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## SURVEY OF ROOT ROT DISEASES OF SUGAR BEET IN CENTRAL GREECE\*

**ABSTRACT:** An extensive survey was conducted during the summer and autumn of 2004 in sugar beet fields in the area of Larissa, Thessaly region, with plants showing symptoms of root rot diseases. The aim of the monitoring was to identify the causal agents of root rot diseases. In total, 76 sugar beet fields were surveyed and 5—10 diseased roots were examined from each field. Isolations, carried out on PDA, showed that two main fungal pathogens causing root rot were *Rhizoctonia solani* and *Phytophthora cryptogea*. The former was isolated in 46% of the fields and the latter in 38% of the fields. In addition, *Rhizopus stolonifer*, *Fusarium* spp., *Scerotium rolfsii* and *Rhizoctonia violacea* were isolated in 14%, 7%, 4% and 1% of the fields, respectively. In most of the surveyed fields only one pathogen species was isolated and only in a few of them more than one fungal species was identified.

**KEY WORDS:** root rot diseases, sugar beet

### INTRODUCTION

During the summer and autumn of 2004, an extensive survey of root rot diseases was conducted in 76 sugar beet fields in the area of Larissa, Thessaly region, where each year 10—12 thousand hectares are cultivated with sugar beet.

The climate in Thessaly is warm and humid with a few rain showers during summer and early autumn. Irrigation is absolutely necessary for sugar beet cultivation. Growers generally use a 3—4-year rotation system mainly with cereals and cotton.

Root rot diseases more often appear in randomly scattered plants within a field, but they also, very often occur in small patches with a few meters in di-

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ameter. It is estimated that an average of 1—5% yield is lost due to these diseases annually, but it is not uncommon to have 10—30% loss in some fields.

Root rot diseases are considered to be of minor importance for the sugar beet crop in Greece and there are only a few reports (G i l p a t h i et al., 2001) related to soil fungal pathogens infecting sugar beet roots. The aim of this survey was to identify the fungal pathogens which relate to this kind of disease symptoms.

## MATERIALS AND METHODS

From each sampled field, 5—10 rotted roots were collected and transferred into the laboratory for pathogen isolation. Only roots showing rot in initial stage were selected to reduce contaminating saprophytic microorganisms. Small root tissue pieces, obtained from the margin between the healthy and diseased internal tissue were transferred on PDA slants, amended with lactic acid to avoid bacterial contamination. Petri dishes were incubated in the dark, at 25 C. After 2—3 days of incubation, fungal colonies were visible and agar blocks were removed and transferred to new PDA petri dishes for growth. After a week of incubation, the fungal cultures were identified using a binocular light microscope (magnification 10—40X). Fungal hyphae, fruiting bodies and spores were used for the identification of parasitic fungi.

## RESULTS AND DISCUSSION

During summer and early autumn of 2004 the climate in the region of Thessaly was warm and humid. The total amount of precipitation was 32 mm of rainfall. Microscopic examination of the isolated fungal cultures showed that *Rhizoctonia solani* and *Phytophthora cryptogea* are the major soil fungal pathogens of sugar beet roots in Central Greece. They were isolated from all the counties and all the types of soil.

*Rhizopus stolonifer* and *Fusarium* spp. were isolated only from crops suffering from water deficiency or abnormal irrigation, while *Scerotium rolfsii* was isolated only from fields of saline soil. *Rhizoctonia violacea* was isolated in the field where the previous crop was alfalfa.

In 10 out of 76 sampled fields more than 2 pathogens related to root rot diseases were isolated. Results are shown in Table 1.

The purpose of this paper is to record the fungal pathogens which induce root rot diseases of sugar beet in Central Greece.

The results from the survey showed that *Rhizoctonia solani* and *Phytophthora cryptogea* were the major causal agents of root rot diseases of sugar beets in Thessaly.

Root rot diseases from *Rhizopus stolonifer* and *Fusarium* spp. seem to be related only to sugar beet stressed from draught. *Scerotium rolfsii* and *Rhizoctonia violacea* were only rarely isolated from diseased sugar beet roots. In most cases, only one pathogen was involved in root rot disease in each sampled field.

Table 1. Fungal species isolated from diseased sugar beets showing root rot symptoms in Greece during 2004.

Casual agent	Number of fields with pathogen / Total number of fields	% fields with pathogen
<i>Rhizoctonia solani</i>	35/76	46
<i>Phytophthora cryptogea</i>	29/76	38
<i>Rhizopus stolonifer</i>	11/76	14
<i>Fusarium</i> spp.	5/76	7
<i>Sclerotium rolfsii</i>	3/76	4
<i>Rhizoctonia violacea</i>	1/76	1

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#### БОЛЕСТИ КОРЕНА ШЕЋЕРНЕ РЕПЕ У ЦЕНТРАЛНОЈ ГРЧКОЈ

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#### Резиме

Током лета 2004. у пољима шећерне репе у области Ларисе, у региону Солуна, изведен је екстензиван преглед биљака које показују симптоме болести трулежи корена. Циљ мониторинга био је да се идентификују проузроковачи болести трулежи корена. Прегледано је укупно 76 поља шећерне репе и са сваког поља је прегледано 5—10 оболелих корена. Изолације, изведене на ПДА, показале су да су главни проузроковачи трулежи корена два главна патогена изолована из оболелих корена, *Rhizoctonia solani* и *Phytophthora cryptogea*. Први је изолован са 46% поља, а други са 38% поља. Уз то, *Rhizopus stolonifer*, *Fusarium* spp., *Sclerotium rolfsii* и *Rhizoctonia violacea* изоловани су са 14%, 7%, 4% и 1% поља. Код већине прегледаних поља изолована је само једна патогена врста, а само на неколико поља су утврђене више од једне врсте гљива.