

《智慧农业发展战略研究》专题快报

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中国工程科技知识中心农业分中心

中国农业科学院农业信息研究所

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【动态资讯】

1. 海南杂交水稻双季稻亩产突破1500公斤

【农民日报】近日，海南省三亚市崖州区南繁公共试验基地晚稻测产亩产660.36公斤，加上早稻926.5公斤，双季稻亩产达1586.86公斤，袁隆平团队杂交水稻双季稻亩产攻关再获成功，创海南双季稻亩产最高纪录。据了解，杂交水稻双季稻亩产1500公斤攻关研究与示范项目，旨在实现“早稻+晚稻”组合下的全年亩产总量达1500公斤的目标。该项目主要采用超级杂交稻，通过籼粳亚种间优势利用培育出的“超优千号”、第三代杂交水稻“叁优一号”等产量潜力有重大突破的水稻为基础组合进行杂交。2020年12月，全国杂交水稻双季稻亩产1500公斤项目启动会在三亚市召开，袁隆平院士亲任项目攻关领导小组首席科学家。今年以来，海南省农科院、三亚市农业农村局、三亚市南繁科学技术研究院等项目实施单位克服种植季节紧张、条件差等困难，在海南5个市县组织6个早造水稻示范点，今年5月早造水稻平均亩产926.5公斤。在晚造水稻试验中，经反复论证，在海南东西北中等9个市县确定了10个试验示范点。10月26日，在三亚市崖州区南繁公共试验基地，测产专家随机挑选了3个地块测产。此前，水稻双季亩产1500公斤目标已在我国云南、湖南实现。而实现双季亩产1500公斤目标，海南与湖南、云南等地相比要更加困难。海南受水稻生育期较短、气温高等条件影响，水稻很难高产，此次突破，有利于在东南亚等热区国家推进杂交水稻超高产国际合作。

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WF_kSOAFT-iADOXRykBcx0054.pdf

2. 稻水矛盾，破解何方？

【农民水稻】<p>目前，我国六成以上人口以大米为主食，可下面两个数据少为人知：70%——作为我国第一大口粮作物，人们对水稻的产量和品质要求越来越高。我国水稻

平均亩产长时间未能有较大突破，主要瓶颈在于70%以上的稻田为中低产田，难以满足高产新品种对“高水高肥、精耕细作”的要求。50%——作为我国第一大“用水户”，水稻种植消耗了全国50%左右的淡水资源。作为世界上13个最缺水的国家之一，我国水资源时空分布极不均衡，北方一些稻区地下水超采较为严重，南方稻区局部性、季节性旱灾频发。2020年6月，习近平总书记在宁夏考察时强调，“要注意解决好稻水矛盾”。既要保证粮食安全也要保证生态安全已成为不容回避的重大课题之一，这就要求我们必须要在满足水稻高产优质刚性需求与缓解水资源紧缺严峻形势之间寻出两全之策，开辟出一条增产增效与节水抗旱相结合的新路。好在总有智者登高望远，总有勇者探路先行。来自上海市农业科学院的罗利军团队正是其中的代表之一，他们历时20余年探索开拓、引领坚守，致力培育推广节水抗旱稻，以期为有效破解稻水矛盾提供一套可行方案。

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WF ktOAT47IAGNwgMucnuo993.pdf>

3. 专家齐聚共同探讨生物技术与种业创新

【中国农业科学院】10月17-19日，中国农业生物技术学会（以下简称学会）第六次全国会员代表大会暨2021年学术年会在成都召开。会议以“生物技术与种业创新”为主题，来自全国农业生物技术研发领域的专家学者、会员代表、师生代表和企业代表齐聚蓉城，共同见证中国农业生物技术学会的新起点、新征程。会议还选举产生了学会第六届理事会，万建民当选理事长，邓子新等8名同志当选副理事长。会议围绕农业生物工程技术、全基因组选择与人工智能技术、基因编辑与合成生物技术等前沿技术，5位院士和其他知名专家作大会特邀报告，41位国内农业生物技术领域取得突出成果并具有重要学术影响的专家学者作大会专题报告，并邀请8种高影响力英文期刊的主编、编辑部主任或资深编辑及研究生作了学术报告。大会聚焦农业生物技术领域科技前沿，共同探讨农业生物技术与种业创新的新发现、新问题、新态势，展现了我国前沿生物技术的最新成果，深度呈现了以基因编辑、合成生物、智能设计等代表的前沿生物技术在种业创新中的核心作用。

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAK yACT4gAAMs9F0KZdE109.pdf>

4. 中国农科院北方草甸草原生态修复等一系列新技术获得突破

【中国农业科学院】10月21日至27日，北方草甸草原生态修复与智慧管理等一系列新技术在国家“十三五”科技创新成就展亮相。这是由中国农科院农业资源与农业区划研究所牵头的国家重点研发计划项目“北方草甸退化草地治理技术与示范”取得的重大突破。我

国北方草甸和草甸草原是北方牧区生产力最高、生物多样性最丰富、生态承载力最大的草场，在草原牧区乡村振兴和美丽中国建设中具有举足轻重的作用。当前气候变化、过度利用等因素导致北方草甸和草甸草原出现普遍退化倾向，而国内还缺乏针对性的退化评估标准和恢复理论，应用上没有形成相关治理技术体系与模式。为了加强草原生态恢复，构建国家生态安全保障体系，“北方草甸退化草地治理技术与示范”项目针对退化机理、恢复机制及有效治理技术缺乏等问题，着重开展了我国北方草甸和草甸草原生态系统退化机理、系统性修复、退耕地快速重建等生态修复技术以及智慧牧场管理等生态产业技术的创新应用研究。

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAkJOAEqhlAAQIDc2G7WA624.pdf>

5. 第二届深圳国际食品谷创新论坛 共商未来农业食品科技发展

【中国农业科学院】<p>10月21日，由深圳市市场监督管理局、深圳市大鹏新区管委会、中国农业科学院深圳农业基因组研究所等共同主办的第二届深圳国际食品谷创新论坛在深圳开幕。农业农村部国家首席兽医师（官）李金祥、国家市场监督管理总局食品生产司副司长顾绍平发表致辞，瓦赫宁根大学校长亚瑟·莫尔（Arthur Mol）等海外专家进行云致辞。中国农业绿色发展研究会理事长余欣荣、国家食物与营养咨询委员会主任陈萌山，以及国内外多位食品领域专家、企业家和投资机构代表参加会议。李金祥在致辞中表示，食品产业在乡村振兴战略中举足轻重，希望深圳进一步完善规划设计，构建“企业+科研机构+政府”创新体系，推进成果转化、加强示范引领，为全面推进乡村振兴，加快农业农村现代化作出更大贡献。此次论坛以“新科技 新食品 新机遇”为主题，共同探讨未来农业食品科技、农业食品产业升级发展等内容。会上，中国（深圳）农业食品创新产业园区正式揭牌，这标志着酝酿已久的深圳国际食品谷已从规划和顶层设计阶段正式迈进落地实施阶段。深圳国际食品谷比照“荷兰瓦赫宁根大学+食品谷”的模式，以“大学+”的功能组织模式，建设以基因组所为代表的科技智核群组，充分利用基础研究成果，分三个阶段推动国际食品谷建设成为全球食品营养领域前沿技术、核心产品、新兴产业的策源地。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GF_k5WAE3obAAObSHDS7YU457.pdf

6. 连云港海州：生态农业成为乡村振兴新“引擎”

【新华网】10月21日，在位于江苏连云港海州区浦南镇草舍村的番茄庄园，只见近百种正在挂果的番茄、各种新式的栽培技术，令人眼花缭乱。庄园内集设施农业控制系统、

现代高科技种植为一体，一个可生产、可观赏、可品尝的高科技现代农业庄园呈现在眼前。党史学习教育开展以来，海州区把农业持续增效、农民快速增收、农村面貌改善作为“我为群众办实事”实践活动的重要抓手，以建设都市农业发展高地为目标，进一步探索生态休闲都市农业发展新模式，整合全区涉农资源，全力推动海州农业产业向吸引都市客流、满足都市消费需求发展，带动都市资本向农业产业发展倾斜，番茄庄园项目便是海州区聚力壮大现代农业发展的农业农村重大项目之一。

链接:

<http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAlmAYXcrAAUvQbj8tCU474.pdf>

【文献速递】

1. Identification and ecotoxicity prediction of pyrisoxazole transformation products formed in soil and water using an effective HRMS workflow

文献源: ScienceDirect,2022-02-15

摘要: <p>Pyrisoxazole, an isoxazoline-class fungicide, has been registered and used for approximately 19 years. However, its environmental transformation products (TPs) and corresponding ecotoxicological effects remain ambiguous. In this study, the photolysis, hydrolysis, and soil transformation behavior of pyrisoxazole were systematically investigated by indoor simulation experiments and analyzed by liquid chromatography quadrupole-time-of-flight mass spectrometry (LC-QTOF-MS) and UNIFI software. Transformation products in different environments were effectively identified by a proposed workflow, which organically combined suspect and non-target screening strategies. In total, 17 TPs were screened out. Eight TPs were confirmed using the corresponding reference standards. Structures of another 9 compounds were tentatively proposed based on diagnostic evidence. Among them, 14 products were reported for the first time. The transformation pathways of pyrisoxazole in soil and water were proposed. Pathway analysis demonstrated that the different pH of aqueous solutions had little effect on the pathways, while the influence of different soil types and oxygen conditions was evident. Finally, the toxicity of the proposed TPs to fish and daphnids was predicted using ECOSAR software. These proposed TPs in soil and water, transformation pathways, and predicted ecotoxicity information could provide systematic insight into the fate and environmental risks of pyrisoxazole.

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WF_jfyAQnFiAC7ZEijPjxs727.pdf

2. 广灵大尾羊TP53INP2基因的克隆、生物信息学分析及其在不同脂肪组织中的表达研究

文献源：中国畜牧杂志,2021-10-29

摘要：<p>本研究旨在克隆绵羊TP53INP2基因CDS区，分析基因mRNA序列及其编码蛋白的性质，并检测该基因在5种脂肪组织中的表达情况。选择广灵大尾羊为研究对象，PCR扩增TP53INP2基因的CDS区，生物信息学软件分析其性质，实时荧光定量PCR检测脂肪组织表达量。结果显示：绵羊TP53INP2基因CDS全长为675 bp，可编码224个氨基酸，mRNA序列与山羊相似性最高。TP53INP2蛋白为不稳定亲水性蛋白，主要分布在细胞核中，有17个潜在的磷酸化位点和7个O-糖基化位点，无N-糖基化位点、跨膜区结构和信号肽。二级结构和三级结构预测发现，TP53INP2蛋白主要由 α -螺旋和无规则卷曲构成。TP53INP2基因在广灵大尾羊皮下脂肪组织中表达量最高，腹膜后脂肪表达量最低，整体表现为皮下脂肪表达量高于内脏脂肪，提示该基因有促进脂肪沉积的作用。本研究结果可为进一步研究TP53INP2基因参与绵羊脂质代谢过程和改善绵羊肉品质奠定基础。

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链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WF_hpyAAh1rABH19dR7QJ8595.pdf

3. 植保无人机喷洒作业雾滴飘移的质点运动学分析

文献源：排灌机械工程学报,2021-10-29

摘要：<p>为了研究雾滴飘移对植保无人机喷洒作业质量的影响，基于多相流理论和质点运动学方法，对植保无人机喷洒的雾滴其受力和运动轨迹进行了理论分析与数学建模。在对近地面层和层流副层风速进行假设的基础上，即假设风速测量高度范围内的风速近似为线性函数分布，进行方程耦合迭代求解，分析了雾滴直径、飞行高度、飞行速度大小和航向、风速大小和风向、雾滴初始速度大小和方向对雾滴飘移的影响。进一步讨论了各因素之间耦合作用对雾滴飘移的影响，得到雾滴飘移浓度分布情况。结果表明：风速和风向对雾滴飘移距离影响较大；雾滴飘移距离和初始速度角度呈二次函数分布，在所给条件下经计算得出初始速度角在 20° 左右飘移距离最近；雾滴飘移主要集中在喷嘴周围，并且呈散射状分布。

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WF_hWmAID80ACSzrqZqtEk390.pdf

4. 融合栈式自编码与CNN的高光谱影像作物分类方法

文献源：农业机械学报,2021-10-27

摘要：在高光谱影像作物分类中，为了充分利用高光谱遥感影像完整的光谱信息，同时避免高维数据带来的Hughes现象。从栈式自编码网络的数据降维与CNN网络的分类优势出发，首先分析了此种网络在训练过程中的共性，以自编码网络优化过程中分类器的选取作为切入点，构建了可用于高光谱影像分类的融合网络架构。相较于传统方法，本文方法仅通过一次监督训练，即可实现高光谱影像直接分类，简化了传统数据处理流程，而且具有更优的分类性能。在实验中，本文利用Pavia University与雄安地区两组典型的高光谱遥感影像数据集对本文方法进行了验证，实验结果表明，Pavia University数据集中，在仅选用10%的像素点作为训练集的情况下，本文方法的总体分类精度达到了98.73%，比传统方法提升了8%以上；在雄安数据集中，在仅选用1%的像素点作为训练集的情况下，本文方法的总体分类精度达到了98.04%，比传统方法提升了7%以上，证明了本文分析的正确性和所提方法有效性，也为小样本情况下的高光谱影像分类提供了一种新的研究思路。

链接：

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GF_hDiAfC6GABpK-7_eQk4404.pdf

5. 近地遥感监测冬小麦关键发育时期的方法研究

文献源：河南农业科学,2021-10-26

摘要：为探寻准确高效的冬小麦关键发育时期监测方法，首先利用归一化植被指数测量仪（SRS-NDVI）监测了河南省鹤壁市农业气象试验站2017—2018、2018—2019年度冬小麦生长季的时序归一化植被指数（Normalized difference vegetation index,NDVI）；然后，采用邻域差值分析法重构时序NDVI，并运用S-G滤波法（Savitzky-golay,S-G）平滑处理时序NDVI中异常值；最后，根据冬小麦生长季NDVI变化特点，综合运用广义动态阈值法、曲线速率法和极值法，提取冬小麦关键发育时期特征点。结果表明，邻域差值分析法可有效去除观测数据的明显异常值，经S-G滤波法处理后的NDVI时序数据，更加符合冬小麦生长过程NDVI变化规律。此外，NDVI时序数据监测发育时期平均误差为2.5 d，精度较卫星遥感监测冬小麦发育时期精度明显提高。

链接：

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WF_g7GAYmVRABfO2nbKms8508.pdf

6. 江苏省农业碳排放时序特征与趋势预测

文献源：农业环境科学学报,2021-10-20

摘要：【目的】为探讨江苏省农业碳排放时序特征及未来碳排放趋势，【方法】利用排

放因子法对江苏省2000-2019年农业碳排放进行估算，并运用STIRPAT模型对2020-2030年全省农业碳排放进行趋势预测。【结果】结果表明：江苏省2000—2019年CO₂-e排放量整体呈现降低-升高-降低的趋势，并已在2005年达峰，估算为8361.77万t，其中种植业、畜牧业则分别在2010年、2003年达峰，种植业排放量远高于畜牧业。农业CO₂-e排放强度主要呈先升高后降低的趋势，2003年后排放强度逐年递减，到2019年已降至1.31 t·万元⁻¹；在各碳源中，水稻种植是全省农业碳排放的最大排放源，而在主要畜禽中，猪养殖过程中造成的碳排放远高于其他畜禽；预计2020—2030年，伴随城镇化发展、农业人均GDP提高和农业碳排放强度的进一步降低，全省农业CO₂-e排放量仍将呈下降趋势，在减碳的同时可以兼顾农业经济高效发展。【结论】研究表明，江苏省农业已实现碳达峰，未来农业碳排放的持续降低将有利于加速全省碳中和目标的实现。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GF_hvmART2kABR2jtiehQw761.pdf

7. 基于无人机和地面图像的田间水稻冠层参数估测与评价

文献源：作物学报,2021-10-19

摘要：田间水稻表型监测可用于分析水稻产量相关性状，对指导水稻栽培管理以及产量预测具有重要意义。本研究以3种氮肥处理下6个不同栽培品种的水稻为研究对象，估测并评价了水稻冠层的主要表型参数，以探讨利用图像分析方法评价多品种及栽培环境下田间水稻长势的适用性。基于无人机和田间固定相机图像，本研究通过图像处理、三维建模和机器学习自动测算出田间水稻冠层覆盖度、株高、穗数，并结合实际测量结果进行了精度评价。结果表明：（1）基于无人机图像使用决策树分类模型提取的水稻冠层图像与人工勾绘结果一致性较好(Q_{seg}均值为0.75，方差为0.08)，由此计算的冠层覆盖度与人工勾绘计算的冠层覆盖度相关性较高(R²=0.83，RMSE=5.36%)；（2）使用冠层高度模型估测的各小区水稻株高均值与田间实测高度均值相关性较高(R²=0.81，RMSE=9.81 cm)，但整体呈现低估；（3）基于地面图像使用决策树分类和形态参数过滤得到的穗数计数结果与实测穗数相关性较高(R²=0.83，RMSE=10.99)。总体而言，结合图像分析算法，应用低空无人机遥感技术高通量自动化估测水稻冠层覆盖度、株高的精度较高，而应用地面平台进行稻穗精确识别的潜力很大，可用于分析氮肥施用量对水稻长势指标的影响及不同品种对氮肥的响应情况，对田间水稻表型信息的深入挖掘及实际产量预测具有重要意义。

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GF_hcWAYh3EACaQKMyGcU743.pdf

8. 畜禽养殖废水处理技术动态与发展趋势

文献源: 农业环境科学学报,2021-10-18

摘要: 近年来, 畜禽养殖粪污的处理利用已经成为社会各界关注的焦点。本文着重从工程应用的角度, 分析了预处理、厌氧处理、沼液利用、沼液自然处理、好氧处理、厌氧-好氧组合处理、深度处理等工艺单元的技术研究与应用现状。

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGEhW6AXY1IABLHFb9gk6o861.pdf>

9. February orchid cover crop improves sustainability of cotton production systems in the Yellow River basin

文献源: Agronomy for Sustainable Development,2021-10-04

摘要: Cotton-winter fallow is the major cropping system of cotton in the Yellow River basin of China, which not only leads to a considerable waste of land and natural resources, but also high greenhouse emissions and a loss of reactive nitrogen. Replacing winter bare fallow in cotton production with February orchid as a cover crop is a new cropping system in this area, but its sustainability is still unknown. Therefore, a field experiment was conducted with two cropping systems (cotton-winter fallow and cotton-February orchid) under four nitrogen application rates (0, 112.5, 168.75, and 225 kg N ha⁻¹). Field observations were incorporated into a life cycle assessment to estimate the carbon footprint, nitrogen footprint, net ecosystem economic benefits, and economic benefits. The estimated carbon footprint per unit of sown area was 43.6–76.1% lower in the cotton-February orchid system than in the cotton-winter fallow system, mainly because of the increase in soil organic carbon. The cotton-February orchid system significantly increased the nitrogen footprint per unit of sown area by 6.7–11.5% under different application rates mainly because of the increase in N₂O emissions. The nitrogen application rate significantly impacted the carbon and nitrogen footprints. After accounting for changes in the nitrogen and carbon footprints, the cotton-February orchid system with 168.75 kg N ha⁻¹, which resulted in the highest net ecosystem economic benefits and economic benefits, resulted in a 25.0% reduction in nitrogen fertilizer applied and a 9.5% increase in net ecosystem economic benefits compared with the conventional cotton-winter fallow system and nitrogen fertilizer application rate (225.75 kg N ha⁻¹). Thus, adopting an integrated strategy combining February orchid as a cover crop and a reduced nitrogen fertilizer application contributes to improvements in green and sustainable cotton production systems in the Yellow River basin

and other regions with similar ecological conditions.

链接:

http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GF_i8CAOzqvACD3tjGvYM8903.pdf

10. 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 (2017-2019) 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/Csgk0GF_jpKAdxOLAB_kaMJ6Zrk146.pdf

【会议论文】

1. Analysis on the Development of Smart Logistics of Agricultural Products under Epidemic Situation

发布源: IEEE

发布时间: 2021-09-13

摘要: The sudden outbreak of COVID-19 has not only affected people's normal life, but also brought certain impact on logistics. People's demand for agricultural products suddenly increased in a short time, and agricultural products logistics didn't have time to respond. Many new problems have been exposed, because there are many intermediate links in agricultural products logistics, so on the basis of higher logistics cost, it also increases the problem that logistics cannot guarantee timely supply. In addition, the price of agricultural products is low, and the cost of advanced technology is high, so it is impossible to use modern technology to trace the source of agricultural products. During the epidemic period, because the severity of the epidemic varies from place to place, it is particularly important to trace the source of products at the same time, due to the sudden outbreak of the epidemic, it also brought challenges to emergency logistics, and the response of emergency logistics in various places was slow. However, the epidemic has brought difficulties to logistics and also created opportunities for the development of smart logistics. In order to avoid human contact, information registration systems have been adopted in various places, and unmanned driving, automatic warehousing, automatic distribution and logistics robots have been put into use, which has promoted the sharing of information by smart logistics using the Internet and the intelligentization of logistics operation process.

链接:

http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAmwCAFVX_AAmR2FbO5RM079.pdf

2. Revolutionizing Secure Commercialization In Agriculture Using Blockchain Technology

发布源: IEEE

发布时间: 2021-09-06

摘要: As a result of specific international products and agricultural product distribution, there is a greater emphasis on security , dependability , and the centralization of many required food and agricultural production standards. A growing number of food security problems and pollution threats has also generated a powerful need for an effective tracking solution to ensure the safety of products throughout the agricultural industry, using it as an instrument for quality management. The block-chain is an effective disruptive technology that offers a state -of-the-art solution for food production and marketing. Our intended response eliminates centralized power, intermediaries and records of performance , which

increases security and efficiency while retaining high integrity, reliability and safety . All is encrypted and saved with the distributed recording system connection to a non-removable block chain logger , which provides an exceptionally safe , reliable and economic level of disclosure and a cable supply system.

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAmUCAV9w2AHnJuBh1syY616.pdf>

3. Research on the Innovation of “Cloud Financing” Mode of Family Farm from the Perspective of Agricultural Industry Chain

发布源: IEEE

发布时间: 2021-08-09

摘要: —the characteristics of large-scale operation, specialization and marketization. It is the representative of the new agricultural mode in China's agricultural modernization reform. However, due to the lack of funds, the development of most family farms is restricted, and the financing channels are blocked, which is an important problem to be solved. Therefore, this paper puts forward an innovative research on the "cloud financing" mode of family farms from the perspective of agricultural industry chain. This paper makes an in-depth investigation on the main financing modes and main demands of family farms in China. According to the survey results, family farms have a large demand for modern agricultural machinery, and there is a large funding gap. However, the interest rate of existing financing channels is too high and the financing cost is too high. In view of this situation, this paper introduces "cloud financing" which has been widely used in recent years into family farms, and analyzes it from the perspective of agricultural industry chain. This paper believes that through the cloud financing mode, driven by the Internet and information technology, it can effectively integrate idle resources and establish network financing platform under the support of policies. This mode simplifies the operation mode of traditional financing mode, optimizes the structure of financing mode, and plays a positive role in promoting the development of the upper and lower industrial chain of family farms.

链接:

<http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAmbGAPjKOAARjoAzN1JA936.pdf>

【相关专利】

1. 无人飞行器、喷洒作业方法、套件及可读存储介质

发布源：中国专利

发布时间：2021-10-22

摘要：提供了一种无人飞行器、喷洒作业方法、套件及可读存储介质,其中无人飞行器,包括：机架(20)；喷洒组件(10),所述喷洒组件(10)包括液体驱动装置以及与所述液体驱动装置连通的喷头组件(100),所述喷头组件(10)中包括至少两个喷头(130),所述至少两个喷头(130)沿所述无人飞行器的俯仰轴方向排列,并且所述至少两个喷头(130)至少具有两种开启压力,控制器,用于控制所述液体驱动装置的工作速度,其中,所述控制器根据获取到的所述液体驱动装置的期望工作速度,控制所述液体驱动装置按照所述期望的工作速度进行工作,以调节所述无人飞行器的喷幅。无人飞行器利用不同液体液压实现开启不同数量的喷头,实现无人飞行器飞行过程中即可实现改变喷幅、流量。

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGAN0-AT5vhABWI3MYEf-k241.pdf>

2. 一种治理农田镉污染土壤的复合修复剂及修复方法

发布源：中国专利

发布时间：2021-10-22

摘要：本发明涉及土壤修复技术领域,具体公开一种治理农田镉污染土壤的复合修复剂及修复方法。所述复合修复剂包括质量比为100:(5-50):(1-50):(1-10):(1-10)的农牧业有机废弃物、腐植质、菌液、矿物质肥和络合剂；所述菌液由菌种浓度比为1:(1-6)的芽孢杆菌和固氮溶磷解钾菌组成。本发明的复合修复剂及修复方法可实现对农田土壤镉金属污染的生物修复、兼治土壤病害的双重目的,其修复效果好、费用低、易于管理与操作、不产生二次污染,具有很高的田间使用价值。

链接:

<http://agri.ckcest.cn/file1/M00/03/15/Csgk0WGANfqAXk0PAAxNKyKjBac680.pdf>

3. 农业上有利的微生物、微生物组合物以及聚生体

发布源：中国专利

发布时间：2021-10-22

摘要：本发明涉及经分离的微生物、微生物聚生体以及包含其的农业组合物,所述经分离的微生物包括新型微生物品系。此外,本公开教导在用于赋予目标植物物种有利特性的方法中使用所描述的微生物、微生物聚生体以及包含其农业组合物的方法。在具体方面中,本公开提供用于增加在农艺学上重要的作物物种中的理想植物特性的方法。

链接:

<http://agri.ckcest.cn/file1/M00/0F/E7/Csgk0GGAnI-AAJk9ALcBc4qJhJc270.pdf>

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