RESEARCH ON ARTIFICIAL INFECTION TO SUNFLOWER LEAVES GROWN IN CONDITIONS OF THE EZĂRENI FARM

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Abstract

Sunflower is the most imporant oil crop grown in Romania, with wide use in the food and industry sector. The fungus Sclerotinia sclerotiorum (Lib) de Bary, is a class Ascomycetes, order Heliotiales, family Sclerotinacea. The disease causes economic losses in entire world, particulary the culture on sunflower, Helianthus annuus, was the object of research and disease for decades (Gulya et al., 1997). Sclerotinia sclerotiorum (Lib. de Bary) was described in 1837 by Libert and indentified by Fuckel in 1861(Purdy) is the fungus that causes the most damage up to 100% in many cultures(Sackston, 1992). In all temperate climates regions in the world, white rot disease is the most important, because the fungus remains in the ground,for a period of many years, and range of host plants. This fungus attacks various organs of the plant, the root, stem, leaveas, and head root. This fungus is a parasite polifag which attack over 400 plant species belonging to 75 botanical families, of which many species are plants of cultura of a particular importance in agricultura (sunflower, rapeseed, soybeans) (Boland and Hall 1994). For developing hybrids with genetic resistance, we must reduce the loss caused by this pathogen. The objective in this study was to test some sunflower hybrids under Ezăreni farm with resistant pathogen attack.

Key words: sclerotinia, *Helianthus annuus*, artificial infection

The white rot was described in 1886, in France by Antoane de Bary. The disease extended in all sunflower grownig countries in Europe, going even North America and Australia. Since year 1993, all plant health publication, the disease appears to cause great damage especially to sunflower, damage estimated at 60-70% of production (Iacob Viorica, 2003). The vegetative aparatus of the fungus, is an tall, richly-branched, hyaline, saprophyte or parasite in conducting vessels which produces traheomycosis. By overlapping of the mycelium and his dehydration, on the strains, in the bone of head root, even among achenes, appear black coloured sclerotia to the outside and white on the inside. Sclerotia formed on the outside of the strain,or of the head root,can fall and infest the soil,where they remain viable 6-8years. (Ulea E., 2003).

MATERIALS AND METHODS

Material research was constituted by a group of 19 hybrids,14 from Pioneer,three from Limagrain and two autentic romanian hybrids (Fundulea 225 and Favorit) .The field leaf tests were conducted as describe by Denger et al. (1998)

The work method by Denger et al.(1998)

One leaf of the 10th -12th fully grown leaf (corresponding pair the fifth to to sixth internodal segment) of four plants in a plot was infected by Sclretinia mycelium. Mycelial disks of 0.5 in diameter were cut from the edge of Sclerotinia culture and placed at the edge of the leaf main vein.The disks were fixed with Parafilm.The fungal explants and leaves were covered by a transparent plastic bag and filled with two ml water, to mantain a humid atmosphere.

RESULTS AND DISCUTIONS

Four days after infection, were recorded the following observations and measurement regarding the leaf lesion. The lenght of the necrotic tissue along the leaf main vein.The maximum expansions were measured four days post infection.Were given evaluation notes on a scale one to five. The obtained results were processed by using methods of mathematical statistics. In figure one we can se that the year 2011 was favorable for development of the fungus *Sclerotinia sclerotiorum* to both isolates. Isolate Iaşi obtained a value of 5,89 cm lesion size, recording difference positive, distinct significant , compared with control, and Giessen isolate achieved a value of lesion size of 4,35 cm, the differences are distinct significant. Comparing the two isolates (figure 2) results that, isolate Iaşi

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presented a higher virulence than isolate Gissen. This presented a mean lesion size of 5,12cm, the difference from the control was very significantly.

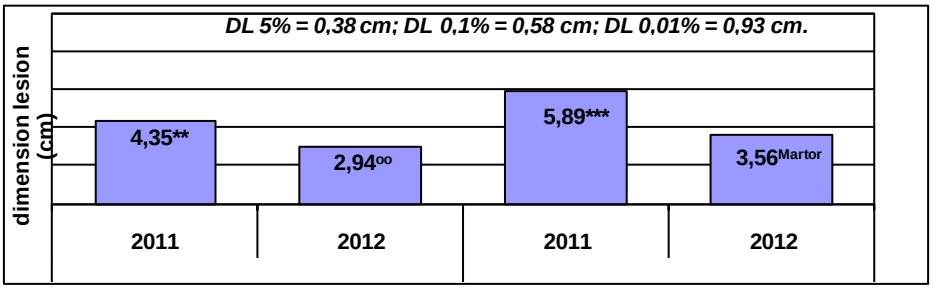

Figure 1 **Interaction influence Isolate x year on dimension lesion to leaf**

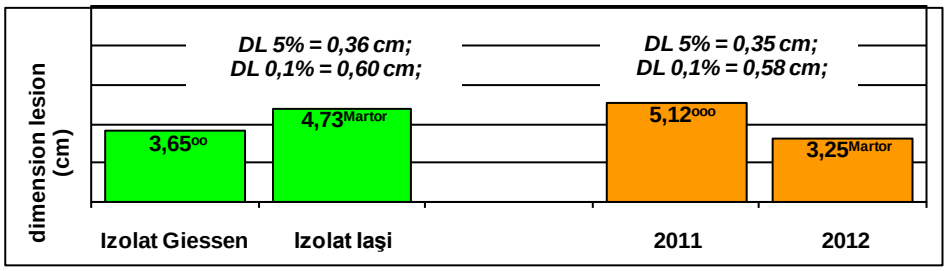

Figure 2 **Influence Isolate and year on dimension lesion to leaf**

After artificial infection with Gissen isolate, were recorded values of lesion size between 3,93 and 5,40 cm.The genotype LG58.63CL, presented a very good tolerance to the fungus attack, recording thery significant values. The genotype PR64E71 (lesion dimension = 5,40 cm) recorded a hypersensitivity ago artificial infection leaf (figure 3).

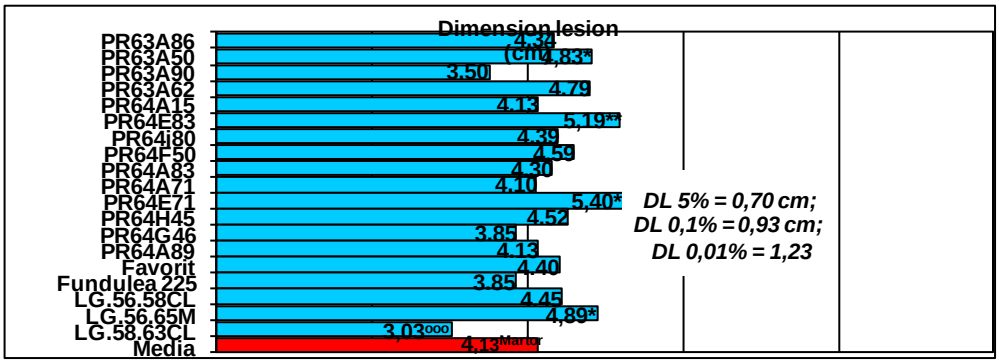

Figura 3 **Hybrid influence on dimension lesion to leaf in year 2011 with isolate Giessen**

In year 2012, at infected leaves with the same isolate, the dimension lesion variated from 1,52 cm to 4,29 cm. The genotype PR64G46 presented very good tolerance to the fungus, recording very significant differences comparing with control. The hybrid LG56.58CL was sensitive to the artificial infection on leaf with s*clerotinia* , showed differences thery significant compared with witness (figure 4) .The year 2012 was less favorable for developing the fungus,caused by the climate conditiones. The obtained medies to the 19 genotypes in the two years, with the two isolates to the artificial leaf infection with *Sclerotinia sclerotiorum*, showed that LG56.65M presented a higher resistance to the fungus, differences with witness are thery significant (figure 5). The genotypes PR63A62, PR64A71 and PR64G46 presented a middle resistance recording significant differences. The genotypes PR63A50, PR63A90 and PR64J80, presented a lower tolerance, the differences beeing significant.

PR64A15, PR64E71, LG56.58CL showed hypersensitivity to fungus,with very significant differences to the control. Two cultivars PR64E83 and PR64H45, presented sensitivity with *Sclerotinia sclerotiorum*, recording distinct significant differences. Favorit and Fundulea 225 showed significant difference.To five hybrids (PR63A86, PR64F50, PR64A83, R64A89, LG58.63.CL) weren't recorded statitics values.

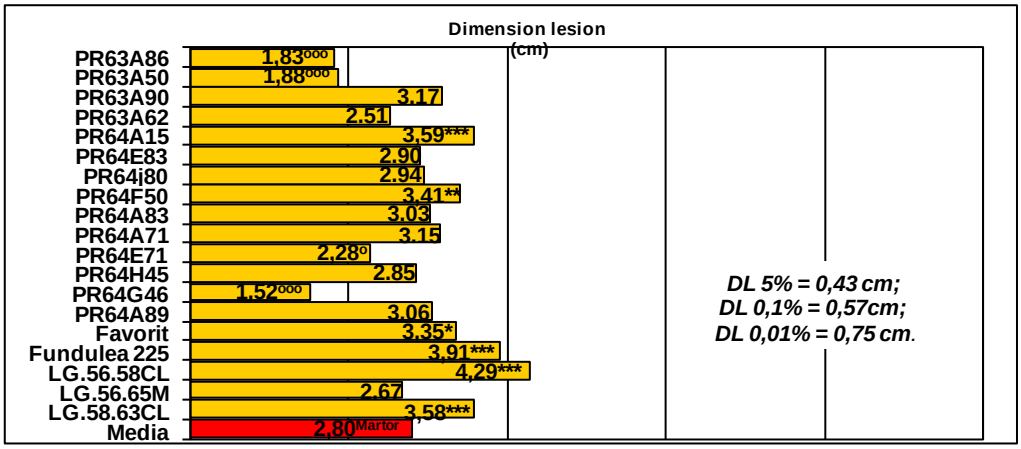

Figura 4 **Hybrid influence on dimension lesion to leaf in year 2012 with isolate Giessen**

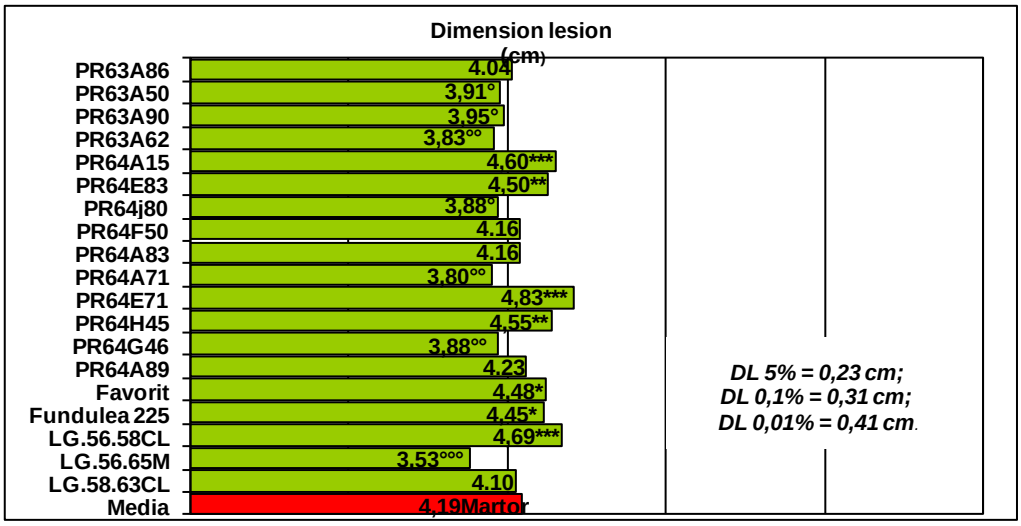

Figure 5 **Hybrid influence on dimension lesion to leaf**

CONCLUSIONS

1. Genotype LG56.65M presented a very good resistance to fungus, recorded thery significant differences comparativ with control.

2.Genotypes PRR64A15, PR64E71, LG56.58CL showed a hypersensitivity with fungus, recording differences thery significant. Two cultivars PR64E83 and PR64H45, presented sensitivity with *Sclerotinia sclerotiorum*, recording distinct significant differences.

3.Favorit and Fundulea 225 showed significant difference significant with control.

4.To five hybrids (PR63A86, PR64F50, PR64A83,R64A89, LG58.63.CL) weren't recorded statitics values.

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