ONLINE ISSN : 1349-1008
PRINT ISSN : 1343-943X

Plant Production Science
Vol. 12 (2009) , No. 1 80-87

[PDF (476K)] [References]

Pedigree Analysis of Early Maturing Wheat Cultivars in Japan for Breeding Cultivars with Higher Performance

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(Received: December 10, 2007)

Abstract: Pedigree analysis was conducted for early maturing wheat cultivars developed in Japan. Materials used for this analysis were mainly developed at Nagano Agricultural Experiment Station (Tozan lines). In a recently released Tozan line, the maximum number of generations traced in the pedigree, total number of ancestors in the pedigree and total number of ancestors except common ones was 11, 222 and 94, respectively. Chunaga contributed 24.0% of the genetic background of Tozan lines. Seven ancestors, collectively, contributed 51.5% to the gene pool. Hiyokukomugi had the highest mean coefficient of parentage to Tozan lines and the mean value was 0.216, followed by Kinuiroha (0.213), Norin 61 (0.206), Mikunikomugi (0.205) and Tokai 80 (0.194). The mean coefficient of parentage between Tozan lines and cultivars in the Kanto-Tokai region, Kinki-Chugoku-Shikoku region and Kyushu region was 0.165, 0.155 and 0.157, respectively. Tozan lines more related to cultivars in the Tohoku region tended to be late heading and more cold-tolerant. Tozan lines more related to Ayahikari or Kinuazuma tended to be early maturing. Fukuhokomugi, which was a high yield cultivar and often used as a cross parent, did not contribute to high flour protein. KS831957 showed a positive effect on the crude protein content of flour. In general, Tozan lines had no specific cultivars used extensively as a cross parent having significant influence on yield or flour quality.

Keywords: Coefficient of parentage, Maximum number of generations traced in the pedigree, Number of ancestors in the pedigree, Pedigree analysis, Wheat

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To cite this article:
Tomohiko Ushiyama, Kazuhiro Nakamura, Anas and Tomohiko Yoshida: “Pedigree Analysis of Early Maturing Wheat Cultivars in Japan for Breeding Cultivars with Higher Performance”. Plant Production Science, Vol. **12**, pp.80-87 (2009) .

doi:10.1626/pps.12.80
JOI JST.JSTAGE/pps/12.80