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Original scientific paper

VIRULENCE OF THE ERYSIPHE GRAMINIS DC. EX MERAT F. SP. TRITICI EM. MARCHAL GENOTYPES PROLIFERATED BY SEXUAL REPRODUCTION*)

The paper deals with the virulence of genotypes which are causal agents of powdery mildew in wheat proliferated by sexual reproduction, in 1988 and 1989. Analysis of 735 isolates showed that dominant genes had virulent formulae 1, 2, 3a, 3b, 5, 6, 8/4a and 1, 2, 3a, 3c, 5, 6, 8/3b, 4a. 45 genotypes were found in 1988 and 83 in 1989. Frequencies of V—3b and V—4a were the lowest. Most genotypes possessed 5 to 8 virulent genes.

Key words: *Erysiphe graminis*, wheat, virulence, genotypes, breeding, Serbia

Introduction

Powdery mildew induced by the fungus *Erysiphe graminis* f. sp. *tritici* is regular and economically significant disease of wheat in our country. It has been spread in all wheat growing regions reducing significantly the grain yield. According to Nikolić (1965), the yield reduction in the commercial wheat fields was as great as 45%. According to our results (Stojanović and Stojanović, 1990), the maximum yield decrease, achieved in average for three varieties which were grown in the conditions of artificial infection and different levels of plants nutrition in pots, was 56.1%. Due to its efficiency, varietal resistance is most effective, safe, and economically feasible control (Powers and Sando, 1960; Kostić *et al.*, 1987).

The successful wheat breeding for resistance to causal agent of powdery mildew is based on the identification of virulence and changes in the pathogne population. In our country, the continual population surveys started in 1961, when physiological races were identified (Smiljaković, 966) and have been continuing up to day (Stojanović, *et al.*, 1990). In early 70s, the conventional investigations of physiological races were improved by introducing the survey of the pathogen population virulence (Kostić

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Original scientific paper

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SCREENING THE VIRULENCE OF ERYSIPHE GRAMINIS DC. Ex Merat f. sp. TRITICI Em. Marchal IN MOBILE NURSERIES*)

In 1989 and 1990, we tested in mobile nurseries the virulence of causal agent of powdery mildew during the spring vegetation of wheat in Novi Sad and Kragujevac. The different virulence spectra were determined and the least frequent alleles were V–3b, V–4a and V–9. Mobile nurseries are suitable for collecting and screening the population at different intervals.

Key words: Erysiphe graminis, screening, virulence, wheat, nurseries, Serbia

Introduction

Erysiphe graminis tritici = (Blumeria graminis tritici), the causal agent of powdery mildew in wheat, occurs regularly in Yugoslavia. Infection intensity varies depending on wheat variety, climat conditions and agricultural practices (S m i l j a k o v i ć, 1966).

The necessary predisposition for rational wheat breeding for resistance to powdery mildew, is to know the virulence of the pathogen and the sources of resistance. The screening of virulence is usually done by testing the cleistothecia isolates, proliferated by sexual reproduction (K o s t i ć and P r i b a k o v i ć, 1981, 1985; S t o j a n o v i ć and P o n o š, 1988, 1990). However, it is very important to know the structure of the population and to make the quantitative analyses of its virulence in the course of the vegetation (W o l f e and M i n c h i n, 1976).

In our country, the population of the causal agent of powdery mildew has not been screened in mobile nurseries so far.

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Original scientific paper

INHERITANCE OF RESISTANCE TO ROOT ROT (FUSARIUM SOLANI MART., SACC.) IN MAIZE

This paper deals with the inheretance of resistance of maize to root rot (*Fusarium solani* Mart., Sacc.). The results of the combining ability analysis and related data suggest both additive as well as nonadditive gene action; the additive gene action predominating.

Key words: maize, root rot, *Fusarium solani*, inheritance, resistance, combinig abilities

Introduction

Maize appears to be a host of a number of diseases. The most common, therefore the most important in a terms of economy, are the root rot, the stalk rot and the ear rot. The causers of these diseases are mainly fungi species belonging to a group of facultative parasites. These species cause the diseases of young plants (up to occurrence of the fourth leaf), as well as diseases of the mature plant root, stalk or ear.

In Yugoslavia, the most important pathogens of the maize root, stalk and ear rot are the *Fusarium* species, most often registered are *Fusarium graminearum* and *Fusarium moniliforme*. Besides these, some other species may occur, *Fusarium solani*, e.g. (Smiljaković & Draganić, 1977).

In a process of a maize cultivation of a special importance is a genetic analysis of the maize root resistance to *Fusarium solani*. By using diallel analysis for the combining abilities needed information may be obtained.

Materials and Methods

During these investigations 6 inbred lines of a standard grain qulaity were involved (ZPP 4–1, L 105, V 312 A, R 59, L 2039 and R 455). The lines were selected in Maize Research Institute, Zemun Polje. In 1983 diallele crosses (without the reciprocal) were made in order to produce the F_1 generation seed. In 1984, a parallel trial on lines and hybrids in 4 repetitions involving 25 plants per replication were set up. The liens and hybrids of maize root were inoculated by *Fusarium solani* originated from the locality of Zrenjanin. The inoculating method was applied (Molot & Simone, 1967).

The rating of a degree of the resistance was made according to the sclae ranging from 1 = the highest degree of resistance to 6 = the lowest resistance.

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Original scientific paper

COMPARISON OF MAIZE RESISTANCE TO STALK ROT UNDER CONDITIONS OF ARTIFICIAL INFECTION WITH COLLETOTRICHUM GRAMINICOLA (CES) G.W. WILS. AND FUSARIUM GRAMINEARUM SCHWABE*)

Maize stalk anthracnose caused by the fungus *Colletotrichum graminicola* has been occurring in Yugoslavia sporadically already for 15 years. The objective of this investigation was to determine resistance of inbred lines to stalk anthracnose and to find a linkage between this resistance with the resistance to stalk rot caused by the most important causal agent in this country – *Fusarium graminearum*.

Over the five–year period of investigations, 357 maize inbred lines were tested for resistance to the both stalk rot pathogens under conditions of artificial infection. The most important Bc lines, foreign lines and our own experimental inbreds were included in the investigations.

In late maturing lines, moderate correlative association between resistance to *Colletotrichum graminicola* and *Fusarium graminearum* was found ($r = 0.55^{**}$ to 0.70^{**}). In mid–late lines the correlation coefficient was $r = 0.41^{*}$ to 0.69^{**}, while in early lines it was not found ($r = -0.18$ to 0.29).

In breading maize for resistance to stalk anthracnose, application of artificial infection with *C. graminicola* is necessary.

Key words: maize, resistance, stalk rot, Yugoslavia

Introduction

Anthracnose stalk rot of maize is an important maize disease (Kruger, 1965; Pupipat and Mehta, 1969; Messian, *et al.*, 1959). In recent times, this disease has been causing considerable damages in the U.S.A. and is therefore being intensively investigated (Warren *et al.*, 1973; Hooker, 1976; White *et al.*, 1979). Maize stalk anthracnose has been sporadically occurring also in Yugoslavia for 15 years (Milatović, 1976; Milatović and Palaveršić, 1979).

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Original scientific paper

MONITORING THE OCCURRENCE AND SEVERITY OF MAIZE DISEASES IN CROATIA FROM 1985 TO 1989*)

In this paper, results of monitoring the occurrence and severity of the existing maize diseases as well as of possible new diseases and races are presented. The investigations were carried out in the period from 1985 to 1989 in Croatia, at 6 locations, on differential test assortment. During the 5—year monitoring program any new (quarantine) disease was found or any new pathotype (physiological race) of the existing diseases.

Key words: maize, diseases, Croatia, monitoring

Introduction

Maize diseases occupy an increasingly important place in breeding and production. Changes that are taking place in practice, like asortment, plant density, fertilizer application, tillage practices, irrigation and so on can influence the disease development.

Program of monitoring the spread of maize diseases in Croatia was initiated in 1985 within the Yugoslav—American project JFP 651 „Breeding Corn for Resistance to Leaf, Stalk, and Ear Diseases", after some similar programs conducted in the U.S.A. (S m i t h, 1977; T u r n e r 1982).

Materials and Methods

The investigated material was chosen according to differential response to several leaf diseases. All materials were planted in two rows with 20 plants in each, no replications.

A survey of the materials included in the test assortment, by years and locations:

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Original scientific paper

ENTOMOPATHOGENIC FUNGI OF CABBAGE APHID (BREVICORYNE BRASSICAE L.)*

The entomopathogenic fungi of *Brevicoryne brassicae* L. have been surveyed for four years. In diseased specimens of cabbage aphid, eight species of entomopathogenic fungi were found. Seven species belong to the *Entomophthorales* and one species to the *Deuteromycetes*. In all examined localities mycoses were the most frequently caused by *Pandora neoaphidis* (Remaudiere et Hennebert) Humber. The identified fungi were also found in mixed infections.

Key words: cabbage aphid, cabbage plant, entomopathogenic fungi, Serbia

Introduction

The leaf alphids mouth apparatus and feeding by sucking plant juices predetermine the entomopathogenic fungi as a main causer of diseases in that group of insects. In nature, among the most important fungi pathogenic to leaf aphids are those from order *Entomophthorales*. With the exception of leaf aphids from the families *Phylloxeridae* and *Adelgidae* all the families of the *Aphidoidae* are hosts to those fungi (Thaxter, 1888; Gustafsson, 1971; Rabasse, 1974). Waterhouse and Brady (1982) quote 18 species of *Entomophthorales* registered as the aphid pathogens of which 13 are pathogenic to the aphids only.

There are no published papers concerning the pathogens of aphids in Yugoslavia. The need for research of entomopathogenic fungi is especially required for the insects such as *Brevicoryne brassicae* L., which are to be controlled in the cabbage growth stages 8–9 when the application of chemicals is delicate. Therefore, the goal of this work is to find out, primarily the taxonomic status of fungi pathogenic to the cabbage aphid.

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Original scientific paper

FRANKLINIELLA OCCIDENTALIS (Pergande, 1895) – NEW PEST IN GLASSHOUSES IN YUGOSLAVIA

In this preliminary report some data about Californian thrips *Frankliniella occidnetalis* (Pergande, 1895) are given. *Frankliniella occidentalis* is a new pest species in Yugoslav entomofauna. It was first recorded in North America, than in Europe in 1986. Since now it has spread in almost whole Europe. We have found *Frankliniella occidentalis* for the first time in Yugoslavia in glasshouse in Kočani (Macedonia) in autumn 1988, when Californian thrips caused great damages on flowers of carnations, gerberas and roses. Symptoms of the attack are white chlorotic spots on petals which later necrotize and reduce the market values of flowers.

Key words: quarantine pest, *Californian thrips*, glasshouses, Yugoslavia

Introduction

The Californian thrips was first recorded in western parts of the North America. The pest was found on ornamental plants in glasshouses. In Europe it was first recorded in Sweden, Denmark and Germany – in surrounding of Hamburg (zur Strassen, 1986). Specimens from Scandinavia were found in glasshouses on young plants of the African violet *Saintpaulia ionantha* Wendl., and these ones from the surrounding of Hamburg on roses in the vicinity of glasshouse where also the African violets were grown. After the first find in Europe, many publications were published (Straus, Schickedanz, 1986; Bournier, A., Bournier, J. P., 1987; Lacasa *et al.*, 1988; Mantel, Vande Vrie, 1988; Arzone *et al.*, 1989; Jenset, Tusnadi, 1989; Brodsgaard, 1989 and others). In some of mentioned papers the life cycle and biology of this pest were described in details (Arzone *et al.*, 1989). In the paper of zur Strassen (1986), the differential characteristics of the species *Frankliniella occidentialis* by which it differs from the related European spcies from the same genus are cited. Mantel (1989) has published a detailed bibliography of works deals with the Californian thrips.

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Original scientific paper

INFLUENCE OF CULTAR ON THE VEGETATIVE AND GENERATIVE GROWTH AND DEVELOPMENT OF PEARS

The results of a two–year investigation on the influence of **Cultar** on the vegetative and generative growth and development of the Santa Maria and William Bovey pear cultivars are presented. At doses of D_1 = 0.5 l/ha and D_2 = 1 l/ha/1500 l of water, applied two to three times during the vegetative period **Cultar** inhibited a stem extension of the annual shoots by blocking gibbereflin biosynthesis. Diversion of „spared" assimilates stimulated the initiation of flower buds and promoted flowering in the second year of the trial, resulting in significantly increased fruitfulness of both tested pear varieties.

Key words: pear, Cultar, influence vegetative, generative

Introduction

Pruning is a routine pomotechnological procedure utilized in intensive pear cultivation which requires a great deal of qualified manpower. In order to reduce pruning costs and increase the yield, growth regulators are nowadays increasingly used in fruit growing. To inhibit vegetative growth, various growth retardants, including **Cultar** which has recently been introduced into the apple and peach production, are applied (Williams 1982; Williams *et al.*, 1983; Stinchcombe *et al.*, 1984; Dubravec *et al.*, 1984, 1986, 1990). Since no data on the influence of **Cultar** on the vegetative and generative growth of pears have been published in Yugoslav journals, the investigation described in this paper was conducted.

Materials and Methods

The ultimate effects of growth regulators depend on the species, variety, nutrition of plants, manner of application of the regulators and a number of environmental factors.

Cultar is a growth regulator of the growth retardent type. Although growth retardants or growth inhibitors have very similar effects, they differ in their mechanism of action and the amounts