

镉胁迫对不同基因型小麦产量及构成因子的影响

杨玉敏¹, 张庆玉^{1*}, 杨武云², 田丽¹, 雷建容¹, 张冀¹, 李俊²

1四川省农业科学院土壤肥料研究所, 四川成都 610066; 2四川省农业科学院作物研究所, 四川成都 610066

Effect of cadmium stress on yield and yield components of different wheat genotypes

YANG Yu-min¹, ZHANG Qing-yu^{1*}, YANG Wu-yun², TIAN Li¹, LEI Jian-rong¹, ZHANG Ji¹, LI Jun^{2*}

1 Soil and Fertilizer Institute, Sichuan Academy of Agricultural Science, Chengdu, Sichuan 610066, China; 2 Crop Research Institute, Sichuan Academy of Agricultural Science, Chengdu, Sichuan 610066, China

摘要

参考文献

相关文章

Download: [PDF \(869KB\)](#) | [HTML 1KB](#) | Export: [BibTeX](#) or [EndNote \(RIS\)](#) | [Supporting Info](#)

摘要 盆栽试验以筛选出的6份子粒镉(Cd)高积累和5份子粒Cd低积累小麦为试材, 研究不同基因型小麦在0、28(对照CK)、5、10和20 mg/kg 4个Cd浓度胁迫下小麦子粒产量及其构成因子的变化。结果表明, 不同基因型小麦产量及其构成因子对土壤Cd浓度的变化响应差异很大。产量对Cd胁迫很敏感, 随着Cd浓度的提高极显著降低; 小穗数、穗粒数和千粒重随Cd浓度的增加逐渐降低, 响应显著的浓度分别为5、5和10 mg/kg; 而有效分蘖随着Cd浓度的提高先在5 mg/kg显著增加, 然后极显著降低, 响应强烈的浓度为10 mg/kg。相关性和通径分析表明, Cd浓度与小麦产量及构成因子呈负相关, 影响程度为: 产量>千粒重>穗粒数>有效分蘖>小穗数。由此可知, 产量随着Cd浓度的提高极显著降低的直接原因是瘪粒和空粒的增加; 同时还看出, Cd胁迫下子粒Cd高积累小麦的产量、小穗数和穗粒数显著低于Cd低积累品种, 千粒重两者相差不多, 有效分蘖是前者高于后者。

关键词: 小麦 镉胁迫 产量 基因型差异

Abstract: To investigate the effect of the soil Cd concentration on yield and yield components of different wheat genotypes, a pot culture experiment was performed. Six highCd accumulating wheat (HCA) and five lowCd accumulating wheat (LCA) were used under 0, 28 (CK), 5, 10 and 20 mg/kg soil Cd concentrations. The wheat yield decreased gradually and significantly with increasing Cd concentration in the soil, and the 1000grain weight (TGW), tiller number, spikelet number and kernel number per spike decreased gradually, while the effective tiller number increased significantly in the 5 mg/kg treatment, but was reduced significantly at higher soil Cd concentrations. The correlation and path analysis procedures were utilized to investigate the effect of Cd stress on yield and yield components of the different wheat genotypes. The results showed that Cd in the soil can easily lead to significantly reduced wheat yield, mainly because of shriveled grains and empty seeds, which suggested that Cd may affect fertilization or pollination, and growth of the embryo or endosperm. In addition, the yield, spikelet number per spike and kernel number per plant of HCA genotypes were significantly lower than those of LCA genotypes under the four different soil Cd concentrations, TGW was unchanged between HCA and LCA, while the effective tiller number of the former was higher than that of the latter.

Keywords: wheat cadmium stress yield genotypic difference

Received 2010-05-26; published 2011-03-31

Fund:

国家级项目

Corresponding Authors: 杨玉敏 Email: yangym12@163.com

引用本文:

杨玉敏 张庆玉 杨武云 田丽 雷建容 张冀 李俊. 镉胁迫对不同基因型小麦产量及构成因子的影响[J] 植物营养与肥料学报, 2011, V17(3): 532-538

YANG Yu-min ZHANG Qing-yu YANG Wu-yun TIAN Li LEI Jian-rong ZHANG Ji LI Jun. Effect of cadmium stress on yield and yield components of different wheat genotypes[J] Acta Metallurgica Sinica, 2011, V17(3): 532-538

Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

作者相关文章

- ▶ 杨玉敏
- ▶ 张庆玉
- ▶ 杨武云
- ▶ 田丽
- ▶ 雷建容
- ▶ 张冀
- ▶ 李俊