

GRAIN YIELD AND YIELD COMPONENTS IN SPRING MALTING BARLEY

Milomirka MADIĆ^{1*}, Dragan ĐUROVIĆ¹, Aleksandar PAUNOVIĆ¹, Desimir KNEŽEVIĆ²,
Miodrag JELIĆ²

¹University of Kragujevac, Faculty of Agronomy Čačak, Cara Dušana 34, Čačak, Serbia

²Faculty of Agriculture, Lešak, University of Priština, (Kosovska Mitrovica) Serbia

*Corresponding author: mmadic@kg.ac.rs

Abstract

Malting barley thrives in temperate climates that exhibit small temperature fluctuations, especially during grain maturation, when the crop is particularly sensitive to heat stress. A field trial involving four two-rowed spring barley cultivars was conducted at the experimental field of the Secondary School of Agriculture and Chemistry, Kraljevo (Serbia) over a period of three years (2012-2014) to evaluate the variability of yield components (plant height, number of kernels per spike, kernel weight per spike and thousand-kernel weight) and grain yield in different growing seasons. The experiment was laid out in a randomized block design with three replications on a pseudogley soil acidic in reaction. Seeding rate was 450 germinable seeds m⁻². At tillering, 50 kg ha⁻¹ nitrogen was applied. Calcium ammonium nitrate (CAN) with a nitrogen content of 27% was used for top dressing. The studied traits were significantly affected by weather conditions during the growing season. The effect of weather differed across cultivars. Grain yield, thousand-kernel weight, kernel weight per spike, number of kernels per spike and plant height were highest in all cultivars in the year characterized by moderate temperatures during grain filling and a high rainfall total in the second part of the growing season. The highest values for grain yield, number of kernels per spike and kernel weight per spike were obtained in 'Novosadski 448'.

Key words: *malting barley, climate, grain yield, yield components.*

Introduction

In Serbia spring barley goes through growth and development stages mostly under high temperature and water deficit conditions, especially during grain filling, which leads to a reduction in grain filling period, kernel size, kernel weight and, hence, grain yield and quality (Pržulj and Momčilović, 2002). Temperature and rainfall are not necessarily the most important factors that govern the level of production and grain quality in malting barley, since the harvested grain is often of poor quality when these factors are close to optimal (Pržulj et al., 2014). Therefore, the market is often lacking in barley that satisfies quality requirements of the malting and brewing industry (O'Donovan et al., 2011). In contrast, different soil and climatic conditions, especially temperature and moisture content during grain filling (Passarella et al., 2005) can cause a high variation in major grain yield components and, hence, total grain yield and quality of malting barley (Atlin et al., 2000; Paunović et al., 2007; Madić et al., 2009). Environmental conditions in Serbia and Southeastern Europe are considerably different from those in the barley belt of Western and Central Europe (Malešević and Starčević, 1992). Due to frequent heat waves during the growing season and considerable fluctuations in the amount and distribution of rainfall, there has been a tendency in Serbia for protein to accumulate in the barley grain and for kernel size to decrease (Malešević et al., 2010).

The objective of this study was to assess the effect of genotype and production conditions (year) on yield components and grain yield in spring malting barley grown on poorly productive soil.

Impressum

VII International Scientific Agriculture Symposium „Agrosym 2016“

Book of Proceedings

Published by

University of East Sarajevo, Faculty of Agriculture, Republic of Srpska, Bosnia
University of Belgrade, Faculty of Agriculture, Serbia
Mediterranean Agronomic Institute of Bari (CIHEAM - IAMB) Italy
International Society of Environment and Rural Development, Japan
Balkan Environmental Association, B.EN.A, Greece
University of Applied Sciences Osnabrück, Germany
Selçuk University, Turkey
Perm State Agricultural Academy, Russia
Voronezh State Agricultural University named after Peter The Great, Russia
Biotechnical Faculty, University of Montenegro, Montenegro
Institute for Science Application in Agriculture, Serbia
Institute of Lowland Forestry and Environment, Serbia
Academy of Engineering Sciences of Serbia, Serbia
Agricultural Institute of Republic of Srpska - Banja Luka, Bosnia and Herzegovina
Maize Research Institute „Zemun Polje“ Serbia
Institute of Field and Vegetable Crops, Serbia
Institute of Forestry, Podgorica, Montenegro
Balkan Scientific Association of Agricultural Economics, Serbia
Institute of Agricultural Economics, Serbia

Editor in Chief

Dusan Kovacevic

Technical editors

Sinisa Berjan
Milan Jugovic
Velibor Spalevic
Noureddin Driouech
Rosanna Quagliariello

Website:

<http://www.agrosym.rs.ba>

CIP - Каталогизација у публикацији
Народна и универзитетска библиотека
Републике Српске, Бања Лука

631(082)(0.034.2)

INTERNATIONAL Scientific Agricultural Symposium "Agrosym 2016" (7 ; Jahorina)

Book of Proceedings [Elektronski izvor] / VII International Scientific Agriculture Symposium "Agrosym 2016", Jahorina, October 06 - 09, 2016 ; [editor in chief Dušan Kovačević]. - East Sarajevo = Istočno Sarajevo : Faculty of Agriculture = Poljoprivredni fakultet, 2016. - 1 elektronski optički disk (CD-ROM) : tekst, slika ; 12 cm

CD ROM čitač. - Nasl. sa nasl. ekrana. - Registar.

ISBN 978-99976-632-7-6

COBISS.RS-ID 6216984