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# **ZAŠTITA BILJA PLANT PROTECTION**

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## CHEMICAL STRUCTURE OF TELIOSPORES CAUSAL AGENTS OF WHEAT BUNT

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### Summary

Since 1992 kernel bunt has become actual wheat disease in Serbia again. So far, the species *Tilletia tritici* and *Tilletia laevis* were reported as the causal agents of bunt, but it was suggested that *Tilletia controversa* occurred, too.

In this paper the content of macroelements (N, P, K, Ca, Mg and Na) and microelements (Cu, Fe, Co, Ni, Mn, Zn, Li, Ba, Sr, Cr and As) in the teliospores, healthy grain and diseased grain (teliospores + seed coat) was determined. The goal of this investigation is to search for a possibility to identify bunt on the basis of mineral element content, as it was shown in the paper of Liu *et al.*, 1982.

The obtained results showed that the macroelements occurred most in the teliospores were the following ones: nitrogen (32100 µg/g), and potassium (8530 µg/g), then phosphorus (3870 µg/g), magnesium (2124 µg/g), calcium (1301 µg/g) and sodium (72 µg/g). Very low values of microelements were recorded (Co and Cr < 0,1 µg/g, As 0,053 µg/g, Li 0,12 µg/g, and Ni 1,8 µg/g). Of this group of elements, Fe (69,4 µg/g), Zn (48,0 µg/g), Mn (46,1 µg/g), Cu (10,8 µg/g) and Ba (6,2 µg/g) occurred most. The content of mineral elements in healthy grain corresponded to literature data.

The total content of the investigated elements was higher in the teliospores than in healthy grain of wheat, the ratio of which was as the same as the ratio between the mass of 1000 grains and a healthy and diseased grain. It proved that micelia of the parasite contained all the amounts of mineral elements which were distributed from vegetative organs to grain.

Based on the content of chemical elements it cannot be concluded which species the investigated teliospores originated from.

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## EFFECT OF ESSENTIAL OIL OF *MYRISTICA FRAGRANS* HOUTT ON *LEPTINOTARSA DECEMLINEATA* SAY. AND *LYMANTRIA DISPAR* L.

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### S u m m a r y

A harmful effect of herbivorous insects is still mostly controlled by chemicals. Insecticide effect, apart from other possible negative effects, most often is a cause of the resistance of insects, and consequently of the continuous research of new possibilities of plant protection.

The goal of this paper was to raise the possibility to protect plants also with substances of antifidous or masking effect. The investigation on the effect of alcohol solution of the essential oil of *Myristica fragrans* Houtt on two pests, *Leptinotarsa decemlineata* Say. (oligofagous) and *Lymantria dispar* L. (polifagous), was carried out in a chamber under controlled microclimatic conditions. Toxic effect was tested by treating glass plates and depositing the insects. Digestive toxic and antifidous effect were investigated by treating host plant leaves and twigs and depositing test insects. The experiments were set up in 4 repetition with at least 10 insects per repetition, and the results were calculated according to Abbott's formula.

Contact toxic effect of the alcohol solution of the essential oil of *M. fragrans* on Gypsy moth was not the outstanding one, or it is of minor value in higher concentrations. The essential oil of *M. fragrans* had a certain toxic digestive effect, more outstanding on Gypsy moth than on Colorado potato beetle.

Our study has proved that the alcohol solution of the essential oil of *M. fragrans* had antifidant effect on Colorado potato beetle and Gypsy moth larvae, which was more outstanding in higher concentration applied (0.10%), on Gypsy moth larvae. Mortality of test insects was probably the consequence of their starvation.

These preliminary investigations proved that the application of essential oils in the future can be regarded as one of the measure to control oligophagous and polyphagous herbivore insects.

*Key words:* *Myristica fragrans*, essential oil, *Leptinotarsa decemlineata*, *Lymantria dispar*, contact effect, digestive effect, antifidance, plant protection.

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**THE VIRULENCE SPECTRUM OF *Puccinia graminis* F. SP. *TRITICI* ORIGINATED FROM GRASSES**

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The virulence spectrum of fungal population of *Puccinia graminis tritici* originated from grasses (*Hordeum murinum*, *Hordeum spontaneum*, *Hordeum villosa*, *Hordeum marinum*, *Hordeum leporinum*, *Lolium perenne*, *Aegilops cylindrica*, *Aegilops variabilis*, *Aegilops ventrikosa*, *Aegilops ovata*, *Aegilops longissima*, *Aegilops biuncialis*, *Aegilops charonensis*, *Bromus rigens* i *Agropyrum repens*) was shown in the present paper. Investigations were carried out in the Center for Small Grains, Kragujevac, during the period 1991-1992. The isogenic lines with well-known Sr genes for resistance were used.

Seven pathotypes (BBB, DBB, RHK, RHS, LGB, THK, QGF) were isolated from grasses in the first and five (BBB, RRK, BBD, NTH, TNT) in the second year of investigations. The pathotype BBB was dominant in both years. The structure of virulence of the fungal population on grasses in 1991. consisted pathotypes containing 8, 12 and 14 virulence genes. Genes V37, V5 and V6 had the highest frequency. The pathotypes containing 13, 14 and 16 of virulence genes were prevalent in 1992. and the most frequent ones were the virulence genes V5, V6, V9g, V9b, V30, V17, V13 and V22. Neither of Sr genes was completely efficient to pathotypes from grasses while the gene Sr33 was recorded the most efficient one.

Population of *Puccinia graminis tritici*, the causal agent of stem rust, was characterized by rather low virulence, the result of which was occurrence of variability, but in static form.

*Key words:* grasses, *Puccinia graminis tritici*, pathotypes, of virulence genes.

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## IDENTIFICATION OF THE CAUSAL AGENTS OF PEA ROOT AND STEM BASE NECROSIS

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### S u m m a r y

Disease symptoms, pathogenic, morphological and cultural characteristics of the pea root and stem base necrosis of the causal agents of were presented in this paper.

Pathogenicity of fungal isolates was tested by artificial inoculation of pea seed and plants. Symptoms observed in the conditions of natural infection were reproduced.

Morphological characteristics of the isolates were investigated so that they were grown on carnation leaf agar, while the cultural characteristics were studied so that they isolated fungi were grown on the different nutrient agars and at different temperatures. Based on the results obtained, the investigated strains were identified as *Fusarium oxysporum* f. sp. *pisi* and *F. solani* f. sp. *pisi*,

*Key words:* pea, root and stem base necrosis, *Fusarium oxysporum* f. sp. *pisi*, *F. solani* f. sp. *pisi*, morphological and cultural characteristics, pathogenicity.

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- Kirpatrick B.L., Wax L.M., Stoller E.W.: Competition jimsonweed with soya bean. *Agronomy Journal*, 833-866., 1983.
- Knežević S.Ž., Weise S.E., Swantom C. J.: Comparison of empirical models depicting density of *Amaranthus retroflexus* L. and relative leaf area as predictors of yield in maize (*Zea mays* L.). *Weed Research* 35, 207-214, 1995.
- Šinžar B., Stefanović L., Stanojević M.: Prilog poznavanju višegodišnjih promena florističkog sastava korovske zajednice useva kukuruza. *Acta Herbologica*, N° 2, 17-26, 1996.
- Tešić M.: Osnove zaštite kukuruza od korova u Srednjem Banatu. Doktorska disertacija, Poljoprivredni fakultet, Univerzitet u Novom Sadu, Novi Sad, 1989.

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## THE INFLUENCE OF POPULATION DENSITY OF THORN-APPLE ON PLANT MASS AND MAIZE YIELD

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### S u m m a r y

The study shows the results of competitive effect of thorn-apple (*Datura stramonium* L.) on maize crops depending on its population growth. As a consequence, there has been a significant maize decrease in height, as well as reduction of stem, leaf and leaf folder mass, green area index and maize yield. The more increased thorn-apple population from 5 to 10, 15 and 20 units per 1 m<sup>2</sup> was, the more intense competitive impact was, which results in decrease of all investigated parameters.

The least average decrease is shown in the maize stem height and is 5,7 % in relation to the control. Afterwards average decrease of yield by 25,6% followed the reduction of stalk mass by 26,3%, and leaf folder mass by 28,1%. Average reduction of green leaf area was 17,7%, in the phase of 9-11 maize leaves up to 35,3%, in the phase of full maturity of the maize seed.

*Key words:* competition, *Datura stramonium* L., population growth, maize, maize yield.

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**XANTHOMONAS CAMPESTRIS PV. CAMPESTRIS THE PATHOGEN OF CABBAGE, CAULIFLOWER AND KALE IN SERBIA**

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**S u m m a r y**

Pathogenic, biochemical and physiological characteristics of the strains isolated from the samples of diseased cabbage, cauliflower and kale plants were investigated, collected from different regions of the Republic of Serbia in the last five years.

The obtained results indicated that investigated strains, the causal agents of V-shaped leaf edge necrosis and black rot of vascular tissue of cabbage, cauliflower and kale, were pathogenic to several *Brassica* spp. (broccoli, rutabaga, oilseed rape). According to biochemical and physiological characteristics (Tab. 1) they belong to the bacterium *Xanthomonas campestris* pv. *campestris* (Pammel) Dowson, the pathogen of cruciferous plants spread worldwide.

The investigated strains, the pathogens of *Brassica* spp., were susceptible to copper sulfate (200 mg/l) as well as to streptomycinsulfate (20 mg/l) (Tab. 1).

*Key words:* cabbage, cauliflower, kale, black rot, necrosis, bacterium, *Xanthomonas campestris* pv. *campestris*, pathogenicity, biochemical and physiological properties, copper sulfate, streptomycinsulfate.

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