GENETICALLY MODIFIED CROPS AND DERIVED PRODUCTS: FOOD, ECOLOGICAL AND AGROTECHNICAL RISKS

V.V. Kuznetsov, A.M. Kulikov, V.D.Tsydendambaev

Presently over 134 million hectares or over 9% of all fields in the world are occupied by transgenic (genetically modified, GM) agriculture crops. In the world market the natural products are substituted for GM ones and the process is accelerating. Seeking the over profit from food market, the biological safety is pushed to the background. In this respect the review presents the analysis of modern scientific data on food, ecological and agricultural risks at intensive and extensive usage of transgenic plants. It is clear that long-term feeding of animals with GM fodders lead to abnormalities in liver and kidneys as well as in generative functions. The review concentrates on discussion of real and/or potential risks at cultivation of transgenic plants. Those risks are based on imperfectness of technologies of GM organisms constructing and poor knowledge of mechanisms regulating eukaryotic genome expression.

DETECTION OF SELECTABLE MARKER GENES FOR ESTIMATION OF SAFETY OF GENE MODIFIED FOOD

D.L. Gaganidze, T.A. Sadunishvili, E.G. Kvesitadze

Positive and negative sides for application of genetically modified organisms are considered in the article; experimental approaches by means of which is possible to obtain genetically modified food harmless to human health are described. Assessment of safety of genetically modified food by detection of selectable marker genes is discussed. Identification of selectable marker gene nptII (antibiotic neomycin resistant gene) by PCR and sequence analysis in genetically modified maize is demonstrated.

GENETICAL SAFETY EVALUATION OF THE POTENTIAL FOOD ADDITIVES OBTAINED FROM *MORUS ALBA*, *MORUS NIGRA* AND THEIR COMPOSITIONS

R.A. Agabeyli*, F.R. Zeinalova, G.G. Mirza-zade***

Promising food supplements - extracts from leaves of *Morus alba, Morus nigra* and their compositions were evaluated for genetics safety by assessing their effects on animals (rats) and plants *(Arabidopsis thaliana* and *Vicia faba*) objects. All studied biologically active substances demonstrated lack of genotoxic properties and displayed gene protecting activities.

NEW FERTILIZERS OF PROLONGED ACTION ON THE BASIS OF NATURAL ZEOLITES

T.G. Andronikashvili*, T.F. Urushadze, T.N. Kordzakhia*, L.G. Eprikashvili***

The present paper is a review. It shows that effectiveness of positive action of natural zeolites of sedimentary origin in plant growing depends on many factors, namely, types of zeolites, application of this mineral in combination with mineral and organic fertilizers; the manner of its application in the soil, types of soil and degree of its contamination; species and sorts of plants; climatic and geographical conditions of the environment and others.

MATHEMATICAL SIMULATION OF THE EXPERIMENTAL RESULTS IN ACAROLOGY

K.P. Dilbaryan

Information on the application of mathematical simulation of biological experiment with the aid of the approximation of experimental data by the appropriate analytic functions and the graphical imaging is given. The analytical expressions, which describe the dependence of the average duration of the development of different phases, as well as, the edge of average duration of the development of tongs from the ambient temperature are found.

INFLUENCE OF PHOSPORUS AND POTASSIUM ON CHICKREA YIELD IN EAST GEORGIA DRY CONDITIONS

A.A. Korakhashvili, T.T. Urushadze, D.R. Kirvalidze, M.R. Chachava

In Eastern Georgia Dry area Phosphorus and Potassium fertilization increases Chickpea *(Cicer arietinum L*) yield and stand persistence (1). But the changes in yield components as affected by P and K fertility level are not known for above mentioned zone. Our hypothesis is that P and (or) K fertility level are not known in this conditions. Our hypothesis is that P and (or) K fertilization will increase Chickpea grain yield components (grain, straw, roots), and those component responses may change with harvesting time. The objectives of this field study were to determine the impact of P and K fertilization on Chickpea yield and yield components during 3 years cultivation (2007-2009) in standard pilot plots. Treatments were the factorial combinations of four P rates (0, 25, 50, and 75 kg P ha^{-1}) and four K rates (0, 10, 20 and 30 kg K ha^{-1}) arranged in a randomized complete block design with four replications on 50 m^2(calculated area). Chickpea harvests four times at the maturity time, and yield and straw/root mass were determined. Incremental additions of P and K increased chickpea yield in each year. Improved grain yield of P and K-fertilized plot was consistently associated with greater mass of straw. Because fertilizer responsiveness is closely associated with greater mass of straw, cultivars possessing this trait may be relatively more productive under well-fertilized condition (2)**.**

PERSIAN WALNUT ORIGIN AND SPREADING ON CAUCASUS

Z. A. Ibrahimov

Genetic relationships among populations, the six walnut populations from Azerbaijan, three each from the Greater Caucasus and the Talysh**,** were examined using distance-based clustering methods such as the unweighted pair group method using arithmetic means (UPGMA) and the distance Wagner procedure. On the 3D projection of populations along the first three principal components the Caucasus populations showed marginal differentiation among them and exhibited considerable divergence from the Talysh populations. The Talysh populations located within the famous Tertiary relic Hyrcan flora are probably ancient as compared to that of the Caucasus, and formed a basal sister group. The populations from the Caucasus are interrelated and genetically differentiated from the Talysh group.

RATIONAL USE OF ORGANIC-MINERAL FERTILIZERS IN YOUNG NUT GARDEN

R. Sh. Kopaliani, N. N. Kelenjeridze , N. K. Kelenjeridze

Rational use of organic-mineral fertilizers on low productive alluvial soil in fresh/new nut garden increases the harvest 10 times in comparison with non-fertilized variant. Among organic fertilizers manure as well as siderites (green fertilizers) increase the soil productivity and ecologically pure products are gained, but the most special among them is siderite - fall oats, sown in autumn and ploughed in early spring, which enrich the soil by organic substances and biologically pure nitrogen.

ESTIMATION OF MICROBIOLOGICAL GROUP PORTION IN THE LAKE SEVAN TRIBUTARIES WATER SELF-PURIFICATION PROCESS IN PHYSICAL – CHEMICAL PARAMETERS CHANGES

A.M. Minasyan, R.H. Hovhannisyan, H.S. Vardanyan, L.R. Hambaryan, M.S. Ivanyan

The results of Lake Sevan tributaries water microbiological investigations in summer-autumn season 2004 are considered. The quantitative and qualitative characteristics of the microbiological community dynamics basis of the saprophytic bacteria and fungies are presented. The role of each microbiological group in the process of tributaries water self-purification has been analyzed based on the obtained data. It had been shown that the most active in the process of tributaries water self-purification had participated saprophytic bacteria and fungies, the most passive – yeasts. The comparative analyses of microbiological and physical-chemical parameters makes possible to assume of the privilege of dissolved organic matter in the Lake Sevan tributaries water.

PHENORHYTHMS OF FLOWERING DENDROFLORA IN WINTER AND EARLY SPRING IN BATUMI BOTANICAL GARDEN

I.Sh. Mikeladze, M.B. Metreveli

A great variety of exotic plants are generated in Batumi Botanical Garden, among them we have selected and studied 54 species deciduous and evergreen plants, trees and bushes of different geographic origin, which flower in winter and early spring. Almost every species start leafing and growing in March-April and continues till June-July. Some of them are characterized by the second period of growth, which basically continues till the end of August, sometimes till the first half of September. Some species of Magnolia start growing late and finish in a short period. On the basis of phenological observations we have estimated that vegetation period in studied species lasts 8-9 months. Above mentioned species are characterized by effective blossoming, normal growth-development and deserve great attention in decorative gardening.

METHODOLOGY OF REVEALING OF CLIMATOLOGICAL SHIFTS IN THE REGION OF SOUTH CAUCASUS

Z.I. Tskvitinidze, M.V. Pkhakadze, L.Z. Tskvitinidze, G.O. Dartsimelia

Importance of processing and certification of climatological monitoring data was analyzed with the purpose of revealing of climatological shifts in the region of South Caucasus. Issues of improvement of methodical approaches for solution of the problem in conditions of creation of climatological monitoring digital data basis and determination of factual tendencies of changes of daily climatological characteristics of separate territories of the region were set out.

STUDY OF HUMIDITY LEVEL DEPENDENCE ON AIR TEMPERATURE AND ALTITUDE IN THE BASIN OF AKHURYAN RIVER

K. A. Aghababyan, K. A. Deghoyan

This article studies the interaction of basic climate characteristics - precipitations, air temperature, as well as altitude on the example of Akhuryan river basin. The average annual and monthly data groups of several years were analyzed, the coefficients of correlation were calculated, the mode of relationship was defined. General view of graphical dependance and positive value of coefficient correlation indicate that the raise of temepreature causes precipitation increase in Amasja station, whereas in the Leninakan station (descending line and positive value of coefficient correlation) the raise of temperature result in precipitation decrease. At the beginning of vegetation period (March) the dependence of temperature in all the studied stations is obvious – the precipitation quantity is increased parallel with raise of atmospheric temperature. From April to October negative assosiation of parameters are observed. The obtained data are expected to be used for water resources management aimed at stable water supply for irrigation purposes under the various global climate change scenarios. The obtained data are expected to be used for water resources management aimed at stable water supply for irrigation purposes under the various global climate change scenarios.

TO THE THEORY OF RIPPER OPERATION

P. A. Tonapetyan

In the event of minimal tillage technology, normally, rippers with diverse operating elements have been used, establishing operation and geometric parameters for which can serve a basis for designing the most energy-efficient operating elements. Based on the above statement, power analysis of interaction between the operating element of ripper and the soil are brought up below.

ANTAGONISM BETWEEN ESCHERICHIA AND CLOSTRIDIA

J. V.Nachkebia, K. J.Nachkebia, E.J. Nachkebia, M. R. Oniani

During associated cultivation of strains of toxic Clostridia and Escherichia, Clostridia and Staphylococci gradual elimination of Clostridia cells from liquid nutrient medium takes place, which is caused by antagonistic action of Escherichia and Staphylococci on the cells of anaerobic microorganisms. The same process occurs in solid nutrient medium – growth of toxigenic anaerobia was at a significant distance from the zone of growth of Escherichia and Staphylococci. By generalizing the results of the experiment, it is possible to come to the conclusion that toxigenic

anaerobia are permanently presented in human and animal gastrointestinal tract, but their growth and generation are oppressed by antagonists, Escherichia and Staphylococci. Thanks to antagonism, Clostridia's development is oppressed and toxin secreted by them does not accumulate in the amount that will cause remarkable harm in a short time, while it accelerates ageing in the course of time, and because of this fact it is necessary to reduce their amount to a minimum by means of giving checked strains of Escherichia (E. coli M-17) and other antagonists.

APPLICATION OF RECTIFICATION FOR SEPARATION OF HYDROGEN PEROXIDE

R.A. Baklachyan

The thermal stream caused by difference of temperatures between steam and liquid phases during rectification results lead to the increase of separation process efficiency. Research results on packed rectification column are checked up on the concrete shared mixture for receiving of hydrogen peroxide, available in practice. Calculation of the process heat and mass transmission during rectification on method of mixture water-hydrogen peroxide has shown that the given problem is possible to solve not on the column having 8 m height, but with lower height, approximately 6,5-7 m.

STABILIZING PROPERTIES AMINES AND QUATERNARY AMMONIUM SALTS WITH ALLYL- AND 2-HYDROXYETHIL GROUPS AND THEIR MODIFIED ANALOGUES ON CLINOPTILOLITE

G.O.Torosyan, V.A.Davtyan, A.G.Kudryavtsev, A.H.Nazaretyan

The paper givs stabilizing properties of monoethanolamine derivatives for carotene and chlorophyll on artificially dehydrated forages and also on carotene and chlorophyll preservation in lucerne. Earlier the authors carried out the synthesis of (*N*-allil-*N*-2-oxyethyl), (*N, N*-diallil-*N*-2- oxyethyl), (*N, N*-diallil-*N*-2-allil oxyethyl) amines. Nowdays researches on synthesis of these compounds on zeolites are being carried out. It has been shown, that diallyl-derivative of monoethanolamine possesses high antioxidant properties. It is established, that modifying clinoptilolite with studied compounds also positively influences stabilizing properties.From the conducted tests it is visible, that allyl-derivatives of monoethanolamine, basically (*N, N*-diallil-*N*-2-hydroxyethil) and its salt with allylbromide - triallil-2-2-hydroxyethilammonium bromide, show expressed anti-oxidant properties in comparison and even surpassing known substances santokhin or 1,4-di (*N*-2- hydroxyethil) butadiene (DIA).

USE OF CALCULATING MACHINES FOR DEFINING WINE PRODUCTS

Sh. I. Shatirishvili, Kh. Sh. Chkhikvadze, M. R. Makharoblidze

There have been lots of attempts to estimate the correlation between the quality and the consistence of drinks. The data of chromatographic analysis is the most realistic. In order to define the connection between the estimation of quality and individuality, we have researched two possible usages of chromatographic data: the regressive equations, based on the basis of chromatographic data and the type of chromatograms, called "finger prints". The chromatograms, received from the standard conditions, are written in the way of histograms and this way the passport of the given wine is stated. The defining parameters (number of peaks, their position, intensiveness and height) give us the chance to distinguish not only species, but also individual characters. The results of mathematical analyses of the received data are located in the memory of electro processing machine. The normalized chromatograms of any analyzed wine are researched the same way and the result is also located in the memory of electro processing machine. Later they are compared.

INFLUENCE OF PACKAGING ON THE MARKETING APPEARANCE OF APRICOT

E.G. Mailova, A.G. Harutyunyan

Recently much attention is being devoted to the issues of raising competitiveness of fresh crop and vegetable products. And in that case packaging comes to help as the use of packaging for preservation of qualitative parameters of product is considered as one of the decisive factors of producers' profitability. Correctly packaged crops allow the trade to significantly increase flexibility and mobility while working on the market with consumers. We aimed at investigating the possibility of long-term storage of apricots in packages from polymer membrane depending on the temperature of storage.

PROLONGATION OF STORAGE PERIOD OF DRIED VEGETABLES WITH INTERMEDIATE LEVEL OF HUMIDITY

S.I. Sahradyan, V.S. Voskanyan, A.V. Kazaryan, R.A. Beglaryan

It is shown, that in the terms of strong destruction of microbe properties by means of the different dozes of gamma radiation (4.0 kGy) the cultivation in different portions increases dried vegetables and at average humidity dried vegetables (35-40%) validity is accordingly 3 - 4 times more in comparison with control sample.

INTERRELATIONS OF WOOD AND GRASS PLANTS IN REGARD WITH DENSE POPLAR PLANTATIONS ON THE COASTAL SANDS OF LAKE SEVAN

A.M. Pahlevanyan

Interrelations between arboreous and herbaceous plants in poplar plantations of different densities on coastal sands of the Lake Sevan were investigated. It was found that the change in the number of trees per unit of area affects significantly the appearance of herbaceous synusia. In this case the increase of the density of tree stands is accompanied by impoverishment of the species composition of live cover. With the increase of density, vegetative capacity of grass vegetation decreases dynamically. In all the trials the maximum of tree roots is concentrated in the layer of 20-30 cm. The main root mass of herbaceous synusia is concentrated in the upper layer of soil - 0-10 cm regardless the density. Competing activity of grass roots has a negative impact especially on poplar root mass in the upper horizon. The maximum of active roots of the latter is observed at 20-30 cm depth regardless the density that testifies to the weak competition of herbaceous plants roots. The negative impact of herbage on growth of cultivated tree species becomes apparent especially in the sparsest plantations. Interrelations between arboreous and herbaceous plants are more favorable in plantations with intermediate density.

PECULIARITIES OF HEAVY METALS ABSORPTION AND ACCUMULATION BY ARBOREOUS SPECIES GROWING IN THE CITY OF YEREVAN

G.S.Nersisyan, H.A.Hovhannisyan

The research goal was to study some peculiarities of metal absorption and accumulation properties of some arboreous species widely spread in the city of Yerevan: *Robinia pseudoacacia L., Fraxinus Excelsior L. and Populus alba L.* The obtained outcomes evidence that all the studied species accumulate heavy metals and particularly Pb, Ni and Mo. The highest metal accumulation potential was established in Robinia pseudoacacia.

PROBLEMS OF LEASING RISK ASSURANCE IN REPUBLIC OF ARMENIA

A. A. Hakobyan

The paper gives the analysis of the role of leasing in the current stage of development of Armenian economy and subsequent steps of leasing market development. Particularly, the authors suggest to generate leasing operation risk management and advance assurance system in order to decrease leasing expenditure. There is a discussion on legislative issues of purchasing assets from lessees by their initiative, as well as on lease fees formation, modernization and exploitation of leased assets by leasers in RA, which is subject to economical-legislative development in leasing management. The authors also suggest to involve in leasing assurance the system of not only direct participants, for instance leasers, lessees, assets suppliers, but also indirect partners, such as brokers, banks, insurance companies, that promote effective and ongoing leasing operations.