

The Impact of Temperature and Humidity on Germination Energy and Length of Embryonic Roots at Sweet Corn

Rodica SIMA¹⁾, Nicușor SIMA¹⁾, Dan MĂNIUȚIU¹⁾, Vasile LAZĂR¹⁾, Diana FICIOR¹⁾

¹⁾ University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăștur Street, 400372; flaviusima@yahoo.com

SUMMARY

Actual climatic conditions affect agricultural harvests reason for farmers have to be direct to those crops which are most adapted at conditions of low humidity and high temperatures. Sweet corn presented in the last period a growing interest both thanks to its chemical composition as well as nutritive value and to the various possibilities for utilization in the alimentary industry. Besides these features sweet corn became interesting as well for its drought resistance in the first vegetation stages (Borș, 2011). The evolution of crop depends by the evolution of specie during germination process, reasons for it was considered as necessary to study the germination energy and the length of embryonic roots. Seeds were put to germinate both in standard conditions (AOSA and ISTA rules, V₁ – 16 hours at 20°C and 8 hours at 30°C during 7 days – as control) and in less favorable conditions, similar with some conditions which can occur in field immediately after sowing: V₂ – damping in water for 24 h at 25°C followed by 7 days at 25°C; V₃ – 7 days at 25°C; V₄ – damping in water for 24 h at 25°C followed by thermal shock (2 h at 50°C) and germination during 7 days at 25°C. Among the tested variants the highest germination energy (362.1%), very significant in comparison with control (standard conditions), was recorded by the variants V₃ with seeds put to germinate in constant conditions of temperature (25°C) and humidity. The germination energy was distinctly significant higher in comparison with control in case of variants V₄ (241.4%) and V₂ (244.8%) which for the seeds were preliminary damped in water for 24 hours. The length of embryonic roots was higher for all variants: V₂ (6.43 cm), V₃ (6.58 cm) and V₄ (7.50 cm) in comparison with control V₁ (6.10 cm). The result of statistical analysis indicated a distinct significant increase of length of embryonic roots in comparison with control just in variant V₄ (1.4 cm), which for the seeds were damped with water for 24 h and then exposed at a thermal shock (50°C) for 2 h. Based on the obtained results it can be concluded that sweet corn has good odds to resist at a short period of drought immediately after sowing if the sowing is done in conditions of good humidity of soil.

Keywords: drought, seeds, germination, sweet corn

Acknowledgments. This work was supported by CNCSIS-UEFISCSU, project PNII-IDEI, nr. 1107, CNCSIS code 1488/2008.

REFERENCES

1. Borș, A. (2011). Efectul genotipurilor și al mediului de cultură. asupra cantității și calității produsului final la porumbul zaharat cultivat în sisteme de agricultură convențională și organică. Teză de doctorat. USAMV Cluj Napoca.
2. Association of Official Seed Analysts (AOSA) (1986). Rules for testing seeds. J. Seed Technol. 6:1-125.
3. International seed testing association – ISTA rules. www.seedtest.org/en.