中国农业工程学会

《中文核心期刊要目总览》收录 Ei Compendex(核心版)收录 百种中国杰出学术期刊 RCCSE中国权威学术期刊









ISSN 1002-6819 CN 11-2047/S **CODEN NGOXEO** www.tcsae.org



NONGYE GONGCHENG XUEBAO

TRANSACTIONS OF THE CHINESE SOCIETY OF AGRICULTURAL ENGINEERING

2022年 第38卷VOL.38



农业工程学报

2022年9月第17期 (总第441期) 第38卷

目 次

· 农业装备工程与机械化 ·

联合整地机匀土旋平刀辊设计与试验刘尚坤,刘 超,张秀花,刘江涛,弋景刚,张晋国(1)
圆弧渐进式红花丝采收装置设计与试验 张振国, 邢振宇, 杨双平, 冯 宁, 梁荣庆, 赵敏义 (10)
水稻直播机气流式施肥监测系统设计与试验 曾 山,魏斯龙,廖明铭,曾 力,陈海波(22)
气送式油菜飞播装置投种过程分析与试验 黄小毛,张 顺,朱耀宗,刘 宇(31)
轴流螺旋滚筒式食用向日葵脱粒装置设计与试验 连国党, 魏鑫鑫, 马丽娜, 周国辉, 宗望远 (42)
油电混合机械液压式拖拉机动力系统节能性
・农业水土工程・
基于氮收支平衡的河套灌区春小麦农田灌溉和施氮策略 李 越,李根东,陈志君,张雪晨,黄冠华(61)
基于多元非线性空间建模的拉萨河流域沟蚀发生风险探测
李建军,陈玉兰,焦菊英,陈同德,陈一先,赵文婷,赵春敬,尚天赦,简金世,曹 雪(73)
饱和状态下黄绵土坡面细沟侵蚀可蚀性和临界剪切应力特征
麦田土壤水分时空变异特性及 CA-Markov 模型模拟预报
斯亚红,王 晶,郄志红,吴鑫淼,李秀梅,甄文超(91)
激光扫描和摄影测量在坡面侵蚀演变过程的适用性
罗 斌,张 勇,张志伟,倪世民,张 歆,王军光(101)
石漠化区露石岩-土界面流形成过程模拟试验曾 麻,彭旭东,戴全厚,刘婷婷,许胜兵,岑龙沛(110)
三峡库区典型流域水质时空特征及污染防控策略
李刚浩,范先鹏,夏 颖,刘宏斌,吴茂前,张富林,黄 敏,翟丽梅,周继文,孔祥琼,程子珍(118)
・农业信息与电气技术・
室内高通量种质资源表型平台研究进展与展望
·····································
基于无人机图像混合像元分解模型提高小麦基本苗数的反演精度
基于通道特征金字塔的田间葡萄实时语义分割方法 ······孙 俊,宫东见,姚坤杉,芦 兵,戴春霞,武小红(150)
多尺度分解双寻优策略 SPCNN 的果园苹果异源图像融合模型
多八及分解双寸
基于改进 YOLOv5 的复杂跨域场景下的猪个体识别与计数宁远霖,杨 颖,李振波,吴 潇,张 倩 (168)
利用改进 Faster-RCNN 识别小麦条锈病和黄矮病

基于 JDE 模型的群养生猪多目标跟踪	·涂淑琴	,黄	磊,	梁 云	,黄.	正鑫,	李承桀,	刘晓龙	(186)
基于改进 MobileNetV3-Large 的鸡蛋新鲜度识别模型									
	·刘雪	,沈十	长盈,	吕学泽	,董	萌萍,	包乾辉,	张圆之	(196)
·农业生物环境与能源工程·									
生物转化玉米浆生产生物菌肥的共生发酵特性									
任晓洁,	班恒	,贺丬	壮壮 ,	王晓龙	., 赵	玉斌,	宋元达,	赵新河	(205)
反光膜对舍内温热环境及青年奶牛血液生化指标的影响									
赵俐辰,赵心念,	冯 曼	,宋i	连杰,	王亚男	, 李	永亮,	郭建军,	高玉红	(214)
寒区降解多环芳烃耐冷菌株的分离鉴定及特性									
				·孙 棹	,朱	广雷,	杨安培,	王思铭	(224)
旱区光伏组件疏水性表面自清洁研究与参数优选									
实验室条件下不同盐度水体去分层试验									
冰雹冲击下塑料薄膜的损伤分析				·朱自强	, 赵	洪志,	蔡沅冶,	曲 嘉	(246)
・土地保障与生态安全・									
生态安全格局视角下村庄用地减量地块识别与分区									
	·冯惠懿	,赵	泰 江,	唐文正	. , 唐	秀美,	孙宁,	乔晓东	(254)
基于地貌分区的河北省近10年耕地时空变化分析				·黄旭红	- , 杨	俊泉,	陈东磊,	张 静	(264)
目标差异化导向下南方丘陵地区农村居民点空间重构 …				·邹起鑫	, 张	安录,	赵 可,	熊燕飞	(273)
"人-地-产"关联视角下乡村绅士化的影响效应		…程	研,	齐元静	+, 于	露,	王锦宇,	刘羽鸽	(284)
・农产品加工工程・									
基于改进 MSVR 的鲜食葡萄运输过程中环境因子与感官	品质建	模							
		…冯3	建英,	贺 苗	i, 李	鑫,	朱志强,	穆维松	(294)
茶多酚对淀粉酯纳米颗粒及其稳定的 Pickering 乳液性质	〔的影响								
					王	然,	钟玉珍,	张丽红	(303)
基于动力学模型的高油大豆储藏期间品质指标变化规律									
		…张.	玉荣,	倪浩然	、吴	琼,	张咚咚,	寇含笑	(311)
利用低场核磁共振分析蓝莓贮藏过程中水分含量及迁移	变化								
	·陈 毅	,顾	莹,	宋 平	- , 杨	磊,	杜明波,	姜凤利	(321)
基于改进 YOLOv5 的茶叶杂质检测算法									
		• • • • • •		• • • • • • • • • • • • • • • • • • • •	• • • • • •		黄少华,	梁喜凤	(329)

致谢:感谢西北农林科技大学焦菊英团队提供的封面图片"拉萨河畔农田航拍图"。

Transactions of the Chinese Society of Agricultural Engineering Vol.38 No.17 (Total No.441) Sept. 2022 CONTENTS

• Agricultural Equipment Engineering and Mechanization •

Design and tests of the soil moving and leveling blade roller for combined tilling machines
Liu Shangkun, Liu Chao, Zhang Xiuhua, Liu Jiangtao, Yi Jinggang, Zhang Jinguo (1)
Design and experiments of the circular arc progressive type harvester for the safflower filaments
Zhang Zhenguo, Xing Zhenyu, Yang Shuangping, Feng Ning, Liang Rongqing, Zhao Minyi (10)
Design and experiments of the airflow type fertilizer application monitoring system for rice direct seeders
Zeng Shan, Wei Silong, Liao Mingming, Zeng Li, Chen Haibo (22)
Seeding process analysis and test of the air conveying rapeseed aerial seeding device
Design and experiments of the axial-flow spiral drum threshing device for the edible sunflower
Lian Guodang, Wei Xinxin, Ma Lina, Zhou Guohui, Zong Wangyuan (42)
Energy saving characteristics of the mechanical hydraulic tractor power system with oil electric hybrid power
• Soil and Water Engineering •
Irrigation and N application strategies for spring wheat fields in the Hetao irrigation district based on N balance
Li Yue, Li Gendong, Chen Zhijun, Zhang Xuechen, Huang Guanhua (61)
Detecting gully occurrence risks using multivariate nonlinear spatial modeling in the Lhasa River Basin of China
Li Jianjun, Chen Yulan, Jiao Juying, Chen Tongde, Chen Yixian, Zhao Wenting
Zhao Chunjing, Shang Tianshe, Jian Jinshi, Cao Xue (73)
Characteristics of soil erodibility parameter and critical shear stress on saturated loess soil slope
······ Huang Yuhan, Yang Mengge, Lei Tingwu, Li Fahu, Wang Wei (83)

Spatial-temporal variation of soil moisture in wheat field and simulation prediction using CA-Markov model
Jin Yahong, Wang Jing, Qie Zhihong, Wu Xinmiao, Li Xiumei, Zhen Wenchao (91)
Application of laser scanning and photogrammetry in the evolution process of slope erosion
Luo Bin, Zhang Yong, Zhang Zhiwei, Ni Shimin, Zhang Xin, Wang Junguang (101)
Simulation test on the formation of rock-soil interface flow from outcrops in the rocky desertification areas
Zeng Xiu, Peng Xudong, Dai Quanhou, Liu Tingting, Xu Shengbing, Cen Longpei (110)
Spatio-temporal characteristics of water quality and pollution prevention strategies in typical watersheds in the Three Gorges
reservoir areas ······ Li Ganghao, Fan Xianpeng, Xia Ying, Liu Hongbin, Wu Maoqian, Zhang Fulin,
Huang Min, Zhai Limei, Zhou Jiwen, Kong Xiangqiong, Cheng Zizhen (118)
• Agricultural Information and Electrical Technologies •
Research progress and prospect of indoor high-throughput germplasm phenotyping platforms
He Yong, Li Xiyao, Yang Guofeng, Yu Zeyu, Yang Ningyuan, Feng Xuping, Xu Lijia (127)
Improving the accuracy of wheat basic seedling number inversion based on the mixed pixel decomposition model for remote
sensing image of drone · · · · · Du Mengmeng, Li Minzan, Ji Jiangtao, Ali Roshanianfard (142)
Real-time semantic segmentation method for field grapes based on channel feature pyramid
Sun Jun, Gong Dongjian, Yao Kunshan, Lu Bing, Dai Chunxia, Wu Xiaohong (150)
Heterologous image fusion with multi-scale decomposition and dual optimization SPCNN in an apple orchard
Liu Liqun, Gu Renyuan, Zhou Yubo, Huo Jiuyuan (158)
Detecting and counting pig number using improved YOLOv5 in complex scenes
Recognizing stripe rust and yellow dwarf of wheat using improved Faster-RCNN
Multiple object tracking of group-housed pigs based on JDE model
Tu Shuqin, Huang Lei, Liang Yun, Huang Zhengxin, Li Chengjie, Liu Xiaolong (186)
Recognizing egg freshness using an improved MobileNetV3-Large
Liu Xue, Shen Changying, Lyu Xueze, Dong Mengping, Bao Qianhui, Zhang Yuanzhi (196)

• Agricultural Bioenvironmental and Energy Engineering •

Symbiotic fermentation characteristics of biotransformed maize pulp for biofertilizer production
Effects of reflective film on the thermal environment in shed and blood biochemical parameter of growing dairy cows
······ Zhao Lichen, Zhao Xinnian, Feng Man, Song Lianjie, Wang Yanan, Li Yongliang, Guo Jianjun, Gao Yuhong (214)
Isolation, identification and characterization of cold resistance and PAHs-degrading bacteria
Sun Nan, Zhu Guanglei, Yang Anpei, Wang Siming (224)
Hydrophobic surface self-cleaning investigation and parameter selection of PV modules in arid areas
Zhang Dong, Yu Kai, Yan Chengtao, Liu Chang, Shen Yongqian, An Zhoujian (232)
Effects of different salinity on water delamination under laboratory conditions
Zhang Kun, Han Yuning, Li Lezhou, Zhou Wei (240)
Damage analysis of plastic film under hail impact······ Zhu Ziqiang, Zhao Hongzhi, Cai Yuanye, Qu Jia (246)
• Land Security and Ecological Safety •
Recognition and zoning of the reduced plot of village land from the perspective of ecological security pattern
Feng Huiyi, Zhao Chunjiang, Tang Wenzheng, Tang Xiumei, Sun Ning, Qiao Xiaodong (254)
Spatio-temporal variation of cultivated land in Hebei Province of China using geomorphic regionalization during 2009-2018
Spatial reconstruction of rural settlements in the hilly areas of southern China under the guidance of target differentiation
Zou Qixin, Zhang Anlu, Zhao Ke, Xiong Yanfei (273)
Impact of rural gentrification from the perspective of population-land-industry integration
• Agricultural Produce Processing Engineering •
Modeling of environmental factors and sensory quality during transportation of table grapes using improved MSVR
······Feng Jianying, He Miao, Li Xin, Zhu Zhiqiang, Mu Weisong (294)

Effects of tea polyphenols on the properties of starch ester nanoparticles and their stabilized Pickering emulsions
Change law in quality indicators of high oil soybean during storage based on kinetic model
Zhang Yurong, Ni Haoran ,Wu Qiong, Zhang Dongdong, Kou Hanxiao (311)
Analysis of the moisture content and migration changes of blueberries during storage by low-field nuclear magnetic resonance
Detecting the impurities in tea using an improved YOLOv5 model
······································