

## 施氮量对不同品质类型小麦子粒蛋白质组分含量及加工品质的影响

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## Effects of nitrogen fertilization on protein components contents and processing quality of different wheat genotypes

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摘要

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**摘要** 选用强筋小麦济麦20、中筋小麦泰山23和弱筋小麦宁麦9号, 利用反相高效液相色谱(RP-HPLC)方法测定了施氮量对不同品质类型小麦子粒蛋白质组分含量和高分子量谷蛋白亚基(HMW-GS)、低分子量谷蛋白亚基(LMW-GS)含量的影响, 并分析其与子粒加工品质的关系。结果表明, 随施氮量增加, 强筋小麦济麦20和中筋小麦泰山23的子粒蛋白质含量及各组分含量均呈先增加后降低的趋势, 施氮量为N 240 kg/hm<sup>2</sup>时, 蛋白质各组分含量较高, 加工品质较好; 过量施氮抑制了HMW-GS合成, 这是过量施氮导致强筋和中筋小麦子粒蛋白质品质变劣的原因之一。随施氮量增加, 弱筋小麦宁麦9号子粒的蛋白质各组分含量显著增加, 加工品质变劣。增施氮肥, 3个品种的谷蛋白和醇溶蛋白含量的增加幅度显著高于清蛋白+球蛋白含量, 这是施氮改善强筋和中筋小麦子粒加工品质的主要原因。济麦20和泰山23两品种的总蛋白质含量及醇溶蛋白含量无显著差异, 但强筋小麦济麦20的谷蛋白含量、贮藏蛋白、HMW-GS、LMW-GS、谷蛋白大聚集体(GMP)含量及谷蛋白与醇溶蛋白含量的比值(Glu/Gli)和HMW-GS与LMW-GS含量的比值(HMW/LMW)高于中筋小麦泰山23, 这是强筋小麦济麦20加工品质形成及其面团形成时间和稳定时间显著高于泰山23的重要原因。

**关键词:** 小麦 施氮量 蛋白质组分 加工品质

**Abstract:** Effects of nitrogen application amounts on protein components contents and glutenin subunits (HMW-GS, LMW-GS) of wheat genotypes with different qualities, namely Jimai 20 (strong gluten), Taishan 23 (middle gluten) and Ningmai 9 (weak gluten) were studied by reversed-phase high-performance liquid chromatography (RP-HPLC), and the relationships between protein components contents and processing quality were analyzed. Results show that total protein content and its components contents are increased at first and then decreased with the increase of nitrogen application amounts for Jimai 20 and Taishan 23. The protein components contents are higher and the processing quality is better under the treatment of applying nitrogen at N 240 kg/ha, while HMW-GS is retrained synthesis under the excessive nitrogen fertilization, which is one of reasons which decrease protein quality for strong and middle gluten wheat. With the increase of nitrogen application amounts, all protein components contents for Ningmai 9 are significantly increased and processing quality become poor. On the condition of applying nitrogen fertilizer for the three cultivars, the increased extents of glutenin and gliadin contents are significantly higher than those of albumin + globulin contents, which is an important reason to improve strong and middle gluten wheat grain protein quality with applying nitrogen fertilizer. Total protein and gliadin contents are not significant different between Jimai 20 and Taishan 23, and glutenin, gluten protein, HMW-GS, LMW-GS and GMP contents, and the ratios of HMW/LMW and Glu/gli of Jimai 20 are higher than those of Taishan 23, which is an important reason for Jimai 20 obtaining higher dough development time and dough stability time than those of Taishan 23.

**Keywords:** wheat nitrogen rates; protein components; processing quality

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