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ESSAIS DE LUTTE CONTRE L'EXCORIOSE DE LA VIGNE (PHOMOPSIS VITICOLA SACC.)

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Les conditions climatiques, de régime, méditerranéen ou subméditerrannéen, favorisant le développement de l'excoriose d'une part et la sensibilité à la maladie des cultivars dominants dans la région viticole de Monténégro d'autre part, demandent une lutte adéquate. Les essais

menés de 1976 à 1978 dans le vignoble expérimental de l'Institut d'agriculture de Titograd, se proposaient ce but. Ils ont été conçus sur deux possibilités de lutte contre le parasite: intervention d'éradication contre les spores dans les pycnides avant le débourrement et la protection des jeunes organes de la vigne dès le départ de la végétation. C'est ainsi que le plan des essais comportait un traitement d'hiver (I) et deux traitements de postdébourrement (II et III), avec deux fongicides dans le premier et trois dans le second cas: onze combinaisons expérimentales au total.

Les pulvérisations de l'époque I ont eu lieu à peu près à 3 à 4 semaines avant le départ de la végétation. Les traitements de post--débbourement ont été exéqutés deux reprises: premier, lorsque les bourgeons les plus avancés avaient atteint 2 à 5 cm de longueur et ensuite 7 à 10 jours plus tard (II et III respéctivement).

Les essais comportaient 4 repétitions et le dispositif experimental était le même tous les trois années.

Les contrôles des résultats ont été effectués à la fin d'hiver, avant la taille, On decomptait les taches noires sur les cinq merithalles à la base des sarments sur les 11 ceps de chaque parcelle unitaire. Les degrés d'attaque ont été repartis en trois catégories, chaqune d'elles recevant un coéficient arbitraire, approximativement proportionel à l'intensité des symptômes, ce qui permit de calculer les index des dégâts. En partant de ces index, on a trouvé aussi les index d'efficacité des traitements. Par des méthodes statistiques habituelles, on a établi la signifiance des différences entre les traitements.

Les résultats des essais, portés dans les tab. 2 à 4, permentent les conclusions suivantes:

Le degré d'attaque varie suivant la position de merithalle sur le sarment. Indépendement des traitements, il est plus fort sur l'entre — noeud le plus bas et diminue, plus ou moins régulièrement, avec l'éloignement de la base du sarment (tab. 3).

Les différents traitements essayés (fongicides, leur combinaisons et époques d'application) assurent une protéction rélative:

— La bouillie bordelaise, appliqués seule, a une influence insignificative sur la diminution da la maladie (tab. 2 et 3). Elle n'a pas le pouvoir de pénétration et n'affècte pas les spores dans les pycnides (tab. 4, traitement 1).

— Kreozan (DNOC) à 1,5%, appliqué seul avant le débourrement, diminue l'attaque pour 2/3 environs par rapport au témoin (tab. 2 et 3, traitement 5). L'efficacité est liée à son pouvoir de pénétration et la détérioration des spores avant leur dissémination. Cette efficacité est, pourtant, toujours insuffisante (tab. 4), ce que demande des pulvérisations complémentaires après le départ de la vigne.

— Les trois fongicides employés après le débourrement, sans pulvérisations d'hiver préalables (traitements 9, 10 et 11), ont diminue l'attaque de 50% environs par rapport au témoin (tab. 2). Leur efficacité, à eux seuls, est pourtant insuffisante (moyenne de trois ans est de 49,94 pour le mancozèbe, 40,62 pour le propinèbe et seulement 37,73 pour le folpète — tab. 4).

— Les traitments combinés de pre- et post-débourrement donnent les meilleurs résultats. C'est, pourtant, valable seulement pour les produits à base de DNOC, la bouillie bordellaise n'attribuant que très peu au succès de la protection. Par l'emploi combiné de Kreozan (DNOC) en prédébourrement et des fongicides organiques après le départ de la végétation, l'attaque du parasite peut être réduite à 1/5 de celle sur le témoin (tab. 2 et 3, traitements 6, 7 et 8), l'efficacité étant de 80% environs (tab. 4).

Les résultats précités permettent de conclure que le programme des traitements doit comporter:

— un traitement d'hiver au DNOC (les produits à base d'arsénit sont interdits en Yougoslavie) à trois semaines avant le débourrement. On doit mouiller abondanement les ceps;

— deux ou trois applications à 7 jours d'intervals avec un des produits suivants: mancozèbe, propinèbe ou folpete à 0,2 à 0,3% à partir du moment où la moitié des sarments ait atteint 2 à 5 cm de longueur.

Pour diminuer le potentiel infectieux dans le vignoble il est indispensable de détruire tous les organes taillés de la vigne avant le départ de la végétation.

nađen u Dalmaciji i na vinovoj loizi (Šarić, Vrdoljak 1973); ispoljava vrlo izrazite simptome na mnogim vrstama *Nicotiana*, dok na prisustvo ovog virusa *Petunia hybrida* reaguje posebno karakterističnim lokalnim i sistemičnim simptomima, u vidu jasnih i pravilnih nekrotičnih pega i prstenova.

Zaključak

Na osnovi rezultata preliminarnih proučavanja virusa izolovanog sa lozne podloge SO-4 u našoj zemlji, posle ispitivanja reakcije nekih test-biljaka i snimanja virusnih partikula pod elektronskim mikroskopom, može se zaključiti da izolati ovog virusa ne pripadaju ni jednoj od dosad opisanih vrsta virusa na vinovoj lozi u Jugoslaviji.

U cilju identifikacije ovog virusa, tokom daljih istraživanja biće potrebno da se prouče njegove najvažnije karakteristike, krug domaćina, stabilnost u soku inficiranih biljaka, kao i njegove serološke reakcije.

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A NEW LATENT VIRUS FROM GRAPEVINE ROOTSTOCKS IN YUGOSLAVIA

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From different symptomless grapevine rootstocks *Riparia x Berlandieri So-4*, grown in the vicinity of Trstenik in Serbia, a mechanically transmissible virus was isolated twice, in 1978 and 1979. By electron microscopy, in crude juice from infected *Chenopodium quinoa* plants, some isometric particles of about 30 nm in diameter have been observed, so that this virus seems to belong to the NEPO virus group. According to the reactions of some test plants this virus is evidently different from similar viruses of the NEPO group (Grapevine fanleaf, Arabis mosaic and Tomato ringspot) known so far to infect grapevine in Yugoslavia.

A CONTRIBUTION TO THE INVESTIGATION OF THE NUMERICAL INCREASE OF POPULATIONS OF NATURAL ENEMIES OF GYPSY MOTH (LYMANTRIA DISPAR L.) IN FORESTS

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Summary

Previous investigations of the numerical increase of populations of natural enemies of Gypsy moth by adding considerable quantities of Gypsy moth eggs into the forests have shown the possibility to stop the gradation (Maksimović, M. et al. 1970) on a small area. By further reduction of the quantity of added eggs has been demonstrated that in small-size forest the number of Gypsy moth could be maintained permanently on a low level with 200 gr of eggs/ha (Maksimović, M., 1977). In the present paper set forth the initial results of the adding of Gypsy moth eggs in larger forests. The investigation was carried out from 1976 to 1979 in oak forests Matijevica and Visoka šuma near the village Obrež in Lower Srem. The adding of eggs has been reduced to 17—20 gr/ha. The method of adding was the same, for 200 gr of eggs were added on experimental areas in two equal doses of 100 gr each, before the caterpillars have begun to hatch and a month later. The experimntal areas where the eggs are situated at the distance of 400 to 500 m from one another. In the course of the development have been collected caterpillars and cocoons of the parasites from the genus *Apanteles* from the trunk of each tree up to the height of 2 m and from 20 lower branches (70cm), on experimental plots 20×20 m.

In Matijevica the adding of Gypsy moth eggs began in 1976. For the first tests was added 1 kg of eggs on the experimental plot. In the course of the three following years were regularly added 200 gr on each of 8 experimental plots in 3 sections of the forest. In Visoka šuma the adding of eggs began in 1978 and was carried out on experimental plots in 4 sections of the forest. The second part of the forest Visoka šuma, situated at a distance of 1.2 km served for the check of the numerical increase of Gypsy moth.

The adding of eggs showed different reactions in these forests. In Matijevica (Tab. 1) was found a low number of caterpillars in the course of 4 years and in Visoka šuma considerably more within two years.

The adding of eggs in two doses influenced the dynamics of the development of Gypsy moth caterpillars. As early as in June were observed 63.7 p. c. of young caterpillars, 47 p. c. of which were in the third stage.

The number of cocoons of *Apanteles* is growing from year to year (Tab. 2). The hyperparasites appeared in small numbers.

The prolonged presence of young caterpillars in June helped the numerical increase of the second generation of the sawflies *Apanteles*.

In July were still observed 34.8 p. c. of cocoons, 40 p. c. of which were whole with the sawflies of the second generation and partly in the diapause from the first generation.

The total percentage of parasitization has been obtained by rearing a larger number of caterpillars (Tab. 3). A high degree of parasitization up to 81.4 p. c. shows the part played by the adding of eggs in the numerical increase of the populations of Gypsy moth's natural enemies.

Among the caterpillars hawe been established 3.4—9.8 p. c. of dead with polyhedry (Tab. 4) which was introduced with the Gypsi moth eggs.

The numbers of Gypsy moth egg clusters were different in two forests. In Matijevica (Tab. 5) they remained at a low level, whereas in Visoka šuma, on the experimental plots where the eggs had been added, the numbers varied from 2.5—12.5 egg clusters/ha. This shows that the limit od enemies' number has not been attained yet to prevent a small numerical increase of Gypsy moth populations.

In the second, check part of Visoka šuma there appeared the critical numbers of Gypsy moth (Maksimović, M., 1958/1968 with 61.1 egg clusters/ha). In spring 1979 was effected the control and in autumn of that year were established 27.7 egg clusters/ha.

Further investigations of the necessary quantity of added eggs are indispensable. By means of traps with the feromon or by means of the network of permanent experimental plots can be established the beginning of the multiplication of Gypsy moth as well as the first focuses. By adding the Gypsy moth eggs in the focuses will be made possible a rapid multiplication of enemies and slowing down of the numerical increase of Gypsy moth populations.

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DAMAGES CAUSED IN BOSNIA BY RHYACIONIA BUOLIANA, SCHIFF AND ITS NUMERICAL OCCURRENCE

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Summary

The investigation of the numerical occurrence of *Rh. buoliana*, Schiff. and the damages it caused on pine cultures in Bosnia, 1978—1979, on the Kozara mountain, Preslica (Doboj) and Ilijak (Višegrad) has shown a different population density of the pest and considerable damages it had caused. By measuring the average annual increase in height and the density of pine stands showed the differences and the influence of *Rh. buoliana*, Schiff. (Tab. 1).

The damages consist in great irreparable crookedness of the trunks and in forming of several leading, terminal shoots. The greatest damages have been observed on the Kozara mountain, in the cultures of Scotch pine, aged from 4 to 11 years, on 50—60 p. c. of trees (Tab. 2). The culture of Austrian pine had 13. 6 p. c. and *Pinus contorta* 35 p. c. Most of remaining Scotch pine trees have 1—3 gentle bents on the trunk from previous attacks. There is a probability that such deformations will disappear as a consequence of the increase of thickness.

There are 12. 5 p. c. damages, caused by intensive bending of Scotch pine trees in the culture, aged 4 years, and on the older ones 29 p. c. on the Kozara mountain; at Preslica 15. 6 p. c. and on the Austrian pine 4. 6 p. c. (Tab. 3). Several leading shoots on the Scotch pine are to be met with in 32.6—48.4 p. c. of cases, and the percentage is similar on the Kozara mountain and on Preslica. On the Austrian pine there are 11. 6 p. c. of them and on *P. contorta* 35 p. c. Both kinds of damages are to be found at the height of 0.1 to 5 m from the ground (Tab. 4).

The maximum number of the pest (Tab. 5) on the Kozara mountain, in the culture of Scotch pine, aged 7 years, is 89, the average is 57.2 per each tree and in the culture aged 4 years the average number is 10. 2. On the Austrian pine and on *P. contorta* the attack amounts to 1.1—5 on an average per each tree.

The attack on the terminal shoot of the Scotch pine amounts to 34.5—78 p. c.; on the Austrian pine to 4.6 p. c. and on *P. contorta* 30 p. c.

The fundamental preventive measure of protection is the removing of attacked seedlings before planting. Another measure is the struggle against the pest in surrounding cultures before planting the new culture.

Sanitation of damages in grown up cultures is possible partly also by means of thinning out. In younger cultures the sanitation can be carried out cutting off the superfluous leading shoots, having previously effected the struggle against the pest and the reduction of its population.

The numerical occurrence of *Rh. buoliana*, Schiff. established on the basis of attacked terminal shoots does not present a real picture of the attack, for there is no correlation between these values and the percentage of attacked trees.

The checking of the numbers of *Rh. buoliana*, Schiff. ought to be oriented to the method of traps containing synthetic feromon, for it is the most appropriate way for establishing the degree of the attack and for taking the protiction measures.

P. contorta is not resistant to *Rh. buoliana*.

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SOME BIOLOGICAL CHARACTERISTICS OF SMALL RED-BELTED CLEARWING (*Synanthedon myopaeformis* Bork.) AND POSSIBILITY OF ITS CONTROL

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Summary

The investigations carried out in our apple-tree plantations have shown an increasing occurrence of small red-belted clearwing (*Synanthedon myopaeformis* Bork.) as the pest of the bark. The data obtained point out that some apple sorts, such as Red delicious Richared, suffer a heavier attack, where as Golden delicious and Jonathan are considerably les menaced.

In the same way have been examined some moments from the biology of this pest, particularly its latent phase of caterpillar and pupal development and the results obtained supplied the first data of this kind in our country, which are important for the solving of the control problem. Considering the latent way of life caterpillars as well as the modest amount of information in the literature about the possibilities of their control, it was necessary to include several preparations into the investigation. The results which were obtained after having investigated a series of preparations have shown that only the preparation HOE-2961 (triazophos in oil with 5 p. c. a. s.), used in a higher concentration, presented some interest in application.

gdje se razvio imago parazita nakon njegovog napuštanja mine nalazimo okrugli otvor. Ova razlika u otvoru ujedno je najuočljivija razlika između mina parazitiranih i zdravih gusjenica. Mine uginulih gusjenica poznaju se naprotiv po tome, što nemaju otvora.

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EVALUATION OF PARASITATION IN THE LEAF MINERS

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Summary

In the integrated control in which all natural limited factors are used the evaluation of parasitation in the leaf miner is of an extreme importance. The parasitation is determined on the basis of the examination of caterpillars where it can be found but whether the larve of entomophag is present or not.

The determination is carried but according to mines and that by length of the mine.

In a later stage, when the mines are empty, the determination of the parasitation can be carried out by the opening of the mines. The caterpillar of a miner, if not parasited, makes the semicircle opening. On the mine of the parasited caterpillar, when the imago of entomophag has been developed after its leaving of the mine the round opening can be found. This difference in opening is by all means the most remarkable difference between the parasited caterpillars and the healthy ones. Otherwise the mines of the dead caterpillars are rcognised by the fact that they have not the opening.

EURYTOMA AMYGDALI END. — ENNEMI DE L'AMADIER DANS LA REPUBLIQUE SOCIALISTE DE LA MACEDOINE

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Résumé

Après plusieurs années consacrées à l'étude des dégâts causés aux amandiers dans la République Socialiste de la Macédoine, l'auteur est arrivé aux conclusions suivantes:

Les dégâts en question sont dus à *Eurytoma amygdali* End. (*Hymenoptera, Chalcidoidea, Eurytomidae*) dont la larve se nourrit du fruit de l'amandier.

Il a été constaté, que cet insecte nuisible est repandu sur l'ensemble du territoire de la Macédoine, partout où l'on cultive l'amandier; sa présence n'est influencée ni par l' altitude au-dessus du niveau de la mer ni par l'exposition du terrain.

On a remarqué que dans les vergers attaqués il y avait un certain nombre de pieds non attaqués ou faiblement atteints par l'insecte; il s'agit peut-être d'un phénomène de résistance à l'attaque, ou de non concordance entre le développement de la plante et de celui de l'insecte.

Eurytoma amygdali est capable de détruire jusqu'à 71% des fruits.

L'insecte n'a qu'une génération par an; il passe l'hiver à l'état larvaire et se transforme en pupe àl'intérieure de l'amande le printemps suivant. 72.8% des furits attaqués restent sur l'arbre, alors que le reste (27,2%) tombe par terre.

L'éclosion des adulte a lieu après la floraison. En 1955 les adultes sont apparus 19 jours après la floraison. en 1956 l'éclosion a débuté 41 jours après la floraison.

La date la plus précoce du début de l'éclosion a été constatée en 1956, le 14 avril; la plus tardive l'année précédente, le 25 mai.

La période d'éclosion des adultes s'étale sur plus d'un mois; en 1955 elle a durée 34 jours, en 1956 cette période était de 41 jours.

Les femelles prédominent numériquement. En 1955 sur 1209 adultes examinés, 58,0% étaient des femelles; les chiffres correspondents pour l'année 1956 sont 1401 et 53,1% ceux de l'année 1957 son 853 et 54,4%

Cependant, les premiers jours de l'éclosion des adultes, le pourcentage des mâles est plus elevé, alors que plus tard, la rélation des sexes shange au benefice des femelles. En 1956, an cours des lo premiers jours, les mâles représentaient 84% de la population éclose.

La durée de la vie des adultes non nourris n'est que de 13 jours pour les mâles, et de 14 jours pour les femelles. Les mâles ayant pris de la nourriture peuvent rester en vie pendant 20 jours, les femelles 21 jour

87,6% des insectes restent au stade larvaire un hiver, 12% passen à l'état d'adulte seulement la deuxiéme année, et 0,5% des larves resten en diapause plus de deux ans.

CICADA — EMPOASCA DECEDENS PAOLI — PEST ON CITRUS CULTURES ON THE MONTENEGRIN LITTORAL ZONE PRELIMINARY INFORMATION

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Summary

On orange and mandarine fruits on the Montenegrin Littoral there were perceived damages looking like pale yellowish spots caused by *Empoasca decedens* Paoli.

This cicada was found on citrus trees during autumn and winter in the stage of imago, while the pre-imago stages were not found on citrus trees. During spring and summer *E. decedens* was found on several other host plants, on which it developed and fed, namely on capsicum, tomato, potatoes. Spotlike damages on fruits impair the quality and appearance of fruits. It has not been established with certainty whether it caused deformations of leaves too.

Primena hemijskih sredstava — herbicida je najenergičniji način suzbijanja divljeg ovsa. Ispitivani herbicidi u toku 1977, 1978. i 1979. godine: Suffix, Suffix BW, Avenge 200 E, Awedex BWG, Illoxon i dr. u pšenici ispoljili su visoku efikasnost u suzbijanju divljeg ovsa.

U odnosu na kontrolu u svim varijantama primenjenih herbicida dobijeni su znatno veći prinosi pšenice, kao rezultat suzbijanja divljeg ovsa i širokolisnih korova.

U našoj zemlji poslednje 2 godine uspešno je sprovedeno suzbijanje divljeg ovsa na 3—5 hiljada hektara. Mada su neznatne, prema ukupnim zakorovljenim površinama, tretirane površine pšenice su od velikog značaja u pogledu stečenog iskustva za preduzimanje mera u većem obimu narednih godina.

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APPEARANCE OF WILD OATS (AVENA SPP) AND POSSIBILITY OF ITS CONTROL

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Among numerous weed species which occur in our country in wheat and other cereal crops, the appearance of wild oats in individual areas is the most important problem of present interest.

Its appearance was recorded on the territories of Šumadija, Mačva, in the basins of South and West Moravas, in Macedonia, Montenegro, Bosnia and Herzegovina and in Croatia (Istria).

In the continental part of the country is represented the species *Avena fatua* L, and in Macedonia and in the littoral zone the species *Avena ludoviciana* L.

The most efficient control of the wild oats is effected by the use of herbicides. In the course of 1977, 1978 and 1979 were applied following herbicides: Suffix, Suffix BW, Avenge 200 E, Awadex BWG and Illoxon. All the examined herbicides proved to be highly efficient in the wild oats control.

In relation to the check plots, in all the variants of applied herbicides were obtained considerably higher yields of wheat, as the result of the efficacity of the control of wild oats and of broadleaved weeds.

In the last two years was carried out in Yugoslavia a successful control of wild oats on an area of 3—5 thousands of hectares. Although these are but insignificant area in relation to the total areas under the cereals, in this way were acquired precious experiences which will allow to take the necessary measures on a larger scale in the following years.

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THE EFFICIENCY OF SOME HERBICIDE COMBINATIONS IN MAIZE

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Summary

In this paper results are given of a two-year investigation of 17 herbicide combinations in maize.

The trial was set up in 1977 and 1978 in Mačvanski Belotić. On the basis of results obtained, the following was concluded:

— Broadleaf weed species were found dominant in the investigated area. Most common were *Chenopodium album, Chenopodium hibridum* and *Stahis annua.* In 1978. it was observed, that *Panicum crus galli* occurred more often.

— All investigated combinations have shown a good efficiency on most weeds Penoxalin 50% + Atrazine 50% in the dosage of 4 + 1,5 kg/ha stood out with the highest coefficient of efficiency (98%) in 1978.

— The yield of the maize hybrid ZP SC 58C in all treatments was higher then the control.