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Revial scientific paper

SURVEY OF STUDIES ON MAIZE RESISTANCE TO STALK AND EAR ROT PATHOGENS IN YUGOSLAVIA

This paper presents a survey of former studies on the resistance of maize to the stalk and ear rot pathogens in Yugoslavia and highlights further directions of research in this field.

Key words: Maize, stalk and ear rot pathogens, resistance

Introduction

During the last decade, due to breeding and growing of the high yielding maize hybrids, excellent results were achieved in increasing maize yields. However, numerous factors considerably impede better use of the genetic potential and yielding capacity of developed hybrids. Diseases and pests, in addition to climatic factors, are the most common factors of reductions in yield. Damages caused by the stalk and ear rot depend on the genotype of the host, i.e. the maize hybrid, the pathogenicity of different causal organisms of these diseases, as well as, on agroecologic conditions. The most common pathogens of these diseases are fungi of the *Fusarium* genus. Of lesser importance are *Sclerotium bataticola* Taub., *Nigrospora oryzae* (Berk. et Br.) Petch., *Helminthosporium* spp., *Curvularia* spp., *Colletotrichum* spp., *Pythium* spp., and others, while bacteria occur more rarely and are commonly found in seed crops and irrigation conditions.

Diseases of stalk and ear rot type are significant for the production of maize, because they reduce yields and deteriorate kernel quality.

According to more recent works, regardless of various difficulties due to the existance of a greater number of pathogens, even isolates of different agressivity within one species, it is possible through breeding to develop more resistant and higher yielding maize hybrids having a horizontal (general) resistance.

The inheritance of resistance to rot pathogens is of a poligenic nature, making the development of resistant hybrids even more difficult.

Stalk and ear rot pathogens of maize

Root and stalk rot. — Earlier, maize root and stalk rot were described as two different diseases. Today, however, the opinion prevails that it is a complex disease caused by a greater number of fungi and bacteria.

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AGRIS: H20 0336
Original scientific paper

VARIABILITY OF DIAPORTHE PHASEOLORUM VAR. CAULIVORA ON SOYBEAN IN THE VOJVODINA PROVINCE IN SERBIA

Seedlings of three soybean varieties (Mandarin, Harosoy, Tracy –M) and one line (J 77–339) were inoculated by the toothpick method with five *D. phaseolorum* var. *caulivora* isolates collected in different locations in the Vojvodina Province in Serbia. The reaction of the variety Tracy–M indicated that the isolates were similar to the northern race and quite different from the southern race of the parasite which causes stem canker of soybean in the United States. The isolates were grouped according to the significant differences in virulence. The isolate S1–Novi Sad was the least virulent, the isolates S4–Erdevik and S5–Boka were most virulent, while the virulence of the isolates S2–Dolovo and S3–Alibunar was intermediate. Despite the significant differences in virulence observed between the isolates, the obtained data are insufficient to confirm or contest the presence of different physiological races of *D. phaseolorum* var. *caulivora* on soybean in the Vojvodina Province in Serbia.

Key words: Soybean, *Diaporthe phaseolorum* var. *caulivora*, virulence, Serbia

Introduction

Diaporthe phaseolorum (Cke. et. Ell.) Sacc. var. *caulivora* Arhow and Caldwell, the agent of black stem spot, is one of the most detrimental parasites of soybena. Its occurrence intensified in the 1950's in northern and central parts of the United States and in Ontario, Canada (A t h o w *et al.*, 1951; H i l d e b r a n d, 1956; F r o s h e i s e r, 1957). The disease was named soybean stem canker. After a few years, the intensity of the disease dropped down below the level of economic significance. A t h o w (1973) associated it with the withdrawan from the commercial production of the highly susceptible soybean varieties, Hawkeye and Blackhawk. In the late 1070's however, intensive outbreaks of the disease occurred in the southern parts of the United States (B a c k m a n *et al.*, 1981; H i l t y, 1981; K r a u s e *et al.*, 1983) as well as in Yugoslavia (J a s n i ć *et al.*, 1983).

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AGRIS: H00 0110
Original scientific paper

DISTRIBUTION OF BARLEY YELLOW DWARF VIRUS IN WHEAT AND BARLEY IN VOJVODINA

Barley yellow dwarf virus in wheat and barley was recorded in several locaties in Vojvodina in 1790. The presence of virus in collected plant samples was proved by the DAS--ELISA serological tests.

Key words: Barley yellow dwarf virus, distribution, wheat, barley, Vojvodina.

Introduction

It was noticed in spring time of 1990 that in numerous localities of Vojvodina wheat plants were stunting. The occurrence of chlorosis and purple color was noticed on the top parts and at the margin of older leaves. The barley plants were yellow and dwarfed.

These changes on plants were very similar to the symptoms described in literature as the *barley yellow dwarf virus*[1)]. However, it is necessary to point out that such changes could be confused with some abiotic factors such as the effects of drought, frost, high temperatures, deficiency of nutritive elements in soil etc. (R o c h o w, 1970; D' A r c y, 1983; C o n t i *et al.*, 1987).

The aim of these investigations was to confirm the presence of this virus in the wheat and barley plants in Vojvodina.

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1)in furtehr text *BYDV*

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Original scientific paper

DISTRIBUTION AND INTENSITY OF OCCURRENCE OF SOME MAIZE VIROSIS IN THE PROVINCE OF VOJVODINA

The paper presents the data on the distribution and intensity of occurrence of *Maize Dwart Mosaic Virus (MDMV)* and *Barley Yellow Dwarf Virus (BYDV)* on seed corn crops in several localities in the province of Vojvodina in 1989 and 1990.

Key words: Maize Dwarf Mosaic Virus, Barley Yellow Dwarf Virus, distribution, intensity of occurrence, maize, Vojvodina

Introduction

During 1989 and 1990 in Vojvodina, on a number of plots covered with seed corn crops a mass occurrence of stunted platns with the chlorotic and purple colored leaves was registered.

The above mentioned changes were very similar to the symptoms which may be caused by the viruses. However, similar changes could be also caused by some abiotic factors such as environmental conditions, the lack of nitrogen or herbicide residues etc. (Pearson and Robb, 1984; Loi *et al.*, 1937; Marić *et al.*, 1989; Marić *et al.*, 1991).

In order to determine the causers of these changes on seed corn crops, a number of collected samples were tested to the presence of MDMV in 1989 and 1990 and BYDV in 1990.

Material and Methods

The investigation on the distribution and intensity of occurrence of virosis of the seed corn crops in Vojvodina was carried out in 13 localities in 1989, i.e. 8 localitеis in 1990, respectively.

The infection intensity for the seed corn crops on trial fields was determined according the method described below:

1) 100 maize plants of mother and father lines chosen randomly were counted;
2) within these plants, the plants with changes were counted and registered;

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AGRIS: H00 0120
Original scientific paper

MAIZE SEEDLING PROTECTION AGAINST FUSARIUM VERTICILLOIDES (SACC.) NIRENBERG BY SEED FUNGICIDE TREATMENT

This research was undertaken to elucidate the effect of seed fungicide treatment (captan, mancozeb, TCMTB, thiram, triadimenol, organomercury, metalaxyl thiabendazole and guazatine acetate) on a) incidence of *Fusarium verticillioides* (Sacc.) Nirenberg(*Fusarium moniliforme* Sheld.), b) seed germination, c) height, d) fresh weight and e) dry matter of seedlings. Fungal invasion was determined by the rolled towel method after a 6–day incubation period.

The *F. verticillioides* infection in treated seeds ranged from 4.0–4.8 (organomercury, metalaxyl + thiabendazole) to 20.0–20.3% (guazatine + acetate, triadimenol). In nontreated seed infection was established at 23.3%. The highest germination was found in seed treated with thiram (95.5%–94.8%). The lowest germination was found in seed treated with guazatine + acetate (85.0%) and triadimenol (85.8%). The organomercury, thiram and captan treatments resulted in increased yield and fresh seedling weight, both of root and plumules. The dry matter content was higher in plumules of seedlings developed from treated seed than that from the control. The reverse was found in seedling roots. There were no significant differences between treatments of thiram with and without adherent spreader sticker.

Key words: Maize (*Zea mays* L.), Mo17, *F. verticillioides*, fungicides, germination, height, weight and dry matter of seedlings.

Introduction

Fusarium verticillioides (Sacc.) Nirenberg (*Fusarium moniliforme* Sheld.) was abundant on maize kernels (*Zea mays* L.) in Yugoslavia in 1986 and 1987. The seed–borne pathogen was 7 increased by favourable environmental conditions and a severe attack of the second generation of the European corn borer – ECB (*Ostrinia*

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Original scientific paper

ERYSIPHE CRUCHETIANA BLUMER AND ERYSIPHE THESII JUNELL, NEW PARASITES ON ONONIS SPINOSA L.AND THESIUM LINOPHYLLUM IN YUGOSLAVIA

The occurence of powdery mildew on *Ononis spinosa* L. and *Thesium linophyllum* L. caused by *Erysiphe cruchetiana* and *Erysiphe thesii* registered for the first time in Yugoslavia have been studied.

Key words: powdery mildew, *Erysiphe cruchetiana, Erysiphe thesii,* host plant, *Ononis spinosa, Thesium linophyllum*

Introduction

Fungi of the *Erysiphe* (DC). FR. genus are the parasites on a large number of both cultured and spontaneously growing plants. Up to now, in our country, greater attention has been paid to the study of causers of powdery mildew on cultured plants. There is not enough data about their presence on the other hosts and the taxonomic characteristics of these powdery mildew species (Ranojević, 1910; Radosavljević, 1924; Škorić, 1926; Janežić 1950, 1957; Perišić; Minev, 1957; Ranković 1985, 1988, 1989).

Material and Methods

Samples of diseased plants were collected in the localities of Serbia from 1987 to 1990. The taxonomic characteristics of the presented species are: the appearance, size and distribution of conidia; shape and type of the conidiophore, mode and speed of germination of the conidia; distribution, size and appearance of germinated tubes and the appressors on them; appearance and size of the diameter of cleistothecium; size and shape of the cell wall; distribution, shape and length of appandages on the cleistothecium; number of asci inside them, their appearance, dimension and number, shape and size of ascospores in the ascus. The size of the mentioned characteristics are based on theexamination of 300 samples.

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Original scientific paper

PHYTOPHTHORA NICOTIANAE B. De HANN VAR. PARASITICA (DAST.) WATERHOUSE AS THE PARASITE OF MANDARIN TREES

This paper deals with the identification of the pathogens which cause disease and dieback of mandarin trees in Macedonia. The cause for decay of the mandarin fruit has also been researched on fruits originated from the locality of Igalo (Montenegro) and Greece.

The *Phytophthora nicotianae B. De Haan var. parasitica (Dast.) Waterhouse* has been identified as the causer of the mentioned phytopathological changes. This work presents the results on morphological and specific phytopathological characteristics of the parasite.

Key words: mandarin, citruses, *Phytophthora nicotianae var. parasitica*, dieback

Introduction

The production and consumption of citruses take the first place in the world fruit production. The production of citruses in Yugoslavia is on the 3th place (Mišić, 1982). The production of citruses in Yugoslavia is in continous growth, since the citruses are the most profitable fruit in the country.

A large part of the production and consumption of citruses is on the mandarin *(Citrus nobilis* Lour.), the fruit of the subtropical regions.

Production of mandarins is very profitable, but favorable climate conditions are in some regions of Yugoslavia only. In some parts of the country, along the Adriatic coast, the comercially grown mandarins cover large areas.

In Macedonia the climate conditions are not suitable for raising mandarins in the field; therefore, related protected spaces (greenhouses) are required. The growing of mandarins in the greenhouses requires minimal additional heating during the winter season; therefore, some Macedonian organisations for the production of early seasonal vegetables have been reoriented toward the mandarin production („Gradinar" Ohrid, „Chashka" AIK – „Lozar" T. Veles, eg.). In the greenhouses the cultivar Unshiu prevailes, as the most resistant to the negative effects of low temperatures.

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Original scientific paper

ENCARSIA FORMOSA GAHAN IN CONTROL OF TRIALEURODES VAPORARIORUM VESTWOOD*)

In 1988 and 1989, the efficacy of *Encarisia formosa* Gahan in reduction of the *Trialeurodes vaporariorum* Westwood population on tobacco, cucumber and tomato planted in clima chamber and commercial greenhouses was studied. The classic method and the method of introduction after the occurrence of greenhouse whiteflies were applied. The obtained results indicate the higher efficacy of *E. formosa* when the classic method was applied.

Key words: biological control, greenhouse whitefley, *Encarsia formosa*, introduction of parasites

Introduction

The occurence of resistant populations of whiteflies, *T. vaporiorum,* after several applications of pesticides caused the require for further development of biological measures. *T. vaporiorum* has a large number of natural anemies. The most important is *E. formosa* (V e t *et al.*, 1980).

In 1926, S p e y e r applied successfully *E.sformosa* in control of *T. vaporariorum* (S p e y e r, 1927). However, due to the unprecise methods the results were not satisfied. In 1938, M c L e o d was the first who gave precise data on the ways of introduction of *E.formosa* in control over *T.vaporiourum*. The early 70s were the beginning of an intensive development of biological control of whitefly (G o u l d *et al.*, 1975; K o p p e r t, 1978; L e n t e r e n *et al.*, 1976; P a r r i S c o p e s, 1973; P a r r *et al.*, 1976; S c o p e s and B i g g e r s t a f f, 1971; S t e n s e t h and A a s e, 1983; W o e t s, 1973 and 1976). In Great Britain and the Netherlands, the methods for production and application of *E. formosa* in practice were developed in details.

*) The paper is a part of M.A. thesis defended in 1990, Agriculture Faculty, Belgrade

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Original scientific paper

EFFECTIVENESS AND SELECTIVENESS OF HERBICIDES IN MAIZE EXPOSED TO SEVERE DROUGHT STRESS

Modern corn production calls for the use of selective herbicides for weed control. Their effectiveness is affected by the amount of rainfall and its distribution during the growing season. In view of the limited rainfall and its unfavourable distribution over the last few years, we analyzed the effectiveness and selectiveness of herbicide combinations in drought conditions. Small-plot trials were established on the chernozem soil.

Key words: Maize, herbicide, effectiveness, selectiveness, weed species, yield, rainfall level and distribution.

Introduction

Numerous investigations have shown that the increase in field crop yield is due to the introduction of new varieties and hybrids, efficient disease, pest and weed control, and improved nutrition. Weed control is an important agricultural practice because yields of agricultural crops are reduced by 0–12% if weeds are not controlled (Janjić, 1977; Dražić, Glušac and Kosovac, 1989, etc.).

Weed control in crop production is a complex operation. At present, the most effective and economical weed control is achieved with herbicides.

Weed species about in corn plots. In 1985, Kojić reported that about 150 weed species had been registered in Serbia. When selecting a herbicide, special attention should be given to the dominant weed species and the ecological conditions of the region. Ecological, especially climatic conditions, may influence the effectiveness of herbicide combination, especially if it is applied preemergence. In that sense, soil and air moisture are of primary importance. In conditions of low soil moisture, herbicides volatilize quickly, without coming in contact with weeds. This minimizes its effectiveness (Janjić, 1977). Also, excessive rainfall immediately after herbicide application tends to lower the effectiveness of the herbicide because it is washed into the deep soil layers.

Depending on climatic conditions, herbicide may be applied before planting (incorporated into the soil in dry regions), before emergence (in humid regions), and after