

农学—研究报告

磷素对不同大豆品种籽粒异黄酮含量的影响

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摘要:

为探索磷素对不同大豆品种籽粒异黄酮含量的影响, 寻找不同基因型大豆品种最佳施磷水平, 以期提高大豆籽粒异黄酮的含量, 改善其品质。选用‘黑农48’ (高蛋白品种)、‘黑农37’ (中间型品种)、‘黑农44’ (高油品种) 3个大豆品种作为试验材料。采用盆栽, 在每kg土壤施N和K₂O各为0.033 g基础上, 设P₁、P₂、P₃、P₄ 4个P处理 (即每kg土壤分别施P₂O₅ 0、0.033、0.067、0.100 g)。采用紫外分光光度法测定不同大豆品种籽粒总异黄酮的含量。结果表明: 同一品种P₂处理大豆总异黄酮含量显著高于P₁、P₃、P₄处理, ‘黑农37’、‘黑农44’、‘黑农48’ 3个品种大豆P₂处理大豆总异黄酮含量分别比对照组增加3.7%、4.3%、3.8%; 不同品种同一处理都是‘黑农44’总异黄酮含量最高; 在12个处理组合中‘黑农44’P₂处理总异黄酮含量最高, 3个大豆品种异黄酮含量在品种间和施磷处理间差异显著。施磷对3个大豆品种异黄酮含量有影响, 适宜的施磷量有利于提高大豆籽粒异黄酮的含量。

关键词: 异黄酮

Effect of Phosphorus on the Content of Kernal Isoflavone in Different Soybean Varieties

Abstract:

In this study, the effect of phosphorus on the content of kernal isoflavone in different soybean varieties was analyzed. The best phosphorus levels of different genotype soybean varieties were explored, in order to increase the content of kernal isoflavone and improve their qualities. Three soybean varieties (‘Heinong-48’, high-protein cultivar; ‘Heinong-37’, middle cultivar; and ‘Heinong-44’, high-oil cultivar) were investigated. The soybean seeds were planted in pots and fertilized with 0.033 g of nitrogen (N) and potassium oxide (K₂O) per kg soil. Four levels of phosphorus (P) treatment were designed, which were P₁, P₂, P₃ and P₄ (i.e., 0, 0.033, 0.067, and 0.100 g of phosphorus pentoxide (P₂O₅) per kilogram of soil). The content of total kernal isoflavone in different soybean varieties was determined by ultraviolet spectrophotometry. The results showed that the content of total isoflavone under the P₂ treatment was significantly higher than that of P₁, P₃ and P₄ treatment in the same variety of soybean. The content of total isoflavone under the P₂ treatment in the three soybean varieties (‘Heinong-37’; ‘Heinong-44’; ‘Heinong-48’) compared to the control group was increased by 3.7%, 4.3%, 3.8%, respectively. It showed that the content of total isoflavone in ‘Heinong-44’ was the highest under the same treatment in different soybean varieties. In the 12 treatment combinations, the content of total isoflavone in ‘Heinong-44’ was the highest under the P₂ treatment. Significant differences were observed in the content of isoflavone between the varieties and levels of P treatments. These findings suggest that phosphorus affects the total content of isoflavone in the three soybean varieties, and appropriate amounts of P fertilization might contribute to improving the content of kernal isoflavone.

Keywords: isoflavone

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参考文献:

- [1] 王春娥,赵团结,盖钧镒.中国大豆资源异黄酮含量及其组分的遗传变异和演化特征[J]. 中国农业科学,2010,43(19): 3919-3929.
- [2] 徐冉,石荣,张礼凤,等.山东部分大豆品种异黄酮含量的比较分析[J]. 山东农业科学,2006,1: 18-20.
- [3] Jong-Sang Kim, Chong-Suk Kwon.Estimated dietary isoflavone intake of Korean based on National Nutrition Survey[J]. Natrtion Re-search 21 (2001): 947-953.
- [4] 彭向雷, 王蕊, 王悦,等. 大豆异黄酮研究进展[J]. 中国食品卫生杂志,1998, 10(3): 38-40.
- [5] 杨镇洲. 大豆异黄酮的抗癌效应研究进展[J]. 国外医学肿瘤学分册, 2001, 28(2): 107-110.
- [6] 张永忠, 石冬冬, 孙艳梅, 井乐刚. 新型保健食品功能因子—大豆异黄酮[J]. 食品研究与开发, 2002, 8(23): 62-65.
- [7] Potter SM. Baum JA.Teng H, et al.Soy protein and isoflavone: Their effects on blood lipids and bone density in postmenopausal women.Am J Clin Nutr, 1998, 68(suppl): 1375-1379.
- [8] 刘炳智, 王涛. 大豆成分的功能及其应用研究进展[J]. 食品研究与开发, 2001, 22(2): 25-28.
- [9] Cassidy A, et al. Biological effects of a diet of soy protein rich in isoflavone on the menopausal cycle of premenopausal women [J]. Am. J. ClinNutr: 1994, 60: 333-340.
- [10] Sarkar F.H., Li Y. W. Mechanisms of cancer chemoprevention by soy isoflavone genistein [J]. Cancer and Metastasis Reviews, 2002, 21(3-4): 265-280.
- [11] 蔡柏岩,葛菁萍,祖伟.磷素对不同大豆品种7S和11S球蛋白亚基组成及含量的影响[J].中国农业科学,2008,41(11): 3872-3877.
- [12] 张大勇,谢甫缙,李文滨,等.施肥、品种及密度对大豆籽粒异黄酮含量的影响[J].大豆科学,2009,28(1): 76-80.
- [13] 马嘉萌,李建东.不同环境条件对大豆异黄酮含量的影响研究[J].中国种业,2008,7: 23-24.
- [14] 高秀芝, 刘慧. 大豆异黄酮的研究与应用进展[J]. 食品科学, 2004, 25(11): 386.
- [15] 冯国洲.提取大豆中异黄酮的方法[P].中国专利:98119864.3.1999-03-24.
- [16] 谢皓,Gyorgy V.,Gergo S.,等.北京地区不同大豆品种异黄酮含量比较研究.中国粮油学报,2009,5(5): 25-30.
- [17] 宋志峰,王丽,孟凡钢,等. 吉林省普通大豆品种(系)异黄酮含量分析.大豆科学,2009,28(8): 1076-1080.
- [18] Wang H J, Murphy P A. Isoflavone composition of American and Japanese soybean in Iowa: Effects of variety, crop year, and location.Agric Food Chem, 1994, 42: 1674 - 1677.
- [19] Hoeck J A, Fehr W R, Murphy P A, Welke G A. Influence of genotype and environment on isoflavone contents of soybean.Crop Sci, 2000, 40: 48 - 51.

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1. 井乐刚, 张永忠.大豆异黄酮的物理化学性质[J]. 中国农学通报, 2006,22(1): 85-85
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