

## **Water use of winter cereals under well-watered and drought-stressed conditions**

*B. Varga, E. Varga-László, S. Bencze, K. Balla, O. Veisz  
Cereal Resistance Breeding Department, Centre for Agricultural Research,  
Hungarian Academy of Sciences, Martonvásár, Hungary*

### **ABSTRACT**

A reduction in the water available to plants will lend increasing importance to the dynamics of water uptake and to the water use efficiency (WUE) of cereals. The effect of drought on the water use efficiency of winter cereals was investigated in a greenhouse experiment in the Centre for Agricultural Research. The effect of water deficiency on the water use properties was studied by measuring changes in the grain weight, thousand-kernel weight and aboveground biomass. The water use efficiency of wheat varieties generally ranged from 1.5–2.3 kg/m<sup>3</sup> and 1.06–2.0 kg/m<sup>3</sup> in the case of optimum and limited water supplies, respectively, while these figures were 1.4 kg/m<sup>3</sup> and 0.8 kg/m<sup>3</sup> for winter barley and 0.8 kg/m<sup>3</sup> and 0.5 kg/m<sup>3</sup> for winter oat. Investigation on the relationship between harvest index (HI) and WUE was found that the harvest index is only one indicator of drought tolerance; but the stability of HI under non-optimum environmental conditions also needs to be determined. Keywords: water uptake; water use efficiency; harvest index; water shortage