

1 Phenology and Yield of Winter Barley in Semiarid Conditions

2 N. Przulj, V. Momcilovic

Institute of Field & Vegetable Crops, Novi Sad, Yugoslavia

Each yield component of barley is determined by developmental events during specific phenological phases. The number of spikes per unit area is established from tillering to jointing. Spikes continue to develop between single ridge and flag leaf elongation and the number of kernels per spike is established from jointing, i.e., it starts from double-ridge of apical meristem development and sets shortly after anthesis. Duration and rate of grain filling determines kernel weight. The objectives of this study were to examine the variation and relationships among phenology and yield components.

Twenty-four winter barley cultivars were used in this investigation. The stage of leaf development of the main culm was referenced to the Haun scale. All phenological measurements were assessed using growing degree days (GDD) with a base temperature of 0°C. The relationship between kernel weight and GDD accumulated from anthesis for each plot was determined by fitting the quadratic polynomial.

The duration from planting to flag leaf was 1223 GDD across two-rowed varieties and 1304 GDD across six-rowed varieties. The variety NS 519 had the shortest grain fill period (648 GDD), the variety Marinka the longest (940 GDD). GF rate was mainly determined by genotype (44.3% of total variation) and GxY interaction (31.1% of total variation). GF rate across two-rowed varieties was rather higher (7.251 mg 100 GDD⁻¹) than across six-rowed varieties (6.395 mg 100 GDD⁻¹). The duration of the vegetative and generative phases should be balanced, since neither too early nor too late a flowering will bring maximum yields. Our results show that the pre-heading period varied more than the grain filling period in the tested varieties. Selection for shorter vegetative period and longer grain filling period is recommended in the development of varieties for semiarid conditions of growing.

Key words: winter barley (*Hordeum vulgare* L), phenology, vegetative period, grain filling, yield components