

中国科技核心期刊  
全国中文核心期刊  
中国农业核心期刊

ISSN 1673-6257

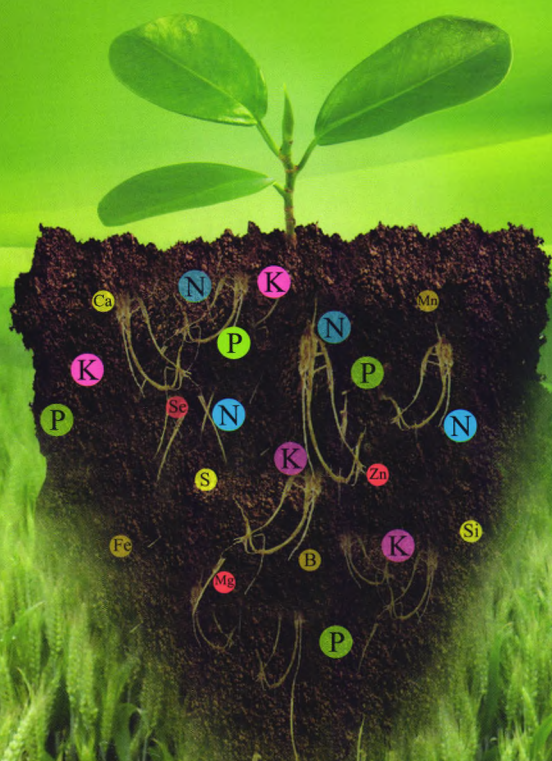
CN 11-5498/S



# 中国土壤与肥料

SOIL AND FERTILIZER SCIENCES IN CHINA

2017年 第4期



ISSN 1673-6257



万方数据

主管：中华人民共和国农业部

主办：中国农业科学院农业资源与农业区划研究所

中国植物营养与肥料学会

# 中国土壤与肥料

ZHONGGUO TURANG YU FEILIAO

双月刊(1964 年创刊)

2017 年第 4 期(总第 270 期)

2017 年 8 月 10 日出版

主 编 徐明岗

副 主 编 卢昌艾

编 委(以姓名笔画为序)

王 旭 王秋兵 石孝均  
白由路 刘宝存 孙建光  
李 俊 李晓林 杨俊诚  
吴立忠 张甘霖 张旭东  
林新坚 周建斌 郑海春  
赵秉强 逢焕成 黄子蔚  
黄鸿翔 曾思坚 谢良商  
鲁剑巍 魏 丹

责任编辑 单秀枝

英文编辑 武淑霞

主办单位 中国农业科学院农业资源与农业  
区划研究所  
中国植物营养与肥料学会

协办单位 国家化肥质量监督检验测试中心  
(北京)  
农业部微生物肥料和食用菌菌种  
质量监督检验测试中心

编辑出版 《中国土壤与肥料》编辑部

地 址 北京中关村南大街 12 号

邮政编码 100081

网 址 <http://chinatrfl.alljournal.net.cn>

电子信箱 trfl@caas.cn

电 话 (010)82108656

传 真 (010)82106225

印 刷 北京科信印刷有限公司

发 行 北京市报刊发行局

订 阅 全国各地邮局

邮发代号 2-559

订 价 15.00 元

中国标准连续出版物号 ISSN 1673-6257  
CN 11-5498/S

广告经营许可证 京海工商广字第 0082 号

## 目 次

### · 专题综述 ·

- 陆地生态系统土壤呼吸的影响因素研究综述 ..... 熊平生(1)  
绿肥腐解及养分释放过程研究进展 .....  
..... 李增强,王建红,张 贤(8)

### · 研究报告 ·

- 深旋松耕改善耕层结构促进马铃薯增产 ..... 张 莉,  
翟 振,逢 博,李玉义,王 婧,逢焕成,韦本辉,王庆伟,慕少伟(17)  
苹果专用肥对果园土壤理化性质及苹果产量、品质的影响 ...  
..... 张 超,张 海,周 旭,翟 辉,燕君芳(24)  
有机肥在油-稻轮作田块对油菜生长和土壤肥力的影响 .....  
..... 王建红,张 贤,李增强,伍建平,卢昌艾(31)  
生物炭与菜籽饼配施对土壤养分及烟叶产质量的影响 .....  
..... 李司童,毛凯伦,郑璞帆,  
赵鹏博,李爱梅,吴 薇,金保锋,扈 强,刘海轮,唐永红,张立新(37)  
生物炭对云南典型植烟土壤持水性及烤烟产量的影响 .....  
..... 代 快,计思贵,张立猛,李江舟,乔志新,焦永鸽,张庆忠(44)  
冬种绿肥和稻草全量还田对单季稻田土壤理化性质的影响...  
..... 刘 威,秦自果,耿明建,吴礼树,鲁剑巍,鲁君明,曹卫东(52)  
黄瓜适宜的负压灌溉条件与养分配比研究 .....  
..... 赵秀娟,宋燕燕,张淑香,岳现录,武雪萍,龙怀玉(59)  
氨基酸发酵尾液在水溶肥料中的应用及其效果 .....  
..... 张 健,李絮花,李燕婷,袁 亮,赵秉强,李 伟(66)  
石灰用量对酸性土壤 pH 值及有效养分含量的影响 .....  
..... 胡 敏,向永生,鲁剑巍(72)  
单施和配施有机物料对沙化土壤微生物群落功能多样性的短  
期影响 ..... 屈皖华,李志刚,李 健(78)  
微喷水肥一体化提高冬小麦产量与品质 .....  
..... 张孟妮,毛平平,王 丽,  
宜丽宏,党建友,吴会军,李银坤,裴雪霞,张 晶,张永清,武雪萍(86)

|                                   |                                             |
|-----------------------------------|---------------------------------------------|
| 施肥方式对滴灌加工番茄干物质积累、养分吸收和产量的影响 ..... | 李青军,张炎,胡伟,王金鑫,哈丽哈什(93)                      |
| 基于蒸汽爆破技术的烟秆炭对烤烟生长及烟叶品质的影响 .....   | 李静静,常建伟,任天宝,张幸博,王欢欢,云菲,刘国顺(99)              |
| 栽培方式与施磷量对水稻养分累积、分配及磷素平衡的影响 .....  | 郭鑫年,孙娇,梁锦绣,周涛,田旭东,陈刚(104)                   |
| 不同专用肥施肥水平对柠檬幼树光合生理特性的影响 .....     | 刘红明,李进学,杜玉霞,龙春瑞,周先艳,董美超,岳建强(112)            |
| 叶面喷施氨基酸锌复合物对水稻产量性状和锌吸收的影响 .....   | 王晨,刘朝,马婧,杨系玲,范文艳,韩文革,姜述君(118)               |
| 喷施硅肥对烤烟圆顶期光合特性、氮钾含量及产质量的影响 .....  | 郑璞帆,崔志燕,陈富彩,唐永红,勾薇,金保锋,李司童,毛凯伦,刘海轮,张立新(124) |
| 硼肥用量对油菜产量与硼养分吸收的影响 .....          | 朱芸,陆志峰,肖文豪,任涛,张洋洋,鲁剑巍(129)                  |
| 硒对水稻光合作用及抗氧化作用的影响 .....           | 钟松臻,张宝军,张木,李革,付弘婷(134)                      |
| 海藻酸钠寡糖提高水稻幼苗对镉胁迫的抗性 .....         | 张运红,孙克刚,杜君,和爱玲,尹海庆(140)                     |
| 不同促腐菌剂对有机废弃物堆肥效果的研究 .....         | 鲁耀雄,崔新卫,龙世平,范海珊,边文亮,陈山,彭福元(147)             |
| 生物改性聚乙烯醇可降解包膜材料的特征及其光谱特性 .....    | 陈松岭,蒋一飞,巴闯,凌尧,张玉龙,邹洪涛(154)                  |
| 不同热水处理方式对橡胶园覆盖绿肥种子萌发的影响 .....     | 杨春霞,赵志平,陈永川,李春丽(161)                        |
| 基于 SEM 的农户施肥行为及其影响因素实证研究 .....    | 肖阳,李云威,朱立志(167)                             |

#### · 广告 · 信息 ·

|                       |       |
|-----------------------|-------|
| 《中国土壤与肥料》征稿简则 .....   | (16)  |
| 江苏淮安大华生物科技有限公司 .....  | (166) |
| 上海晟声自动化分析仪器有限公司 ..... | (封二)  |
| 双龙集团有限公司 .....        | (封三)  |
| 北京新禾丰农化资料有限公司 .....   | (封底)  |

# SOIL AND FERTILIZER SCIENCES IN CHINA

Bimonthly (Started in 1964)

No. 4, 2017 (Tot. No. 270)

Published on Aug. 10, 2017

**Editor in Chief** XU Ming-gang

**Deputy Editor in Chief** LU Chang-ai

## Members of Editorial Board

WANG Xu WANG Qiu-bing SHI Xiao-jun  
BAI You-lu LIU Bao-cun SUN Jian-guang  
LI Jun LI Xiao-lin YANG Jun-cheng  
WU Li-zhong ZHANG Gan-lin ZHANG  
Xu-dong LIN Xin-jian ZHOU Jian-bin  
ZHENG Hai-chun ZHAO Bing-qiang  
PANG Huan-cheng HUANG Zi-wei  
HUANG Hong-xiang ZENG Si-jian XIE  
Liang-shang LU Jian-wei WEI Dan

## Sponsored by

Institute of Agricultural Resources and Re-  
gional Planning, CAAS  
Chinese Society of Plant Nutrition and Fertil-  
izer Sciences

## Assisted in

National Center (Beijing) for Quality Supervi-  
sion and Test of Fertilizers  
Center for Quality Supervision and Test of Mi-  
crobial Fertilizers and Mushroom Spawn, Min-  
istry of Agriculture, P. R. China

**Published by** Editorial Department of Soil and  
Fertilizer Sciences in China

**Address** No. 12 South Street, Zhongguancun,  
Beijing

**Postcode** 100081

**URL** <http://chinatrf1.alljournal.net.cn>

**E-mail** trf1@caas.cn

**Tel** (010)82108656

**Fax** (010)82106225

## Oversea Distributor

China International Book Trading Corporation

# CONTENTS

- Research review of the impact factors on soil respiration in terrestri-  
al ecosystem ..... XIONG Ping-sheng(1)
- A review on the research of decomposition and nutrients release of  
green manure ..... LI Zeng-qiang, WANG Jian-hong, ZHANG Xian(8)
- Deep vertically rotary tillage improve soil structure and tuber yield of  
potato ..... ZHANG Li, ZHAI Zhen, PANG Bo, LI Yu-yi, WANG Jing,  
PANG Huan-cheng, WEI Ben-hui, WANG Qing-wei, QI Shao-wei(17)
- Effect of apple special fertilizer on soil physicochemical properties  
and yield and quality of fruit of apple orchard .....  
..... ZHANG Chao, ZHANG Hai, ZHOU Xu, ZHAI Hui, YAN Jun-fang(24)
- Effects of organic fertilizer on rape growth and soil fertility in rape-  
rice rotation field .....  
WANG Jian-hong, ZHANG Xian, LI Zeng-qiang, WU Jian-ping, LU Chang-ai(31)
- Effects of combining application of biochar and rapeseed cake on  
soil nutrition and yield and quality of flue-cured tobacco .....  
LI Si-tong, MAO Kai-lun, ZHENG Pu-fan, ZHAO Peng-bo, LI Ai-mei, WU Wei,  
JIN Bao-feng, HU Qiang, LIU Hai-lun, TANG Yong-hong, ZHANG Li-xin(37)
- Effect of biochar application on soil water retention and flue-cured  
tobacco yield in Yunnan typical soils ..... DAI Kuai, JI Si-gui, ZHANG  
Li-meng, LI Jiang-zhou, QIAO Zhi-xin, JIAO Yong-ge, ZHANG Qing-zhong(44)
- Effects of winter green manure planting and rice straw retention on  
soil physical and chemical properties from a mono-rice cultivation  
system ..... LIU Wei, QIN Zi-guo,  
GENG Ming-jian, WU Li-shu, LU Jian-wei, LU Jun-ming, CAO Wei-dong(52)
- Effect of different nutrient ratios on cucumber under negative pres-  
sure irrigation ..... ZHAO Xiu-juan, SONG  
Yan-yan, ZHANG Shu-xiang, YUE Xian-lu, WU Xue-ping, LONG Huai-yu(59)
- Effects of water soluble fertilizer with amino acid fermentation tail  
liquid addition on tomato yields and qualities .....  
ZHANG Jian, LI Xu-hua, LI Yan-ting, YUAN Liang, ZHAO Bing-qiang, LI Wei(66)
- Effects of lime application rates on soil pH and available nutrient  
content in acidic soils .....  
..... HU Min, XIANG Yong-sheng, LU Jian-wei(72)

|                                                                                                                                                    |                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Short term response of microbial community functional diversity in desertified soils under fertilized individual and mixed organic materials ..... | QU Wan-hua, LI Zhi-gang, LI Jian(78)                                                                                                                |
| Effect of integral control of micro-sprinkling and fertilization on the population dynamics, yield and quality of winter wheat .....               | ZHANG Meng-ni, MAO Ping-ping, WANG Li, YI Li-hong, DANG Jian-you, WU Hui-jun, LI Yin-kun, PEI Xue-xia, ZHANG Jing, ZHANG Yong-qing, WU Xue-ping(86) |
| Effects of fertilization on dry matter accumulation, nutrient uptake and yield of processing tomato under drip irrigation .....                    | LI Qing-jun, ZHANG Yan, HU Wei, WANG Jin-xin, Harlax(93)                                                                                            |
| Effect of tobacco stalk biochar made by steam explosion technology on the growth and quality of flue-cured tobacco .....                           | LI Jing-jing, CHANG Jian-wei, REN Tian-bao, ZHANG Xing-bo, WANG Huan-huan, YUN Fei, LIU Guo-shun(99)                                                |
| Cultivation way and phosphorus fertilizer on rice nutrient accumulation, distribution and soil phosphorus balance .....                            | GUO Xin-nian, SUN Jiao, LIANG Jin-xiu, ZHOU Tao, TIAN Xu-dong, CHEN Gang(104)                                                                       |
| Effects of different special formulated fertilizer application levels on photosynthetic physiology characteristics of lemon saplings .....         | LIU Hong-ming, LI Jin-xue, DU Yu-xia, LONG Chun-rui, ZHOU Xian-yan, DONG Mei-chao, YUE Jian-qiang(112)                                              |
| Effects of foliar applications of zinc-amino acid complexes on yield characters and zinc uptake of rice .....                                      | WANG Chen, LIU Zhao, MA Jing, YANG Xi-ling, FAN Wen-yan, HAN Wen-ge, JIANG Shu-jun(118)                                                             |
| Effects of silicon fertilizer on photosynthetic characteristics, nitrogen and potassium contents, yield and quality of flue-cured tobacco .....    | ZHENG Pu-fan, CUI Zhi-yan, CHEN Fu-cai, TANG Yong-hong, GOU Wei, JIN Bao-feng, LI Si-tong, MAO Kai-lun, LIU Hai-lun, ZHANG Li-xin(124)              |
| Effects of boron application levels on rapeseed yield and boron uptake .....                                                                       | ZHU Yun, LU Zhi-feng, XIAO Wen-hao, REN Tao, ZHANG Yang-yang, LU Jian-wei(129)                                                                      |
| Effects of selenium on photosynthesis and antioxidation of rice .....                                                                              | ZHONG Song-zhen, ZHANG Bao-jun, ZHANG Mu, LI Ping, FU Hong-ting(134)                                                                                |
| Alginate oligosaccharides enhanced the resistance of <i>Oryza sativa</i> L. to cadmium stress .....                                                | ZHANG Yun-hong, SUN Ke-gang, DU Jun, HE Ai-ling, YIN Hai-qing(140)                                                                                  |
| Study on effect of different decay agents on organic waste in composting process .....                                                             | LU Yao-xiong, CUI Xin-wei, LONG Shi-ping, FAN Hai-shan, BIAN Wen-liang, CHEN Shan, PENG Fu-yuan(147)                                                |
| Characteristics and spectral properties of biodegradable modified polyvinyl alcohol coated materials .....                                         | CHEN Song-ling, JIANG Yi-fei, BA Chuang, LING Yao, ZHANG Yu-long, ZOU Hong-tao(154)                                                                 |
| Effects of different hot water treating approach on the seed germination of mulch green manure in rubber plantation .....                          | YANG Chun-xia, ZHAO Zhi-ping, CHEN Yong-chuan, LI Chun-li(161)                                                                                      |
| The empirical research of farmer's fertilization behavior and its influencing factors based on the structural equation model .....                 | XIAO Yang, LI Yun-wei, ZHU Li-zhi(167)                                                                                                              |



绿色农业 绿色新禾丰

**丰利惠®**

# 美国进口 真正的糖醇螯合肥 实现养分双渠道运输 利用更高效

## 丰利惠果蔬钙肥

第5代螯合钙，  
双渠道吸收，补钙快速有效。



## 惠得营养液

配方新养分全，  
补营养补糖醇，  
增产量提品质。



## 丰利惠锌

既补糖醇又补锌，  
引领补锌新潮流。



## 丰利惠铁

糖醇螯合铁  
激活植物铁动力



糖醇螯合  
Sugar Alcohol Inside



## 丰利惠硼

既补糖醇又补硼，  
增产提质两不误。



## 丰利惠锰

糖醇螯合锰  
激活植物锰动力



## 丰利惠钙镁

糖醇螯合钙镁  
叶美果更美



## 丰利惠多硼

糖醇螯合硼  
含量更高吸收更好



## 丰利惠多元微肥

糖醇螯合肥  
全面补充多种微量元素



北京新禾丰农化资料有限公司

电话：010-65447841 <http://www.xinhefeng.com.cn>

