Turkish Journal

of

Agriculture and Forestry

Keywords
Authors

agric@tubitak.gov.tr

Scientific Journals Home Page

Turkish Journal of Agriculture and Forestry

Inheritance of Cold Tolerance in Common Wheat (Triticum aestivum L.)

Omid SOFALIAN, Seyyed Abolghasem MOHAMMADI, Saeid AHARIZAD, Mohammad MOGHADDAM,
Mohammad Reza SHAKIBA
Department of Agronomy and Plant Breeding, Faculty of Agriculture, University of Tabriz, Tabriz 51664, IRAN

Abstract: Low temperature is one of the most severe abiotic stresses limiting wheat growth, productivity, and distribution. Understanding the genetic nature of cold and frost tolerance is regarded as the primary step in wheat breeding programs. This study used a winter wheat cultivar, Norstar, which has a high level of cold tolerance (LT_{50} = -22.3 ºC), and a highly cold-susceptible Iranian spring wheat variety, Zagros (LT_{50} = -3.5 °C), as parental lines to develop different generations. Seven generations, P_1, P_2, F_1, F_2, $F_{2:3}$, BC_1, and BC_2, were used for generation mean and generation variance analysis for estimating genetic effects and variances, and also for determining the number of genes governing cold tolerance in wheat. LT_{50}, the temperature at which 50% of the plants were killed, was used as a measure of cold tolerance. Broad-sense and narrow-sense heritabilities were 80.1% and 65.98%, respectively. Estimating gene number by different formulae showed that several genes or QTL were involved in the genetic control of LT_{50}. Additive, dominance, additive x additive, additive x dominance, and dominance x dominance effects were significant, indicating that all modes of gene action were involved in governing cold tolerance in this type of wheat cross.

Key Words: Frost tolerance, gene action, gene number, generation mean analysis, generation variance analysis, heritability, LT_{50}, wheat

---

Turk. J. Agric. For., **30**, (2006), 399-405.
Full text: pdf
Other articles published in the same issue: Turk. J. Agric. For.,vol.30,iss.6.