

中国农机化学报

全国中文核心期刊 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 555147

万方数据

07>



2014 4

第35卷 总第254期

目 次

关于“十三五”我国农业机械化发展的思考	白人朴(1)
农业机械化与装备工程研究	
气吹式大豆精量播种机的设计	张维, 王佳(6)
基于 ADAMS 油菜播种机排种器型孔形状对破碎率的影响	黄明, 张建, 肖洁(9)
2BC—1.2 型山地牧草播种机设计与试验	戴立勋, 赵春花, 陈凯(12)
甘薯苗开穴注水移栽机的研制与试验	王彩贤(17)
2YZS 式移栽机平衡仪设计	王俊豪, 王晔(22)
梳刷式微型小麦联合收割机的设计	耿令新, 李广伦, 张利娟, 等(25)
5TG—70 型水稻脱粒清选机的设计	林宇钢, 张加清, 王刚, 等(29)
玉米联合收获机立式摘穗切碎装置的试验研究	向丹(32)
基于 Workbench 的甘蔗叶粉碎机刀辊模态分析	杨喜, 王金丽, 郭昌进, 等(36)
统收式机采棉预清理装置研究现状	黄铭森, 石磊, 袁建宁, 等(40)
核桃采摘机中偏心块结构设计优化	郑甲红, 刘梦飞, 高警(44)
蒲草收割船割台的设计	金金, 王泽河, 姜海勇, 等(48)
钉刺式残膜回收机的设计及试验研究	靳伟, 张学军, 李超新(52)
小型手扶自走式有机肥撒施机的设计	田耘, 赵亚祥, 潘世强等(55)
双季稻北缘区早稻机插适宜行距的研究	吴文革, 陈刚, 许有尊, 等(59)
我国花生起收机概念与结构特点分析	高连兴, 刘维维, 刘志侠, 等(63)
稻茬田小麦种植不同耕作方式的比较与分析	程玉龙, 张礼钢, 翟步顺, 等(69)
半干旱山区秋覆膜马铃薯生产机械化技术模式初探	王文智, 谭静, 朱玉德(73)
基于形状特征的棉花成熟度判别方法	时颢, 赖惠成, 汪烈军, 等(77)
木薯杆力学特性沿茎秆分布规律的研究	黄正明, 李玲, 薛忠, 等(82)
吉林西部罗布麻驯化栽培方法研究	丛建民, 韩国君, 陈凤清(88)
成都平原油菜直播关键农艺措施对油菜产量的影响	代昌富, 董娅, 姜心禄, 等(92)
水田激光平地机水平控制系统的研究进展	陈君梅, 赵祚喜(98)
离心轴流复合式新型潜水泵的研制	咸丽, 牟国良, 梁龙辉(103)
基于遗传算法的叶轮的优化设计	朱宁帅, 刘元义(107)
水泵性能曲线拟合研究	梁山城, 夏培松(111)
自卸车液压举升系统可控性与可观性研究	翟正银, 崔俊杰, 李红梅, 等(114)
推土机 W 型铲刀的设计研究	季有昌, 侯文军, 金丹, 等(117)
基于云计算的起重机械开发服务系统研究	邹建华(122)
基于 Deform—3D 的钛合金车削温度的有限元研究	何志祥, 胡亚辉, 尹成君(124)
设施农业与植保机械工程研究	
圆锥雾喷头静电电极优化设计与试验	张玲, 薛新宇, 孙竹, 等(128)
卷盘式喷灌机液压驱动系统设计	佟哲, 韩智雷, 李伟, 等(132)
恒压控制在喷灌系统中的应用	邱明权, 李伟, 邱志鹏, 等(135)

中国农机化学报

(1957 年创刊)

2014 年第 4 期 第 35 卷 总第 254 期
双月刊, 2014 年 7 月 25 日

Journal of Chinese Agricultural Mechanization

(Started in 1957)

Vol. 35 No.4 2014 Total 254
Bimonthly, Published in Jul. 25, 2014

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 曹曙明
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: Cao Shuming
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: 40 元

臭氧在设施农业及畜禽舍的应用研究	柴新君, 马俊贵(140)
车辆与动力工程研究	
实现农用柴油机 p-HCCI 清洁燃烧的柱塞式两次喷油泵的原理与结构	邓飞中(143)
可变增压器分段式膜片-弹簧控制器设计	黄永荣, 王航(148)
多工况下气缸套温度场及耦合变形仿真分析	卢鹏, 张翼, 郑伟茂, 等(152)
低温等离子体协同催化技术降低柴油机 NO _x 和碳烟	胡明江, 赵丽霞(157)
基于 TRIZ 理论的农用车座椅减振结构设计	赵鹏睿(161)
农产品加工工程研究	
自然生长状态下库尔勒香梨采摘期评价方法研究	兰海鹏, 唐玉荣, 王伟, 等(165)
基于 Kinect 视觉系统的西红柿自动识别与定位	董建民, 陈伟海, 岳昊嵩, 等(169)
蓝莓深加工的研究进展	李丽敏, 吴林(174)
农业生物系统与能源工程研究	
秸秆综合利用模式效益分析	何勋, 张志鹏, 史景钊, 等(180)
生物质双循环流化床质量循环率冷态实验研究	李松, 范晓旭, 郭冬彦, 等(184)
挟风沙作用下风力发电机叶片涂层冲刷过程腐蚀评价研究及实验平台设计	杜嘉楠, 韩宝生, 张永, 等(187)
农业电气化与信息化工程研究	
基于改进广义回归神经网络玉米田中无线传感器网络信号路径衰减预测	潘贺, 李太浩(191)
基于 Zigbee 蔬菜大棚温湿度远程监控系统的研究设计	侯卫平, 钟亦丽, 包君(196)
基于 S3C2440 的粮库温湿度自动控制系统	李士军, 吴巨鑫, 温竹等(199)
冬枣恒温库无线监测系统设计	刘暉, 李爱宁, 孙士尉, 等(203)
基于 JN5168 的温室监控系统设计	卜艳茹, 程海, 翟淑霞, 等(208)
基于单片机技术的温室温度测控系统的设计	李伟(212)
基于 VACA 的智能温控系统的 PID 参数优化	徐秀芬(214)
基于 RS485/Modbus 皮带跑偏检测传感网络的研究与实现	朱亮, 李东波, 李妍, 等(217)
基于 PLC 的养殖场气体标本采集系统的设计	陈煦, 高蒙蒙, 蔡振江, 等(221)
基于 QoS 智能控制系统的无线传感器农业物联网平台设计研究	战忠丽, 王强, 刘志刚(224)
基于 PLC 的双轴工作台控制与实现	杨海波, 杨新春, 李金热, 等(228)
基于 PID 算法双变量液压调速系统设计研究与试验	吴金林, 张立新, 喻俊志, 等(232)
光透射式孔隙度测量系统的研制与试验	黄伟锋, 程建兴, 吴卓葵, 等(238)
一种小型化智能农业管理系统的设计	张安然(242)
遗传算法与蚁群算法的改进融合	陈亚云, 韩文涛, 崔鹤平(246)
基于蚁群算法的矩形件排样问题研究	郭怡, 李辉(250)
一种基于数据属性的 Apriori 算法的改进方法	马冬来, 张文静(253)
基于自适应全变分模型和正则化技术的湍流图像复原算法研究	赵春喜(257)
模糊 C 均值 BP 神经网络算法及其应用	申彩英, 胥帆, 李刚(260)
不平衡系统中 STATCOM 装置的控制性能分析	张鹏, 周碧英(264)
农业水土工程研究	
土壤肥力时空变异规律的研究与应用	陈航, 曹丽英, 陈桂芬(268)
基于光滑流体力学的土壤切削仿真研究	朱留宪, 杨玲, 杨明金, 等(274)
智能农田灌溉潜水泵无线控制器设计	郭建昌, 李丰(278)
基于 STC12C5A60S2 单片机设计的水源地信息采集装置	闫世杰, 张曙光, 彭晓云(283)
农业机械化综合研究	
甘肃陇东地区农业机械化发展现状及对策	曹宏, 荔克让, 刘万里(286)
云南高原特色农业机械化发展探讨	张汝坤, 朱云, 时玲, 等(292)
发展甘蔗收获机械化的建议	尹明玉, 马剑(296)
基于 SWOT 分析的中国农机产业发展研究	杜浦, 卜伟(301)
我国农机合作社起源与发展阶段研究	李二超(305)
农民合作经济组织发展中的政府作用机制分析	陈楠(310)
农机互助保险的中外比较研究	袁连升, 范静(315)
山区拖拉机道路交通事故原因分析与防范措施	施伟强, 翁炎生, 杨必林(319)
丘陵农机高端技能人才培养模式研究与实践	陈贵清, 陈小刚(323)
农民大学生培养路径及实施效果分析	张玲(326)
生态约束下农村水电站优化调度研究	楼骏, 宋洋, 徐楨(329)
基于 WTO/SPS 协议的中国食品安全体系构建研究	刘翠, 徐凡(333)
粮食大县县域经济发展影响因素的实证分析	杨朝丹(338)
我国粮食主产区农业生产可持续发展研究	刘文明, 高宏, 费红梅(344)

Contents

Thinking on the development of agricultural mechanization during the '13th Five-year' in China Bai Renpu(1)

Research on Agricultural Mechanization and Equipment Engineering

- Design of air blown soybean precision planter Zhang Wei, Wang Jia(6)
- Influence of metering hole shape of the rape seeder on the crushing rate based on ADAMS Huang Ming, Zhang Jian, Xiao Jie(9)
- Design and experiments of 2BC-1.2 grass seeder Dai Lixun, Zhao Chunhua, Zheng Kai(12)
- Development and experiments of opening hole-watering injection transplanting machine
for sweet potato seedlings Wang Caixian(17)
- Design of balancing instrument for 2YZS-Transplanter Wang Junhao, Wang Ye(22)
- Design of threshing mini type wheat combine Geng Lingxin, Li Guanglun, Zhang Lijuan, et al(25)
- Design of the 5TG-70 type rice threshing and cleaning machine Lin Yugang, Zhang Jiaqing, Wang Gang, et al(29)
- Experimental research on vertical snapping shredding device of corn combine harvester Xiang Dan(32)
- Modal analysis of the sugar cane leaf shredder knife roll based on ANSYS-Workbench Yang Xi, Wang Jinli, Guo Changjin, et al(36)
- Research status on pre-cleaner of cotton harvester Huang Mingsen, Shi Lei, Yuan Jianning, et al(40)
- Design and optimization on eccentric block structure of walnut picking machine Zheng Jiahong, Liu Mengfei, Gao Jing(44)
- Design of cutting platform on cattail harvesting ship Jin Jin, Wang Zehe, Jiang Haiyong, et al(48)
- Design and experiment of stud type residual film recycling machine Jin Wei, Zhang Xuejun, Li Chaoxin(52)
- Design of small self-hand propelled manure spreader Tian Yun, Zhao Yaxiang, Pan Shiqiang, et al(55)
- Study on suitable line space of early indica rice with mechanical transplanting
in north rimland of double-cropping rice region Wu Wenge, Chen Gang, Feng Jun, et al(59)
- Analysis on concept and structure characteristics of peanut diggers in China Gao Lianxing, Liu Weiwei, Liu Zhixia, et al(63)
- Comparison and analysis of different tillage methods for planting wheat
in rice stubble fields Cheng Yulong, Zhang Ligang, Zhai Bushun, et al(69)
- Potato production mechanization technology model of autumn mulching film
in semi-arid mountain Wang Wenzhi, Tan Jing, Zhu Yude(73)
- Discriminating algorithm of cotton maturity based on shape feature Shi Hao, Lai Huicheng, Wang Liejun, et al(77)
- Research on the distribution regularities of cassava stalk mechanical
properties along the stem Huang Zhengming, Li Ling, Xue Zhong, et al(82)
- Research on apocynum domestication and cultivation in western region
of Jilin Province Cong Jianmin, Han Guojun, Chen Fengqing(88)
- Effects of key agricultural measures on yield for mechanized direct seeding rapeseeds
in Chengdu plain Dai Changfu, Dong Ya, Jiang Xinlu(92)
- Research progress on the leveling control system of laser-controlled paddy field leveler Chen Junmei, Zhao Zuoxi(98)
- Development of centrifugal and axial-flow composite submersible pumps Xian Li, Mou Guoliang, Liang Longhui(103)
- Optimization design of pump impeller based on genetic algorithm Zhu Ningshuai, Liu Yuanyi(107)
- Study on the pump performance curve fitting Liang Shancheng, Xia Peisong(111)
- Research on the controllability and observability of dump truck hydraulic lift system Zhai Zhengkun, Cui Junjie, Li Hongmei, et al(114)
- Design and research of W-type bulldozer blade Ji Youchang, Hou Wenjun, Jin Dan, et al(117)
- Research on hoisting machinery development service system based on cloud computing Zou Jianhua(122)
- Finite element analysis on cutting temperature of titanium alloy turning based on Deform-3D He Zhixiang, Hu yahui, Yin Chengjun(124)

Research on Facilities Agriculture and Plant Protection Machinery Engineering

- Electrostatic electrode optimization design and test on pressure-swirl nozzle Zhang Ling, Xue Xinyu, Sun Zu, et al(128)
- Design of hydraulic driving system of hose-reeling irrigation machine Tong Zhe, Han Zhilei, Li Wei, et al(132)
- Application of constant pressure control in sprinkler irrigation system Qiu Mingquan, Li Wei, Qiu Zhipeng, et al(135)
- Research on the ozone use in facility agriculture and poultry shed Chai Xinjun, Ma Jungui(140)

Research on Vehicle and Power Engineering

- Principle and structure of twice injection plunger pump for p-HCCI agricultural diesel engine Deng Feizhong(143)
- Design of diaphragm-spring controller for double volute variable turbo charger Huang Yongrong, Wang Hang(148)
- Analysis of temperature field and coupling deformation
under different working conditions Lu Peng, Zhang Yi, Zheng Weimao, et al(152)
- NOx and soot removal of diesel engine by non-thermal plasma assisted catalyst Hu Mingjiang, Zhao Lixia(157)
- Vibration damping structure design of agricultural vehicle seat based on TRIZ theory Zhao Pengrui(161)

Research on Agricultural Products Processing

- Research on evaluation methodology of Korla pear maturity based
on physicochemical index Lan Haipeng, Tang Yurong, Wang Wei, et al(165)
- Automatic recognition and location of tomatoes based on Kinect vision system Dong Jianmin, Chen Weihai, Yue Haosong, et al(169)
- Research progress of blueberry deep processing Li Limin, Wu Lin(174)

Research on Agricultural Biological Systems and Energy Engineering

- Efficiency analysis on model of comprehensive utilization of straw He Xun, Zhang Zhipeng, Shi Jingzhao, et al(180)
- Research on recycling mass flux in biomass dual circulating fluidized bed Li Song, Fan Xiaoxu, Guo Dongyan, et al(184)
- Corrosion evaluation research and experimental platform design of wind turbine under the action of blade coating erosion process in the aspect of sand-bearing current wind Du Jianan, Han Baosheng, Zhang Yong, et al(187)

Research on Agricultural Electrification and Informationization Engineering

- Path-loss prediction for radio frequency signal of wireless sensor network in corn field based on improved generalized regression neural network Pan He, Li Taihao(191)
- Design of temperature and humidity in vegetable greenhouse remote monitoring system based on Zigbee Hou Weiping, Zhong Suli, Bao Jun(196)
- Design of automatic control system of temperature and humidity for granary based on S3C2440 Li Shijun, Wu Juxin, Wen Zhu, et al(199)
- Design of wireless monitoring system in constant temperature storage of Jujube Liu Wei, Li Aining, Sun Shiwei, et al(203)
- Design of greenhouse monitoring and controlling system based on JN5168 Bu Yanru, Cheng Hai, Zhai Shuxia, et al(208)
- Design of greenhouse temperature measurement and control system based on MCU Li Wei(212)
- Parameter optimization of PID intelligent temperature control system based on VACA Xu Xiufen(214)
- Design and implementation of belt deviation detection sensor network based on RS485/Modbus Zhu Liang, Li Dongbo, Li Yan, et al(217)
- Design of the livestock farm's gas sample collection system based on PLC Chen Xu, Gao Mengmeng, Cai Zhenjiang, et al(221)
- Agricultural IOT platform design based on intelligent wireless sensors of QoS control system Zhan Zhongli, Wang Qiang, Liu Zhigang(224)
- Control and realization of biaxial work bench based on PLC Yang Haibo, Yang Xinchun, Li Jinre, et al(228)
- Design and experiment of bivariable hydraulic stepless speed control system based on PID ... Wu Jinlin, Zhang Lixin, Yu Junzhi, et al(232)
- Research and development of porosity measurement system based on light penetration method Huang Weifeng, Cheng Jianxing, Wu Zhuokui, et al(238)
- Design of a small intelligent agricultural management system Zhang Anran(242)
- Improved combination of genetic algorithm and ant colony algorithm Chen Yayun, Han Wentao, Cui Heping(246)
- Research on rectangular packing problem based on ant colony algorithm Guo Yi, Li Hui(250)
- Improved method of Apriori algorithm based on data attributes Ma Donglai, Zhang Wenjing(253)
- Research on turbulence image restoration algorithm based on adaptive total variation model and regularization technique Zhao Chunxi(257)
- Application of BP neural network algorithm based on fuzzy C-means clustering Shen Caiying, Xu Fan, Li Gang(260)
- Analysis of STATCOM control performance under unbalance system Zhang Peng, Zhou Biying(264)

Research on Agricultural Soil and Water Engineering

- Research and application of the space-time change of soil fertility Chen Hang, Cao Liying, Chen Guifen(268)
- Simulation research of soil cutting based on smoothed particle hydrodynamics Zhu Liuxian, Yang Ling, Yang Mingjin, et al(274)
- Design of wireless controller of submerged pump in intelligent farmland irrigation Guo Jianchang, Li Feng(278)
- Design of water source information collection device based on STC12C5A60S2 microcontroller Yan Shijie, Zhang Shuguang, Peng Xiaoyun(283)

Comprehensive Research

- Development and strategies of agricultural mechanization in Longdong region of Gansu Province Cao Hong, Li Kerang, Liu Wanli(286)
- Discussion of promoting the development of Yunnan plateau characteristic agricultural mechanization Zhang Rukun, Zhu Yun, Shi Ling, et al(293)
- Suggestion on development of sugarcane harvest mechanization Yin Mingyu, Ma Jian(296)
- Research on the development of China agricultural machinery industry based on SWOT model Du Pu, Bu Wei(301)
- Research on the original and developing period of agricultural machinery cooperatives in China Li Erchao(305)
- Analysis on government mechanisms in farmers' cooperatives economic organizations development Chen Nan(310)
- Comparative research on domestic and foreign mutual assistant insurance of agriculture machinery Yuan Liansheng, Fan Jing(315)
- Causal analysis and preventive measures of traffic accidents on the tractor road in mountainous area Shi Weiqiang, Weng Yansheng, Yang Biling(319)
- Research and practice of the training mode of hilly agricultural high skill talents Chen Guiqing, Chen Xiaogang(323)
- Path and implementation effect analysis on cultivating peasant college students —Take Agricultural University of Hebei for example Zhang ling(326)
- Research on the optimal operation of rural hydropower plants under ecological constraint Lou Jun, Song Yang, Xu Zhen(329)
- Research on the construction of food security system in China based on WTO/SPS Liu Hui, Xu Fan(333)
- Empirical analysis on the county economic development influence factors of the major grain-producing county in Jilin Province Yang Chaodan(338)
- Research on sustainable development of major grain producing areas of agricultural production in China Liu Wenming, Gao Hong, Fei Hongmei(344)

The duty editor Ling Xiaoyan Yang Jianping Qiao Lu Zhang Jinlong

欢迎投稿 欢迎订阅

《中国农机化学报》

《中国农机化学报》由农业部主管、农业部南京农业机械化研究所主办，是我国农业机械化领域学术刊物。全国中文核心期刊、中国农业核心期刊。

《中国农机化学报》报道我国农业机械化领域最新科研成果，传播农业机械化科学理论与技术，加强农业工程学术交流，促进农业机械化科研人才培养，服务我国农业现代化建设。

《中国农机化学报》栏目设置为：农业机械化与装备工程研究、设施农业与植保机械工程研究、车辆与动力工程研究、农产品加工工程研究、农业生物系统与能源工程研究、农业电气化与信息化工程研究、农业水土工程研究、农业机械化综合研究。

《中国农机化学报》为国内农业机械化科研、推广、鉴定部门科研人员，农业高等院校师生，政府有关决策部门服务；为国外有关科研机构和应用部门研究人员，农业高等院校师生服务。

《中国农机化学报》为双月刊，2015年定价60.00元，全年共360元。欢迎广大读者到当地邮局办理订阅手续（邮发代号：28-116），也可直接将征订款邮寄到本刊编辑部订阅。

地址：南京市柳营100号，210014

电话：025-84346270 025-84346296

传真：025-84346271

投稿 E-mail: jcam@vip.163.com

审稿 E-mail: zgnjh@163.com

《中国农机化学报》编辑部

