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LARVAL TUNNELING OF EUROPEAN CORN BORER (*Ostrinia nubilalis* Hübner) ON OS CORN HYBRIDES

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ABSTRACT

European Corn Borer (*Ostrinia nubilalis* Hübner) is one of the major pests of corn in Croatia. Selection of OS corn hybrids has tradition of more than 120 years. Many valuable materials have created and today are sown on wide areas in Croatia. The aim of this study was to evaluate the tolerance of some OS hybrids against this pest. Field trials were conducted during three years (1999-2001) on two localities. Five OS corn hybrids were evaluated: OSSK 247; OSSK 332; OSSK 444; OSSK 552 and OSSK 644. Dissection of corn stalk was done during harvest period. Intensity of attack of ECB (%) was determined, as well as position and length of damage (cm/plant), and grain yield (t/ha). Average intensity of attack caused by ECB during three years of investigation was 34,2%. The lowest attack intensity were determined in 2000 with the average of 9,6%, and the greatest was in 2001 with the average value of 60,9%. Length of damages on corn stalk was least in 2000 when average damage was 0,48 cm/plant, while in 2001 year, 5,46 cm/plant were damaged. In 1999 when attack intensity was 34,2%, the length of damage on the stalk was 0,95 cm/plant. The greatest length of damage on hybrids were recorded in 2001, when hybrid OSSK 444 has damage of 16,62 cm/plant, OSSK 552 has 13,54 cm/plant, and OSSK 644 has 10,68 cm/plant, and the attack intensity was in the same time over 90% in those hybrids. Three years trials showed that if attack intensity was under 40%, the greatest length of damage on corn stalk was in average 1,58 cm. If the intensity of attack was over 50%, the average length of damage on the corn stalk was 5,78 cm/plant. Significant positive correlation occurred between intensity of attack and length of damage (r=0, 80-0, 99). Some of the hybrids showed tolerance to ECB and reached satisfying results.

Key words: corn, European corn borer, damage

IZVLEČEK

TOLERANTNOST OS HIBRIDOV KORUZE NA LIČINKE KORUZNE VEŠČE (*Ostrinia nubilalis* Hübner)

Koruzna vešča (*Ostrinia nubilalis* Hübner) je eden od poglavitnih škodljivcev koruze na Hrvaškem. Selekcija OS hibridov ima tradicijo, daljšo od 120 let. Pridobili smo veliko dragocenega materiala, ki ga danes sejejo širom Hrvaške. Namen raziskave je bil, da ocenimo toleranco nekaterih OS hibridov proti temu škodljivcu. Poljski poskusi so trajali 3 leta (1999 – 2001) na dveh lokacijah. Ocenili smo 5 OS koruznih hibridov: OSSK 247, OSSK 332, OSSK 444, OSSK 552 in OSSK 644. Med spravilom koruze smo opravili pregled stebla. Določili smo intenzivnost napada koruzne vešče v odstotkih, lego in dolžino rovov (cm/rastlino) in pridelek zrnja (t/ha). Povprečna intenzivnost napada koruzne vešče v 3 poskusnih letih je bila 34,2 %. Najnižja intenzivnost napada je bila ugotovljena v letu 2000, s povprečjem 9,6 %, najvišja pa v letu 2001, s povprečjem 60,9 %. Najkrajši rovi v koruznem steblu so bili v letu 2000, s povprečjem 0,48 cm/rastlino, v letu 2001 pa 5,46 cm/rastlino. V letu 1999, z intenzivnostjo napada 34,2 %, je bila dolžina rovov povprečno 0,95 cm/rastlino. Najdaljši rovi so bili ugotovljeni v letu 2001, in sicer pri hibridu OSSK 444 16,62 cm/rastlino, OSSK 552 13,54 cm/rastlino, OSSK 644 10,68 cm/rastlino, intenzivnost napada pa je bila na teh hibridih prek 90 %. Triletni poskusi so pokazali, da je pri intenzivnosti napada pod 40 %, največja dolžina rovov v povprečju 1,58 cm. Če je

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intenzivnost napada prek 50 %, je povprečna dolžina rovov 5,78 cm/rastlino. Med intenzivnostjo napada in dolžino rovov je statistično značilna pozitivna korelacija (r=0,80 – 0,99). Nekateri hibridi so bili tolerantni na koruzno veščo in so dali zadovoljive rezultate.

Ključne besede: koruza, koruzna vešča, poškodbe

1 INTRODUCTION

The corn production has been organized on around 400 000 ha in Croatia, mostly (30%) in eastern part of the country. Selection of OS corn hybrids in Croatia has a tradition of more than 120 years. Many valuable material has been created and today is sown on wide areas in Croatia. European Corn Borer (ECB) (*Ostrinia nubilalis* Hübner) is one of the major pests of corn.

Attack intensity of ECB in last 10 years was around 50% (Ostojčić *et al.,* 2001). Sowing corn after corn and leaving the corn stalk in the field after harvest, are the reasons for having so huge population of ECB. The larvae damage leafs, stalk and the ear of corn plant. The farmers mostly don't implement any controlling measures against ECB (Ivezić & Raspudić 1997, 2000). The field trials with biological preparations against ECB showed good results, but they are still not accepted by farmers (Valenčić *et al.,* 1988; Ivezić *et al.,* 1998). The main reason is the lack of proper mechanization and knowledge for the implementation of biological measures.

The aim of this study was to evaluate some of OS hybrids against larval feeding of ECB.

2 MATERIAL AND METHODS

Field trials were conducted during three years (1999-2001) on two localities (Osijek and Karanac). Five OS corn hybrids were evaluated: OSSK 247; OSSK 332; OSSK 444; OSSK 552 and OSSK 644. Dissection of corn stalk was done during the harvest period. Intensity of attack of ECB (%) was determined, as well as length of damage (cm/plant) and grain yield (t/ha).

3 RESULTS

Average attack intensity of ECB on the area of Slavonia and Baranya in last 10 years was around 50 %. During the investigation period average intensity of attack in Osijek area was 38 %, while in Karanac it was 31 %, but attack intensity differed significantly between hybrids and years.

Meteorological factors had great influence on attack intensity during the investigation period. The year 2000 was extremely dry, and in vegetation period just 153,4 mm of rain fallen. It is below the years-long average. In 2000 intensity of attack was 4-16% at Osijek locality and 2-18% at Karanac locality. Vegetation period in 1999 had 502,8 mm of rain, and in 2001 649,3 mm, which have great impact on increasing the attack intensity. In 1999 it was between 18-42% in Osijek, and 16–58 % in Karanac. In year 2001 attack intensity vary between 32-94% in Osijek and 34-58 % in Karanac (Figure 1).

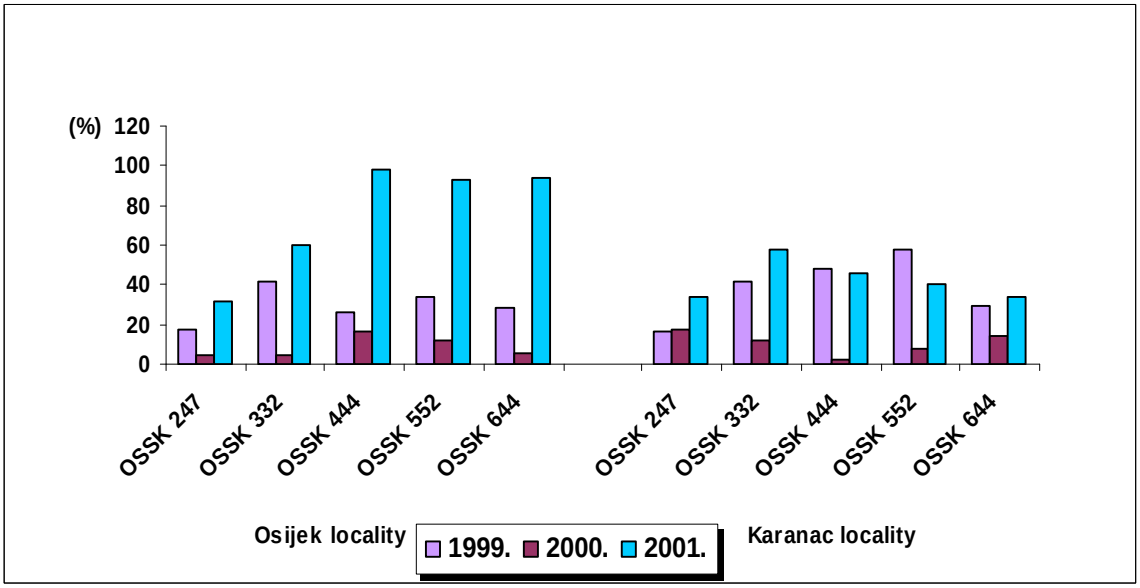

Figure 1: Attack intensity of European corn borer

The average length of damage on corn stalk was 3,49 cm per plant at Osijek locality. The least were in 2000 (0,28 cm/plant), and the greatest were in 2001 (9,11 cm/plant). At Karanac locality the average length of damage on corn stalk was 1,08 cm/plant. The least were in 2000 (0,64 cm/plant), and the greatest were in 2001 (1,81 cm/plant). Three-year results are shown in figure 2.

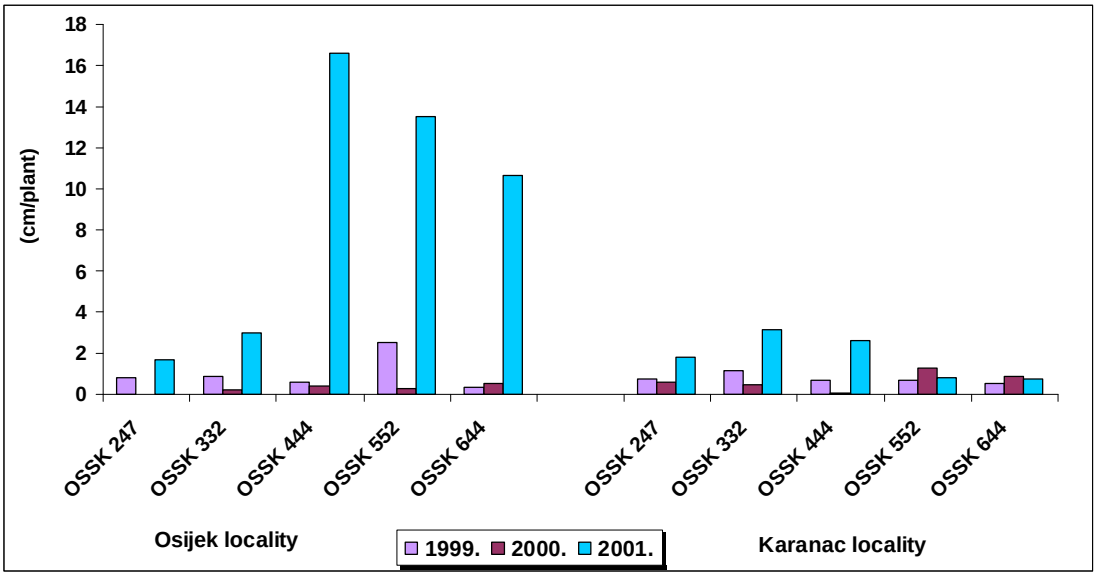

Figure 2: Length of damage on corn stalk caused by European corn borer

On figure 3 the intensity of attack of ECB and length of damage on corn stalk showed significant positive correlation in all investigated hybrids (r=0,80-0,99).
Three-year trials showed that if attack intensity was under 40%, the greatest length of damage on corn stalk was in average 1,58 cm. If the intensity of attack was over 50 %, the average length of damage on the corn stalk was 5,78 cm/plant.

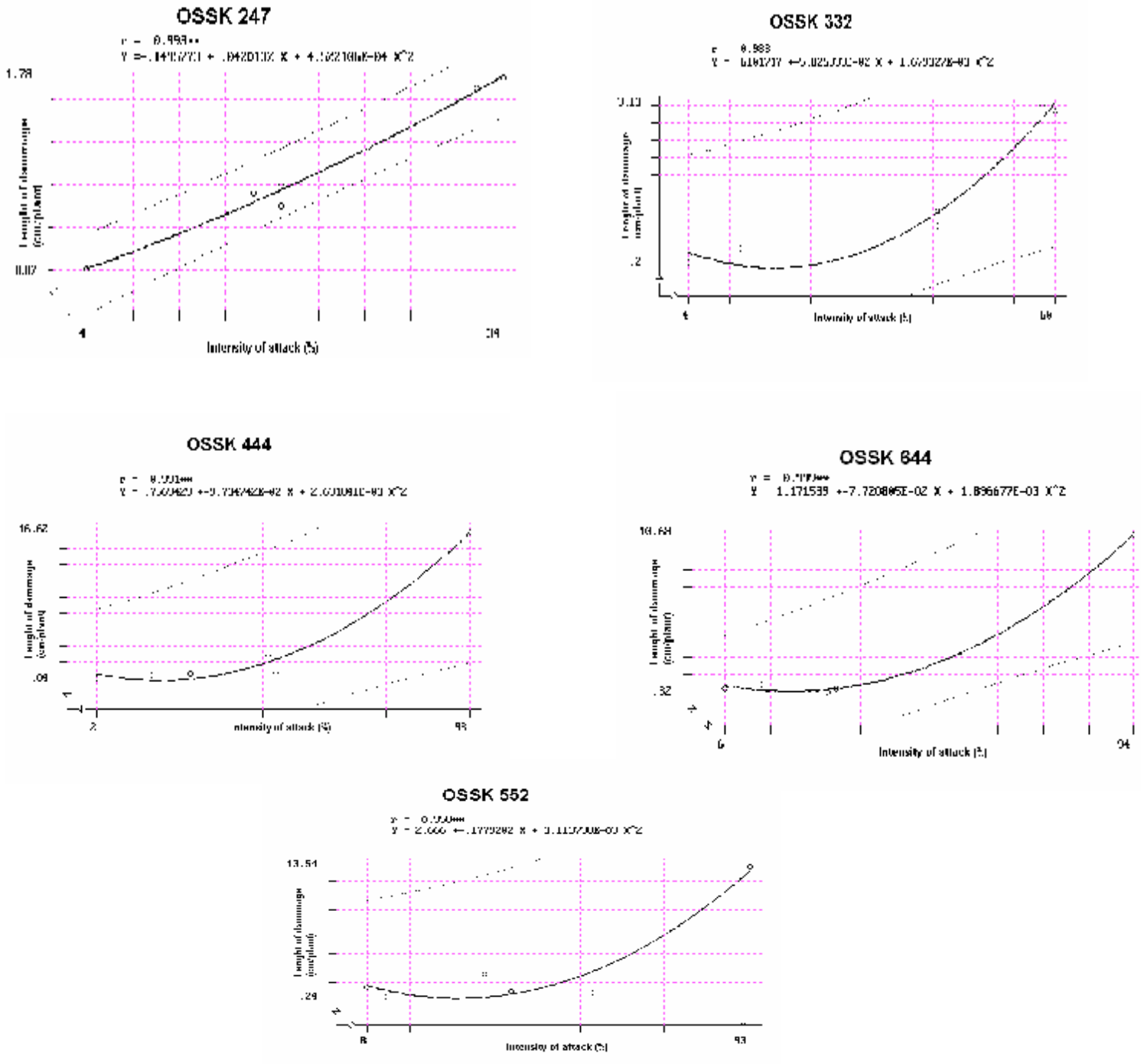

Figure 3: Correlation between length of damage (cm/plant) on OSSK hybrids and attack intensity

4 CONCLUSION

Three years trials showed that if attack intensity was under 40 %, the greatest length of damage on corn stalk was in average 1,58 cm. If the intensity of attack was over 50 %, the average length of damage on the corn stalk was 5,78 cm/plant. Significant positive correlation occurred between intensity of attack and length of damage. All hybrids used in these trials reached satisfying results concerning yield and nosignificant influence of attack intensity or length of damage on grain yield.

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