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Factors in the Reduction in Grain Number in Winter Wheat by Early-Sowing in Yamaguchi

Li Zhang[1)], Tadashi Takahashi[2)], Kana Fujimoto[2)], Shinji Yamaguchi[2)] and Tomohiko Matsuzawa[2)]

1) The United Graduate School of Agricultural Sciences, Tottori University
2) Faculty of Agriculture, Yamaguchi University

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Abstract: Grain number per spike of wheat is lower in early sowing than in the conventional standard cultivation in Yamaguchi, Prefecture, Japan. Components of the grain number per spike in five cultivars were analyzed with respect to temperature during the spike development period throughout three growing seasons 2001/2002, 2002/2003 and 2003/2004 to find the cause of the problem of early sowing cultivation. The plants sown in early-October and late-November were called the early sown group and the standard group, respectively, in the following. Three of the five cultivars, Hokushin, Akitakko and Nanbukomugi, showed a strong winter habit, which requires very cold temperatures for spike differentiation. The other two cultivars, Iwainodaichi and Airakomugi, had a moderate winter habit. Grain number per spike and grain yield were decreased by early-sowing (compare with the standard group) in almost all cultivars throughout the three growing seasons. The three cultivars which had a strong winter habit had fewer spikelets per spike in the early-sown group than in the standard group. The other two cultivars which had a moderate winter habit had fewer grains per spikelet in the early-sown group. The higher the temperature during the spikelet formation phase, which is from flag leaf initiation to terminal spikelet initiation, the higher the number of spikelets per spike in the standard group. The spikelet number per spike in the early-sown group increased with the increase in productive tillers under fertile conditions. Such conditions also increased the grain number per spike.

Keywords: Early sowing cultivation, Grain number per spike, Grain number per spikelet, Multiple regression, Spike development period, Spikelet number per spike, Temperature, Winter wheat cultivar

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