

农业工程学报

2011年第2期 总第163期(第27卷)

目次

• 综合研究 •

生物炭生产与农用的意义及国内外动态 何绪生, 耿增超, 余 雕, 等 (1)

• 农业水土工程 •

基于宏观尺度的三江平原区域农业水土资源承载力 任守德, 付 强, 王 凯 (8)

大豆秸秆基保水剂对南阳烟田土壤物理性状及烟叶生长的影响 左广玲, 叶红勇, 杜朝军, 等 (15)

长距离控制渠系结冰期的水力响应分析 刘孟凯, 王长德, 冯晓波 (20)

马蹄形断面临界水深的一种计算公式 赵延凤, 王正中, 芦 琴 (28)

畦灌地表储水形状系数的变化规律 聂卫波, 费良军, 马孝义 (33)

不同沟灌方式下根区水氮调控对棉花群体生理指标的影响 李培岭, 张富仓 (38)

滴灌梯形迷宫滴头流道水力性能的响应曲面法优化 刘春景, 唐敦兵, 郑加强, 等 (46)

基于分形理论的土壤优先流运动控制方程 盛 丰, 张仁铎, 刘会海 (52)

灌溉、施肥和浅水埋深对小麦产量和硝态氮淋溶损失的影响 杜 军, 杨培岭, 李云开, 等 (57)

华北平原高产粮区不同水氮管理下农田氮素的淋失特征 陈淑峰, 吴文良, 胡克林, 等 (65)

不同耕作模式下旱作玉米氮磷肥产量效应及水分利用效率 代 快, 蔡典雄, 张晓明, 等 (74)

春小麦留茬处理对复种油菜产量和水分利用效率的影响 尹 辉, 张恩和, 王 琦, 等 (83)

双作物系数模型 SIMDual_Kc 的验证及应用 赵娜娜, 刘 钰, 蔡甲冰, 等 (89)

不同水肥条件下农业非点源田间产污强度 李强坤, 胡亚伟, 孙 娟, 等 (96)

基于水环境功能区划的农业面源污染源解析及其空间异质性 钱晓雍, 沈根祥, 郭春霞, 等 (103)

• 农业装备工程与机械化 •

胶棒滚筒棉花采摘头的设计与试验 张宏文, 康 敏, 傅秀清, 等 (109)

鲜食玉米剥皮机的设计与试验 赵玉强, 何晓鹏, 师建芳, 等 (114)

水田高茬秸秆旋耕埋覆装置功耗测试方法 王志山, 夏俊芳, 许绪川, 等 (119)

棉花秸秆剪切力学性能试验.....李玉道, 杜现军, 李法德 (124)

智能烟草打顶抑芽机控制系统.....马 敏, 张晓辉, 宋 涛, 等 (129)

多轴转向车辆二自由度鲁棒控制.....刘芹芹, 高秀华, 张小江 (136)

基于用户使用工况的 ZL50 装载机传动比设计.....常 绿, 刘永臣 (141)

重塑黏土圆锥指数和抗剪强度的关系.....冯晓斌, 丁启朔, 丁为民, 等 (146)

喷油定时对燃用生物柴油发动机经济性与排放的影响.....马志豪, 王 鑫, 张小玉, 等 (151)

扫描间距对 45 钢激光熔凝强化组织性能的影响.....孙 浩, 凌 刚, 李洪文, 等 (156)

甘蔗切割过程的有限元仿真.....黄汉东, 王玉兴, 唐艳芹, 等 (161)

耕作措施对华北地区冬小麦田 N₂O 排放的影响.....黄光辉, 张明园, 陈 阜, 等 (167)

• 农业信息与电气技术 •

稻田水分监测无线传感器网络优化设计与试验.....肖德琴, 古志春, 冯健昭, 等 (174)

基于变化向量分析的玉米收获期遥感监测.....王 堃, 顾晓鹤, 程耀东, 等 (180)

基于信息扩散和关键期遥感数据的冬小麦估产模型.....朱再春, 陈联裙, 张锦水, 等 (187)

基于串行 BP 网络的农业机器人视觉导航控制 (英).....唐晶磊, 景 旭, 何东健, 等 (194)

电介质型水分传感器测定栽培基质含水率的标定模型.....刘志刚, 李萍萍, 胡永光, 等 (199)

新型高精度温湿度检测箱及其测控系统研制.....王庆祝, 陈攀峰, 马玉泉, 等 (203)

基于水平集的作物病叶图像分割方法.....袁 媛, 李 淼, 梁 青, 等 (208)

基于多尺度分形特征的 ETM+ 影像耕地提取.....董士伟, 李宪海, 李 红, 等 (213)

苏北沿海滩涂地区土壤有机质含量的高光谱预测.....徐明星, 周生路, 丁 卫, 等 (219)

配电变压器无弧有载自动调容仿真分析.....朴在林, 王冬冬, 郑 钰 (224)

基于数据处理及图件的小麦-水稻种植制度的气候风险评估.....赖纯佳, 千怀遂, 段海来, 等 (230)

• 农业生物环境与能源工程 •

日光温室传热筒与空气间的换热量及对气温的影响.....李天来, 韩亚东, 刘雪峰, 等 (237)

沸石作为添加剂对鸡粪高温堆肥氮挥发的影响.....罗一鸣, 魏宗强, 孙钦平, 等 (243)

Cu 污染条件下封闭循环水养虾系统的效能.....程 波, 刘 鹰, 杨红生, 等 (248)

水生植物对金属矿山丁铵黑药污染的生长响应与植物修复.....黄显东, 莫测辉, 李彦文, 等 (255)

磷钾肥施用对日光温室土壤溶液离子组成的影响.....陈竹君, 高佳佳, 赵文艳, 等 (261)

纸质湿帘力学特性及其测试方法.....王 莉, 丁小明 (267)

热泵与家用太阳热水器联合供热性能试验.....湛学先, 高文峰, 兰 青, 等 (272)

不同贮存温度对木屑热裂解生物油理化性质稳定性的影响.....沈晨杰, 刘荣厚, 陈天举 (276)

生物质气化特性研究及烟分析.....张小桃, 黄明华, 王爱军, 等 (282)

不同预处理条件对棉秆厌氧发酵产沼气的影晌.....李艳宾, 张 琴, 李 为, 等 (287)

纤维乙醇工艺中酸处理稻秸秆反应条件的优化.....湛含辉, 黄丽霖 (293)

高寒地区沼气发酵料液加热增温装置传热特性.....刘建禹, 樊美婷, 刘 科 (298)

冷藏库用风冷太阳能双级水喷射制冷系统性能分析.....陈洪杰, 卢 苇, 郑立星, 等 (302)

温室温度控制系统的神经网络 PID 控制.....屈 毅, 宁 铎, 赖展翅, 等 (307)

• 土地整理工程 •

中国 1999—2009 年土地覆盖动态变化的时空特点.....黎治华, 高志强, 高 炜, 等 (312)

基于农用地分等和土壤环境质量评价的耕地综合质量评价.....路 婕, 李 玲, 吴克宁, 等 (323)

不同复垦模式及复垦年限对土壤微生物的影响.....樊文华, 白中科, 李慧峰, 等 (330)

基于 GIS/RS 和 USLE 鄱阳湖流域土壤侵蚀变化.....陆建忠, 陈晓玲, 李 辉, 等 (337)

• 农产品加工工程 •

基于近红外光谱和机器视觉融合技术的板栗缺陷检测.....展 慧, 李小昱, 周 竹, 等 (345)

基于机器视觉技术的淡水鱼质量分级.....张志强, 牛智有, 赵思明, 等 (350)

基于计算机视觉的番茄催熟与正常熟识别.....赵海波, 周向红 (355)

紫外线—臭氧组合式营养液消毒机的设计及灭菌性能试验.....宋卫堂, 王 成, 侯文龙 (360)

蜂蜜还原能力的电化学传感器检测.....汤明杰, 蔡健荣, 吴小娟, 等 (366)

基于超高频 RFID 的生猪屠宰数据采集方案.....罗清尧, 熊本海, 杨 亮, 等 (370)

伽马辐照对冰藏大黄鱼品质和货架期的影响.....杨宪时, 姜兴为, 李学英, 等 (376)

热风微波耦合干燥胡萝卜片工艺.....周 韵, 宋春芳, 崔政伟 (382)

Br 离子液体中微波辐射加热促进稻草秸秆酸水解制备还原糖.....杨明妮, 柴连周, 毕先钧 (387)

• 会 讯 •

全国农村清洁能源与低碳技术学术研讨会通知 (第二轮) (229)

全国农产品产地初加工学术研讨会通知及征文启事 (第一轮) (392)

Transactions of the Chinese Society of Agricultural Engineering

Vol.27 No.2 2011

CONTENTS

• Comprehensive Research •

Implications of production and agricultural utilization of biochar and its international dynamics

..... *He Xusheng, Geng Zengchao, She Diao, et al.* (1)

• Soil and Water Engineering •

Regional agricultural water and soil resources carrying capacity based on macro-micro scale in Sanjiang Plain

..... *Ren Shoude, Fu Qiang, Wang Kai* (8)

Effects of soybean straw-based water retaining agent on tobacco growth and soil physical properties of tobacco field in Nanyang..... *Zuo Guangling, Ye Hongyong, Du Chaojun, et al.* (15)

Analysis on the hydraulic response of long distance canal control system during ice period

..... *Liu Mengkai, Wang Changde, Feng Xiaobo* (20)

Simplified calculation formulae for critical water depth of horseshoe cross section

..... *Zhao Yanfeng, Wang Zhengzhong, Lu Qin* (28)

Variation shape factor of surface water under border irrigation..... *Nie Weibo, Fei Liangjun, Ma Xiaoyi* (33)

Effect of root zone water and nitrogen regulation on cotton population physiological indices under different furrow irrigation patterns..... *Li Peiling, Zhang Fucang* (38)

Optimization of hydraulic performance for drip irrigation trapezoidal labyrinth channel of emitter using response surface methodology..... *Liu Chunjing, Tang Dunbing, Zheng Jiaqiang, et al.* (46)

Governing equations for modeling preferential flow in unsaturated soil based on fractal theory

..... *Sheng Feng, Zhang Renduo, Liu Huihai* (52)

Influence of the irrigation, fertilization and groundwater depth on wheat yield and nitrate nitrogen leaching

..... *Du Jun, Yang Peiling, Li Yunkai, et al.* (57)

Characteristics of nitrate leaching in high yield farmland under different irrigation and fertilization managements in North China Plain..... *Chen Shufeng, Wu Wenliang, Hu Kelin, et al.* (65)

Effects of nitrogen and phosphorus on dry farming spring corn yield and water use efficiency under different tillage practices

..... *Dai kuai, Cai Dianxiong, Zhang Xiaoming, et al.* (74)

Effect of spring wheat stubble treatments on grain yield and water use efficiency of multiple cropping rape

..... *Yin Hui, Zhang Enhe, Wang Qi, et al.* (83)

Validation and application of dual crop coefficient model SIMDual_Kc.....	ZhaoNana, LiuYu, CaiJiabing, et al. (89)
Agricultural non-point source pollution load intensity of the paddy field in different water and fertilization conditions	Li Qiangkun, Hu Yawei, Sun Juan, et al. (96)
Source apportionment and spatial heterogeneity of agricultural non-point source pollution based on water environmental function zoning.....	Qian Xiaoyong, Shen Genxiang, Guo Chunxia, et al. (103)

• **Agricultural Equipment Engineering and Mechanization** •

Design and experiment of rubber-bar roller of cotton harvester	Zhang Hongwen, Kang Min, Fu Xiuqing, et al. (109)
Design and development of sweet and waxy corn husker	Zhao Yuqiang, He Xiaopeng, Shi Jianfang, et al. (114)
Power consumption testing system of high stubble buried device in paddy field	Wang Zhishan, Xia Junfang, Xu Qichuan, et al. (119)
Test of shear mechanical properties of cotton stalks.....	Li Yudao, Du Xianjun, Li Fade (124)
Control system of intelligentized tobacco topping and sucker controlling machine	Ma Min, Zhang Xiaohui, Song Tao, et al. (129)
Robust two-degree-freedom control for multi-axle steering vehicle.....	Liu Qinqin, Gao Xiuhua, Zhang Xiaojiang (136)
Transmission ratio design of ZL50 Loader based on working condition	Chang Lü, Liu Yongchen (141)
Relationship between cone index and shear strength of remolded clayey soil	Feng Xiaobin, Ding Qishuo, Ding Weimin, et al. (146)
Effects of fuel injection timing on economy and emissions of diesel engine fuelled with diesel/biodiesel blends	Ma Zhihao, Wang Xin, Zhang Xiaoyu, et al. (151)
Influence of scanning interval on microstructure and abrasive wear resistance of 45 Steel by laser melting	Sun Hao, Ling Gang, Li Hongwen, et al. (156)
Finite element simulation of sugarcane cutting	Huang Handong, Wang Yuxing, Tang Yanqin, et al. (161)
Influences of tillage methods on N ₂ O emission from winter wheat field in North China Plain	Huang Guanghui, Zhang Mingyuan, Chen Fu, et al. (167)

• **Agricultural Information and Electrical Technologies** •

Design and experiment of wireless sensor networks for paddyfield moisture monitoring	Xiao Deqin, Gu Zhichun, Feng Jianzhao, et al. (174)
Remote sensor monitoring for harvest time of summer maize based on change vector analysis	Wang Kun, Gu Xiaohe, Cheng Yaodong, et al. (180)
Winter wheat yield estimation model based on information diffusion and remote sensing data at major growth stages	Zhu Zaichun, Chen Lianqun, Zhang Jinshui, et al. (187)
Visual navigation control for agricultural robot using serial BP neural network	Tang Jinglei, Jing Xu, He Dongjian, et al. (194)

- Calibration method for detection of matrix water content with dielectric-type moisture sensor
..... *Liu Zhigang, Li Pingping, Hu Yongguang, et al.* (199)
- Development of high-precision temperature and humidity testing cabinet and its measure and control system
..... *Wang Qingzhu, Chen Panfeng, Ma Yuquan, et al.* (203)
- Segmentation method for crop disease leaf images with complex background
..... *Yuan Yuan, Li Miao, Liang Qing, et al.* (208)
- Extraction of cultivated land using ETM+ image based on multiscale fractal signature
..... *Dong Shiwei, Li Xianhai, Li Hong, et al.* (213)
- Hyperspectral reflectance models for predicting soil organic matter content in coastal tidal land area, northern Jiangsu
..... *Xu Mingxing, Zhou Shenglu, Ding Wei, et al.* (219)
- Simulation analysis of arcless on-load automatic capacity regulating for distribution transformer
..... *Piao Zailin, Wang Dongdong, Zheng Yu.* (224)
- Assessing the climate risk degree of wheat-corn double cropping system based on date processing and images
..... *Lai Chunjia, Qian Huaisui, Duan Hailai, et al.* (230)

• Agricultural Bioenvironmental and Energy Engineering •

- Heat transfer effect of cylinder ectexine on air temperature in greenhouse
..... *Li Tianlai, Han Yadong, Liu Xuefeng, et al.* (237)
- Effects of zeolite addition on ammonia volatilization in chicken manure composting
..... *Luo Yiming, Wei Zongqiang, Sun Qinqing, et al.* (243)
- Performance of shrimp recirculating aquaculture system with copper polluted water
..... *Cheng Bo, Liu Ying, Yang Hongsheng, et al.* (248)
- Growth response and phytoremediation of several species of hydrophytes to ammonium butyl aerofloat in metal mines
..... *Huang Xiandong, Mo Cehui, Li Yanwen, et al.* (255)
- Effects of application of phosphorus and potassium fertilizers on ion compositions of soil solution in solar greenhouse
..... *Chen Zhujun, Gao Jiajia, Zhao Wenyan, et al.* (261)
- Mechanical performance and test method for water wet-pad *Wang Li, Ding Xiaoming* (267)
- Performance jointly test of heat pump water heater with household solar heating
..... *Chen Xuexian, Gao Wenfeng, Lan Qing, et al.* (272)
- Influence of storage temperature on stability of physicochemical properties of sawdust pyrolysis bio-oil
..... *Shen Chenjie, Liu Ronghou, Chen Tianju* (276)
- Characteristics of biomass gasification and exergy analysis..... *Zhang Xiaotao, Huang Minghua, Wang Aijun, et al.* (282)
- Effects of different pretreatment conditions on biogas production by anaerobic fermentation of cotton stalk
..... *Li Yanbin, Zhang Qin, Li Wei, et al.* (287)
- Optimization on acid pretreatment conditions for rice straw in process of lignocellulosic ethanol
..... *Zhan Hanhui, Huang Lilin* (293)

Heat transfer characteristics of warming methane fermentation liquid heating device in alpine region	Liu Jianyu, Fan Meiting, Liu Ke (298)
Performance analysis on a solar-powered air-cooled two-staged ejector refrigeration system with water as refrigerant for cold store	 Chen Hongjie, Lu Wei, Zheng Lixing, et al. (302)
Neural networks based on PID control for greenhouse temperature	Qu Yi, Ning Duo, Lai Zhanchi, et al. (307)

• Land Consolidation and Rehabilitation Engineering •

Spatio-temporal feature of land use/land cover dynamic changes in China from 1999 to 2009	 Li Zhihua, Gao Zhiqiang, Gao Wei, et al. (312)
Cultivated land comprehensive quality evaluation based on agricultural land classification and soil environmental quality evaluation	 Lu Jie, Li Ling, Wu Kening, et al. (323)
Effects of different vegetation restoration patterns and reclamation years on microbes in reclaimed soil	 Fan Wenhua, Bai Zhongke, Li Huifeng, et al. (330)
Soil erosion changes based on GIS/RS and USLE in Poyang Lake basin	Lu Jianzhong, Chen Xiaoling, Li Hui, et al. (337)

• Agricultural Produce Processing Engineering •

Detection of chestnut defect based on data fusion of near-infrared spectroscopy and machine vision	 Zhan Hui, Li Xiaoyu, Zhou Zhu, et al. (345)
Weight grading of freshwater fish based on computer vision	 Zhang Zhiqiang, Niu Zhiyou, Zhao Siming, et al. (350)
Recognition of artificial ripening tomato and nature mature tomato based on computer vision	 Zhao Haibo, Zhou Xianghong (355)
Development and test of nutrient solution disinfection machine by combining UV with ozone	 Song Weitang, Wang Cheng, Hou Wenlong (360)
Determination of reducing power of honey by electrochemical sensor	 Tang Mingjie, Cai Jianrong, Wu Xiaojuan, et al. (366)
Solution of data collection of swine slaughter based on ultrahigh frequency RFID	 Luo QingYao, Xiong BenHai, Yang Liang, et al. (370)
Effects of gamma irradiation on quality and shelf life of iced <i>Pseudosciaena crocea</i>	Yang Xianshi, Jiang Xingwei, Li Xueying, et al. (376)
Coupled hot air and microwave drying technology for carrot slices dehydration	Zhou Yun, Song Chunfang, Cui Zhengwei (382)
Microwave irradiation promoting acid hydrolysis of straw pole into reducing sugar in ionic liquid Br	Yang Mingni, Chai Lianzhou, Bi Xianjun (387)