

el index. The findings were stated in mcg of glycine per 1 ml of plasma (or erythrocytes) for an hour of the incubation. The erythrocytometry was carried out using the method of microscopy with the help of the program "Videotest" (to study blood formed elements).

The carried out research have detected the presence of distinct interrelation between the proteolysis processes and time of the day. It has been determined that plasma proteinases, like erythrocyte proteinases, manifest their maximal activity at night (from 24.00 till 05.00 in the mean). The determination of plasma total protein amount has detected the presence of two peaks of activity of the given parameter in all the probes during the day: 1st peak – from 10.00 till 14.00, 2nd peak – from 19.00 till 24.00.

A large body of circadian activity research of blood composition factors in intact rats (576 species) showed that there are no considerable fluctuations of hemoglobin, erythrocytes and leucocytes amount, and also plasma pH, during the day that testifies to the lack of distinct diurnal rhythms, which occurred while investigating blood proteolytic activity.

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### Shot report

#### WINTER WHEAT DAMAGE CAUSED BY GAEUMANNOMYCES GRAMINIS VAR TRITICI AND RHIZOCTONIA, EFFECT OF THE ROOT ROT PATHOGENS ON GRAIN YIELD COMPONENTS

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Distribution of major pathogens causing root rot on winter wheat in Krasnodar, Stavropol and Rostov regions had been studied by KNIISH researchers during 2000-2005. Forty eight strains had been distinguished. Infestation of root system and coleoptile of various winter wheat varieties by *Gaeumannomyces graminis* var. *Tritici* showed that root damage varied between 63.3 and 100%, and stem base damage – between 0 and 80% depending on a variety. Infestation with *Rhizoctonia* spp. revealed that root system damage in this case varied between 36.3% and 100%, stem base damage – between 18.1 and 63.6%. *Gaeumannomyces graminis* var. *Tritici* reduced productive tiller number in winter wheat variety Krasnodarskaya 99 by 23.5%, plant height – by 32.3%, ear length – by 19.1%, number of spikes per ear – by 14.4% and TKW – by 45.5%. *Fusarium* fungi reduced the same figures by 18.5, 23.1, 42.2, 31.7 and 39.5% respectively; and *Rhizoctonia* – by 45.9, 15.4, 16.2, 5.6 and 19.5%.

Distribution of major pathogens causing root rot on winter wheat in Krasnodar, Stavropol and Rostov regions had been studied by KNIISH researchers during 2000-2005. Forty eight strains had been distinguished. The most pathogenic of the strains were used to evaluate winter wheat varieties' response to these pathogens.

Infestation of root system and coleoptile of various winter wheat varieties by *Gaeumannomyces graminis* var. *Tritici* showed that root damage varied between 63.3 and 100%, and stem base damage – between 0 and 80% depending on a variety.

Maximal level of damage was observed on the variety Deya: root system – 100%, coleoptile – 80% (at *G. graminis* var. *graminis* infestation it had minimal damage: root system – 10.5%, stem base damage – 5.0%).

The lowest level of root system damage by *Gaeumannomyces graminis* var. *Tritici* was observed on a durum wheat variety Leukurum 21 – 63.6% as well as on bread wheat varieties Pamyat and Fortuna – 72.7%.

Stem base damage caused by this pathogen was not observed on varieties Batko and Moskovskaya 39.

Infestation with *Rhizoctonia* spp. revealed that root system damage in this case varied between 36.3% and 100%, stem base damage – between 18.1 and 63.6%.

The highest level of damage was observed on a durum wheat variety Leukurum 21: roots – 100%, stem base – 54.5%, and on bread wheat varieties Tanya (90.9 and 63.6%), Pamyat (72.7 and 63.6%), Batko (72.7 and 54.5%).

The lowest level of root damage was observed on Deya – 36.3%, and of stem base – on Moskvich, Nota, Yubilejnaya 100, Vostorg, Ermak, Krasnodarskaya 99, PalPich, Vita and Voronezhskaya 95 – 18.8%.

In 2007 root rot pathogens naturally occurred in field in the following proportion: *Gaeumannomyces* -74, *Fusarium* -14,5 и *Rhizoctonia* -

10%. Their effect on grain yield structure is presented below.

*Gaeumannomyces graminis* var. *Tritici* reduced productive tiller number in winter wheat variety Krasnodarskaya 99 by 23.5%, plant height – by 32.3%, ear length – by 19.1%, number of spikes per ear – by 14.4% and TKW – by 45.5%. *Fusarium* fungi reduced the same figures by 18.5, 23.1, 42.2, 31.7 and 39.5% respectively; and *Rhizoctonia* – by 45.9, 15.4, 16.2, 5.6 and 19.5%.

As seeds were treated with Premis200 before sowing (0.2 l/t) the proportion of rot causing agents changed: *Gaeumannomyces* – 47.1%, *Fusarium* – 52.0%, while the reduction in yield components changed within the experimental error.

Pre-sowing treatment of the seeds with a mixture of lignogumat and Premis200 (0.2 l/t) increased root weight of winter wheat plants compared to the control variant where seeds were treated neither with disinfectants nor with bioactive substances.

As winter wheat varieties Leukurum and Moskvich were treated with Premis200 only under artificial infection conditions their root weight increase was 2-11% lower than when they were treated with both Premis200 (application rate decreased by 30%) and lignogumat. While in the varieties Vostorg and Voronezhskaya 95 application of Premis200 decreased root weight by 14-7%.

In those variants where only Premis200 was used both were observed increase in root system damage by 23.8% (variety Fortuna) and decrease by 54.6% (variety Deya). When both chemicals were used (Premis200 (application rate decreased by 30%) and lignogumat), root system damage either remained unchanged (varieties Tanya and PalPich) compared to that of the control, or decreased by 12.5% (variety Pamyat) – 60-66% (varieties Vostorg, Yubilejnaya 100, Doka).

As winter wheat varieties Tanya, Yubilejnaya 100 and Voronezhskaya 95 were treated with Premis200 only, the increase in their root weight under artificial *Rhizoctonia* infection lowered by 5-10%, while complex treatment of the seeds with both Premis200 (application rate decreased by 30%) and lignogumat caused increase of root weight by 1-5%.

In those variants where only Premis200 was used both were observed increase in root system damage by 55.6% (variety Deya) and decrease by 81.9% (variety Moskvich). After complex treatment of the seeds with both chemicals (Premis200 (application rate decreased by 30%) and lignogumat), root system damage either increased by 9 (variety Fortuna) – 36.4% (variety Pamyat) compared to that of the control, or decreased by 27.3% (variety Nota) – 72.8% (variety Moskvich).

## BLOOD PLASMA FREE FATTY ACIDS COMPOSITION IN METABOLIC SYNDROME PATIENTS

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A metabolic syndrome (MS) involves a variety of systemic clinical-biochemical processes – insulin resistance, abdominal obesity, arterial hypertension, dislipidemy [8, 9]. The MS origin has been studied insufficiently; the risk factors and pathological processes leading to this syndrome development remain disputable. There are some MS development hypotheses offered, from which the leading one is the theory of insulin resistance (IR) [7, 10]. An important role in the IR development is taken by free fatty acids (FFA). The mechanisms of glucose-insulin homeostasis and FFA interconnection predetermine the necessity to study the role of FFA and their separate components in the course of the MS formation [2, 3].

The research purpose – is to study the composition of blood plasma free fatty acids in 22 metabolic syndrome patients and 11 healthy people. The MS was diagnosed according to the criteria offered by the experts of the USA National Education Program on cholesterol [1, 12]. The investigation of carbohydrate metabolism included the glucose content determination in blood serum on an empty stomach and in 2 hours after the oral glucose load, the insulin level determination by the immunoenzyme method (the sets of the firm «DRG – diagnostics», Germany); the HOMA index was calculated (insulin on empty stomach, mUnit/ml  $\times$  glucose on empty stomach, mmol/l/22,5). The lipid exchange parameters in blood serum was determined on the biochemical analyser FP- 901M of the firm “Labsystem” (Finland) using the “Labsystem” firm sets. The A and B apolipoproteins (apo-A and apo-B) content was determined (the «DiaSys» firm sets, Germany); the apo-B/apo-A ratio was calculated. The extraction of lipids from blood plasma was executed by the method of Bly and Dyer [5]. The methyl ethers of fatty acids (FA) were obtained by the method of Carreau и Duback [6], the analysis was executed on the gas-liquid chromatograph Shimadzu GC-17A. The results were stated in relative % from the total FA sum [11].

The FFA quality composition represented by 31 components of individual fatty acids, was analyzed with due consideration of glucose-insulin homeostasis changes in the MS patients: the 1<sup>st</sup> group – MS patients with no insulin resistance, the