度，为破解耕地细碎化问题的解决奠定了法律和政策依据。

链接：

http://agri.ckcest.cn/file1/M00/02/FC/Csgk0WFuMhyAGYOyAFneUcEgrhU114.pdf

3．高标准农田管护落实到人

【农民日报】为彻底改变高标准农田建设"重建轻管"的现状，安徽省怀宁县坚持建管并重，夯实管护基础，认真做好建后管护"后半篇"文章。明确管护人员。已规模流转的建成项目区，由取得土地经营权的新型农业经营主体自行选定管护人员；未流转的建成项目区，由管护实施主体负责选定管护人员。择优选择村组干部、有一定农田设施管理经验的村民及有劳动能力的建档立卡贫困户成为管护人员，并签订管护合同。细化各方责任。该县制定了责任明确的建后管护机制，由管护人员承担日常巡视检查，泵站、闸门设备保养维护，中小沟渠、沉砂池清淤等日常管护工作；由管护实施主体负责对较大规模的沟渠维修清淤、道路修整、设备更换等专项管护工作。强化资金保障。除县级财政在年度财政预算中用于高标准农田的建后管护经费外，通过高标准农田项目结余资金、新增耕地指标交易收益、村组集体经济收益等，多渠道筹措建后管护资金；积极探索投资补助、贷款贴息等多种模式，鼓励社会资本参与，进一步提升项目资金保障能力。

链接：

http://agri.ckcest.cn/file1/M00/02/FC/Csgk0WFuMZ-Ae0H-AFneUcEgrhU685.pdf

4．中国农科院百位专家科技保障主产区"三秋"工作

【中国农业科学院】当前正是小麦播种最佳时间和关键时期，黄淮海等小麦主产区晚播

面积有可能扩大。入秋以来多次连阴雨过程给冬小麦播种造成一定困难。为科学指导"三秋"抢种抢收工作，中国农业科学院按照农业农村部统一部署，决定派出专家分赴河南、河北、山东、山西、陕西等五省，开展抢收抢种技术指导服务。12日，104位专家已全部到位。此次科技保障，中国农科院作科所、植保所、蔬菜花卉所等17个研究所组成18个专家组、2个技术指导组（玉米专家为主的抢收组和小麦专家为主的抢种组），对接服务5个重点省份的20个地市的69个重点县。专家组将下沉到重点县，包县包乡、进村入户、深入田间指导农民抢收抢种；实地调研农田积水、作物受灾等情况，协助制定防灾减灾技术意见；开展玉米收获烘干、小麦整地播种技术指导服务，加快秋收秋种进度；跟踪了解秋收秋种进度，以及农机、农资保障情况，及时反映生产中存在的问题并提出建议。院党组强调，中国农科院在前期派出专家参与支援河南24县救灾指导服务工作两个多月后，又紧急派专家组参与"三秋"抢收抢种技术指导服务，就是要坚持服务国家重大需求、服务现代农业建设主战场，继续发挥科技支撑国家粮食安全、支撑乡村振兴的先锋队和主力军作用。各单位要高度重视，党政主要负责人要亲自抓，要为专家在一线的科技服务提供坚强保障。专家们要从科学角度出发，开展调查研究，提出切实可行的技术指导方案，力戒形式主义。要遵守八项规定和当地疫情防控要求。要做到真指导真服务，为抢种抢收工作提供坚强有力的科技支撑，确保"三秋"生产顺利开展。

链接:

http://agri.ckcest.cn/file1/M00/02/FD/Csgk0WFuNLmAA7EbAAOvNTl6UJA152.pdf

5．"耕地中的大熊猫"要保护好

【新华网】2020年7月，习近平总书记在吉林考察时强调，采取有效措施切实把黑土地这个"耕地中的大熊猫"保护好、利用好。一年多来，梨树模式在保障粮食增产的基础上，朝着适应现代化农业发展方向不断升级。东北是世界四大黑土区之一，得天独厚的特质，使其成为滋养粮食生长的绝佳地域，也是牢牢稳住粮食安全的"压舱石"。"心疼得要命！"跟黑土地打了几十年交道的王贵满说，前些年，东北粮食产量节节高，但是过度开垦和化肥的大量使用，让黑土地越来越"瘦"、越来越薄。担忧2000年前后加剧了。罕见的大风把地里的黑土卷走一层又一层。从此以后，如何在稳增产的基础上保住黑土成了他心中头等大事。当时，欧美国家已经探索出以秸秆还田和少免耕播种为主的保护性耕作方式。一些科研人员因地制宜，在梨树开发试验田，陆续开始保护性耕作的探索。其中一位就是中国农业大学教授李保国。2008年李保国来到梨树县考察后，次年与同事们在泉眼沟村建立了试验田。2011年，他又成为中国农业大学吉林梨树实验站站长，与中国科学院等科研机构的专家们共同研究适宜当地的保护性耕作技术。从土壤测试，到计量不同秸秆还田量，再到研究不同播种方式……每年，李保国几乎每个月都会来

梨树，还在这里设置研究生实习基地，把论文写在大地上。

链接:

http://agri.ckcest.cn/file1/M00/02/FD/Csgk0WFuMzqAWMAJABKXrNng8dI382.pdf

6．重庆今年起开展高标准农田新增耕地指标交易

【新华网】市农业农村委、市财政局、市规划和自然资源局日前联合印发通知，要求全市各区县规范开展高标准农田新增耕地指标交易并做好收益管理，进一步为高标准农田建设提供资金保障。市财政局相关负责人介绍，高标准农田新增耕地指标，是指在高标准农田建设中增加的耕地作为占补平衡补充耕地的指标，包括新增耕地数量、新增水田数量及新增粮食产能3类指标。通过开展高标准农田新增耕地指标交易，能拓宽补充耕地来源，发挥经济发达地区和新增耕地资源丰富地区资金资源优势互补，形成高标准农田新增耕地、新增耕地指标交易、所得收益用于高标准农田建设的良性互动。通知明确要求，各区县高标准农田新增耕地指标计提10%（按耕地开垦费收取标准）保障市级重点项目，并预留10%作为监督检查调剂使用指标后，由区县农业农村部门按市农业农村委制定的新增耕地指标交易计划，及时将对应项目的合格证、《重庆市耕地占补平衡指标证书》或记载耕地占补平衡指标的其他载体原件提交重庆农村土地交易所申请交易。通知明确提出，指标交易获得的收益在扣除中央、市级补助资金之外的建设投入和市、区县两级技术指标工作经费后，市、区县按3:7的比例分配。指标收益要用于高标准农田建设，市级收益统筹用于高标准农田重点项目建设，区县收益用于高标准农田建设和工程管护等。通知还要求，各区县要用足用活高标准农田新增耕地政策，按照"宜田则田、宜土则土"的原则，在高标准农田建设中大力实施土地平整工程，严禁水田改旱地，鼓励旱地改水田，确保备案项目新增耕地率不低于5%。与此同时，还应做好高标准农田新增耕地后期利用，用于粮油、粮菜等产业发展。

链接:

http://agri.ckcest.cn/file1/M00/02/FD/Csgk0WFuM8aAFspxAAbmoDWAl_k877.pdf

<p style="text-align:center">【文献速递】</p>

1．基于温度带分区的中国粮食生产格局与热量资源利用效率研究

文献源：作物学报,2021-10-19

摘要：研究并揭示粮食生产格局及自然资源利用效率变化规律，对于合理利用资源、保障国家粮食安全和实现可持续发展具有重要意义。本文利用ArcGIS空间分析方法，基于1985—2015年中国县域粮食生产数据和全国683个气象站点数据，分析了基于温度带分区的中国粮食生产格局变化及热量资源利用特征。研究表明，在1985—2015年间，中国

粮食总产的90%左右由中温带、暖温带、北亚热带和中亚热带生产,其占比分别为18.6%、25.6%、21.6%和25.9%。30年来一熟区的粮食产量比重增加了13.8%,而二熟区和三熟区分别下降了2.7%和11.2%。其中一熟区的中温带粮食产量占比增加了13.9%,播种面积和单产的同步增加是中温带粮食增产的驱动因素,而三熟区中亚热带的粮食生产占比下降了13.9%。30年来不同温度带≥10℃年积温不断增加,南方增温趋势较北方更明显,但是热量资源利用效率增幅低于北方,中国粮食生产格局变化与热量资源分布间存在"错位现象"。因此,在进行区域粮食生产布局优化和策略制定时,需要以区域自然资源特点为基础,分析粮食生产与资源自然匹配的协调性,从而提高中国粮食生产的资源利用效率。

链接:

http://agri.ckcest.cn/file1/M00/0F/CE/Csgk0GFuYQuAE8fNABftT6WrePQ991.pdf

2．长江流域水土保持科学研究进展及展望

文献源：长江科学院院报,2021-10-18

摘要：自20世纪80年代以来,长江流域水土保持科学研究取得了重要进展,为了解流域水土流失现状、制定水土保持政策与规划及实施水土保持防治提供了科学依据。当前,我国正处于推进生态文明建设的关键时期,系统总结长江流域水土保持科学研究发展历程、基础理论重点与亮点及水土保持关键技术、科研平台建设等取得的成果。但总体来看,长江流域水土保持科学研究还比较薄弱,理论研究还落后于水土保持实践。通过明确今后的研究重点,即土壤侵蚀动力学机制及其过程、水土保持措施防蚀机理及其适用性、退化生态系统的修复机理及其技术研发、重大生态治理工程生态过程及其效应评价,对于加强科技创新,推进流域水土保持事业发展具有重要意义。

链接:

http://agri.ckcest.cn/file1/M00/0F/CE/Csgk0GFuYVWAD5BBAAOM13b_YyI918.pdf

3．社会网络和感知价值对农户耕地质量保护行为选择的影响

文献源：西北农林科技大学学报(社会科学版),2021-10-18

摘要：农户是耕地质量保护的直接主体,农户外在嵌入的社会网络和内在的感知价值对其参与耕地质量保护行为的影响不容忽视。利用陕西省1 019户农户调查数据,在对农户社会网络和感知价值进行测度的基础上,采用二元Probit模型分析了社会网络及感知价值对费用型和资产型耕地质量保护措施行为选择的影响。研究结果表明:(1)社会网络中网络互动与网络规范对农户采取两类措施均有显著正向影响,网络信任仅对采取资产型措施有显著影响,网络互惠仅对采取费用型措施有显著影响;(2)经济价值感知、生态

价值感知和社会价值感知对农户采取两类措施均有显著正向影响,社会价值感知仅对资产型措施有显著影响;（3）感知价值能够强化社会网络对费用型措施的正向影响;（4）技能培训和耕地流转对两类措施的采取均有促进作用,文化程度和劳动力人数仅对费用型措施有促进作用,性别和耕地面积仅对资产型措施的采取有促进作用,而劳动力完全分工对费用型措施的采取表现为促进作用,对资产型措施的采取表现为抑制作用。据此,相关方案的实施应充分利用社会网络和感知价值在农户耕地质量保护中的作用,对不同措施采取差异化的激励策略。

链接:

http://agri.ckcest.cn/file1/M00/0F/CE/Csgk0GFuYBKAZlH1AAXsFGQe-kY938.pdf

4．干旱区绿洲耕地撂荒与复耕对土壤水力性质的影响

文献源：中国沙漠,2021-10-11

摘要：土地利用变化会改变土壤质地与结构,影响土壤水力性质,进而改变土壤水分有效性,影响植物生长。由于区域气候的干湿交替与水资源利用效率的提高,干旱区绿洲耕地普遍存在着撂荒-复耕现象。为了明确干旱区耕地撂荒与复耕对土壤水力性质的影响,以民勤绿洲北部边缘的耕地、撂荒地与撂荒复耕地为研究对象,测定0—40 cm深度土壤理化性质,分析不同土地利用下土壤水力性质差异及其影响因素。结果表明：耕地撂荒导致0—40 cm深度黏粒与粉粒比重增加,有机质含量降低,容重降低（P<0.05）,土壤孔隙度显著增加（P<0.05）,犁底层消失;在高水势阶段,土壤持水与导水能力增强,在土壤有效含水量对应的水势阶段,土壤持水与导水能力变差,有效含水量显著降低（P<0.05）。撂荒地复耕后,0—40 cm深度黏粒与粉粒含量继续增加,有机质含量转而增加,容重增加（P<0.05）,土壤孔隙度降低（P<0.05）,犁底层重新出现,土壤持水与导水能力又逐渐趋向于耕地水平。撂荒对干旱区绿洲土壤肥力与蓄水能力的提升不显著,而留茬免耕、深耕灭茬还田等保护性耕作措施能有效提高持水能力。利用研究区易测的土壤黏粒、砂粒含量与土壤容重,采用多元线性回归方法,可以准确、快捷预测土壤水分常数,这将有利于研究区农田灌溉制度的准确制定与优化,以及耕地利用变化对土壤水力性质影响的快速评估。

链接:

http://agri.ckcest.cn/file1/M00/0F/CE/Csgk0GFuYhKAS75FABElTYOwRhA179.pdf

5．基于国土空间三线融合的城市周边耕地分区保护研究

文献源：农业资源与环境学报,2021-10-11

摘要：城市周边耕地保护是国土空间规划的重要议题,对保障城市生态安全和粮食安全

以及促进城市可持续发展具有重大意义。本研究通过协同量化耕地自然质量特征以及周边立地条件的关系，融合永久基本农田红线、生态红线、城镇开发边界三线划定要求，在LESA理论基础上构建基于自然质量与立地条件特征的综合评价系统，建立城市主城区周边耕地利用与保护分区，提出耕地保护分区管控措施。结果表明：鞍山市域主城区耕地可分为4类区域：永久基本农田区占80.70%；永久基本农田储备区占10.15%；城镇开发边界弹性用地区占3.98%；生态保育区占5.17%。评价结果综合反映城市主城区周边耕地质量的差异性及立地环境的稳定性，同时融合国土空间中三线划定的政策要求，对城市主城区周边耕地布局进行有效探索，划定了永久基本农田保护区，又在一定程度上满足了城镇开发边界弹性发展空间用地需求和生态红线管控要求。

链接:

http://agri.ckcest.cn/file1/M00/0F/CE/Csgk0GFuYciAGajRABnmHvM4bgs398.pdf

6．农业科技投入对农业生态效率的空间效应分析

文献源：中国生态农业学报(中英文),2021-10-10

摘要：农业污染日益严重背景下， 探究农业科技投入对农业生态效率的作用机制， 对缓解农村生态压力、农村健康发展具有重要现实意义。鉴于此， 本文在采用超效率SBM（Slack-based measure）模型测度2000—2018年我国东中西部省际农业生态效率基础上，根据莫兰指数对农业生态效率及农业科技投入进行空间自相关检验， 采用空间计量模型剖析农业科技投入对农业生态效率影响的空间溢出效应与门槛特征。结论表明，2010—2018年东中西部的农业生态效率呈现东西部高、中部低的态势; 2000—2018年东中西部的农业生态效率波动明显， 2000—2003年有小幅波动， 2004—2008年农业生态效率略有下降， 2008—2010年稍有上升， 2010年农业生态效率为0.731; 之后2011—2014年稍有下降， 2015—2017年全国农业生态效率分别下降到0.5894、0.5839、0.5159; 2018年农业生态效率提升到0.5453。农村科技投入对农业生态效率影响呈现为"倒U"型， 农业科技投入规模对农业生态效率有着显著的溢出效应。东中西部分组面板门槛回归显示: 东中西部的农业科技投入门槛效应差别较大， 东部表现为正向促进作用， 中部农业科技投入对农业生态效率积极作用没有东部稳定， 西部农业科技投入对农业生态效率表现为负向抑制作用， 中西部地区农业发展中的科技投入要兼顾经济与生态效率。为此， 我国要大力推广绿色高效技术模式， 积极采取有机肥替代化肥行动，加快实施科学施肥用药技术， 抓好示范带动减量增效， 提高农业生态效率。

链接:

http://agri.ckcest.cn/file1/M00/0F/CF/Csgk0GFwNcGARsCLAAnumcBnRlY996.pdf

7．Organic carbon distribution and soil aggregate stability in response to long-term phosphorus addition in different land-use types

文献源：ScienceDirect,2021-09-28

摘要：Understanding the relationships among phosphorus (P), soil organic carbon (SOC) and aggregate stability is vital for improving soil fertility and P and C cycling in different land-use types. Here, we assessed the responses of SOC distribution in different aggregate fractions to P addition in two different land-use types categorized in either a Plimitation or non-P-limitation status based on the stoichiometric ratios of microbial enzymes. Four different longterm fertilization managements (no fertilizer [control, non-P limitation]; nitrogen and potassium [NK treatment, P limitation]; phosphorus [P treatment]; and nitrogen, phosphorus, and potassium [NPK treatment]) were established in upland and paddy soils to compare the effects of pre-assessed non-P- and P-limited soil conditions in combination with different fertilizer additions. A wet-sieving method was used to obtain four sizes (> 2-, 0.252-, 0.0530.25- and < 0.053-mm) of soil aggregates. The concentrations of SOC and iron and aluminum (Fe/Al) oxides in the forms extractable by DCB (Fed/Ald), oxalate (Feo/Alo) and polyphosphate decahydrate (Fep/ Alp) were measured. The results showed that compared to the non-P-limited control, the P treatment reduced soil mean weight diameter (MWD) by 13.1% in upland and 9.7% in paddy soils. The MWD of NPK treatment was significantly higher by 24% than that of the P-limited NK treatment in upland soil, while the difference between the same two fertilization treatments was not significant in paddy soil. Compared with that of the control, SOC concentration in each size was greater in the P-treated upland soil, while in the paddy soil, SOC concentration of the >2-mm size were lower in the P and NPK treatments than in the control and NK treatments, respectively. Phosphorus addition decreased Fep/Alp of each aggregate size in upland soil, while it increased Fep/Alp of each aggregate size in paddy soil. To better quantify the effects of P on SOC and aggregate stability, we used a partial least squares path model (PLS-PM). The results indicated that P addition had a direct negative effect on MWD (− 0.797, P < 0.01) under the non-P limitation condition (control vs. P treatment). The addition of P in upland soil had a high positive effect on MWD (0.565, P < 0.05) under the P-limitation condition (NK vs. NPK treatments), but the effect was not significant in paddy soil (0.047, P > 0.05). Thus, strategies aiming to improve soil carbon cycling and aggregate stability by regulating phosphorus addition should consider land-use type and soil P-limitation status.

链接**:**

http://agri.ckcest.cn/file1/M00/0F/CF/Csgk0GFuZpKAHV0AACpDoQOfml8741.pdf

1．LAI Modeling in Degraded Mediterranean Rainfed Cultivated Crop Linked with Soil Erosion Stages Based on VNIR-SWIR Hyperspectral Data

发布源：IEEE

发布时间：2021-10-12

摘要：Soils are an essential factor contributing to agricultural production of rainfed crops such as barley and triticale cereals. Inadequate land management is endangering soil quality and productivity, and in turn crop quality and productivity are affected. In this paper, hyperspectral VNIR-SWIR airborne data (0.4-2.5 μm) is used to analyze spatial differences in vegetation vitality related to soil degradation status in a Mediterranean agricultural area of central Spain. Specifically, biophysical indices such as the leaf area index (LAI) are spatially derived from the remote sensing data and discussed regarding the land degradation status. The results of this study illustrated the potential of hyperspectral remote sensing in the context of crop and land resource monitoring.

链接:

http://agri.ckcest.cn/file1/M00/0F/CF/Csgk0GFufJiAIQWrAAgfd0H61R0547.pdf

2．Land Surface Temperature Based Soil Moisture Dynamics Modeling for Chinese Mainland

发布源：IEEE

发布时间：2021-09-27

摘要：Since remotely sensed land surface temperature (LST) and LST-derived indexes such as surface-to-air temperature gradient (ΔT) and day-to-night LST gradient (ΔLST) all contain important soil moisture (SM) information, it is meaningful to utilize easily available and near-real-time LST data for modeling the spatiotemporal SM dynamics. However, the optimal LST-derived index to appropriately quantify SM dynamics on a large scale remains to be studied. Considering the complex and diverse climate conditions and land cover types in the Chinese mainland, this letter proposes to evaluate Z-score indexes from LST-based SM dynamic modeling for the Chinese Mainland. Monthly LST and SM during April-October in 2000-2019 years are derived from the MOD11C3 (MODIS LST product) and ERA5-Land (the global reanalysis dataset), respectively. The Pearson correlation coefficients (Rs) between ZSM (Z-score of SM) and ZLST (Z-score of LST), ZΔT (Z-score of ΔT), as well as ZΔLST (Z-score

of ΔLST) are calculated. The average R between ZSM and ZLST is 0.44 over the whole domain. It is up to 0.7 for cultivated land and grassland in semi-arid and semi-humid areas. The R between ZSM and ZLST is stronger than the ones between ZSM and ZΔT and ZΔLST. Overall, ZLST can be viewed as a relatively robust and easy-to-calculate indicator for modeling SM dynamics in a large region. Even if the approach used is simple, its results are encouraging because it makes sense to actually use LST to capture SM dynamics in the Chinese mainland.

链接:

http://agri.ckcest.cn/file1/M00/02/FC/Csgk0WFuLbeACHuzAL1A-2eE3ik912.pdf

3．Comparison of TVDI and soil moisture response based on various vegetation indices

发布源：IEEE

发布时间：2021-09-08

摘要：Soil moisture is an important factor that affects crop growth, development and yield. Relative soil moisture (RSM) can express the effect of water deficit on crop growth wonderfully. Temperature vegetation drought index (TVDI) is one of the most widely used methods in agricultural drought remote sensing monitoring at present. In order to improve the accuracy of soil moisture inversion by TVDI, the performance of TVDI calculated by different vegetation indices used in drought monitoring was compared in Northeast China on the 8day scale of the whole growth period (May to September). Enhanced vegetation index (EVI), ratio vegetation index (RVI), modified soil-adjusted vegetation index (MSAVI) and leaf area index (LAI) were selected to construct TVDI. The relationship between these indices and situ relative soil moisture (RSM) were analyzed every 8 days in 2009. The results showed that the correlation between TVDIs and RSM at 20cm depth was stronger than 10cm depth averagely. All the TVDIs obtained by different vegetation indices had a certain negative correlation with soil moisture, indicating that the higher the TVDI, the lower the soil moisture and the drier. Taking the soil moisture at a depth of 20cm as an example, four indices showed relatively consistent trend: the absolute correlation coefficients $\vert r\vert$ in May were less than 0.3, and from June to September $\vert r\vert$ were around 0.5 overall. Especially in the middle of the growing season (the second half of June and Early September), $\vert r\vert$ were greater than 0.5. On the whole, TVDI performs best in the middle of the growing season, followed by the late growing season, and the early growing season is unsatisfactory. Among them, vegetation indices performed best when taking LAI,

followed by RVI, and TVDI constructed by EVI and MSAVI were roughly the same. TVDI when LAI was calculated was higher correlated with soil moisture than RVI, EVI, MSAVI, but generally, all indices performed well after June.

链接:

http://agri.ckcest.cn/file1/M00/02/FC/Csgk0WFuL7eAUgwqAAZ3wN-KH74840.pdf

4．Study on Site Selection Zoning of Dry Land Transformed into Paddy Field Project in Wuhan City Based on the Suitability Grading of Cultivated Land Reconstruction

发布源：IEEE

发布时间：2021-09-08

摘要：For a long time, paddy field as high-quality arable land for growing rice crops, is an important carrier to guarantee food security, and is also a strategic land resource under national priority protection. In recent years, in order to improve the quality of arable land, some places have tried to transform dry land into paddy field, and some results have been achieved. This article sorts out the practical experience of dry land transformed into paddy field in various regions, combined with literature research, and takes Wuhan City as an object, put forward a series of restrictive factors for the dry land transformed into paddy field, and an evaluation index system for the suitability of dry land transformed into paddy field with 14 factors including topographical conditions, soil conditions, field utilization conditions, and management conditions was constructed, and measured the suitability of Wuhan's cultivated land to be changed from drought to water. Next, from the point of view of dry land transformed into paddy field project site selection, the grading standard of dry land transformed into paddy field suitability was studied, and the type of site selection was divided. Finally, a comparative analysis was carried out using multi-year project implementation cases, and the results showed that 75% of the implemented projects fell into highly and moderately suitable areas for reconstruction. This shows that the theoretical methods proposed in this paper are scientific and feasible, and the evaluation results are objective and reasonable, which can provide reference for the site selection and zoning planning of drought-to-water projects in similar areas in China.

链接:

http://agri.ckcest.cn/file1/M00/02/FC/Csgk0WFuLwKAYyg1AAV3nmBqFuA996.pdf

5．Land Cover Extraction of Remote Sensing Images with Parallel Convolutional Network

发布源：IEEE

发布时间：2021-09-08

摘要：As an important link between human and nature, land use/land cover change (LUCC) has become a research hotspot since the first day of the issue initiated. Remote sensing observation supplies important data source for LUCC research. With the constant improvement of the remote sensed image spatial resolution and the continuous development of computer scientific algorithms and models, the study of semantic segmentation in the field of automatic interpretation of remote sensed images has promoted quickly. There have been a number of achievements focusing on the one-class extraction of LUCC classification system, but limited progress in multi-class classifying mission when facing high resolution remote sensing data by using semantic segmentation model, because of its sophisticated structure, the phenomenon of synonyms spectrum and foreign body with spectrum in images. Additionally, the limitation of the semantic segmentation model is a crucial issue which needs to be solv for precision of classification in class recognition and the perfection of semantic segmentation on pixel level as well. The High-Resolution network (HRnet) model was used and improved in the study for semantic segmentation because it has the advantage of low resolution loss. In the LUCC classification work, the distribution of classes (such as cultivated land, woodland, grassland, other land, water, etc.) are usually extremely imbalanced, that leads to the limited classification recognition results of land types when using HRnet. So a combined Loss function of Lovasz Softmax Loss+Cross Entropy Loss was used in HRnet to classify the land cover of remote sensing images, to meet the requirements of high-resolution image classification not only in terms of low resolution loss but also in terms of class recognition. The combined loss function provided the direction of the model, and the appropriate loss function improved the performance of the model when faced with the imbalanced distribution of land classes. The results are as follows: 1) Compared with Deeplab and Unet, HRnet model performed better in segmentation results; 2) HRnet model with combined Loss function Lovasz Softmax Loss+Cross Entropy Loss (HRnet+) had better performance, and its test accuracy PA(Pixel Accuracy) value was 0.9577, MIOU (Mean Intersection over Union) value was 0.8801, and Kappa value was 0.9455. This indicated that the HRnet model with low loss of resolution could achieve better results in the automatic segmentation of high-resolution remote sensing images, and the combined loss function constructed in this study could effectively solve the problem of imbalanced distribution of classes in remote sensing images, and the edge optimization ability was also more significant.

【相关专利】

1．一种防堵式储水农业灌溉智能装置

发布源：中国专利

发布时间：2021-10-08

摘要：本发明公开了一种防堵式储水农业灌溉智能装置,涉及灌溉技术领域,包括壳体,所述壳体的上表面开设有蓄水槽,所述壳体的两侧均开设有空腔,使用时灌溉用水储存在支撑板上部,灌溉水仅能通过支撑板上的下水孔流入至灌溉箱中,水在流出过程中经过滤网过滤,去除水中的杂质,避免堵塞灌溉管,而滤网上部发生堵塞时,可通过推动蓄水槽上部的盖板移动时,盖板下部的齿条带动传动齿轮转动,进而带动横轴与下料轴一同转动,下料轴转动带动第一扇形板与第二扇形板转动,进而使得第一扇形板与第二扇形板刮擦滤网,推动滤网上的杂质移动,以保障滤网能正常下水,防止堵塞。

2．基于铰杆联动式耕地土壤碎石筛选机构

发布源：中国专利

发布时间：2021-10-08

摘要：本发明涉及一种筛选机构,具体地说,涉及基于铰杆联动式耕地土壤碎石筛选机构。其包括筛石机构,筛石机构至少包括：安装储石体,安装储石体包括安装架,安装架设置有安装口,安装架设置有卡接槽,卡接槽连接有储石斗,储石斗设置有储石仓,安装架连接有连接杆,连接杆设置有一号套接体；筛选筛除体,筛选筛除体包括铰杆,铰杆开设有一号套接槽、二号套接槽,铰杆设置有伺服电机,伺服电机套接有传动胶带,二号套接槽设置有过滤体,过滤体包括三个接触体,接触体之间设置有传动连接体,接触体设置有二号套接体,二号套接体设置有传动轮。本发明主要提出一种体型过大妨碍作物播种生长的碎石进行筛除的筛选机构。

3．一种基于深度学习系统的拖拉机耕作方法

发布源：中国专利

发布时间：2021-10-08

摘要：一种基于深度学习系统的拖拉机耕作方法,本发明通过对拖拉机所在位置的定位,辨识耕地边界,从而确定耕犁拖拉机是否可以开始工作,之后进行土壤数据分析,判断土壤类型、土壤板结程度等,通过角位移传感器,指导耕犁的耕深程度的调整,当耕犁拖拉机在工作状态时,深度学习系统通过速度传感器调整耕犁拖拉机速度,使耕犁拖拉机达到最佳状态,从而提高工作的效率,进而提高农作物产量,本发明具有操作简单,工作效率高等特点,适合大范围的推广和应用。

链接:

http://agri.ckcest.cn/file1/M00/0F/CE/Csgk0GFuY9iAAYaOAAjCSMYd5ac918.pdf