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A CONTRIBUTION TO THE BIOLOGICAL CONTROL OF THE GYPSY MOTH (LYMANTRIA DISPAR L.)

by

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Summary

By adding the Gypsy Moth eggs in the first investigation period (M a k s i m o v i ć, 1978), in little rural groves were increased the populations of enemies, which was demonstrated by the number of parasites of young caterpillars of the Gypsy Moth. It has been established that 0,2 kg/ha of eggs makes possible to maintain continuously a low Gypsy Moth population. In the same groves, Savića zabran and Lazarevića lug, the investigations have been continued over the next ten years (1977—1986.). The results have corroborated the continuous increase of the enemy populations and maintaining of low numbers of Gupsy Moth populations, considerably loer than in the check grove (Fig. 1). In both these test groves as well as in the check grove — Sumorina, the Gypsy Moth numbers had a convergent course.

There was investigated the behaviour of the Gypsy Moth 3 years the adding of eggs had been stopped. In the first year there were found no egg masses on the test plots and also in the two following years in Lazarević lug, whereas in Savića zabran there were found 2 egg masses in the second year.

In the course of investigations the Gupsy Moth was in latency. The egg masses were of great and medium size and there were 5,8 p.c. of small ones, whereas in Sumorina there were 12,8 p.c. of them. The egg masses were laid on the trunk up to the heigth of 1 m — 80 p.c., from 1 to 2 m 18,6 p.c. and over 2 m of height 1,7 p.c.

The presence of Gypsy Moth's enemies was investigated by counting the number of parasite's cocoons. In this period it was carried out in 1977 and 1983 (Tab. 1) and in the previous period it was done every year. Total infestation by the parasites was established in the locality of Savića zabran in 1983, when, in addition to cocoons, were collected also the Gypsy Moth caterpillars, afterwards reared in the insectarium and obtained the parasites, amounted to 92,2 p.c. But 76 p.c. of the parasites belonged to the family Braconidae, 15 p.c. to tachinids and 1,2 p.c. to polyhedry. Of 224 collected cocoons, 10,3 p.c. were hyperparasitized.

The most numerous species of parasites on young caterpillars is *Cotesia melanoscelus* and a little less *Glyptapanteles portheriae*. There was observed also a small number of gregarigenous species which has not been determined. It is supposed that was *Cotesia ocneriae* Ivanov, which in this regions has been determined by H a c k e t t according to M a r c h (1979).

The number of cocoons which were found varies from year to year and from one grove to another. In the check grove of Sumorina no cocoons were observed.

In the first year after the adding of Gypsy Moth eggs was stoped, 22 cocoons were found in Savić zabran in autumn when the numbers of egg masses were being determined. This indicates that were considerably more numerous at the time of development in 1984. A similar observation was made at Lazarevića lug in 1983, first year after the adding of eggs had been stopped. Already in the course of two subsequent years no cocoons were found any more.

The correlation course of the dynamics of the Gypsy Moth population in test groves and in the check one (Fig. 1) shows the effect of exterior factors. As an example, characterstic is the year 1982, when the numbers were increased in all of the three groves. In the same year was observed a rash increase in numbers also in some larger woods (Maksimović and Sivčev, 1984). In the following year already there occured a fall in numbers. Such an effect of the climatic factors, according to Benkevič (1984) shows that they, on one side, and the phenomena of population dynamics on the other are casual functions. According to this author, the gradation is preceded by the effect of hydrothermical regimes, conditioned circulatorily and zonally. The origin and the end of gradation are connected with the dynamics of series of other populations in the forest, solar activity and meteorological factors, in dependence on the region. The cyclic activity of the Sun regulates the power of modifying factors in the dynamics of a series of populations. The increase in numbers restrains the mortality caused by the parasites, which was demonstrated also by these investigations.

The investigations were limited to a small part of factors. It is indispensable to establish the optimum quantities of added eggs and to follow all the above mentioned factors.

INFLUENCE OF THE WEIGHT OF WHEAT AND CORN GRAINS AND OF THE NUMBER OF CATERPILLARS ON THE NOXIOUSNESS, SURVIVAL AND FERTILITY OF THE ANGOUMOIS GRAIN MOTH *SITOTROGA CEREALELLA* OLIV. (*LEPIDOPTERA: GELECHIDAE*)

by

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Summary

In the paper are set forth the results of the effect of the Angoumois grain moth population density on the noxiousness, possibility of survival and fertility of moths on wheat sorts with different grain weights and on corn hybrids of different maturation groups and, consequently, of different grain size.

The results of investigation have shown that Angoumois grain moth causes great damages on wheat and corn. The reduced weight of grains is in direct dependence on the weight resp. size of grain. If the grain of a large-grained wheat of the PKB-coarse sort is attacked by a caterpilar, the reduced weight of the grain amounts to 30 mg on an average, whereas with the small-grained wheat sort Novosadska early 1st 21 mg only. Also, a single caterpillar in the grain of the late-maturing corn hybrid with large grain ZP. Sc. 704 reduced the corn weight by 77 mg on an average; of the medium-maturing corn ZP. Sc. 371 by 44 mg, and least with the early-maturing corn with the smallest grains by 36 mg on an average. If in a wheat or corn grain two or there caterpillars have completed their development up to the stage of moth, the amount of the eaten up interior of the grain increases, but counted per one caterpillar, the destroyed interior of the grain diminishes in relation to those grains in which was present but one caterpillar. This may be observed with all the investigated wheat and corn sorts.

Angoumois grain moth caused a proportionally greater reduction of weight of wheat grains than of corn grains, though the caterpillars in corn grains have had a sonsiderably greater part in the total destruction of the interior of corn seeds. It is due to the fact that the corn grains are considerably larger and heavier than those of wheat. On the other hand, the degree of damaging of the grain, caused by caterpillars is also different with different investigated wheat and corn sorts. The presence of a single caterpillar in the grain of the wheat sort PKB-coarse reduced the weight of grains by 50.16 p. c. on an average and with the Novosadska-early 1. by 43,38 p. c., Or, again, in the grains of ZP. Sc. 704 the presence of a single caterpillar reflected itself on the reduction of grain weight by 15.63 p. c.; with ZP. Sc. 371. by 13.97 p. c. and with ZP. Sc. 196 by 17.44 p. c. on an average. However, the presence of two or three Angoumois grain moths in a corn grain increases the reduction

of garin weight in per cents, but the individual part of each caterpillar diminishes.

The results point out that all the wheat and corn sorts do not offer identical conditions for the development and survival of *S. cerealella*, which is certainly conditioned by physiological and anatomic--morphological characteristics. In a grain of wheat sort Novosadska-early 1. develops up to the stage of imago a single caterpillar, whereas in the grains of PKB-coarse in 19.33 p. c. of grains there developed two caterpillars up to the stage of imago. In the grains of corn can complete their development up to the stage of moth up to three caterpillars of the pest, in the highest percentage in coarse grains of ZP. Sc. 704 (in 28.79 p. c. of attacked grains), further of ZP. Sc. 371 (23.78 p. c.) and in ZP Sc. 196 (15.83 p. c.)

The mortality of Angoumois grain moth occurs in all the development stages, but it is particularly great in the caterpillar stage, while the number of dead pupae and of already formed moths is very small. From a total of dead pupae and moths has been recorded with the wheat sort Novosadska-early 1. (2 p. c. of pupae resp 0.75 p. c. of moths in comparison with 63.25 p. c. of dead caterpillars). On the contrary, ZP. Sc. 704 showed a low percentage of dead pupae (0.34 p. c. only in comparison with 50.50 p. c. of dead caterpillars). With this corn sort and with ZP. Sc. 371 we did not record in the grains already formed moths.

The experiments have shown that the fertility of grain moth's imagos depends, among other factors, also on the alimentation of caterpillars, because the size, resp. the weight of grains exerted a direct influence on the fertility of moths. From the grains from which emerged but a single moth, as it is the case with the wheat sort Novosadska-early 1. the average number of laid aggs amounted to 61.54 in comparison with the sort PKB-coarse, where the fertility of moths amounted to an average of 118.46 aggs. However, from the grains of the same wheat sort from which emerged two moths, the number of laid eggs has been reduced to 36.62 eggs. Also the weight of corn grains from which emerged but a single grain moth did not reflect itself essentially on the number of laid eggs, because with al the hybrids the caterpillars had a sufficient quantity of food and space for the development. With the sort ZP. Sc. 704. the fertility amounted to 121.38 eggs; with the sort ZP. Sc. 371 109.56 eggs and with ZP. Sc. 196 116.08 eggs. However, if from the same grain have emerged two or three moths, the number of eggs laid by these females diminishes

CYST NEMATODES IN SERBIA

by

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Summary

On the territory of Serbia there have been observed the following species: *Heterodera schachtii* Schmidt, 1871, *H. avenae* Wollenweber, 1924, *H. cruciferae* Franklin, 1945, *H. goettingiana* Liebscher, 1892, *H. trifolii* Goffart, 1952, *H. fici* Kirjanova, 1954 and *Punctodera punctata* (Thorne, 1928) Mulvey & Stone, 1976.

Among the enumerated species the most harmful, the most widespread and economically the most important in Serbia is undoubtedly *H. schachtii.*

H. avenae, wich, some two decades or more ago, caused damages on some wheat sorts, appears again on this cultured plant, but still in poor intensity.

H. cruciferae, discovered in several localities of Vojvodina.

H. goettingiana has been lately observed in larger populations in three localities of Srem and Bačka, whereas the populations of H. trifolii are in noticeable increase.

H. fici was established in several places on the ornamental rubber plant, grown in flower pots, but without any important and visible damages.

P. punctata, established individually in several soil samples was found in the rhisosphere of wheat and maize, whereas it was not observed on the plant in any of its development stages.

The papar was presented at the IX Yugoslav symposium on the fauna of the soil, Beograd, 25—27 September, 1985.

EFFECT OF MAIZE BREEDING ON RESISTANCE TO FUSARIOUS EAR ROT

by

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Summary

Fusarium spp. is a major maize disease in our country. Fusarious ear rot is exceedingly harmful. In addition to Yield and grain quality decrease, *Fusarium* spp. intoxinate domestic animals. Breeding of resistant, i. e. tolerant hybrids is the only efficient way of maize protection against this disease.

A long-term trial which included finished lines, lines in early generations of selfing and maize hybrids, indicated that resistant genotypes can be made by eliminating susceptible genotypes in early generations of sefing because the resistance is fixed relativly early, i.e., a genetic advance of this parameter is achived in the first three generations of selfing.

EFFECT OF RECURRENT SELECTION OF MAIZE FOR STALK RESISTANCE TO ROT *(GIBBERELLA ZEAE* Schw. Petch.)

by

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Summary

Stalk rot, provoked by fungi *Gibberella zeae* (Schw. Petch.) is one of the most harmful maize diseases in our country and it is spreading more and more in maize-growing regions. In selection of the most resistant genotypes, offsrings of self-pollinated plants were inoculated with *Gibberella zeae* and used to increase frequency of resistant genotypes and breed parent components, i. e. maize hybrides.

Application of cyclical recurrent selection significantly increases the resistance of maize plants in S_1 generation to rot and lodging. There was 60,0%, 89,4% and 95,7% of resistent genotypes in C_0, C_1 and C_2 respectively.

PREVENTIVE AND CURATIVE EFFECTS OF SOME FUNGICIDES USED IN THE CONTROL OF WHEAT SCAB (*FUSARIUM GRAMINEARUM* SCHW.)

by

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Summary

Wheat scab kept gaing importance in Yugoslavia over the last tw decades. In years favorable for its development, the parasite caused considerable reductons in wheat yield and grain quality.

Small-and large-plot trials conducted the last decade in al parts of Yugoslavia as wel as observations made in the commercial production idicated that the effect of chemical treatment was highly variable.

In this study, we assessed several conventionally used fungicide and several new fungicides for their preventive and curative effects i controlling wheat scab in artificialy inoculated plants. The obtained results indicated that most of the tested fungicides were highly efficien in preventing the disease. Converely, most fungicides exhibited a lo curative effect. Only two fungicides, YF—7242 and Folicur, were satisfactorily efficient when experimental plants were treated 36 hours afte the inoculation of the spikes.

EFFECTS OF FUNGICIDES FOR CONTROL STORAGE ROTS OF APPLES AND RESIDUE PROBLEMS FOLLOWING THEIR APPLICATION

by

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Summary

The aim of our research was to establish which fungicides are the most efficient for control the fungi causing apple rots during the storage. At the same time two methods of application of the fungicides were evaluated: dip treatment just before the storage, and spraying the fruit on the trees before picking. The dip treatment was proved to be more effective from these two methods. But without regard to the methods of appilcation the efficacy of the fungicides in descending order was as follows: Benlate, Mikazol T—40, Captan, Kidan.

The residues of the fungicides in the treated fruits were examinated accordingly, after the treatment and during the storage.

After the dip treatment the residues of fungicides in the treated fruits were higher than the law permitted tolerance.

In the case when the fruits were treated on the trees more than two weeks before picking the fungicide residues were below the tolerance. However we have to point out that in our country the use of the fungicides for this purpose is not permitted at the present moment.

RESULTS OF TESTING INSECTICIDES RELDAN 2 E AND ACTELLIC 5 DECTHEIR PERSISTANCE AND EFFICACY IN CONTROL OF *SITOPHILUS ORYZAE* L.

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Summary

To achive a long standing protection of storaged grains against an attack of pest insects, as well as for a warehouse preparation to receive the goods there are suitable some less poisonous insecticides from the group of organophosphorous insecticides, carbamates and pyretroids, being formulated as concentrates for either an emulsion, dusts a dissolver.

Under laboratory conditions the efficiency and persistency were tested of both Reldan 2 E based on the active substance of chlorpyriphos-methyl (234 gr/l) and Actellic 50 EC based on pyrimiphos-methyl (500 gr/l), the chemicals formulated as concentrates for emulsions, being applied on the substrates: wheat, maize and sunflower.

Morever, the efficiency and persistency of the agent Reldan 2 E was tested on the supported materials frequently used for storage walls or floors (such as glass, brick, concrete and timber).

The test insect used in the research was Sitophilus orysae L., having been raised for several years in the Institute's laboratory without any contact with insecticides, thus the population could be considered as normally sensitive.

Reldan 2 E was applied on the treated materials in quantities of 5 or 10 l of the 4% — emulsion spread on the range of 100 m^2, (Reld. I or Reld. II) were compared to Neksion EC 40 (400 gr/l of bromofos) in quantities of 1 l of the 0,2% — emulsion on 100 m^2 spread (rleks). All the materials of the tested variety showed high initial toxicity while the higher persistancy appeared only on more compact and chemically more inert materials such as glass and wood (Fig. 1—4).

The initial toxicity of all insecticides in the research on the treated wheat, maize and sunflower was very high.

Actellic 50 EC (Act.) in quantities of 8 ml in 5 l of water as per 1 ton of grains has shown the longest protection activity; Reldan 2 E in quantities of 20 ml in 1,5 l and 20 ml of the agent in 0,75 l water (Reld. I or Reld. II) has shown a shorter period of protection, while the persistancy of Neksion EC 40 was not worth mentioning.

The substrates — maize and wheat have not shown a great difference in influence on the persistency of the tested agens, but concerning the substrate sunflower, persistency of all the tested varied insecticides was apperently shortened.

On the basis of the research made it could be concluded that Reldan 2 E and Actellic 50 EC may be succesfully used for desinfection of bare warehouses, but the very long activity could not be awaited.

However, after the treatment of the storaged grains by these agens, the protection against the pest *S. orysae* L. is provided for the longer period (i. e. 3 to 5 months).

Results of the research may not generally be widened on to the whole complex of warehouse insects, as the sensitivity of some specific type differres importantly from the sensitivity of *S. orysae* L.

THE RESULTS OF ETHREL APPLICATION ON TOMATOES AND PAPRIKA PRODUCTION

by

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On the basis of the investigations and obtained results we can conclusion:

— Ethrel has in dose 2 l/ha/800 l watter stimulative influence on physiologicals processes of fruits ripening of tomatoes and paprika.

— Fruits of treated plants are earlier and equallier ripe, strongier in color and easilier to harvesting.

— On investigated species Ethrel have not exibited phytotoxic effects.

EPIPHYTOTHIOLOGISCHE UNTERSUCHUNGEN DER HOPFENPERONOSPORA (*PSEUDOPERONOSPORA HUMULI* MIY. ET TAKAH.) UND AUSARBEITUNG DES MODELLS ZUR INFEKTIONSPROGNOSE IN DEN BEDINGUNGEN DER SAVINJSKA DOLINA

Marta Dolinar

Inštitut za hmeljarstvo in pivovarstvo, Žalec

Auszug

Es wurde der Einfluss biotischer und meteorologischer Faktoren auf die Infektion des Hopfens mit der Hopfenperonospora unter kontrollierten Bedingungen und im Freiland untersucht. Im Freiland wurden Hopfenpflanzen in Töpfen exponiert und die jeweilige Infektion in der Anlage ermittelt. Anhand der Resultate wurde ein Modell zur Befallsprognose erstellt, welches gezielte Bekämpfung der Krankheit ermöglicht. Der Ausmass des Befalls ist am stärksten von der Benetzungsdauer der Blätter durch Regen, oder von der Summe der Temperaturäquivalente in der Zeit der durch Regen benetzten Blätter und von der Populationsdichte der Zoosporangien in der Luft abhängig. Es wurden Schwellenwerte für die erwähnte Populationsdichte vor und während der Blühreind der Doldenbildung aufgrund verschiedener Anfälligkeit dieser Organe bestimmt.

Befallsprognose wurde in den Jahren 1978 bis 1980 überprüft. Es konnten 40% Bekämpfungsmassnahmen einespart werden.

CONTRIBUTION TO THE STUDY OF ALFALFA VIRUS DISEASES

by

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Summary

A tobamo virus like was isolated from alfalfa plants showing mosaic symptoms.

Isolated virus has rod shaped particles of the most frequent length of 280—320 nm, TIP 50° C, DEP 10^{-3} and LIV 1 day.

On inoculated leaves of *Chenopodium amaranticolor* and *Ch. quinoa* investigated virus causes numerous local lesions but rarely systemic infection. *Nicotiana glutinosa* and *N. tabacum* cv. Samsun react to this virus only with systemic infection. Beside mosic *N. glutinosa* react also with leaves deformation.

Definitive determination of the virus and its importance for the alfalfa production are the subjects of our further investigation.

LABORATORY INVESTIGATIONS OF *LEPTOSPHAERIA NODORUM*

by

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Summary

Laboratory studies of *Leptosphaeria nodorum* fungus were aimed at selecting the best isolate for inoculum production to be used in artificial infection on the basis of individual morfological and physiological characteristics. This studes I have divided in the several separates whole.

1. Collection of sample.
2. Identification of Leptosphaeria nodorum from samples.
3. Pure culture production.
4. Selecting the best inoculate.
5. Inoculum production for artificial infecstion.

Inoculum was produced on sterilized wheat kernels.