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EPIPHYTE AND ENDOPHYTE MICROFLORA ON SEEDS OF *PICEA EXCELSA* Link.

by

Milka Peno

Institute of forestry, Beograd

Summary

In this paper the author presents the results of investigation of epyphyte and endophyte microflora on seeds of *Picea excelsa* during storage et germination. The process investigated seeds were of different provenience, so the germination percentage ranged from 70,5 to 99,0%. The method of N a u m o v (1960) was used in this investigation.

Four species of bacteria (*Bacillus subtilis*, *B. mycoides*, *Pseudomonas herbicola* adb *Ps. fluorescens*) were found to contaminate the seed coat. The most frequent fungi were those belonging to the genera: *Penicillium* (25,8)%, *Fusarium* (21,2%), *Alternaria* (14,5%) and *Aspergillus* (13,9%). The epiphytes fungi are relatively little represented (0,5—5,1%), but at a high level of humidity and a suitable temperature perform a negative effect on seed germination.

Endophyte fungi induce pathogenic changes not only on seed coat and embryo, but also on young plants in seed beds.

SEVERAL YEAR TESTINGS OF CORN FOR RESISTANCE
TO *COLLETOTRICHUM GRAMINICOLUM* (CES.) G. W. WILS

by

Ivanka Milatović

Faculty of Agricultural Sciences University of Zagreb
Institute of Plant Protection, Zagreb

B. Palaveršić and Viktorija Vlahović

Faculty of Agricultural Sciences, University of Zagreb
Institute for Breeding and Production of Field Crops, Zagreb

S u m m a r y

In trials carried out from 1979 to 1981 a large number of lines and hybrids was tested for resistance to anthracnose, *Colletotrichum graminicolum* on leaves and stalk under conditions of artificial and natural infection.

The experiments were set up in field and in the greenhouse. Taking into consideration the climatic conditions of SR Croatia methods of artificial infection by spraying the spore suspension into the leaf whorl as well as injecting spores into the stalk were successful.

The materials tested showed big difference in the degree of either resistance or susceptibility. The more severe leaf infection the more intensive disease attack on stalk, therefore the material should also be tested according to the degree of leaf susceptibility. Under natural conditions or applying artificial infection both stalk rot and breakage tend to appear on susceptible material more intensively. Also anthracnose tends to attack more severely in corn-corn rotation.

PREDICTING THE RESISTANCE OF THE MAIZE STALK TO
DIFFERENT ISOLATES OF *GIBBERELLA ZEA* BASED ON THE
DEGREE OF RESISTANCE OF PARENT COMPONENTS

by

M. Draganic and Hristina Smiljkovic

Maize Research Institute, Beograd — Zemun Polje

Summary

Besides *Gibberella zea*, maize stalk rot is caused by many other fungi. There is great variability in respect to pathogenicity. Therefore, it would be advantageous to be able to predict the resistance of the maize stalk to isolates of different pathogenicity within a single species, such as *Gibberella zea*, as well as to all rot pathogens.

For these investigations, three hybrids (V 312 a × C 103, ZPL 203/6 × A 623, ZPL 773 × Mo 17) and their parent components were tested. Variety trials, separately for inbreds and hybrids, were set up in 1981 and 1982 according to a random block design in four replications with 25 plants per replication.

Immediately after silking stalks were inoculated in the second internode, tooth-pick method, Yuong (1943), with the following *Gibberella zea* isolates: a) aggressive from Peć; b) medium aggressive from Dimitrovgrad; c) nonaggressive from Zemun Polje; d) mixture of isolates a, b and c; and e) mixture of isolates of all rot pathogens.

The rating of the degree of resistance was performed at harvesting using the scale 1 = most susceptible to 9 = most resistant, Hooker and Draganic (1980). The rating of the degree of stalk resistance of maize inbred lines and hybrids was taken as the actual resistance, while the theoretic resistance of hybrids was calculated on the basis of the degree of resistance of parent components according to the formula $TOF_1 = 3P_1 + P_2/4$. The testing of the equality between the actual and theoretic resistance was performed using the Chi-square test for $n-1$ degrees of freedom.

Results for 1981 and 1982 show the formula $TOF_1 = 3P_1 + P_2/4$ is suitable for the calculation, i. e. prediction of the resistance of the maize stalk to rot on the basis of the resistance of parent components.

**CONTRIBUTION TO THE STUDY OF THE RESISTANCE OF SOME
MAIZE INBRED LINES AND HYBRIDS TO CORN STREAK VIRUS**

by

M. Draganić, M. Vidaković and Lj. Milošević
Maize Research Institute, Belgrad—Zemun Polje**S u m m a r y**

Maize in the PR of Angola is a staple food of the population, more significant than manioc and rice. Because of the primitive method of growing maize, yields in Angola are very low. It is estimated that the national average yield is 0.45 t/ha.

The most important factors limiting maize production in Angola are the soil, diseases and pests. The most severe disease is corn streak virus whose vector is *Cicadulina* spp. It is estimated that losses caused by this virus range between 10% and 20%, and in some cases even exceed 50%.

In addition to the fact that disease development depends on the genotype of the maize host plant, the environment and pathogen genotype, a great difficulty in the development of resistant maize hybrids present numerous other diseases. Due to homogenous maize varieties grown on extensive areas, which is characteristic of Angola, new maize pathogens or new biotypes and races occur.

For these reasons, the government of the PR of Angola has undertaken great efforts to improve the situation. With this aim a National Program for the Improvement of Maize Production was established and the Maize Research Institute in Zemun Polje engaged to realize this project.

As basic material to test the resistance of maize to corn streak virus 55 maize inbred lines and 10 hybrids were used. This material was tested in the province Huambo. Twenty plants per row were planted of each inbred lines and hybrid. The rating of the degree of resistance was performed during the pollination period according to the scale 1 to 5.

Based on trial results, most inbred lines and hybrids were classified as resistant, medium resistant and moderately susceptible, and only a few as susceptible and very susceptible.

EPICOCCUM NEGLECTUM DESM. — A PARASITE OF SUNFLOWER

by

M. Aćimović

Institute of Field and Vegetable Crops, Novi Sad

S u m m a r y

In the last few years, especially in July 1981, characteristic spots occurred intensively on sunflower leaves. Such spots were registered in Vojvodina and Bosnia, in the vicinity of the town of Brčko.

When they occur, the spots are small but numerous. The central part of the spot is brown and necrotic while the peripheral part is pale yellow. The spot is frequently oval or irregularly oval. In consequence to the spreading of the parasite in leaf tissue, the spot enlarges to the size of 2—5 cm. Spots spread between the main nerves and merge, drying a larger or smaller portion of the lamina. The infected part of the lamina frequently falls out leaving a large hole.

A black-brownish film develops over the spot. Those are mycelia, hyphae, and the reproductive organs of the fungus, conidiophores with conidia.

The mycelium is orange colored and septate. The diameter is 2.77—5.54 or 3.32 microns on the average; the length of cells between septa is 11.80—24.93 or 19.90 microns on the average.

The length of the conidium is 9.69—22.16 or 15.61 microns on the average, the width 9.69—19.39 or 14.13 microns on the average.

INVESTIGATION OF THE POSSIBILITY OF SHARKA VIRUS STRAINS DIFFERENTIATION BY ELECTROPHORESIS

by

M. Ranković

Fruit Research Institute, Čačak

D. Veličković

Faculty of Agriculture, Beograd

Summary

The testing of some properties and the possibility of differentiating of Sharka virus strains was done by means of a special form of polyacrylamide gel electrophoresis, known as »Disc« electrophoresis, and by immunoelectrophoresis. For this purpose, the purified intact and alkaline degraded virus preparations were used, characteristic representatives of the three known strains of this virus, viz. necrotic, intermediate and yellow one.

It was assessed that all the three strains tested in the electric field moved towards positive pole — the anode.

In polyacrylamide gel clear differences were observed between the strains tested, which are reflected in the homogeneity of the separated zones. The necrotic strain separates into three layers which lean against one another and are not sharply defined as separate zones. The intermediate strain behaves similarly as necrotic, with the difference that in the separated zone only two layers can be clearly observed. In contrast to these two strains, the yellow virus strain separates in the form of one homogeneous zone. After alkaline degradation all the three virus strains behave in the same manner. They have greater mobility and form in gel only one diffuse zone.

By immunoelectrophoresis of undergraded virus preparations no significant differences were found between the individual strains, although certain differences were observed in the reaction with homologous and heterologous serums. As in the case of »Disc« electrophoresis, these differences disappear after alkaline degradation of virus particles. On the basis of this it was concluded that with necrotic and intermediary strains virus particles are less uniform in length than with the yellow strain.

EFFECT OF *BROME MOSAIC VIRUS* ON GERMINATION AND
LENGTH OF PRIMARY ROOTS IN WHEAT SEED

by

D. Stakić

Institut Pasteur, Novi Sad

S u m m a r y

After two-years investigations it could be concluded that Brome mosaic virus had a harmful effect on the germination of seed and length of primary roots in wheat seed such as:

— the percentage of germination decreased in varieties Sava, Novosadska rana 3, Partizanka and Bankut 1205 by 4,47%, 2,7%, 1,91% and 0,8%, respectively;

— the length of primary roots was reduced in varieties Sava, Novosadska rana 3, Partizanka and Bankut 1205 by 15,12%, 15,03%, 12,32% and 12,25%, respectively.

BIOLOGICAL DATA OF MULBERRY SCALE (*Pseudaulacaspis pentagona* Targ.-Tozz.) AND ITS PARASITES (*Chalcidoidea*) IN BELGRADE

by

Elga Kozarzhevskaya

Main Botanical Garden Academy of Sciences, Moscow

Lj. Mihaĵlović

Forestry Faculty, Beograd

S u m m a r y

The phenology and reproduction of mulberry scale and its parasites have been investigated on forest and ornamental plants in Belgrade, from June 1980 to June 1982. This pest has two generations a year. The fertile females hibernate. The occurrence of scale's stages in nature takes longer time in the second generation than in the first one. In both generations the period of occurrence of mobile stage of the first instar larva takes two weeks, that of the adult males ten days, oviposition during approximately the same time, but the duration of larvae and females in the second generation takes a much longer time. Maximum actual fecundity has been 133 eggs, potential 165. Eggs are different colours: from white to bright orange. Under the scale of each female the eggs have been of one or two colour. It has been noticed that white mobile larvae hatched from the white eggs and orange mobile larvae from the orange ones. Scales of male larvae and females keep the same colour: white and dark gold respectively. Four species of *Hymenoptera* have been hatched out of mulberry scale (family *Aphelinidae*). Two of them — *Encarsia berlesei* (endoparasite) and *Aphytis? proclia* (ectoparasite) — are the most effective and widely distributed. They hibernate in egg, larval and pupal stages. The parasite *E. citrina* has been found one time. The hyperparasite *Azotus perspicuosus* has been established for the first time in the Yugoslav fauna. It lives as parasite of *E. berlesei* in the scale female's body. It has not been mentioned before. This parasite hibernates as a last stage larva. There has been noticed a more higher percentage of parasitized females on the branches without males comparatively with the females covered by male cocoon colonies. Dark sclerosed spots on the female bodies are connected with the nutrition of haemolymph by the parasite *E. berlesei* and its oviposition. The number of dark spots on the body of a female fluctuated between 1 and 6 and increased in population with the high rate of parasitisation. Short information is given on the systematic position of mulberry scale, morphological characteristics of its stages and some literature on this pest in France, Italy, Hungary, Turkey, USSR and Yugoslavia.

NUTRITION OF SUGAR BEET CASSIDA LARVAE (*CASSIDA NEBULOSA* L.) AND POSSIBILITY OF THEIR CHEMICAL CONTROL

by

R. Sekulić and R. Ali Thalji
Faculty of Agriculture, Novi Sad

Summary

Nutrition of sugar beet *Cassida* larvae (*Cassida nebulosa* L.) has been investigated under laboratory conditions, as well as the contact-digestive effect of some insecticides. On the basis of the results obtained the following conclusions can be drawn:

The nutrition of one day larvae by sugar beet leaf caused mass death of plants. After already four days of nutrition the mortality reached 90 per cent. In contrast to the sugar beet, the nutrition by leaf mass of weed plant *Chenopodium album* L. enabled a complete development. Therefore, the larvae of beet cassida cannot be developed immediately on sugar beet without a previous nutrition on weed plants of *Chenopodiaceae* family.

The total development, initiated by one day larvae on goosefoot leaf, being the nutrient, at the temperature of about 24°C, lasted twelve days. During that time, larvae consumed a total of 9,74 sq cm of leaf mass which, in relation to the other important sugar beet defoliators (*Mamestra* spp.), is less than 17 times.

The most intensive damage of leaf mass occurred in the last stages of development. Expressed in numerical values, it means that larvae in the last two thirds of development consume even 85% of food.

Regarding to the amount of leaf mass which larvae can consume in their development, and to the amount of leaf mass of plants in the period of larvae occurrence, according to our investigations, the critical number is the presence of 15 to 20 larvae per plant. On the contrary, the presence of 10 and more larvae per plant can be tolerated because such a numerosity cannot cause economically important losses.

Investigating the contact-digestive effect of insecticides on the adult larvae under laboratory conditions, a mortality between 72 and 94% was achieved.

The best effect was achieved by the application of triazofose insecticides (Hostation EC-40 chemical in the rate of 1,5 l per ha). Other insecticides gave also very good results. However, as regards to the way of life of larvae, it would be necessary to prove in practice the efficiency of the insecticides applied.

ACTION OF CYMBUSH — 10 (CYPERMETHRIN) ON THE COCOONS OF THE APPLE LEAF MINER (*LEUCOPTERA SCITELLA* ZELL.)

by

M. Injac

Institute for Plant Protection, Beograd

Kata Dulic

WO »Peščara«, Subotica

Summary

In the course of the years 1981—1982 in a considerable number of sour cherry and apple orchards there was observed a simultaneous presence of the winter cocoon webs of the summer fruits Tortricids (Tortricidae: *Pandemis heparana* Den et Schiff and *Adoxophyes orana* F. v. R.) and the cocoons of *L. scitella*. Their numbers were above the economic threshold. In the control of hibernating caterpillars by the use of Cymbush in concentration 0.05% there was observed that the number of leaf miner moths which flew out was less than it had been expected on the basis of the number of cocoons.

The action of Cymbush 10 on cocoons of *L. scitella* was investigated in the course of:

a) the first flight of moths.

After the spraying of the sour cherry orchard, effected on April 5, the leaves were collected both from the treated part and the untreated one and put into the emergence cages.

b) the second flight of moths.

The apple orchard was treated on June 17, 5 days before the beginning of the second flight. After the treatment, the leaves with cocoons were put into the emergence cages.

c) the third flight of moths.

During the third flight of moths in the open, the leaves of the apple tree with cocoons were taken and immersed into the water resp. into the emulsion of Cymbush and later dried up and put into the emergence cages.

The moths of the first flight in the Check emergence cage began to emerge on April 28 (Tab. 1) and this lasted to May 21. The total number of emerged moths was 83. In the emergence cage with treated leaves emerged a total of 17 moths.

The second flight began 5 days after the treatment of the apple orchard. In the check there emerged 113 moths and in the emergence cage with treated leaves 7 moths only (Tab. 2).

After the immersion of leaves into the emulsion of Cymbush there was no emergence of moths, whereas in the check there emerged 73 moths (Tab. 3).

In order to establish the possibility of the contact of Cymbush with the pupae, we followed the process of pupation. In the course of the first and the second generations the caterpillars web the cocoons mostly on the leaves (fig. 2) and in the course of the third generation also on the fruits, but for the most part on the cracked parts of the bark (Fig. 1). The cocoons are of rhomboidal form and consist of an upper and a lower part (Fig. 4 and 5). Each part is separately fixed to the base. On the narrower part there is an opening through which the pupae eject the skin of the caterpillar. The moths emerge also through this opening.

Though cypermethrin does not act on the silk threads of the cocoons, there was established the penetration of Aromasol H and 2-methoxy-butanol through the cocoon. Though low doses are used, the long action of the preparation and the perishing of pupae in the cocoons point out the possibility of chemical affinity of the preparation to the silk threads of the cocoons.

ROLE OF LIGHT TRAPS IN FOLLOWING THE DYNAMICS OF CABBAGE MOTH (*MAMESTRA BRASSICAE* L.)

by

I. Sivčev

Institute for Plant Protection, Beograd

Summary

Light traps are one of the methods used in the following of the dynamics of harmful insects population. Considering the fact that the possibilities of light traps are insufficiently known, our aim, in the course of 3 years, was to study their role. Within the framework of the activity of the prognostication-information service on the territory of the city of Belgrade are to be found a considerable number of pests. Our attention, however, was directed this time mainly to the cabbage moth *Mamestra brassicae*. Its caterpillars are the most important pest of cabbage, cauliflower and sugar beet which are being grown on large areas in the surroundings of Belgrade.

In the course of investigations we came to the results which allow us to draw the following conclusions:

The first flight of the cabbage moth as recorded in the beginning or in the middle of May and it was concluded at the end of May or in the beginning of July. It was always protracted, without a maximum and less numerous than the second one. The intergeneration period is not expressed. The moths of the second generation were more numerous, their flight more compact, with an expressed numerical maximum. This flight begins in the middle of July.

In 1979 was observed also the third, uncomplete generation. Between the flight of the moths of *M. brassicae*, recorded by means of light traps and the laying of eggs on the cabbage there is an interdependence. The first laid eggs are found 7 days after the recorded flight. When the numbers of moths in the open are low, the eggs can be observed first. Small number of caught moths shows that only few moths are present in the field resp. that the numbers of eggs are low, and inversely. Along with the number of moths caught there increases also the number of laid eggs. The deviations from that rule occur when the cabbage plants in the field have just been transplanted. Young cabbage plants, 7—10 days old, do not exert an attraction on *M. brassicae* like older plants or other host plants. Also, when on the cabbage have been laid 40 eggs on an average on each plant, further increase in the numbers of moths does not result in the increase of the number of eggs, because the cabbage moth lays its eggs then, to a greater extent, on other host plants.

In the area of Zemun, principal host plants of *M. brassicae* are cabbage and cauliflower.

Meteorological conditions prevailing in this part of Yugoslavia can be, on some occasions only, a limiting factor of the flight of *M. brassicae*. The moths flew intensively at the temperature from 13 to 24°C, at a relative humidity of the air from 75 to 90%. The flight was recorded also at the temperatures of 6.5 and 26°C noted as temperature extremes for the three-years' period, at the relative air humidity of 42% as well as at the average speed of the wind of 2.3 m/s with the blows of 7.0 m/s on an average.

The flight of *M. brassicae*, when followed, shows some regularities and therefore the light traps can be used with success in the short-term prognostication of this pest.

Of two concurrent lights of the same intensity, the ultra-violet one is more attractive for *M. brassicae*, for the number of moths caught on this light was by 19% and 56% higher than the number of moths caught on mercury light. In the case when the source of UV-light has only the half of the intensity of the mercury light trap, the number of caught moths is greater on the latter.

In both localities, among the moths caught on light traps there were always more females. The three-years' repetition shows that this is the normal behaviour of the cabbage moth.

ZUNAHME DER POPULATIONSDICHTE EINIGER GLIEDERFUSSLER
ARACNIDA (*PSEUDOSCORPIONES*, *SCORPIONES*, *ACARINA*), SOWIE
DER INSEKTEN (*COLEOPTERA* — *SCARABAEIDAE*) AUF DEM GEBIET
DER SOZIALISTISCHEN REPUBLIK KROATIEN, UND IHRE BEDEUTUNG
FÜR WALDBESTÄNDE

Katica Opalički

Fakultät der Forstwirtschaft, Zagreb

Zusammenfassung

In dieser Arbeit sind die Ergebnisse der mehrjährigen Untersuchungen der Arten und der Populationsdichte von Spinnentierwelt angeführt worden, die in Waldbeständen Kroatiens vorkommen.

Dabei wurde besonders die Bedeutung der schädlichen Milben (*Acarine*) hervorgehoben, deren Populationsdichte in letzten drei Jahren ständig zunimmt. Parallel mit Zunahme der Populationsdichte der Milben kommen immer häufiger Raubmilben, Skorpionen und Aftersskorpione vor, wie auch Feldmaikäfer, der zu östlichen euroasiatischen Arten gehört, und der bis jetzt in nordwestlichen Teilen Jugoslawiens nicht bemerkt wurde.

Die in Waldkulturen, Beständen und Parkanlagen durchgeführten Untersuchungen haben gezeigt, dass die Familie der Gallmilben dominiert, mehr Schäden dagegen aber die Spinnmilben verursachen, obwohl sie durch geringere Zahl der Arten vertreten sind. *Acarina* sind in unserem Land als landwirtschaftliche Schädlinge bekannt, und im Forstwesen weißt man sehr wenig von ihnen, so dass die in dieser Arbeit genannte Anzahl der Arten nicht als endgültig betrachtet werden soll.

INVESTIGATION OF NEMATOCIDAL EFFECTS OF SOME
NEMATO-INSECTICIDES AND OF THE RESIDUES OF TEMIK
IN SUGAR BEET

by

Đ. Kondić

»Belje«, Development Service, Darda

Ljubinka Stojanović

Institute for Plant Protection, Beograd

Smiljka Krnjač

Faculty of Agriculture, Beograd — Zemun

Đ. Krnjač

Federal Committee for Agriculture, Beograd

S u m m a r y

The modern production of sugar beet is increasingly oriented to the utilization of areas which are infected with the beet nematode (*H. schachtii*). It has been proved that the surfaces which are infected, to a determined degree, by the above mentioned pest, can be used, under the conditions that on them be utilized corresponding nematocides or insecticides with nematocidal effect. In connection with this were investigated the possibilities of utilizing, for the said purposes, Temik G-10, Myral, Furadan, Mocap and Combicide-extra, which, in relation to the check, manifested favourable, i. e. good effects on the increase of the yield and, to some extent, of the sugar contents. These increases of yield and digestion had favourable repercussions on the volume, resp. economy of this production.

The investigations of the residues of Temik in form of sulphone have shown that in the sugar beet root, at the end of vegetation, resp. in the moment of the extraction, are not to be found the quantities which can be detected by standard methodical proceedings. At the same time, in the overground parts are found the amounts which exceed the allowed ones.

SOME CONSIDERATION ON THE PROBLEM OF TOXICITY
OF PESTICIDES FOR BEES AND SOME RESULTS
OF FIELD TRIALS

by

Z. Rucner and M. Maceljski
Faculty of Agriculture,
Institute for Plant Protection, Zagreb

S u m m a r y

Many toxicity data of pesticides for bees established in laboratory condition are not correlated with the real danger for bees in field conditions. Some literature data on this problem are discussed.

Our field trials carried out on rape and sunflowers showed that in some cases phosalon and endosulphan could be highly toxic to bees, and that a special formulation of carbaryl — Sevin XLR — so as deltametrin, have a certain repellent action on bees.

These trials will be continued in order to establish data needed to make compatible a high use of pesticide with intensive beekeeping.

POSSIBILITY OF CONTROLLING RESISTANT WEED SPECIES
IN ORCHARDS

by

B. Veljković and Ksenija Mijatović
Institute for Plant Protection, Beograd
M. Stamenov
AIC "Sirmium", Sremska Mitrovica

Summary

The work at the study of possibilities of controlling resistant weeds was carried out in the course of 1981 and 1982 in older pear- and apple-tree plantations in the surroundings of Sremska Mitrovica.

In the pear-tree plantation the most numerous population was that of *Sorghum halepense*, with an average covering of 65% and in the apple-tree plantation *Urtica dioica*, with a covering of 60%.

Perennial herbaceous weeds *Sorghum halepense* and *Cynodon dactylon* can be controlled by herbicides on the basis of glyphosate, fluazifop-butyl and by a combination of oxyfluorphen and dalapon.

The control of overground mass alone of these weeds is achieved by the use of gluphosinate.

Resistant broadleaved weeds *Urtica dioica* and *Convolvulus arvensis* (perennial) and *Erigeron canadensis* (annual) can be controlled by means of glyphosate. However, for the control of *C. arvensis* and *U. dioica* were required larger quantities of glyphosate (over 6 kg/ha).

These broadleaved weeds can be controlled also by applying the combination of herbicides on the basis of simazine, amytrole and MCPA, better efficiency being achieved by applying them twice. Such a way of application should be carried out under the conditions of heavy weediness by *U. dioica*. In such a case, in the given combination should be increased the quantity of MCPA to a total of 2.25 kg/ha (when applied twice, half of this amount each time). The first treatment ought to be effected when *U. dioica* has reached a height of about 40 cm and the second one when the weediness is restored and the plants reach the corresponding height.

QUALITATIVE AND QUANTITATIVE WEEDINESS OF POTATO UNDER ECOLOGICAL CONDITIONS OF DIFFERENT HABITATS

S. Čuturilo and Ksenija Mijatović

Institute for Plant Protection, Belgrado

Summary

Utilizing the results of their own investigations as well as of other authors' studies on the appearance of individual weed species and their numbers on potato plant for the period 1965—1981, the authors set forth the information on the weediness of potato plants on the wider territory of Yugoslavia.

Analyzing and summing up the obtained results following observations were made:

The weeds of potato plant appear as a stable component of the habitat. From the total number of weed species which attack potato, recorded on six habitats of the wide extent of our country, 36 species were economically important, 17 species constituted 85% of the total weed mass and 10 species could be isolated as a characteristic group of potato weeds (aggressive complex).

Individual weed species from the aggressive complex of potato weeds were distinguished by a high number and density of the population. Among them, *Chenopodium album* can be considered as one of principal competitors of potato, which appeared on the investigated plots much more often than any other weed. Germinating and sprouting throughout the whole vegetation period of potato, *Ch. album* is able to surmount the combined action of the cultivation and of certain herbicides and to conclude, in spite of the effected control measures, the fructification and to eject the seeds.

In working out the system of control measures against weeds in potato crops, the choice of methods and herbicides should be based on the above expounded data on the aggressive complex of potato weeds and on ecological and other properties of the species belonging to this complex, taking into account also all the other agroecological factors.

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OCCURRENCE OF CHRYSANTHEMUM WHITE RUST IN VICINITY OF BELGRADE

by

Ljiljana Đorđević

Flower farm »Rasadnici«, Beograd

Summary

White rust on chrysanthemum in vicinity of Belgrade was recorded for the first time in 1982. The disease was also found on plants from Vršac and Pančevo regions, which were sold at the market in Belgrade.

Disease symptoms were observed on leaves as well as on bracts of infected plants.

The teliospores formed in sori on lower side of leaves were typical in shape and size for *Puccinia horiana* Henn.

The pathogen was introduced by cuttings.