



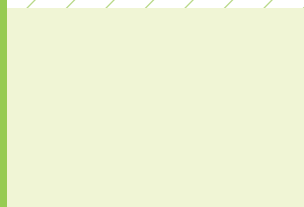
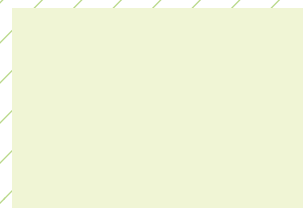
ISSN 0496-3490

CN 11-1809/S

作物学报

ACTA AGRONOMICA SINICA

第48卷 第10期 Vol. 48 No. 10



中国作物学会 中国农业科学院作物科学研究所 主办
Sponsored by Crop Science Society of China and
Institute of Crop Sciences, CAAS

科学出版社 出版
Published by Science Press

10
2022

作物学报

(ZUOWU XUEBAO)

第 48 卷 第 10 期 2022 年 10 月

目 次

综述

2427 发展西南玉米现代生态育种之我见

潘光堂 杨克诚 高世斌

作物遗传育种·种质资源·分子遗传学

2435 *HvLBD19* 基因对大麦不定根发育的调控研究

郭宝健 王 爽 吕 超 王菲菲 许如根

2443 利用中国抗源区分强致病力大豆胞囊线虫群体的探讨

练 云 魏 荷 王金社 张 辉 雷晨芳 李金英
卢为国

2451 基于杂交群体解析玉米籽粒大小相关性状及其配合力的分子遗传机制

李 婷 王亚鹏 董 远 郭瑞士 李冬梅 唐雅伶
张兴华 薛吉全 徐淑兔

2463 青稞早抽穗主效 QTL *cqHD2H-2* 的遗传定位及候选基因分析

余鑫莲 李 新 姚晓华 姚有华 白羿雄 安立昆
吴昆仑

2475 豇豆 *SNP* 高密度遗传图谱构建及重要农艺性状 QTL 定位

李建领 公 丹 王素华 陈红霖 程须珍 熊 涛
王丽侠

2483 基于 *SLAF* 标签测序分析广东省栽培稻种质资源的遗传结构及演化关系

孙炳蕊 潘大建 李 晨 江立群 张 静 吕树伟
刘 清 毛兴学 陈文丰 范芝兰

2494 紫苏溶血磷脂酰转移酶基因 *PjLPAAT* 的克隆及功能研究

徐华祥 鲁 庚 郭 曦 李圆圆 张 涛

2505 中国不同省(市、自治区)糯高粱籽粒酚类物质含量差异分析

王 倩 刘少雄 柴晓娇 李 海 张 芬 陆 平
王瑞云 刘敏轩

2517 谷子 *III* 型 *PRX* 基因家族全基因组鉴定及干旱胁迫下表达分析

马鑫磊 许瑞琪 索晓曼 李婧实 顾鹏鹏 姚 锐
林小虎 高 慧

2533 马铃薯 *PYL* 基因家族的全基因组鉴定及表达分析

贾小霞 齐恩芳 马 胜 黄 伟 郑永伟 白永杰
文国宏

2546 苘麻 *CCRs* 基因家族 3 类成员的生化特性与表达差异

唐映红 刘 芳 陈建荣 毛凯权 李 辉 万海清

耕作栽培·生理生化

2560 玉米籽粒乳线比例变化与灌浆和干燥过程的关系

李红燕 周林立 高 尚 薛 军 明 博 赵如浪
王克如 谢瑞芝 侯 鹏 王永宏 李少昆

2567 土壤增施氮肥对棉蕾 *Bt* 杀虫蛋白表达量影响及氮代谢机制

李涵佳 李 远 刘震宇 张晨霞 徐 泽 吴天凡
陈 媛 张 祥 陈 源 陈德华

2575 施氮对不同结瘤特性花生土壤固氮菌多样性和群落组成的影响

孙棋棋 郑永美 于天一 吴 月 杨吉顺 吴正锋
吴菊香 李尚霞

2588 玉/豆间作产量优势中补偿效应和选择效应的角色

赵建华 孙建好 陈亮之 李伟绮

2597 播期对长江下游不同类型晚稻品种产量的影响及其与水稻全育期温光资源配置间关系

冯向前 殷 敏 王孟佳 马横宇 刘元辉 褚 光
徐春梅 章秀福 王丹英 张运波 陈 松

2614 浅埋滴灌下不同滴灌量对玉米花后碳代谢和光合氮素利用效率的影响

杨恒山 张雨珊 葛选良 李维敏 郭子赫 郭 暖

2625 不同年代玉米品种籽粒产量形成对种植密度的响应

王利青 于晓芳 高聚林 马达灵 胡树平 郭怀怀
刘爱业

2638 种植方式与施氮对西北旱区饲草作物产量、品质和水分利用的影响

魏正业 张海星 石 薇 常生华 张 程 贾倩民
侯扶江

研究简报

2654 小麦品系 *CH7034* 中耐盐 QTL 定位

张潇文 李世姣 张晓军 李 欣 杨足君 张树伟
陈 芳 常利芳 郭慧娟 畅志坚 乔麟轶

2663 水分和腐植酸对燕麦籽粒产量和 β -葡聚糖含量的协同提升效应

李英浩 王 琦 赵宝平 柳妍娣 米俊珍 武俊英
刘景辉

2671 绿洲灌区小麦秸秆还田与耕作措施对玉米产量的影响

王玉珑 于爱忠 吕汉强 王琦明 苏向向 柴 强

ACTA AGRONOMICA SINICA

Vol. 48 No. 10 October 2022

CONTENTS

REVIEW

- 2427 **Insights on developing modern corn ecological breeding in southwest China** PAN Guang-Tang, YANG Ke-Cheng, and GAO Shi-Bin

CROP GENETICS & BREEDING • GERMPLASM RESOURCES • MOLECULAR GENETICS

- 2435 **Regulation of adventitious root development by *HvLBD19* gene in barley (*Hordeum vulgare* L.)** GUO Bao-Jian, WANG Shuang, LYU Chao, WANG Fei-Fei, and XU Ru-Gen
- 2443 **Identification highly virulent population of soybean cyst nematode using China germplasms** LIAN Yun, WEI He, WANG Jin-She, ZHANG Hui, LEI Chen-Fang, LI Jin-Ying, and LU Wei-Guo
- 2451 **Dissecting the genetic basis of kernel size related traits and their combining ability based on a hybrid population in maize** LI Ting, WANG Ya-Peng, DONG Yuan, GUO Rui-Shi, LI Dong-Mei, TANG Ya-Ling, ZHANG Xing-Hua, XUE Ji-Quan, and XU Shu-Tu
- 2463 **Genetic mapping and candidate gene analysis of the major QTL *cqHD2H-2* for early heading in barley (*Hordeum vulgare* L.)** YU Xin-Lian, LI Xin, YAO Xiao-Hua, YAO You-Hua, BAI Yi-Xiong, AN Li-Kun, and WU Kun-Lun
- 2475 **Construction of SNP high-density genetic map and QTL analysis of agronomic traits in cowpea (*Vigna unguiculata* (L.) Walp.)** LI Jian-Ling, GONG Dan, WANG Su-Hua, CHEN Hong-Lin, CHENG Xu-Zhen, XIONG Tao, and WANG Li-Xia
- 2483 **Genetic structure and evolutionary relationship for cultivated rice resources from Guangdong Province based on SLAF tag sequencing** SUN Bing-Rui, PAN Da-Jian, LI Chen, JIANG Li-Qun, ZHANG Jing, LYU Shu-Wei, LIU Qing, MAO Xing-Xue, CHEN Wen-Feng, and FAN Zhi-Lan
- 2494 **Cloning and functional study of lysophosphatidic acid acyltransferase gene in *Perilla frutescens*** XU Hua-Xiang, LU Geng, GUO Xi, LI Yuan-Yuan, and ZHANG Tao
- 2505 **Content diversity of phenolic compounds of waxy sorghum grains in different provinces, cities, and autonomous regions of China** WANG Qian, LIU Shao-Xiong, CHAI Xiao-Jiao, LI Hai, ZHANG Fen, LU Ping, WANG Rui-Yun, and LIU Min-Xuan
- 2517 **Genome-wide identification of the Class III PRX gene family in foxtail millet (*Setaria italica* L.) and expression analysis under drought stress** MA Xin-Lei, XU Rui-Qi, SUO Xiao-Man, LI Jing-Shi, GU Peng-Peng, YAO Rui, LIN Xiao-Hu, and GAO Hui
- 2533 **Genome-wide identification and expression analysis of potato PYL gene family** JIA Xiao-Xia, QI En-Fang, MA Sheng, HUANG Wei, ZHENG Yong-Wei, BAI Yong-Jie, and WEN Guo-Hong
- 2546 **Biochemical characteristics and expression differences of three members of *CCRs* in ramie (*Boehmeria nivea*)** TANG Ying-Hong, LIU Fang, CHEN Jian-Rong, MAO Kai-Quan, LI Hui, and WAN Hai-Qing

TILLAGE & CULTIVATION • PHYSIOLOGY & BIOCHEMISTRY

- 2560 **Milk line changes of maize grain and the relationship with grain filling and drying process** LI Hong-Yan, ZHOU Lin-Li, GAO Shang, XUE Jun, MING Bo, ZHAO Ru-Lang, WANG Ke-Ru, XIE Rui-Zhi, HOU Peng, WANG Yong-Hong, and LI Shao-Kun
- 2567 **Effects of increased nitrogen fertilizer on square Bt protein expression and nitrogen metabolism in cotton** LI Han-Jia, LI Yuan, LIU Zhen-Yu, ZHANG Chen-Xia, XU Ze, WU Tian-Fan, CHEN Yuan, ZHANG Xiang, CHEN Yuan, and CHEN De-Hua
- 2575 **Responses of soil diazotrophic diversity and community composition of nodulating and non-nodulating peanuts (*Arachis hypogaea* L.) to nitrogen fertilization** SUN Qi-Qi, ZHENG Yong-Mei, YU Tian-Yi, WU Yue, YANG Ji-Shun, WU Zheng-Feng, WU Ju-Xiang, and LI Shang-Xia
- 2588 **Role of complementarity and select effect for yield advantage of maize/legumes intercropping systems** ZHAO Jian-Hua, SUN Jian-Hao, CHEN Liang-Zhi, and LI Wei-Qi
- 2597 **Effects of sowing date on the yield of different late rice variety types and its relationship with the allocation of temperature and light resources during the whole growth period of rice in the lower reaches of the Yangtze River** FENG Xiang-Qian, YIN Min, WANG Meng-Jia, MA Heng-Yu, LIU Yuan-Hui, CHU Guang, XU Chun-Mei, ZHANG Xiu-Fu, WANG Dan-Ying, ZHANG Yun-Bo, and CHEN Song

- | | | |
|------|--|---|
| 2614 | Effects of different amount of drip irrigation on carbon metabolism and photosynthetic nitrogen utilization efficiency of maize after anthesis under shallow buried drip irrigation | YANG Heng-Shan, ZHANG Yu-Shan, GE Xuan-Liang, LI Wei-Min, GUO Zi-He, and GUO Nuan |
| 2625 | Response of grain yield formation to planting density of maize varieties in different eras | WANG Li-Qing, YU Xiao-Fang, GAO Ju-Lin, MA Da-Ling, HU Shu-Ping, GUO Huai-Huai, and LIU Ai-Ye |
| 2638 | Effects of planting methods and nitrogen application on forage crop yield, quality and water use in arid area of northwest China | WEI Zheng-Ye, ZHANG Hai-Xing, SHI Wei, CHANG Sheng-Hua, ZHANG Cheng, JIA Qian-Min, and HOU Fu-Jiang |

RESEARCH NOTES

- | | | |
|------|--|--|
| 2654 | QTL mapping for salt tolerance in wheat line CH7034 | ZHANG Xiao-Wen, LI Shi-Jiao, ZHANG Xiao-Jun, LI Xin, YANG Zu-Jun, ZHANG Shu-Wei, CHEN Fang, CHANG Li-Fang, GUO Hui-Juan, CHANG Zhi-Jian, and QIAO Lin-Yi |
| 2663 | Synergistic effect of moisture and foliar-applied humic acid on oat grain yield and β-glucan content | LI Ying-Hao, WANG Qi, ZHAO Bao-Ping, LIU Yan-Di, MI Jun-Zhen, WU Jun-Ying, and LIU Jing-Hui |
| 2671 | Effects of wheat straw returning and tillage practices on corn yield in oasis irrigation area | WANG Yu-Long, YU Ai-Zhong, LYU Han-Qiang, WANG Qi-Ming, SU Xiang-Xiang, and CHAI Qiang |

A BRIEF INTRODUCTION OF *ACTA AGRONOMICA SINICA*

Acta Agronomica Sinica (*AAS*, ISSN 0496-3490) is a monthly academic journal co-sponsored by Crop Science Society of China and Institute of Crop Sciences, Chinese Academy of Agricultural Sciences, under the leadership of China Association for Science and Technology and published by Science Press, Chinese Academy of Sciences. *AAS* was firstly published in 1962. The predecessors were *Chinese Journal of Agricultural Research* started in 1950 and *Acta Agriculturae Sinica* started in 1952. As one of the key scientific journals in China, *AAS* has been financially supported by China Association for Science and Technology since 1997 and the National Natural Science Foundation of China since 2000.

The major aims of *AAS* are to report the progresses in the disciplines of crop breeding, crop genetics, crop cultivation, crop physiology, ecology, biochemistry, germplasm resources, grain chemistry, grain storage and processing, biotechnology and biomathematics etc. mainly in China and abroad. *AAS* provides regular columns for Original papers, Reviews, and Research notes. The strict peer-review procedure guarantees the academic level and raises the reputation of the journal. The readership of *AAS* is for crop science researchers, students of agricultural colleges and universities, and persons with similar academic level.

AAS is the leading journal of crop sciences and reflects the latest achievement in all aspects of crop sciences in China. It occupies the first position on the list of Chinese core journals in "Agronomy and Crops" field. The editorial board consists of 150 specialists in the field of crop sciences. Among them, 26 are academicians of Chinese Academy of Sciences or Chinese Academy of Engineering, 22 are from the outside of China, and 2 are from Hong Kong, China.

AAS is a fully Open Access Journal through the independent website (<http://zwxb.chinacrops.org/>) since 2004. Free full texts are published online two months earlier than printing version, and all articles of the journal from 1962 are available freely. Manuscript submission, tracking, and peer review process are completed online. The functions of eTOCs (Table of Contents Alerting), advanced paper search, and paper recommendation are available.

AAS are indexed in some international index systems, such as AGRIS (FAO), CAB Abstracts and Global Health of Centre for Agriculture and Bioscience International, Cambridge Scientific Abstracts, Chemical Abstracts, DOAJ, Food Science and Technology Abstracts, Index of Copernicus, Japan Science and Technology Agency, Scopus, and VINITI Abstracts Journal (Russia). *AAS* is also referenced by many domestic databases and abstract periodicals.

The purposes of *AAS* are to enhance the development of crop science and technology in China, to promote nationwide and worldwide academic exchanges, and to accelerate the modernization of Chinese agriculture. *AAS* is distributed in China and abroad. The editorial office appreciates to establish publication exchange relationship with related institutions, agricultural colleges and universities, and international organizations in China and abroad.