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Effects of Seeding Rate and Nitrogen Application Rate on Grain Yield and Protein Content of the Bread Wheat Cultivar 'Minaminokaori' in Southwestern Japan

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Abstract: We examined the effects of seeding rate, 50 or 150 seeds m⁻², nitrogen (N) application rate at active tillering and jointing, 4 and 2 g N m⁻², respectively, or none, and N application rate at anthesis, 0, 2, 4, or 6 g N m⁻², on grain yield and protein content of a bread wheat cultivar, 'Minaminokaori', during the 2004-2005 crop season in southwestern Japan. Grain yield was similar at a seeding rate of 50 and 150 seeds m⁻². It was higher when 4 and 2 g N m⁻² were applied at active tillering and jointing, respectively (4-2N), than when no N was applied at these stages (0-0N). However, it was not influenced by N application rate at anthesis. Grain protein content was similar at 50 and 150 seeds m⁻². It was higher in 4-2N than in 0-0N. It was the highest when 6 g N m⁻² was applied at anthesis, followed by 4, 2, and 0 g N m⁻². The SPAD value at anthesis was higher at 50 than 150 seeds m⁻², but leaf area index (LAI) at anthesis was similar at 50 and 150 seeds m⁻² and protein content of grain was nearly the same at 50 and 150 seeds m⁻² irrespective of N application rate at anthesis. LAI and the SPAD value were higher in 4-2N than in 0-0N and the protein content of grain was also higher in 4-2N than in 0-0N irrespective of N application rate at anthesis. Therefore, both LAI and the SPAD value may be important traits related to the N application rate at anthesis suitable for yielding wheat grain with a high protein content.

Keywords: [Anthesis](#), [Bread wheat](#), [Grain protein content](#), [Grain yield](#), ['Minaminokaori'](#), [Nitrogen application rate](#), [Seeding rate](#), [Triticum aestivum L](#)

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