Utjecaj abiotskih čimbenika na pojavu kukuruznog moljca (*Ostrinia nubilalis* Hübner)

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UTJECAJ ABIOTSKIH ČIMBENIKA NA POJAVU KUKURUZNOG MOLJCA (*Ostrinia nubilalis Hübner*)

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Disertacija *(2)*

Istraživanja su provedena tijekom trogodišnjega razdoblja (2012.-2014.) u poljskim uvjetima s prirodnom zarazom kukuruznoga moljca na Poljoprivrednom institutu u Osijeku. Pokus je postavljen po split-split plot metodi s tri ponavljanja. Na pokusnome je polju 15-godišnja plodosmjena kukuruz – soja. Pokus je tročimbenični 3x3x4 s tri razine navodnjavanja (A1 – nenavodnjavano (samo prirodne oborine), A2 od 60 do 100% poljskoga vodnoga kapaciteta (PVK) i A3 od 80 do 100% PVK), tri razine dušične gnojidbe (B1–0, B2–100 i B3–200 kg N/ha) i četiri različita hibrida (C1–OSSK 596; C2–OSSK 617; C–OSSK 602 i C4–OSSK 552). Cilj istraživanja bio je utvrditi utjecaj različitih varijanti navodnjavanja i gnojidbe te različitih hibrida na pojavu i oštećenost biljaka kukuruza od ličinki kukuruznoga moljca te povezanost ishrane gusjenica s koncentracijom dušika, silicija i C/N odnosa. Na kraju svake vegetacijske sezone napravljena je disekcija stabljike, gdje je slučajnim odabirom uzeto 10 biljaka sa svake varijante. Zabilježena je masa klipa za svaku biljku posebno (g), dužina oštećenja (cm), broj gusjenica u stabljici kukuruza, broj gusjenica u dršci klipa, oštećenje drške klipa (cm) te ukupan broj gusjenica po biljci. U fazi svilanja (sredina srpnja) uzeto je 10 listova ispod klipa sa svake varijante. Određena je koncentracija dušika, ugljika i silicija u listu (%) i izračunat C/N odnos. U 2014. godini, s nižim temperaturama i većom količinom oborina, napad kukuruznoga moljca bio je značajno manji u odnosu na druge dvije godine. Utvrđena je dominantnost Z-tipa kukuruznoga moljca na području istočne Slavonije uz pomoć feromonskih mamaca. Povišenom razinom sadržaja vode u tlu utvrdilo se manje oštećenje od kukuruznoga moljca, a povećanjem razine gnojidbe utvrđeno je veće oštećenje na biljkama, kao posljedica ishrane gusjenica. Kod ispitivanih hibrida utvrđena je različita otpornost u odnosu na oštećenje od gusjenica te se hibrid C4 (OSSK 552) izdvojio kao najotporniji, dok je C1 (OSSK 596) bio najosjetljiviji. Koncentracije dušika i silicija bile su u negativnoj korelaciji kao i koncentracija dušika i C/N odnos. Otpornost kod hibrida nije isključivo ovisila o koncentracijama dušika i silicija, iako je pokazala kod većine ispitivanih hibrida da je kod povećane koncentracije dušika oštećenje bilo više, a kod povećane koncentracije silicija utvrđeno je manje oštećenje.

Ključne riječi: kukuruzni moljac, navodnjavanje, gnojidba dušikom, hibridi, silicij, C/N odnos

THE INFLUENCE OF ABIOTIC FACTORS ON THE PRESENCE OF EUROPEAN CORN BORER (*Ostrinia nubilalis Hübner*)

Doctoral thesis

Field experiments with natural population of European corn borer (ECB) were conducted in three vegetation seasons (2012-2014) at Agricultural Institute in Osijek. The experiment was set up in a randomized block design as split-split plot method, with three repetitions. This plot has been constantly maize – soybean rotation for already 15 years. It was a 3×3×4 factorial experiment with three irrigation levels (A1- non-irrigated (only natural precipitation), A2–from 60% to 80% field water capacity – FWC and A3–from 80% to100% FWC), three nitrogen fertilizer levels (B1-0, B2-100 and B3-200 kg N/ha) and four different genotypes (C1-OSSK 596; C2–OSSK 617; C3–OSSK 602 and C4–OSSK 552).The aim of this study was to determine the effect of different levels of irrigation, nitrogen fertilization and genotypes on occurrence and damage of maize plants by the European corn borer larvae and relation between leaf feeding larvae with nitrogen and silicon concentration as well as C/N ratio. At the end of each growing season, ten maize plants from each variant were cut. Ear weight for each specific plant (g), tunnel length (cm), number of larvae in stalk, number of larvae in the ear shank, ear shank damage (cm) and total number of larvae in maize plant were determined. In silking stage (middle of July) ten leaves (below the ear), from 10 maize plants were sampled on each variant. Nitrogen, carbon and silicon concentrations were determined in maize leaf (%) and C/N ratio calculated. In 2014, a significantly lower ECB attack was determined taking into account lower temperatures and higher amount of precipitate compared to the previous years. Dominance of Z-type

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European corn borer on pheromone traps in the area of eastern Slavonia was confirmed. Increasing the level of soil water content, damage from larvae was reduced and increasing the level of nitrogen fertilization feeding activity was increased. We have confirmed different hybrid resistance in regards to damage from larvae, so C4 (OSSK 552) genotype was the most resistant while C1 (OSSK 596) was the most susceptible. Concentration of nitrogen and silicon in a maize leaf was in negative correlation as well as nitrogen concentration and C/N ratio. Hybrid resistance didn't entirely depend on nitrogen and silicon concentrations, even though there was greater damage on most hybrids with higher concentration of nitrogen, while damage was reduced with higher concentration of silicon.

Key-words: European corn borer, irrigation, nitrogen fertilization, hybrid, silicon, C/N ratio