

JOURNAL OF CHINESE AGRICULTURAL MECHANIZATION

中国农机化学报

中国农业核心期刊

中华人民共和国农业部主管
农业部南京农业机械化研究所主办



ISSN 2095-5553



9 772095 555161

万方数据

2016 4
第37卷 总第266期

目 次

农业装备工程研究

1SZL—250A 型深松旋耕施肥联合整地机的设计与试验	孙冬霞, 张爱民, 宫建勋, 等 (1)
电动旋耕培土机的设计研究	毛鹏军, 张松泓, 丁月华, 等 (7)
仿生推土板工作阻力研究	郭志军, 张阳, 倪利伟, 等 (11)
基于 EDEM 离散元法的深松铲仿真与试验研究	邓佳玉, 胡军, 李庆达, 等 (14)
VP6 型水稻插秧机作业质量试验研究	辛明金, 邬立岩, 宋玉秋, 等 (19)
一种播种株距无级调节装置	宋井玲, 徐恩斌, 崔志超, 等 (24)
甜菜收获工艺及挖松位置的研究	王方艳 (27)
两级升运链卷轴式残膜捡拾机的设计与试验	程兴田, 赵建托, 潘卫云, 等 (31)
新型高效深施肥作业机结构设计	芦新春, 陈书法, 杨进, 等 (35)
基于高速摄像技术微型土槽试验台的研制	潘世强, 操子夫, 贾云艳, 等 (39)
二维凹坑型非光滑单元体深度对减阻性能的影响分析	张靖龙, 谢金法, 李洋洋 (44)
分离指加强筋对膜片弹簧性能影响的仿真研究	薄小斌, 张晓东, 张瑞亮, 等 (49)

设施农业与植保机械工程研究

自走式果园风送喷雾机的研制	丁素明, 薛新宇, 张玲, 等 (54)
基于物联网和 Android 的智能植物生长柜视频监控系统设计	梁帆, 谢佳佳, 崔世钢 (59)
基于模糊神经网络的温室温湿度智能控制系统研究	吴晓强, 黄云战, 赵永杰 (63)
基于 CAN 总线的分布式农业温室控制系统设计	高祥, 居锦武, 蒋励, 等 (67)
农业温室大棚智能环境监测系统设计	郭鹏, 马建辉 (71)
基于 ZigBee 无线传感器网络的植物工厂环境调控系统	孙士尉, 刘暉, 刘海波, 等 (74)
民用除湿机在东北地区秋季日光温室的除湿应用研究	王春野, 袁月明, 刘海枝, 等 (79)
基于奶牛精确养殖技术装备的牛场信息管理系统设计	李亚萍, 蒙贺伟, 高振江, 等 (85)
基于 FPGA 的鸡舍环境监控系统	刘艳昌, 左现刚, 李武举, 等 (91)

中国农机化学报

(1957 年创刊)

2016 年第 4 期 第 37 卷 总第 266 期

月刊, 2016 年 4 月 15 日

Journal of Chinese Agricultural Mechanization

(Started in 1957)

Vol. 37 No. 4 2016 Total 266

Monthly, Published in Apr. 15, 2016

主 管 中华人民共和国农业部
主 办 农业部南京农业机械化研究所
社 长 王利民
主 编 陈巧敏
出 版 中国农机化杂志社
编 辑 《中国农机化学报》编辑部
(南京市柳营 100 号, 210014)
电 话: 025-84346270, 84346296
传 真: 025-84346271
电子信箱: jcam@vip. 163. com
印 刷 南京四彩印刷有限公司
国内订阅 全国各地邮局
国外发行 中国国际图书贸易集团公司
(北京 399 信箱)

Responsible Department: Ministry of Agriculture of the PRC
Sponsored by: Nanjing Research Institute for Agriculture Mechanization
President of Magazine Office: Wang Limin
Editor in Chief: Chen Qiaomin
Published by: Chinese Agricultural Mechanization Magazine Office
Edited by: Journal of Chinese Agricultural Mechanization editorial office
(No. 100 Liuying, Nanjing, 210014, China)
Tel: 025-84346270, 84346296
Fax: 025-84346271
E-mail: jcam@vip. 163. com
Printed by: Nanjing Sicai Printing Co., LTD
Subscribed by: All local Post Offices in China
Issued abroad: China International Book Trading Group
(P. O. Box 399, Beijing, China)

中国标准连续出版物号: ISSN 2095-5553
CN 32-1837/S

国内邮发代号: 28-116 国外发行代号: BM5576 国内定价: 60 元

农产品加工工程研究

- | | | |
|-------------------------------|---------------|-------|
| 摩擦式胡椒鲜果脱皮装置的设计与试验分析 | 张园,李明福,李玉林,等 | (96) |
| 核桃破壳取仁生产线的设计与试验 | 王维,贺功民,王亚妮,等 | (100) |
| 秸秆粉碎机实际生产效能改进研究 | 车战斌,乔胜 | (104) |
| 钉齿式玉米秸秆饲草化装置的设计与试验分析 | 郭颖杰,贾东伟,董良杰 | (107) |
| 基于 BP 神经网络的烟叶颜色自动分级研究 | 顾金梅,吴雪梅,龙曾宇,等 | (110) |
| 5GDZ1500 钢带式干燥设备均风装置风速场数值仿真分析 | 丁立利,李晓康,段宗科,等 | (115) |
| 基于单片机的分布式果品贮藏远程监控系统 | 王超 | (120) |

车辆与动力工程研究

- | | | |
|--------------------------------|---------------|-------|
| 轮毂电机驱动电动汽车再生制动控制策略 | 刘阳,谢金法 | (125) |
| NH1500 叶片加装 Gurney 襟翼的气动性能数值模拟 | 王利华,张春友 | (130) |
| 拖拉机液压提升能力试验研究 | 畅雄勃 | (134) |
| F-T 柴油引燃甲醇均质混合气的 HCII 燃烧特性研究 | 孙秀全,王铁,曹贻森,等 | (137) |
| 转子偏心对高速电主轴机电耦合动力学特性的影响 | 邬再新,张亚军,王保民,等 | (143) |
| 受载子午线轮胎的模态分析 | 马心坦,蔡琼阳 | (148) |
| 基于 BOOST 的农用生物柴油发动机性能仿真研究 | 侯军兴,马鹏,刘建伟,等 | (152) |
| 4DW93 柴油机表面辐射噪声仿真研究 | 赵业森,曹晓辉,郭晨海,等 | (156) |
| 酸化油生物柴油喷雾碰壁实验研究 | 刘建新,鲍贯阳,杜慧勇,等 | (161) |
| 混合动力镍氢电池荷电状态估计 | 汪伟,贝绍铁,汪永志,等 | (166) |
| 船用柴油/LNG 双燃料发动机控制系统设计与推进特性试验研究 | 李捷辉,刘大为,毛功平,等 | (170) |
| 基于 AVL FIRE 对柴油机微粒捕集器捕集过程的模拟研究 | 张俊超,杜家益,张旭东,等 | (176) |
| 基于地头转弯工况的拖拉机自动换挡规律研究 | 符冉,周志立,郭志强,等 | (181) |
| 平模固体燃料成型机的结构改进和性能分析 | 王彬,蒋素清,周进 | (185) |

农业电气化与信息化工程研究

- | | | |
|-------------------------------|--------------|-------|
| 基于动力学特性的机器人自适应鲁棒控制算法研究 | 朱龙英,赫建立,苏磊,等 | (190) |
| 变量施肥机下位机控制系统的设计 | 张家华,张立新,李振,等 | (196) |
| 基于 Android 的高效节水灌溉远程监控系统设计及实现 | 金永奎,袁圆,颜爱忠 | (202) |
| 基于遗传算法的棉花成熟度判别研究 | 张豪,郭辉,韩长杰,等 | (207) |
| 基于故障树分析的增氧机控制系统可靠性动态风险评价 | 马从国,赵德安,王建国 | (211) |
| 农业机械用独立光伏逆变器的设计与实现 | 张兰红,黄同越,王忠军 | (217) |
| 一种机械手用触觉传感器设计及仿真分析 | 张兴国,李成浩,张磊,等 | (222) |
| 基于嵌入式 Linux 的农产品物流智能追溯系统设计 | 邓明华,葛蓁,熊琼,等 | (228) |

农业生物系统与能源工程研究

- | | | |
|--------------------------|----------------|-------|
| 大数据处理技术在土壤肥力评价中的研究 | 杨玉琴,陈桂芬,郭宏亮,等 | (233) |
| 农村地区冷气循环控制系统设计 | 张探骊,王立地 | (237) |
| 风力发电机组性能测试中风速有效扇区计算方法的研究 | 包道日娜,霍亚楠,张晓阳,等 | (241) |
| 基于 WSN 的低功耗湿地土壤监测系统设计 | 苗凤娟,吴凌斌,陶佰睿,等 | (246) |
| 固态发酵过程电子鼻系统传感器阵列优化研究 | 束栋鑫,杨铭,梅从立,等 | (249) |
| 针对含噪暂态电能质量扰动信号的检测方法研究 | 程号楠,陈春玲,王建东,等 | (254) |
| 不同缺水量对作物生理指标的影响研究 | 邱兆美,赵龙,毛鹏军,等 | (260) |
| 土壤机械阻力连续测量系统设计 | 赵占军,郭辉,杨宛章,等 | (264) |

农业机械化综合研究

- | | | |
|---------------------------|--------------|-------|
| 基于 PSO-BP 算法的农业机械数据预测分析研究 | 邓涛,黄希光 | (269) |
| 贵州省烟叶生产机械化发展模式研究及应用 | 张炜,文斌,张富贵,等 | (274) |
| 县域农技推广区域站长选拔案例研究 | 郭晶,郑佩佩,袁伟民,等 | (279) |

责任编辑 凌小燕 杨建平 乔璐 朱冰

Contents

Research on Agriculture Mechanization and Equipment Engineering

Design and experiment on 1SXL—250A type sub soiling rotary tillage fertilizer combined soil working machine	Sun Dongxia, Zhang Aimin, Gong Jianxun, et al	(1)
Design and research on electric rotary hillers	Mao Pengjun, Zhang Songhong, Ding Yuehua, et al	(7)
Study on soil resistance of bionic bulldozing plates	Guo Zhijun, Zhang Yang , Ni Liwei, et al	(11)
Simulation and experimental study on the subsoiler based on EDEM discrete element method	Deng Jiayu, Hu Jun, Li Qingda, et al	(14)
Experimental study on work quality of VP6 rice transplanter	Xin Mingjin, Wu Liyan, Song Yuqiu, et al	(19)
Device of stepless adjusting seed spacing for seeder	Song Jingling, Xu Enbin, Cui Zhichao, et al	(24)
Research on harvesting process and digging location for sugar beet	Wang Fangyan	(27)
Design and experiments of two elevator chain reel plastic film collector	Cheng Xingtian,Zhao Jiantuo,Pan Weiyun, et al	(31)
Structural design on new deep-fertilization machine with high efficiency	Lu Xinchun, Chen Shufa, Yang Jin, et al	(35)
Development of micro soil bin based on the high-speed video technology	Pan Shiqiang, Cao Zifu, Jia Yunyan, et al	(39)
Influence analysis of 2D dimple concave non-smooth units' depth on drag-reduction performance	Zhang Jinglong, Xie Jinfa, Li Yangyang	(44)
Simulation research on the effect of stiffeners on the performance of diaphragm spring	Bo Xiaobin, Zhang Xiaodong, Zhang Ruiliang, et al	(49)

Research on Facilities Agriculture and Plant Protection Machinery Engineering

Design on self-propelled air-blowing orchard sprayer	Ding Suming, Xue Xinyu, Zhang Ling, et al	(54)
Design on video monitoring system of smart plant growth cabinet based on Internet of things and Android platform	Liang Fan, Xie Jiajia, Cui Shigang	(59)
Research on control system of greenhouse temperature and humidity based on fuzzy neural network	Wu Xiaoqiang, Huang Yunzhan, Zhao Yongjie	(63)
Design on distributed agricultural greenhouse control system based on CAN bus	Gao Xiang, Ju Jinwu, Jiang Mai, et al	(67)
Design on intelligent environment monitoring system of agricultural greenhouse	Guo Peng, Ma Jianhui	(71)
Plant factory environment control system based on ZigBee wireless sensor network	Sun Shiwei, Liu Wei, Liu Haibo, et al	(74)
Applied study on civilian dehumidifier for greenhouse in autumn of the northeast area	Wang Chunye, Yuan yueming, Liu Haizhi, et al	(79)
Design information management system on cattle ranch based on the equipment of accurate feeding on cows	Li Yaping, Meng Hewei, Gao Zhenjiang, et al	(85)
Henhouse environmental monitoring system based on FPGA	Liu Yanchang, Zuo Xiangang, Li Wuju, et al	(91)

Research on Agricultural Products Processing

Design and experimental analysis of the friction type pepper fruit peeling device	Zhang Yuan, Li Mingfu, Li Yulin, et al	(96)
Design and experiment on walnut broken and shell kernel separation production line	Wang Wei, He Gongmin, Wang Yani, et al	(100)
Research on improvement in actual production performance of biomass straw mill	Che Zhangbin, Qiao Sheng	(104)
Design and test analysis on spiked maize straw pulverization device	Guo Yingjie, Ben Dongwei,Dong Liangjie	(107)
Automatic classification research on tobacco leaf color based on BP neural network	Gu Jinmei, Wu Xuemei, Long Cengyu, et al	(110)
Numerical simulation analysis on the velocity field in wind guide device for 5GDZ1500 steel-belt drying equipment	Ding Lili, Li Xiaokang, Duan Zongke, et al	(115)
Remote distributed monitoring and control system of fruit storage based on single chip microcomputer	Wang Chao	(120)

Research on Vehicle and Power Engineering

Regenerative braking control strategy for hub-motor-driven electric vehicle	Liu Yang, Xie Jinfa	(125)
Numerical simulation of the aerodynamic performance of the NH1500 blade equipped with Gurney flap	Wang Lihua, Zhang Chunyou	(130)
Research on hydraulic lifting capacity test for agricultural tractor	Chang Xiongbo	(134)

IV

- Study on combustion characteristics of methanol homogeneous charge induced ignition for F-T diesel engine Sun Xiuquan, Wang Tie, Cao Yisen, et al (137)
- Influence eccentricity of the rotor makes on the electromechanical coupled dynamical characteristics of high speed motorized spindle Wu Zaixin, Zhang Yajun, Wang Baomin, et al (143)
- Modal analysis of loading radial tire Ma Xintan, Cai Qiongyang (148)
- Simulation research on performance of agricultural biodiesel engine based on BOOST Hou Junxing, Ma Peng, Liu Jianwei, et al (152)
- Simulation study on surface radiation noise of 4DW93 diesel engine Zhao Yemiao, Cao Xiaohui, Guo Chenhai, et al (156)
- Experimental study on spray and impingement characteristics of acidic oil biodiesel Liu Jianxin, Bao Guanyang, Du Huiyong, et al (161)
- Battery state of charge estimation of Ni/MH battery based on UKS algorithm Wang Wei, Bei Shaoyi, Wang Yongzhi, et al (166)
- Design and investigation of diesel/LNG dual-fuel engine control system in ship Li Jiehui, Liu Dawei, Mao Gongping, et al (170)
- Simulation on filtration process of diesel particulate filter based on AVL FIRE Zhang Junchao, Du Jiayi, Zhang Xudong, et al (176)
- Research on automatic shift schedule of tractor based on turn-row Fu Ran, Zhou Zhili, Guo Zhiqiang, et al (181)
- Structure improvement and performance analysis of plat mold solid fuel forming machine Wang Bin, Jiang Suqing, Zhou Jin (185)

Research on Agricultural Electrification and Informationization Engineering

- Research on adaptive robust control algorithm based on dynamic characteristic of robot Zhu Longying, He Jianli, Su Lei, et al (190)
- Design on lower computer control system of variable rate fertilizer applicator Zhang Jiahua, Zhang Lixin, Li Zhen, et al (196)
- Design and implement of remote monitoring system for efficient water-saving irrigation based on Android Jin Yongkui, Yuan Yuan, Yan Aizhong (202)
- Study on discrimination for maturity of cotton based on genetic algorithm Zhang Hao, Guo Hui, Han Changjie, et al (207)
- Dynamic risk evaluation for the reliability of aerator control system based on FTA Ma Congguo, Zhao De'an, Wang Jianguo (211)
- Design and implementation of an independent photovoltaic inverter used in agricultural machinery Zhang Lanrong, Huang Tongyue, Wang Zhongjun (217)
- Design and simulation analysis on a tactile sensor for grasping manipulator Zhang Xingguo, Li Chenghao, Zhang Lei, et al (222)
- Design on logistics intelligent traceability system of agricultural products based on embedded Linux Deng Minghua, Ge Zhen, Xiong Qiong, et al (228)

Research on Agricultural Biological System and Energy Engineering

- Study on big data processing techniques in evaluation of soil fertility Yang Yuqin, Chen Guifen, Guo Hongliang, et al (233)
- Design on cooling cycle system in rural areas Zhang Tanli, Wang Lidi (237)
- Research on calculation methods of wind valid sector in wind turbine performance tests Bao Daorina, Huo Yanan, Zhang Xiaoyang, et al (241)
- Design of a low-power wetland soil environmental monitoring system based on WSN Miao Fengjuan, Wu Lingbin, Tao Bairui, et al (246)
- E-nose array optimization for monitoring straw solid-state fermentation Shu Dongxin, Yang Ming, Mei Congli, et al (249)
- Research on detection method of noisy transient power quality disturbance signal Cheng Haonan, Chen Chunling, Wang Jiandong, et al (254)
- Study on effects of different various water shortage for crop physiological indices Qiu Zhaomei, Zhao Long, Mao Pengjun, et al (260)
- Design on continuous measurement of soil mechanical resistance Zhao Zhanjun, Guo Hui, Yang Wanzhang, et al (264)

Comprehensive Research

- Research on prediction of agricultural machinery data based on PSO-BP algorithm Deng Tao, Huang Xiguang (269)
- Development mode research and application of tobacco mechanized production in Guizhou Province Zhang Wei, Wen Bin, Zhang Fugui, et al (274)
- Case study on selection for leadership of agro-technique extension in regional stations Guo Jing, Zheng Peipei, Yuan Weimin, et al (279)

The duty editor Ling Xiaoyan Yang Jianping Qiao Lu Zhu Bing

- 中华人民共和国农业部主管
- 中国农业机械化行业年鉴
- 发布农业机械化数据的平台
- 了解中国农业机械化的窗口



《中国农业机械化年鉴》

《中国农业机械化年鉴》是农业部主管、农业部南京农业机械化研究所主办的我国农业机械化行业年鉴。出版宗旨为记录农机化发展历史,传承农机化文化精髓,博采农机化研究成果,推动农机化快速发展。编辑定位为成就纪实、发展研究、行业导向、数据参考、决策依据、工作借鉴、市场指南。体现盛世修志、传承文明,携手奋进、共创未来的办刊理念。

《中国农业机械化年鉴》自创刊以来逐年客观地反映我国农机化发展现状,拓展农机化视野,承担中央与地方农机化信息沟通、数据传递的桥梁与平台,有效地向基层传达党和国家关于农机化的方针政策,及时地向中央反馈地方农机化的发展信息,展现权威性、综合性、科学性、指南性、文献性、数据性和史料性等办刊特色。《中国农业机械化年鉴》正式发布权威的农业机械化数据,有助于各地借鉴农机化发展经验,把握农机化发展规律,掌握农机化发展数据,制定农机化发展规划,是各级农机化管理(业务)部门必备的工具书。

2015 年版《中国农业机械化年鉴》自 2015 年 12 月开始发行,每册定价 320 元,欢迎有关单位组织订阅。另外,年鉴编辑部尚有部分自 2005 年创刊以来的各版年鉴,有需求者欢迎征订。

编辑部地址:南京市柳营 100 号

邮编:210014

电话:025-84346296 84346270

传真:025-84346271

E-mail:zgnyjxhnj@163.com

《中国农业机械化年鉴》编辑部