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# **Z A Š T I T A B I L J A**

## **(PLANT PROTECTION)**

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CONTENTS

Scientific papers

- A. Marić, S. Maširević, S. Fayzalla  
Occurrence of *Leptosphaeria lindquisti* the perfect stage of *Phoma macdonaldi* the causer of black spot of sunflower in Yugoslavia — — 334
- R. Numić  
The results of the study the Mikal a systemic fungicide of *Plasmospora viticola* (Be et C.) Barlese et de Toni — — — — — 338
- M. Arsenijević, M. Ševar  
*Verticillium dahliae* Kleb. as pathogen of the plum tree — — — — 351
- M. Tošić, G. Mitrović  
Investigation of pepper seed infection with tobacco mosaic virus — 357
- B. Cvjetković  
The investigations of the possibilities for control of the *Uncinula necator* (Schw-Burr.) the powdery mildew on the grapevine — — — — 366
- V. Mickovska  
Effect of different temperatures of the growth of colonies of *Phytophthora capsici* Leonian — — — — — 373
- M. Ušćuplić  
Infection period of *Lophodermium seditiosum* Min., Stal. and Mill, and the possibility of its control in nurseries — — — — — 382
- K. Dubravec  
Effectiveness of tomatin on fruits and seeds development in tomatoes (*Solanum lycopersicum* Foss.) — — — — — 387
- D. Čamprag, J. Đurkić, R. Sekulić, R. A. Thalji, T. Kereši  
Contribution to the knowledge of the spread and population density of *Carabidae* (Coleoptera) under field crops in Bačka (1975—1979), with a particular regard to wheat and sugar beet — — — — — 399
- B. Ilić, S. Krnjaić  
Effect of physical environmental factors on the development of cereal moth (*Sitotroga cerealella*) — — — — — 407
- K. Dulić, M. Injac  
Control of leaf miners *Leucoptera scitella* Zell., *Lithocolletis blancardella* F. and *L. corylifoliella* Hw. under the productive conditions of apple — — — — — 425
- N. Pagliarini, R. Komnenović  
*Liriomyza trifolii* Burgess veri danger pest of Gerbera in Yugoslavia and possibilities for its control — — — — — 442

OCCURENCE OF LEPTOSPHAERIA LINDQUISTI THE PERFECT STAGE  
OF PHOMA MACDONALDI THE CAUSER OF BLACK SPOT  
OF SUNFLOWER IN YUGOSLAVIA

Marić, A., Maširević, S. and Fayzalla, S.

Faculty of Agriculture, N. Sad

S u m m a r y

The authors have found for the first time the perfect stage of *Phoma macdonaldi*, which cause the black spot disease of sunflower in Yugoslavia. The occurrence of pseudothecia was studied on sunflower stems infected by *Ph. macdonaldi*, exposed to the natural condition for the three years period. During spring of the first and second year, only pycnidia was found on infected tissue. On the end of the winter of the third year, numerous pseudothecia was observed on stems. After transferring pseudothecia on PDA, typical colony and pycnidia of *Ph. macdonaldi* were developed.

On the basis of the description and measurements of pseudothecia, asci and ascospores, the authors came to the conclusion that the perfect stage which they found in Yugoslavia is identical to the fungus *Leptosphaeria lindquisti* described in Argentina by Frezzi.

Loosing vitality in the third year, pycnidia evaluate in to pseudothecia, which prolong the infection potential of the parasite from the soil. The epiphythotic occurrence of the disease in fields where sunflower has never been grown, could be also explained by infection of plants with ascospores transmitted by wind.

THE RESULTS OF THE STUDY THE MIKAL A SYSTEMIC FUNGICIDE IN THE CONTROL OF PLASMOPARA VITICOLA (BE ET C.) BARLESE ET DE TONI

By

**R. Numić**

Faculty of Agriculture, University of Sarajevo

S u m m a r y

The fungicide MIKAL shows a very high efficacy in the control of *P. viticola* and in comparicon to the standard fungicides its efficiency was higher inpite the lower number of sprayings.

The fungicide MIKAL gives a very good protection of vine against the attacks of *P. viticola* in the most crytical period of vegetative growth and in a satisfactory lents. At the same time this fungicide has some influence on the butter physiologic condition of the vine plants.

## VERTICILLIUM DAHLIAE KLEB. AS PATHOGEN OF THE PLUM-TREE

Dr Momčilo Arsenijević, Marija Ševar, dipl. eng.  
Faculty of Agriculture, Novi Sad, Yugoslavia

## Summary

From the samples of diseased plum-trees of the sort požegača, which manifested the symptoms of wilt, there were isolated, in the course of 1975 rather many isolates of the parasitic fungus, whose pathogenic character was tested on herbaceous plants in the greenhouse. The inoculation of plants was effected by soaking the roots in the suspension of pure culture of investigated isolates.

The young plants of capsicum and cotton, used for this purpose, proved to be the most suitable, for on them are manifested the typical symptoms of wilt. Sunflower and begonia are less appropriate because they need more time to manifest changes (Fig. 6). The reisolation has been successfully made from all these plants (Fig. 4).

The inoculated eggplant manifested but an insignificant lagging in the growth and on the tomato visible differences in relation to the check plants do not take place even after a longer growing in the greenhouse.

On the nutritive media the parasite forms, in the beginning of its development, snow-white colonies which become, in the course of time, dark, almost black, with lighter or darker shades in their substrative part. The aerial part of the colony is grey and is formed in an unequal intensity, in dependence on the nutritive media (Fig. 8).

In the culture of fungi are formed microsclerotia and conidia.

The media of carrots, prunes and potatoes ensure the greatest development of microsclerotia, and that of conidia is ensured by the bases of onion, Čapek's agar, prunes and carrots (Tab. 2).

On the basis of phytopathogenic, morphologic and cultivating characteristics of the parasite we conclude that the investigated fungus is the causer of the plum-tree wilt and that it belongs to the special *Verticillium dahliae* Kleb.

INVESTIGATION OF PEPPER SEED INFECTION  
WITH TOBACCO MOSAIC VIRUS

M. Tošić and Gordana Mitrović

Faculty of Agriculture, University of Belgrade, Beograd — Zemun, Yugoslavia

## Summary

In the course of this study the infection of commercial pepper seed with tobacco mosaic virus (TMV) was studied. Inocula were prepared from separate seeds and then checked on *Nicotiana glutinosa* leaves.

Out of 13 seed samples ten of them were proved to be infected with TMV.

Infection was not detected with seed samples of pepper cv. Sivria and Turšara Ia, which originated from »Seme« — Beograd, and with seed sample of cv. Morava, which originated from »Agrostroj« — Čačak. Infection up to 1% was proved with seed samples of following pepper varieties: Aleksinačka, which originated from »Seme« — Beograd, and Zlatna medalja, which originated from »Agrostroj« — Čačak. Infection of 1—5% was established with seed samples of pepper cv. P-26, which originated from »Seme« — Beograd, and »Agrostroj« — Čačak. Infection of 5—30% was discovered with seed samples of pepper cvs. Morava, which originated from »Seme« — Beograd, Kurtovska kapija, which originated from »Agrostroj« — Čačak, and then with Rotund and Feroni, which originated from »Semenarna« — Ljubljana. The highest percentage of infection, i. e. 80 and 96%, was proved with varieties Šorokšari and Niška šipka, seed of which was used for sowing at »Sirmium« — Sremska Mitrovica, and »Staklenik« — Šopić, Lazarevac.

Since the seed plays the most important role in TMV epidemiology on pepper, it is necessary to produce and to plant only healthy pepper seed.

THE INVESTIGATIONS OF THE POSSIBILITIES FOR CONTROL  
OF THE UNICINULA NECATOR (SCHW-BURR) THE POWDERY  
MILDEW ON THE GRAPEVINE

B. Cvjetković

Institut for Plant Protection, Zagreb

Summary

From 1978 to 1980 investigations were made into the efficiency of fungicides for the control of powdery mildew on grapevine. The following fungicides were investigated: Acrex EC, Antracol BT, Bayleton WP-5, Cosan, Karathan WP, Morestan, Plondrel S-50, Rubigan, Saprol, Vigil. Conditions for the development of *Uncinula necator* were extremely favourable. So that in 1978 and 1979 the parasite took hold of the whole of the green parts of the nontreated grapevine.

During the three years of investigations we came to the conclusion that the best results in the control of powdery mildew were obtained by systemic fungicides: Bayleton WP-5, Rubigan, Saprol and Vigil. The test with Antracol BT quite satisfactory as well because Antracol BT contains triadimefon as well as Bayleton. Karathan WP was in those tests less efficient. The efficiency of Cosan depends on the duration of the interval between two treatments and on the weather conditions (temperature). The systemic fungicides Bayleton and Vigil in a concentration of 0,1% and Saprol in a concentration of 0,15% showed a certain curative effect. The fungicides Saprol in concentration of 0,15%, Acrex EC 0,2%, can provoke a phytotoxic effect on the grapevine.

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## EFFECT OF DIFFERENT TEMPERATURES ON THE GROWTH OF COLONIES OF PHYTOPHTHORA CAPSICI LEONIAN

V. Mickovska

Institute for Plant Protection, Skopje, Yugoslavia

### Summary

Effect of temperatures on the growth of colonies of three different *Phytophthora capsici* isolates was studied.

Investigated *P. capsici* isolates originated from three different regions. One of the isolates was obtained from diseased pepper plants collected in the vicinity of Polog, West Macedonia, and was marked with »P«. The second isolate was obtained from Skopje region and was designated with »S«. Third isolate originated from Tikveš region, South Macedonia, and was marked with »T«.

Investigations were carried out on PDA and following temperatures: 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, and 36°C. The growth of colonies was measured after six days, except on 6°C, when colonies' growth was slow and was measured after one month of incubation.



Studied isolates, although belong to the same species of fungus, behave differently on different temperatures. Differences among studied isolates existed on both lower and higher temperatures.

Isolate »P« did not grow on 6°C. The minimum temperature for growth of this isolate colonies was 9°C, optimum 24—30°C. On 33—36°C growth of this isolate was rapidly decreased.

With isolate »S« minimum temperature for growth was 6°C, and optimum 24—30°C.

Isolate »T«, which originated from South Macedonia, had growth of colonies on 6°C, and optimum temperature for its growth was 24—33°C. Lower temperatures (9—12°C) were less suitable for this isolate, but on the other hand growth of colonies of this isolate was more intensive on higher temperatures (27—36°C).

Differences in behaviour of studied isolates to temperature conditions can be considered as a result on their adaptation on the conditions of the areas where they came from.

INFECTION PERIOD OF *LOPHODERMIIUM SEDITIOSUM* MIN., STAL.  
AND MILL, AND THE POSSIBILITY OF ITS CONTROL IN NURSERIES

by

M. Ušćuplić

Faculty of Forestry Sarajevo

Summary

Results on identifying the *Lophodermium seditiosum* infection period on one year scots pine seedlings and the effect of using Zineb and Ortocide in controlling the disease are presented here. As shown in Tab. 1. during the four months infection period there is a relatively short period of mass spore dissemination and corresponding mass infection. This is concerned as a »critical period« for infection.

To control the disease good results could be obtained if preventive sprayings are used only during the time of »critical period« which may vary somewhat from year to year. Infection which arise from the inoculum out of this period is concerned as sporadic. Thus, satisfactory results are achieved by using Zineb S 65 and Ortocide 83 in 0,3% concentration with 4—5 sprayings (Tab. 2).

EFFECTIVENESS OF TOMATIN ON FRUITS AND SEEDS DEVELOPMENT IN  
TOMATOES (*SOLANUM LYCOPERSICUM* FOSS.)

**K. Dubravec**

Faculty of Agricultural Sciences, University of Zagreb  
Institute for Plant Protection, Department of Agricultural Botany

**S u m m a r y**

The investigations and obtained results point to the following conclusions:

1. TOMATIN has very effective influence on seedless (parthenocarpic) of tomatoes fruits development in Rutgers and Valijant varieties.

2. Fruits of treatments plants are heavier, stronger in color and compactly, what had favourably influence on quality and transportation of the fruits.

3. Investigated Plant Growth Regulant have not exhibited phytotoxic effects on tomatoes plants.

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CONTRIBUTION TO THE KNOWLEDGE OF THE SPREAD AND POPULATION DENSITY OF CARABIDAE (COLEOPTERA) UNDER FIELD CROPS IN BAČKA (1975—1979), WITH A PARTICULAR REGARD TO WHEAT AND SGARU BEET

by

D. Čamprag, J. Đurkić, R. Sekulić, R. Talji and Tatjana Kereš  
Faculty of Agriculture, Novi Sad, Yugoslavia

Summary

Investigations of *Carabidae* were made on various field crops, on chernozem and on meadow black earth. For this purpose were used two methods, to wit: method of the soil inspection and method of Barber traps. In the course of five years were collected materials from 724 fields (mostly from wheat and sugar beet) on which were dug out 33,372 soil samples of 0.25 sq m each.

On winter wheat were observed 43 species belonging to 18 genera among which are markedly predominant as to their numbers *Harpalus distinguendus* Duft. and *H. pubescens* Müll. Other important species

belong to the following genera: *Agonum*, *Amara*, *Anisodactylus*, *Calathus*, *Calosoma pterostichus*. etc. As to the alimentation regime, the relation between the predators and the omnivorous species is approximately the same, whereas the phytophagous ones were represented by two species only, belonging to the genus *Zabrus*. The most important among them as pest is *Z. tenebrioides* Goeze. In the five-years' period the imagoes of the above mentioned pest were represented, on the fields on which wheat had been previously grown, with 0.03 individuals per sq m on an average or with 5 p. c. in the total population of *Carabidae*.

By the soil inspection, at the end of summer and in the beginning of autumn, there were established following average numbers of *Carabidae*: on alfalfa 1.62, on sunflower 1.07, on sugar beet 0.76, on winter wheat 0.68 and on soybean 0.20 per sq m. By the analysis of populations of *Carabidae* on winter wheat, (according to the preceding crop), the highest number (1.18 per sq m) was registered in the variant where wheat had been grown in the course of two successive years on the same field, whereas with sugar beet and sunflower as preceding crops at amounted from 0.27 on the former to 0.72 per sq m on the latter. This is a consequence of incomparably greater use of insecticides on these plants in comparison with wheat.

By comparing the population densities of *Carabidae* in two intervals of time (1961—1969 and 1975—1979) it was established that no change had taken place in their population density on winter wheat. On sugar beet there occurred a great reduction of numbers of *Carabidae* in the eighth decade (0.76/sq m) in relation to the preceding decade (1.65—2.38/sq m), which is a consequence of a wide use of insecticides and herbicides, as well as of the reduction of soil cultivation between the rows.

The use of different insecticides, with a view to controlling numerous species of field crop pests, there occur frequently considerable or great reduction of populations of useful *Carabidae* in agrobiocenoses. The utilization of prognostication methods of the occurrence of pests on field crops, as the basis for their rational and economical control, will reduce the danger of destroying these useful insects-predators.

EFFECT OF PHYSICAL ENVIRONMENTAL FACTORS ON THE DEVELOPMENT OF CEREAL MOTH (*Sitotroga cerealella*)

by

B. Ilić and Smiljka Krnjač

Faculty of Agriculture, Belgrade

## Summary

In the paper are presented the results of laboratory investigations of the effect of different constant (17, 21 and 28°C) temperatures, as well as of variable low ones (—4 and 0°C) in the duration up to 10 hours at the relative humidity of 35, 45 and 90 p. c., on the length of duration of the embryonal and total development, on the number of hatched larvae and imagos of the cereal moth (*S. cerealella*.)

On the basis of these investigations and of the results obtained there was established the susceptibility of the cereal moth (*S. cerealella*) to the effect of different constant temperatures. With the increase of temperature the duration of the embryonal development is reduced from 5.4 days (17°C) to 2.3 days (28°C) as well as the total development, the longest one being 119 days (at 17°C) and the shortest one 29 days (at 28°C).

Variable temperatures of —4 and 0°C to which eggs had been exposed in different duration, extended the duration of the embryonal (up to 12.3 days) and the total development (up to 139 days) at the constant temperature of 17°C.

With the increase of temperature, the number of hatched caterpillars and moths increased, too. At the temperature of 17°C from 100 eggs there hatched 16 larvae and 9 imagos, at 21°C 60 larvae and 31 imagos, and at the highest investigated temperature of 28°C 64 larvae and 41 imagos.

When the eggs were exposed to the effect of variable low temperatures the number of hatched larvae and imagos diminished.

The cereal moth manifested a great susceptibility to the humidity. The increase of humidity from 35 to 90 p. c., at the constant temperature of 28°C caused the duration of the embryonal development to be extended, and it lasted most (6.4 days) at 90 p. c. of humidity. The same effect has been achieved as regards the number of hatched larvae, for it increased with the increase of humidity. The greatest number (77.5) of the hatched larvae was obtained at the humidity of 90 p. c.

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CONTROL OF LEAF MINERS LEUCOPTERA SCITELLA ZELL., LITHOCOLLETIS  
BLANCARDĚLLA F. AND LITHOCOLLETIS CORYLIFOLIELLA HW.  
UNDER THE PRODUCTIVE CONDITIONS OF APPLE

Kata Dulić, Peščara Subotica, Marko Injac, Institute for Plant Protection, Beograd

S u m m a r y

We followed the occurrence of leafminers of apple in three orchards of the Agricultural-Forestry-Tourist Combine »Peščara«, Subotica: to wit: Majur, Radanovac and Bački Vinogradi. The flight of moths was recorded once a week and for *L. blancardella* F. and *L. corylifoliella* Hw. were used the feromons.

The time of oviposition and the state of health of caterpillars were established by examining under the binoculars 10 yearly shoots taken at random.

We applied the insecticides by means of the atomizer »Betsler« with 2.000 l. of water/ha. In our experiments we used the following insecticides:

1. for the control of moths: Cymbuch 10 in conc. 0.05 p. c. (ICI). Decis EC 25 in conc. 0.05 p. c. (Ohis, Skopje).

Time of application: maximum of moths' flight.

2. for the ovicidal control: Dimilin WP 25 in conc. 0.05 p. c. (Duphar — Galenika).

Time of application: beginning of moth's flight before or in the course of oviposition.

3. for the control of caterpillars: Nogos (R) 50 in conc. 0.02 p. c. (Ciba-Geigy). Ultracid (R) 40 in conc. 0.1 p. c. (Ciba-Geigy). Lannate WP 90 in conc. 0.03 p. c. (Ohis, Skopje).

Time of control: mines whose size is 2 mm on an average.

The efficacy of the insecticides was determined on the basis of the number of formed new mines.

On the basis of the obtained results, following conclusions can be drawn:

1. *L. scitella* Zell. under the weather conditions of 1980 had three generations. The first generation appeared in mass with an average of 8.63 mines per leaf on the area of 50 ha in the orchard Radanovac. On the territory of Subotica the second and the third generations occurred in larger masses and appeared on more than 500 ha.

2. By the application of Ultracid WP 40 in conc. 0.1 p. c. with 2.000 l/ha of water at the time when the mines had an average size of 1.7 mm was achieved an efficacy of 95.81 p. c.

3. By the application of Dimilin WP 25 in conc. 0.05 p. c. with one treatment in the beginning of the second flight of moths of *L. scitella* Zell. there was achieved the efficacy of 78 p. c. at the end of vegetation.

4. *L. blancardella* F. had 4 moths' flights in the course of 1980 with marked times. This leafminer appeared together with other leafminers species on apple and only on small areas it was dominant, particularly in young apple orchards. The population density in spring was not important, but it increased so that in autumn it passed, in some orchards, the economic thresholds of harmfulness.

5. Under the conditions of the population density of *L. blancardella* F. from 0.58 to 2.09 of mines on a leaf on an average, by the application of Dimilin WP 25 in conc. 0.05 p. c. there was achieved the efficacy of 88 p. c. to 95.7 p. c.

6. *L. corylifoliella* Hw. had three generations. The population density was low in spring, but it increased and in some orchards it reached, in the third generation, an average of 51.9 mines per leaf. This miner appeared most frequently together with other species of leafminers, but in the third generation it was often dominant.

7. In the control of *L. corylifoliella* Hw. with insecticides of larvicidal effect, Lannate WP 90 in conc. 0.03 p. c. and Nogos (R) 50 in conc. 0.2 p. c. there was achieved an efficacy of 97.5 p. c. resp. of 63 p. c. When Nogos (R) 50 was used twice for spraying, the efficacy was 87 p. c.

8. In the control of *L. corylifoliella* Hw. by means of Dimilin WP 25, applied in the beginning of the third moths' flight with the ovicidal effect, there was achieved the efficacy of 96.3 p. c. When applying Cymbuch 10 in conc. 0.05 p. c. and Decis EC 25 in conc. 0.05 p. c. with adulticidal effect, the efficacy achieved was 63.4 p. c. resp. 63 p. c.



PLUM BUD MIDGE GALL — ASPHONDYLIA PRUNORUM WACHL  
(CECIDOMYIDAE, DIPTERA) A NEW SPECIES FOR  
JUGOSLAV FAUNE

K. Dobrivojević and Duška Simova — Tošić  
Faculty of Agriculture, Beograd

Kiro Bubevski  
ZIK »Maleš, Berovo

S u m m a r y

In the period from 1978 to 1980 the plum bud midge gall was investigated in the locality of Berovo (Macedonia). This region is situated at 900 meters above sea level.

Important biological moments of *Asphondylia prunorum* were investigated during various phenophoses throughout the year in the field and periodically in the laboratory.

The imago flies by the end of June or the beginning of July. The female lay their eggs in the foliage buds which produce leaves the following year. It hibernates as a first stadium larva and its development continues in April the following year. Such larvae destroy the plum leaf buds which do not open. They wither, fade and fall off. Larva in the bud has a symbiotic relation with the fungus mycelium. This relation is obligatory.

Beginning May the damaged buds have the shape of an oval gall. The galls are 4—5 mm long and of green colour. By middle June the larva transforms to a pupa in the bud itself. It has annually one generation.

The intensity of attack in 1979 and 1980 on twigs approximately 15,22 cm long in the locality of Berovo is a minimum of 2 and a maximum of 20. There is an average of 6,67 damaged buds.

## LITERATURA

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## LIRIOMYZA TRIFOLII BURGESS VERY DANGER PEST OF GERBERA IN YUGOSLAVIA AND POSSIBILITIES FOR ITS CONTROL

N. Pagliarini

F. A. Sc., Institute for Plant Protection, Zagreb

R. Komnenović

Faculty of Agriculture, Institute for Plant Protection, Zemun — Belgrade

## Summary

An outbreak of a new, vera dangerous pest on Gerberas in Yugoslavia is hereby described. This is a fly, leaf-miner from fam. *Agromyzidae (Diptera)*, *Liriomyza trifolii* Burgess. The pest was imported to Europa on chrysanthemum seedlings from USA (Florida), where it was considered as the one of the most important pest on chrysanthemums. To Yugoslavia that pest was imported with gerbera seedlings from Holland in the same way as into the other european countries (France, England, Italy, etc.).

In Europe that pest is more important on Gerberas, but it attacks the other cultural plants in glasshouses and in the field. Since it was appear for the first time as a pest on Gerbera seedlings in one glasshouse in Zagreb, april 1977, this pest spread over the numerous glasshouses throughout Yugoslavia. Gerberas are mainly affected but it causes a considerable damages on chrysanthemum and some other vegetables in glasshouses.

The results of the field trials show that it is possible to control this pest on gerberas with two sprayings in fourteen days interval with insecticides based on permethrin and cypermethrin at 60 g.A.I./ha.