

FIELD STUDY OF A NEW INTERSPECIFIC HYBRID

Borbála HOFFMANN¹ – Sándor HOFFMANN¹ – József KRUPPA² - Dezső SZALAY

¹University of Pannonia, Georgikon Faculty of Agriculture

²University of Debrecen, Centre for Agricultural Sciences

Introduction

With global climatic changes in prospect the challenge of our days is to increase - or at least maintain - the productivity of crops under less favourable conditions. A feasible proposition is to promote the biological basis of production. Hybridization between related species makes it possible to transfer desirable traits from one species into another (for example resistance to biotic- and tolerance to abiotic stresses and enhance adaptation to changed conditions). Especially crosses between cultivated species and their wild relatives can give valuable genetic material for plant breeding programs. Differences were found between genotypes regarding their tolerance to abiotic stress, allowing selection to be made for better tolerance in the course of breeding (Balla et al., 2006). The belief that global climate change will continue and bring more frequent less favourable conditions for crop production, is becoming more widely accepted (Vágó et al., 2006), so we need plant varieties with enhanced stress tolerance.

In this study we examined an interspecific hybrid originating from a cross between *Triticum aestivum* cv. Bánkúti 1201 as the female parent and *Agropyron elongatum* as the male parent bred by Dr. Dezső Szalay and co-workers. *Agropyron elongatum* is a decaploid species ($2n=10x=70$), while *Triticum aestivum* possess six genome ($2n=6x=42$). The progeny (F1) was treated with colchicine and developed in fertile amphiploid plants from which the line BE-1 has been produced by Szalay. According to Liszt et al. (2004) this line proved to be a stable amphiploid ($2n=56$).

The aim of this study was to evaluate some characteristics of the newly bred BE-1 line selected from the interspecific hybrid *Triticum aestivum* cv. Bánkúti 1201 x *Agropyron elongatum*.

Material and methods

The experiment was carried out at Keszthely, on a lessivated brown forest soil (FAO: Luvic phase) with low organic material, medium K- and P content in growing season 2004/2005 (precipitation between October and July was 790 mm). Grain yield, thousand grain weight (TGW), tillering, ear length and perennial characteristic were examined depending on plant density and fertilization. Four levels of N- fertilizer (0-, 40-, 60- és 80 kg N ha⁻¹) and two levels of plant density (2- and 3 million seeds ha⁻¹) were applied with three replicates in randomised block design. Statistical analysis was carried out by using SPSS 7.5 software package.

Results and discussions

The highest yield in both plant densities was obtained in N = 80 kg ha⁻¹ treatment (Figure 1.) and that was significantly higher than the yield in N = 0 kg ha⁻¹ treatment. In the mean

of N-treatments the 3 million seeds ha^{-1} plant density resulted in 40% higher yield than the 2 million seeds ha^{-1} .

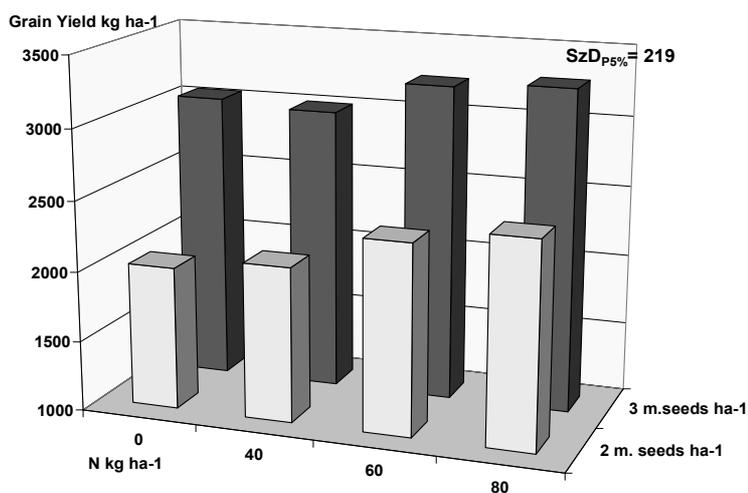


Figure 1. Grain yield of BE-1 line depending on plant density (2- and 3 million seeds ha^{-1}) and fertilization (0-, 40-, 60- és 80 kg N ha^{-1})

Thousand grain weight (TGW) was found between 29,9 – 31,2 g depending on treatment. It is remarkable that TGW was the highest in N = 0 kg ha^{-1} treatment what probable can be explained with the lower number of grains in this treatment (Figure 2., Picture 1.).

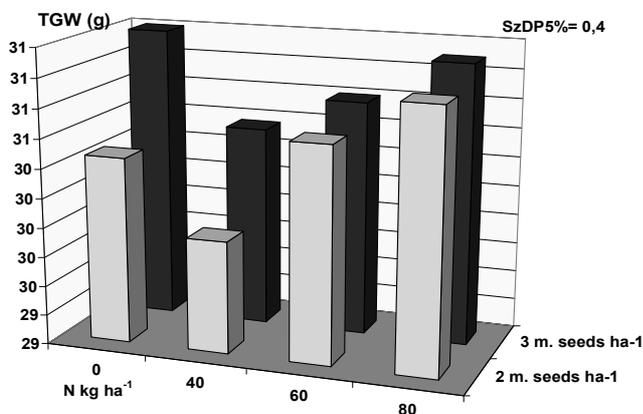


Figure 2: Thousand grain weight (TGW) of BE-1 line depending on plant density (2- and 3 million seeds ha^{-1}) and fertilization (0-, 40-, 60- és 80 kg N ha^{-1})