

第37卷 Vol. 37

ISSN 1000-7601

CODEN GDNYEQ

# 干旱地区农业研究

GANHAN DIQU NONGYE YANJIU

AGRICULTURAL  
RESEARCH IN  
THE ARID AREAS



2

2019

ISSN 1000-7601



9 771000 760195

# 干旱地区农业研究

第37卷第2期(总第173期)

2019年3月10日出版

## 目 次

### 文献综述

优化作物根系构型,发展生态农业——2017年作物根系与根际互作国际研讨会综述

..... 段海霞,罗崇亮,Minha Naseer,等(1)

### 土壤水分与节水灌溉

滴灌施肥条件下土壤水氮运移数值模拟 ..... 黎会仙,王文娥,胡笑涛(10)

生长年限对苜蓿和柠条光合特征及土壤水分的影响 ..... 姚毓菲,邵明安,贾玉华,等(18)

调亏灌溉对绿洲灌区膜下滴灌辣椒生长发育和产量的影响 ..... 高佳,张恒嘉,巴玉春,等(25)

粉煤灰与矿渣复掺对渠道衬砌模袋混凝土流动性和力学性能的影响

..... 谢天逸,娄宗科,霍铁珍,等(32)

燥红土微咸水滴灌下水盐运移规律的试验研究 ..... 董丽艳,王卫华(37)

灌溉施肥对河套灌区垄膜沟灌春玉米土壤水热运移的影响 ..... 李成,冯浩,董勤各(44)

南疆两种膜下滴灌布管方式对机采棉产量和品质的影响 ..... 蔡利华,练文明,邵红忠,等(52)

雨水导入表土以下不同深度土壤蒸发变化研究 ..... 王俊鹏,任小龙,蔡铁,等(59)

### 土壤与植物营养

干旱地区棉田连作对土壤氮素含量及氮转化速率的影响 ..... 何学敏,吕光辉,秦璐,等(64)

包气带土壤pH对灌溉施肥响应的变异过程 ..... 狄龙,刘秀花,胡安焱,等(72)

不同原料好氧堆肥过程中碳转化特征及腐殖质组分的变化 ..... 李孟婵,张鹤,杨慧珍,等(81)

玉米和马铃薯根系分泌物对马铃薯生长的影响 ..... 宇淑慧,吴开贤,欧阳铖人,等(88)

不同生境黑果枸杞实生苗生长及土壤养分空间差异的研究 ..... 郭有燕,聂海松,余宏远,等(95)

滴灌条件下穴施生物有机肥对土壤酶活性时空动态分布的影响 ..... 常文颖,何倩,李俊华(102)

长期施肥对春玉米田土壤呼吸及碳平衡的影响研究 ..... 程万莉,雷康宁,王淑英,等(108)

### 植物抗逆生理

花期低温对水稻叶鞘生理及结实率的影响 ..... 项洪涛,梁晓艳,郑殿峰,等(114)

稀土微肥氯化镨调控马铃薯生长发育及抗旱的生理机制 ..... 杨宏伟,柴强,李朝周,等(123)

Na<sub>3</sub>N<sub>3</sub>诱变胁迫对苜蓿愈伤组织生长和生理特性的影响 ..... 李波,邬婷婷(130)

- 广西玉米品种开花期抗旱性鉴定与评价 ..... 邹成林, 谭 华, 郑德波, 等(136)  
水分胁迫下氮形态对水稻根系孔隙度及水分吸收的影响 ..... 杨秀霞, 燕 辉, 周春火, 等(144)

## 耕作与栽培

- 半干旱区全膜覆土穴播对春小麦耗水特征和产量的影响 ..... 侯慧芝, 张绪成, 尹嘉德, 等(150)  
黄土高原休闲期深松后覆盖播种对旱地小麦产量的影响 ..... 杨清山, 孙 敏, 高志强, 等(158)  
不同深松方式对玉米产量和水分利用效率的影响 ..... 郑家明, 孙占祥, 冯良山, 等(167)  
浅埋滴灌水氮运筹对春玉米产量及水分利用效率的影响 ..... 李 雪, 尹光华, 马宁宁, 等(172)  
旱地燕麦间作对土壤酶活性、微生物含量及产量的影响 ..... 王庆宇, 李立军, 阮 慧, 等(179)

## 旱区生态与资源利用

- 干旱对太行山山前平原雨养农田产量影响的模拟研究 ..... 王亚凯, 刘孟雨, 董宝娣, 等(185)  
焉耆盆地农田耕层土壤盐分的空间变异及分布格局  
..... 王维维, 麦麦提吐尔逊·艾则孜, 艾提业古丽·热西提, 等(195)  
塔里木河干流上游区 WaSSI-C 生态水文模型的适用性评价 ..... 侯晓臣, 孙 伟, 李建贵, 等(202)  
基于 MTVDI 与 DDI 二元回归模型对毛乌素沙地腹部土壤表层水分的研究  
..... 王思楠, 李瑞平, 韩 刚, 等(209)  
降雨强度对农业耕作措施水土保持作用的影响 ..... 方 乾, 赵龙山, 吴发启(215)

## 干旱监测预报

- 潮白河流域气象水文干旱特征及其响应关系 ..... 许怡然, 鲁 帆, 谢子波, 等(220)  
黑龙江省大豆生长季干旱时空格局 ..... 朱海霞, 李秀芬, 赵慧颖, 等(229)  
基于产量灾损的冬小麦干热风综合风险区划 ..... 成 林, 张志红, 方文松(238)

## 旱作农业机械

- 旱地垄作膜面胡麻精量播种机设计和仿真 ..... 周 刚, 石林榕, 赵武云, 等(245)  
收获期马铃薯茎秆切割及杀秧刀片设计与试验 ..... 李晓军, 孙 伟, 张 涛, 等(253)

## 植物保护

- 生防放线菌 ZZ-9 耐药菌株的微波诱变选育 ..... 陈大为, 薛应钰, 沈志彦, 等(260)  
盐碱胁迫下苜蓿促进苜蓿生长的细菌筛选与鉴定 ..... 向君亮, 唐呈瑞, 王佳琦, 等(266)

## CONTENTS

### **Review**

Optimization of crop roots architecture and eco-agriculture development: a review on the international symposium on crop roots and rhizosphere interactions, 2017 ..... DUAN Hai-xia, et al(1)

### **Soil Moisture and Water-saving Irrigation**

Numerical simulation of soil water and nitrogen distribution under the integration of drip irrigation and fertilization ..... LI Hui-xian, et al(10)

Effects of growing age on photosynthetic characteristics and soil moisture for *Medicago sativa* and *Caragana korshinkii* ..... YAO Yu-fei, et al(18)

Effects of regulated deficit irrigation on pepper growth and yield under drip irrigation in oasis region ..... GAO Jia, et al(25)

The impact of mixing fly ash and slag powder with concrete on the flow ability and mechanical property of channel lining of mold bag concrete ..... XIE Tian-yi, et al(32)

Study of movement of water and salts in dry red soil under drip irrigation with brackish water ..... DONG Li-yan, et al(37)

Effects of irrigation and fertilization on water and temperature variation of spring maize under plastic-mulching ridge-furrow irrigation in the Hetao Irrigation District ..... LI Cheng, et al(44)

Effect of two kinds of drip irrigation pipe distribution under plastic film on yield and quality of machine picking cotton in southern Xinjiang ..... CAI Li-Hua, et al(52)

Study of soil evaporation influenced by introducing different depths of rainwater ..... WANG Jun-peng, et al(59)

### **Soil and Plant Nutrition**

Effect of continuous cotton cropping on soil nitrogen content and its transformation rate in arid area ..... HE Xue-min, et al(64)

Responding process of soil pH to the irrigation and fertilization in vadose ..... DI Long, et al(72)

Effects of different compost materials on carbon transformation and the change of humus during composting process ..... LI Meng-chan, et al(81)

Effects of root exudates of maize and potato on potato growth ..... ZI Shu-hui, et al(88)

A study on seedling growth and soil nutrient spatial variations of *Lycium ruthenicum* in different habitats ..... GUO You-yan, et al(95)

Effect of localized application of bio-organic fertilizer on the temporal and spatial distribution of soil enzyme activities under drip irrigation ..... CHANG Wen-ying, et al(102)

Effects of long-term fertilization on soil respiration and carbon balance in spring corn fields ..... CHENG Wan-li, et al(108)

### **Plant Adverse-resistance Physiology**

Effects of low temperature stress during flowering stage on physiological characteristics of rice leaf sheath and seed-setting rate ..... XIANG Hong-tao, et al(114)

Physiological mechanisms of potato growth and drought resistance regulated by rare-earth element PrCl<sub>3</sub> ..... YANG Hong-wei, et al(123)

Effects of NaN <sub>3</sub> mutagenesis and saline-alkali stress on growth and physiological characteristics of alfalfa callus .....	LI Bo , et al( 130)
Identification and evaluation of drought tolerance of different maize varieties during flowering stage in Guangxi .....	ZOU Cheng-lin , et al( 136)
Effects of nitrogen forms on root porosity and water absorption of rice under drought stress .....	YANG Xiu-xia , et al( 144)
<b>Tillage and Cultivation</b>	
Effects of full plastic-film mulching with bunch planting on water consumption characteristics and grain yield of spring wheat in semi-arid region .....	HOU Hui-zhi , et al( 150)
Effect of sowing-mulching following subsoiling in fallow period on wheat yield in arid area on the Loss Plateau .....	YANG Qing-shan , et al( 158)
Effects of different subsoiling methods on maize yield and water use efficiency .....	ZHENG Jia-ming , et al( 167)
Effects of water and nitrogen management on yield and water use efficiency of spring maize under shallow-buried drip irrigation .....	LI Xue , et al( 172)
Effects of intercropping of oat on soil enzyme activity, microbial content and yield in arid land .....	WANG Qing-yu , et al( 179)
<b>Ecology and Resource Utilization in Arid Areas</b>	
Simulation of drought impact on yield of rainfed wheat and maize in the Piedmont Plain of Mt. Taihang, China .....	WANG Ya-kai , et al( 185)
Spatial variability and distribution pattern of soil salinity factors in topsoil of farmland in Yanqi Basin, Xinjiang .....	WANG Wei-wei , et al( 195)
Applicability evaluation of WaSSI-C model in the upstream region of the mainstream of Tarim River .....	HOU Xiao-chen , et al( 202)
Study on the surface soil water in Mu Us Desert using binary regression models of MTVDI and DDI .....	WANG Si-nan , et al( 209)
Effect of rainfall intensity on soil and water conservation of tillage practices .....	FANG Qian , et al( 215)
<b>Drought Monitoring and Forecast</b>	
Characteristics and responses of hydrological and meteorological drought in Chaobai River Basin .....	XU Yi-ran , et al( 220)
Spatial-temporal characteristics of drought during growing periods of soybean in Heilongjiang Province .....	ZHU Hai-xia , et al( 229)
Comprehensive risk zoning of dry-hot wind on winter wheat based on yield loss .....	CHENG Lin , et al( 238)
<b>Dryland Farm Machinery</b>	
Design and simulation of precision seeder for flax in dryland ridge with plastic-film mulching .....	ZHOU Gang , et al( 245)
Design and test of potato haulm cutter at the harvest .....	LI Xiao-jun , et al( 253)
<b>Plant Protection</b>	
Screening of chemical-resistant <i>Streptomyces ZZ-9</i> after microwave mutagenesis .....	CHEN Da-wei , et al( 260)
Screening and identification of <i>Medicago Sativa</i> Linn growth promoting rhizobacteria under saline-alkali stress .....	XIANG Jun-liang , et al( 266)