

研究论文

# 品种、种子大小和施肥对冬小麦生物学特性的影响

吉春容<sup>1, 3</sup>, 李世清<sup>1, 2, 3, \*</sup>, 李生秀<sup>1, 3</sup>

1. 西北农林科技大学 黄土高原土壤侵蚀与旱地农业国家重点实验室, 陕西 杨凌712100 2. 中国科学院水利部水土保持研究所, 3. 资源环境学院,

收稿日期 2006-5-30 修回日期 2006-11-28 网络版发布日期: 2007-6-25

**摘要** 试验设不同年代冬小麦品种、粒重、播种方式和施肥等4个因子, 品种选用白芒麦(20世纪60年代)、咸农39(20世纪70~80年代)、小偃6号(20世纪90年代后期)、远丰998(近期)等不同年代的4个冬小麦品种, 粒重分为2种截然不同重量的大粒和小粒, 播种方式设小粒单播、大粒单播以及大小粒等比例混播等3种播种方式, 施肥设不施肥(CK)、施氮(N)、施磷(P)和同时施氮磷(NP)等4种方式, 共48个处理。以土垆旱耕人为土为供试土样, 进行盆栽试验, 研究不同品种、种子大小和施肥对冬小麦生物学特性的影响。结果表明, 不同品种间、大小粒播种间、不同施肥间植株株高均存在极显著差异( $p < 0.01$ ), 且这些因子间存在显著的交互作用( $p < 0.05$ )。品种间, 苗期和越冬前以近期品种远丰998植株最高, 灌浆期以早期品种白芒麦植株最高。株高稳定后以早期品种高, 反映了育种的演变趋势。大小粒播种间, 苗期和越冬前大粒株高均显著高于小粒株高, 但灌浆期大小粒播种间株高差异基本消失, 说明大粒种子植株在苗期生长具有一定优势。不同施肥处理间株高差异在苗期与越冬前表现一致, 单施P和NP配施植株较高; 灌浆期以NP配施植株株高明显高于其它施肥处理。不同品种、大小粒播种方式和施肥显著影响冬小麦分蘖和单株叶面积。白芒麦、咸农39和小偃6号的分蘖数基本一致, 变化在4.37个/株~4.74个/株之间, 远丰998最少, 仅为2.95个/株; NP配施和施P能够显著增加分蘖数, 其分蘖数几乎是不施肥(CK)和单施N的2倍; 各品种大粒种子植株分蘖数均多于小粒种子植株。远丰998绿叶面积最大(45.72 cm<sup>2</sup>/单茎), 白芒麦最低(仅为26.97 cm<sup>2</sup>/单茎); NP配施单株绿叶面积明显大于其它施肥处理。除远丰998大粒种子植株绿叶面积(50.42 cm<sup>2</sup>/单茎)显著大于小粒种子(41.01 cm<sup>2</sup>/单茎)外, 其余品种大、小粒种子植株绿叶面积相当。就施肥处理而言, 施肥对近期品种小粒种子株高、分蘖数和叶面积促进作用相对较大, 而对远期品种小粒种子植株的影响相对较小。

关键词 [冬小麦](#) [种子大小](#) [品种](#) [施肥](#) [生物学特性](#)

分类号 [Q142](#), [Q945](#), [Q948](#), [S314](#)

## Effect of variety, seed size and fertilizer on biological characteristics of winter wheat

Ji Chun-Rong<sup>1, 3</sup>, Li Shi-Qing<sup>1, 2, 3, \*</sup>, Li Sheng-Xiu<sup>1, 3</sup>

1 State Key Laboratory of Soil Erosion and Dryland Farming on Loess Plateau, Northwest A & F University, Yangling 712100, China

2 Institute of Soil and Water Conservation, CAS and MWR, Yangling 712100, China

3 Dept. of Resource and Environment, Northwest A & F University, Yangling 712100, China

**Abstract** A pot experiment was carried out to compare the biological characteristics of four winter wheat varieties that were released at different times over the past four decades: Yuanfeng 998 (recently released), Xiaoyan6 (released in the 1990s), Xiannong39 (released in the 1970s and 1980s) and Baimangmai (released in the 1960s). Wheat seeds from each variety were divided into two size classes (small or large) and then sown with one of three methods: small seeds sown alone (SA-S), large seeds sown alone (SA-B) and small seeds and large seeds sown together (S-T). The experiment also included four fertilizer treatments: no fertilizer (CK), nitrogen fertilizer (N), phosphorus fertilizer (P), and nitrogen + phosphorus (NP) fertilizer. The results showed that plant height was significantly different among varieties as well as seed size and fertilizer treatment ( $p < 0.01$ ). The recently released variety, Yuanfeng 998, was the tallest variety at the seedling stage.

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ge and before wintering, but Baimangmai was the tallest variety at grain filling. Plants in the large seed treatments were significantly taller than plants in the small seed treatments at the seedling stage and before wintering, but there was no difference in plant height between the two seed size treatments at grain filling. Plants in the P and NP fertilizer treatments were taller than plants in the N and CK fertilizer treatments at the seedling stage and before wintering. Among the four fertilizer treatments, plant height was tallest in the NP fertilizer treatment. Variety, seed size, and fertilizer treatment had a significant effect on the number of tillers and total leaf areas of wheat. The number of tillers of Baimangmai, Xiannong 39 and Xiaoyan6 ranged from 4.37 tillers/plant to 4.74 tillers/plant. In comparison, Yuanfeng 998 only had 2.95 tillers/plant. Application of P and NP fertilizer increased the number of tillers. There were more tillers in the large seed treatment compared to the small seed treatment for all four varieties. Yuanfeng 998 had the largest total leaf areas; Baimangmai had the smallest total leaf areas. Total leaf areas were larger in the NP fertilizer treatment compared to the other fertilizer treatments. The effect of fertilizer on plant height, tiller numbers, and leaf area had a greater effect on small seeds of recently released varieties compared to small seeds of varieties that were released earlier.

**Key words** winter wheat seed size variety fertilizer biological characteristics

DOI

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通讯作者 李世清 [sql@ms.iswc.ac.cn](mailto:sql@ms.iswc.ac.cn)