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CONCERVATION STATUS AGE DENDROSOZOEKZOTIV *IN VIVO* IN BOTANIC GARDEN OF UKRAINE

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The results of the researches of the life state and the successful introduction of the reserved age dendrosozoekzotiv of protected soil botanical gardens of Ukraine , that are included into the "red lists" of international meaning, through the defining of their generative development, natural vegetative propagation method, cold-resistant (during the energetic crisis), and saving habit in culture are shown.

Age dendrosozoekzoty, in vivo, life state, successful introduction, IUCN Red List, the European Red List, botanical gerdens, the Forest-steppe of Ukraine

Flora tropics and subtropics three times the largest species of the flora of temperate and arctic latitudes. But, unfortunately, the wealth of tropical and subtropical flora and vegetation destroyed. As a result of anthropogenic impact destroyed econiche, which often leads to instant disappearance area of species. Especially vulnerable are the island flora trace reduction. The cabin did not open for humanity kinds of plants.

The problem of phytodiversity become relevant in almost all countries. In 1980 was proclaimed World Strategy for Conservation of Nature and Natural Resources. The main objective was to keep the diversity of biological species, regardless of their economic importance, since the disappearance of their irreversible. State of the problem revealed N.V. Tsytsyn, C.A. Sobolev, L.S. Belousov, L.V. Denisov and others in the 70's and early 80 th century. During this time, about 2000 plants described, rare, and those that are endangered. In the selection of materials, the authors used lists of rare species of plants and some regions of Europe, Australia, New Zealand, the former Soviet Union, the United States and other numerous publications on the identification and study of individual taxa in need of protection. At the time, began intensive form

Red List of the International Union for Conservation of Nature and Natural Resources (IUCN World Cup) [4, 9, 10, 12].

In the 80's - 90's of last century, the problem of conservation of species and genetic diversity of tropical and subtropical plants outside their natural habitat (ex situ) in a protected ground (in vivo) temperate latitudes in his writings reveals T.N. Cherevchenko. One of the main tasks of botanical gardens Ukraine it considers introductions in protected ground area of species endemic and relict species of tropical and subtropical flora [5, 7, 13]. Further interest of scientists to rare tropical and subtropical flora growing even more. Particular importance is grounded collections of tropical and subtropical plants in the botanical gardens in temperate zones as an effective means of preserving ex situ diversity of flora of the tropics and subtropics. Before botanical gardens was a problem saving in the first place, rare, endangered, or those that are endangered species. On the bases of collections of botanical gardens studied developmental biology of introduced plants for greenhouse culture conditions, worked out methods of propagation and cultivation for practical use and restoration of natural resources through the tropical regions of repatriation. Particularly valuable in this regard is the age woody plants.

The purpose of research – Inventory and diagnostics living condition vintage age dendroekzotic in vivo, are included in the Red List of the International Union for Conservation of Nature and Natural Resources [15] and the European Red List of species of plants and animals that are endangered on a global scale [2].

Materials and methods research. Desk research served as starting materials catalogs and inventory lists of plants greenhouse botanical gardens and dendrosozological catalog of natural reserve fund steppes of Ukraine [1, 6, 3, 8, 11, 14]. Route survey conducted by vintage age dendrosozoekzotic in vivo in these botanical gardens (BS): them. Acad. O.V. Fomin Kyiv National University (KNU more), Taras Shevchenko National University of Lviv (LNU), Franko and Kharkiv National University (KNU), V.N. Nomination. Integrated assessment of the success of the introduction of some representatives performed by the method of R.A. Karpisonovoyi based on the collection of subtropical plants BS love them, Acad. O.V.

Fomin Kyiv National Taras Shevchenko University. Biometric measurements conducted in the inventory age dendrosozoekzotiv in vivo in 2013 - 2014 pp.

Conclusions

1. Diagnosis living condition vintage age dendrosozoekzotic in vivo botanical gardens steppes of Ukraine demonstrates the conservation objective level, which makes possible their mass propagation and introduction to the culture.

2. The evaluation of success of the introduction of two types dendrosozoekzotic are promising in vivo (P) and five - very promising (SE) for growing conditions in the greenhouse, industrial growth, use for floristic.

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REPRODUCTION SPECIES OF THE GENUS SWEETSHRUB (*CALYCANTHUS* L.) GREEN CUTTINGS IN VOLYN FOREST STEPPE OF UKRAINE

V. Oleshko

The data about the results of breeding plants of the genus Calycanthus L. by rooting green cuttings. The possibility of increasing the ability of cuttings rizogennoy with different rooting stimulants.

Calycanthus L., sweetshrub, vegetative propagation, rooting stimulants, root formation

Introduction to landscaping and extensive use kalikantiv in green construction as valuable in ornamental plants is limited regarding the lack of planting material. For their mass cultivation and introduction of improved methods of breeding is important.

Underlying unsexual or vegetative reproduction, is the ability of the new plant organism, which is part of the parent body, restore independent body similar to the parent [3]. The main advantage of the method of vegetative propagation of seeds can not only save valuable economic characteristics of selected species or forms, but also accelerate the entry of plants and fruiting stage kvituvannya. It is very important that when vegetative propagation new body can be changed by the environment, adapt [1].

There are many ways of vegetative propagation. All variety of ways vegetative propagation of plants are divided into groups [3]:

1) plant propagation specialized bodies, rhizomes,

tubers, bulbs and whips;

2) plant propagation parts of stems, roots or leaves, branches (puff, stem and root cuttings) or neviddilenymy (jigging, root sprouts) from the mother's body;

3) plant propagation by grafting.

For most types of shrubs preferred method of vegetative propagation are cuttings.

This method allows the reproduction in a reasonably short time to get a considerable amount of planting material, which is very important for introduction. The ability to reproduce vegetatively historically occurred in these climatic conditions as an expression of plant adaptation to these conditions [1]. The biological basis of plant propagation by cuttings is their ability to regenerate lost organs formed during phylogeny [4]. Experiment with vegetative propagation kalikantiv conducted in 2012.

Among the various methods of vegetative propagation is common for the production of green cuttings received. Features of this method of reproduction illuminated in the works of many local and foreign authors (Vehov, Ilyin, 1934; Tarasenko, 1967, Turkish, Polikarpov, 1968, etc.). [1, 4, 5]. The main feature of green cuttings is that using functions provided by the leaf regeneration to separate from the mother plant cuttings root system and sometimes the kidneys.

In the green building is especially important to have developed techniques for growing rooted green cuttings with the least cost time and money.

Our long-term monitoring of plants of Calycanthus L. showed that the most favorable for green cuttings is a state of maximum saturation moisture escape all tissues. It promotes the active role of the cambium and the high rate of photosynthesis and displayed on the speed of the process root. So we shoots harvested in the cool morning foggy days or cloudy days and placed in a damp plastic bags. The period of maximum capacity for rooting in different plants can not link the specific calendar dates, because depending on the weather conditions the phase shift is 2-3 weeks.

The purpose of research - finding out the impact of growth factors on rooting green cuttings kalikantiv.

Materials and methods research. Research conducted during the 2005-2012 biennium. The objects of research are 3 species of Calycanthus L .: C. fertilis Walt. - Kalikant fertile, C. floridus L. - blooming K., C. occidentalis Hook. et Arn. - K. western belonging to the family Calycanthaceae Lindl.

In studies of vegetative propagation method used BC Turkey (1963) [5]. Green cuttings harvested from different parts of the shoots. To improve the efficiency rooting used such growth substances (growth promoters), "Ivin", "Charkor", "heteroauxin", "Ivinor», «ά-NUS", "gibberellins" and "Nortiol." When inventory into account the

percentage of rooting. The experiment was performed in triplicate, and 30 cuttings each. Cuttings cut health scalpel. The upper cut above the upper pair of kidneys 0.3-0.5 cm perpendicular to the longitudinal axis did escape, the lower oblique cut - below the lower pair of buds to 0.5-1.2 cm. Green cuttings taken from a part of the leaf blade to ensure formation organic matter in regenerating tissues.

Cuttings cut a length of 1-2 internodes and cuttings soaked in an aqueous solution root stimulants for 24 h. (Control and soaked in distilled water for 24 hrs.) And landed in a cold greenhouse 20.06.2012. Substrate - black soil + peat + coarse sand. Further care of cuttings was in regular watering, shading wooden boards and weeding.

Conclusions

1. To improve the rooting of cuttings plants of Calycanthus advisable to use only some root stimulators. Most stimulant effect better, but only slightly increase the percentage of rooting cuttings from plants kalikantiv vegetative origin.

2. The best results are obtained after processing rooting cuttings kalikantiv certified agents "Ivinor" and "Nortiol." Due to the action of stimulants including managed to increase the percentage of rooting cuttings in Calycanthus occidentalis (which is an important achievement, given the rarity of species in botanical collections). Other drugs, although slightly improved the ability ryzohennoyi kalikantiv, but proved ineffective.

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WINTER HARDINESS THE INTRODUCED SNOWBERRYS (*SYMPHORICARPOS* DUHAMEL) IN CONDITIONS OF KIEV

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There are given the results of studing of the winter hardiness of the alien spicies of Symphoricarpos Duhamel. in the botanical gardens of Kiev. The damage of tissues of 1-year propagules after artificial freezing were estimated. It was determined the potential abilities of the alien species of Symphoricarpos Duhamel. for low temperatures adaptation.

Symphoricarpos Duhamel, Snowberry, Winter-hardiness, frost-resistance, freezing, plants dormancy

For the successful introduction of economically valuable woody plants especially important is their adaptation to the impact of annual low temperatures and other adverse factors in winter, spring and autumn periods. During the evolutionary development of perennial plants produced a certain morphological rhythm, which is formed in specific climates depending on the area of cultivation, and consists of alternating periods of calm repetition (ie all of them - termoperiodychni plants). The depth and duration of rest may be different. It is believed that the deeper mind and its longer term, the longer frosty period with lower temperatures can sustain plants [9, 12].

In the process of joining the rest, providing wintering plants, the most important is their ability to hardening, ie the transfer of resistance to low temperatures (aklimatsiya). The most important changes produced by Acclamation plants appear to accumulate krioprotektornyh substances to prevent ice formation directly in cell development and water-holding capacity, providing resistance to dehydration cells. During deep calm (December, the first half of January) after a period of freezing temperatures -5 ... -15 C plants develop the most frost. During this period, the researcher can determine the biological stability limit - a potential frost aerial parts of plants [9, 12].

To analyze hardiness are two mechanisms for plant resistance to low temperatures, this prevent the formation of intracellular ice in which irreversible cell damage and the development of resistance to dehydration of protoplasm associated with the formation of ice crystals intercellular space [9, 8 16]. It is believed that plants more southern origin develop resistance to low temperatures for the first type - they accumulate cryoprotectants, which reduces the temperature of ice formation in the cell. These plants include, for example, grapes and some stone fruit species [7]. However, this mechanism has a threshold temperature below which is freezing the cells and their death. Although some species - such as plum Ussuriysk and develop resistance to minus 40 ° C, most have low frost within -20 ... - 28 ° C.

Plants north origin, such as birch, while tempering intense lose water (dehydration occurs cells) significantly reduces the risk of ice in them. Under these conditions, plants can develop resistance to -35 ... -45 ° C. As a result of hardening of black currants in the laboratory of frost reached the temperature of liquid nitrogen -196 ° C. However, in terms of tempering dehydration important is the development of high water-holding capacity cytoplasm to save enough for their restoration of functional activity of water. Yet for some crops, such as raspberries, the risk of cell death due to dehydration. This type of damage is called "dry winter." Still, most of the plants are implementing both mechanisms of resistance [12].

The processes occurring in the cells during freezing and ice formation is closely related to the physiological state of cells and especially of the permeability of the membrane structures for ions and water. Because of this property of cells depends on the speed of passing it through water, it proceeds to the intercellular space and, finally, the rate of freezing [5, 8, 13].

Plays an important role and structure of cell walls, which causes the resistance of tissue migration front of ice formation, the penetration of ice crystals in cellular space [15]. Dehydration is accompanied by loss of cell membranes regulatory capacity, as a result there are irreversible changes in the metabolic processes that the following is the direct cause of cell death. The extent of damage from low temperatures mainly determined by the stability of cell membranes and membrane proteins primarily to znevodnyuyuchoyi ice action [7, 13, 2].

To prevent freezing of water in plant cells and tissues functioning system of cryoprotectants, which consists of low molecular weight proteins, carbohydrates and glycoproteins. Cryoprotectants synthesized in plant cells at low temperatures, can prevent or greatly slow down the growth of ice crystals. Hydrophilic proteins, mono- and oligosaccharides, which have krioprotektornyy effect capable of binding a large amount of water. Bound so water will not freeze and not transported. Cryoprotectants begin synthesized primarily in the epidermis and cells surrounding the intercellular cavity, where the most intensive formation of ice crystals during the freezing of tissues [12, 16, 14].

After a period of deep calm plant goes to a state of forced rest, which is due to unfavorable climatic conditions of normal development. This period may be temporary thaw, under the influence of some species may wake up, they activate metabolic processes that further decrease in temperature leads to damage. From a technological point of view, for most regions of Ukraine, forced to rest - the most critical period of the lowest resistance of crop plants to low temperatures.

From the above it is clear that throughout the winter plants are influenced by factors extreme sensitivity of plants which characterizes their hardiness. That is why during the initial introduction is necessary to determine the adaptability of plants to unfavorable conditions and overwintering as one of the most important, the question arises determine levels of hardiness. The most common method is the field, but it takes a long time because of the frequency of winters critical temperatures quite low. It is believed that these winters occur every 10-12 years [1]. Therefore, to accelerate the evaluation of plants to low temperatures is also used and tested them in the laboratory.

Recently more and more widely used method of differential thermal analysis of the processes of ice formation in plant tissues [8, 4, 11, 17, 18]. However, the most common method is freezing laboratory test samples of tissue damage subsequent analysis of anatomical and mikroskopnym method [7, 1, 10].

The purpose of research - to establish actual (field) hardiness introduced plants of Symphoricarpos Duhamel tested in conditions unprotected soil and release them for the most stable species studied traits; explore potential frost selected (nayzymostiykishyh) species of the genus Symphoricarpos.

Materials and methods research. The objects of study were pre-tested plant species of the family Symphoricarpos: Symphoricarpos evening (Symphoricarpos hesperius GNJones), p. Western (S. occidentalis Hook.), p. White (S. albus (L.) S.F.Blake), p. riverine (S. rivularis Suksd.), p. Chenault (S. × chenaultii Rehder), p. rounded (S. orbiculatus Moench), p. soft (S. mollis Nutt.), p. Dorenboza (S. × doorenbosii Krűssm.), P. Mountain (S. oreophilus A.Gray), which reached reproductive age.

Field research was conducted during winter hardiness 2011-2013. At collection sites unprotected soil National Botanic Garden of them. MM Grishko National Academy of Sciences of Ukraine, the Botanical Garden of them. Acad. OV Fomin Kyiv National University. Taras Shevchenko National University Botanical Garden of Life and Environmental Sciences of Ukraine.

The actual hardiness establish a five-point scale icing OA Kalinichenko [3]. The potential frost studied by the method of Horticulture Institute [16], which is based on conducting research anatomomikroskopnyh after direct freezing shoots in a heat chamber. Freezing was performed in the laboratory of Plant Physiology and Microbiology Institute of Horticulture NAAS in the refrigerator for research CRO / 400/40, which is equipped with control temperature field.

For experiments selected shoots (annual branch) of equal strength development and branching order in the middle of the crown of the southern, southeastern and southwestern sides. One repetition selected shoots with 2-3 bushes that each sample was 5-10 shoots; 3-4-fold repetition for each temperature. Each sample was associated with a label in bunches, where recorded: variety, version, date, etc. All samples previously put in plastic bags and placed into the refrigerator.

Freezing all prototypes performed simultaneously, since temperature at which the samples were in the unprotected soil.

Lowering the temperature in the refrigerator was carried out at 5 ° C / h. Control the temperature field in the chamber was carried out using a special system of sensors and digital registrar. As temperature sensors used copper resistance thermometers with a linear dependence of resistance on temperature.

Freezing temperature was -15, -20, -25 and -30 ° C, the duration of exposure - 6 hours. An increase in temperature after freezing was performed at a speed of 2-4 ° C / h. For control samples were used as non promorozhuvalysya.

After freezing the samples were stored in bags on snow. Anatomical analysis was performed on cross sections made with a razor or microtome and mounted on a slide with a pre-image strip glycerol. From each of the shoot done in 3 sections, which are analyzed under a microscope at low magnification (microscope MBS-9). The degree of damage was assessed by a six-point scale. Analyzed separately bark, cambium, wood, core each shoot, and when cut through kidney damage indicator additionally determined the latter. Then summarized overall score damage.

Conclusions

1. Methods of laboratory freezing at -15, -20, -25 and -30 ° C set potential adaptive capacity of most studied of the genus Symphoricarpos (Symphoricarpos Duhamel) to low temperatures. In temperatures -30 ° C vast majority of species of a composite score of tissue damage at least 30 points out of maximum possible 65.

2. most sensitive to low temperatures were fabric tops shoots and interstitials. Among tissue damage had the highest score bark. In control samples bark top of the shoot was damaged from 1.2 to 2.0 points in the middle of - 0.5-1.7 points in the analysis of interstitial tissue damage and kidney - 1,4-2,3 points.

3. Temperature dependence of damage indicates the predominant mechanism for protection against low temperatures through the synthesis and accumulation of cryoprotective substances in the tissue cells, which is typical for the species of southern origin. However, the vast majority of the tested plant species of the genus Symphoricarpos not reached the 50% critical level of tissue damage even at a temperature of -30 ° C. Joined level of damage at different temperatures freezing points to a high enough level aklimatsiyi most studied species Symphoricarpos and a high level of potential frost primarily species S. hesperius, S. × doorenbosi and S. oreophilus.

4. The most actual resistance (winter hardiness) in terms of species observed Kyiv - Symphoricarpos hesperius, S. albus, S. oreophilus, and in some years - S. occidentalis, S. × chenaultii, S. orbiculatus. The main reason is somewhat lowered

actual resistance of one of the most cold-resistant species S. × doorenbosi, and the species S. × chenaulti and S. orbiculatus, apparently is their reliance on the presence of snow cover, which in vivo protects plants from the effects of negative factors.

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BIOLOGICAL CHARACTERISTICS OF PSEUDOMONAS VIRIDIFLAVA ISOLATED FROM SUGAR BEET SEEDS

L. Pasichnyk, L. Butsenko, K. Dvorak

Bacteria Pseudomonas viridiflava were isolated and identified from sugar beet seeds. Its biological characteristics were determined and received results were compared with date of other researchers that also had isolated and investigated this species.

Isolates, properties, identification, Pseudomonas viridiflava

Free of seed infection is one of the basic requirements that ensure high and stable yields of crops. However, because the seeds can spread pathogens that lead to lower quality of seeds and crops to poor performance [3].

On the surface and in the internal tissues of seeds microbiota is very diverse and capable intensively developed [4]. Seeds of sugar beet is also a favorable substrate for a wide range of micro-organisms. In particular the results of the selection of bacteria from the surface of sugar beet seeds, treated chemicals, demonstrating their great species diversity. As part of the microbiota treated seed disinfectants - glomeruli found bacteria of the genera Aureobacterium, Bacillus, Cellulomonas, Enterobacter, Erwinia, Microbacterium, Micrococcus and Pseudomonas [1].

Sugar beets during the growing season affected by many pathogens various etiologies, so it is important to detect pathogens on the surface and inside the seed prior to enabling young plants to avoid infection.

The goal of research - identification of selected isolates of bacteria definition of a number of biological features to prevent early initiation of their infection.

Materials and methods research. For the isolation of bacteria seeds after 15 minutes and rinse with running sterile water were ground with 0.5 ml of saline and used for bacteriological sowing potato agar surface. Bacteria were cultured in an incubator at a temperature of 28 ° C.

The morphological, cultural and physiological and biochemical properties of selected bacteria was determined using classical methods [2, 8], the identification was carried out according to the determinant Burge [6].

To determine the presence of pectinase enzymes studied the ability of bacteria isolates matseruvaty pieces of potatoes and beets. In isolated bacterial isolates was determined as the ability to induce hypersensitivity reaction in tobacco leaves. Pathogenic properties of the isolates was determined by artificial infection of sugar beets and beans. We used a suspension of bacteria (at a concentration 1h109 cfu / ml of sterile tap water), which was applied to the surface of plant leaves, followed by needle injury [2].

The range of fatty acids (FA) in total cellular lipids was studied by gas-liquid hromatomas spectroscopy. For hydrolysis of bacterial cells, lipids and their methylation LCD bacterial mass was maintained at 1.5% - tion H2 SO4 solution in methanol in sealed ampoules for one hour at 80 ° C. Methyl esters LCD extracted with a mixture of ether - hexane (1: 1). The prepared samples were analyzed in hromatomas-spektrychniy system Agilent 6800N / 5973 inert.

Conclusions

Isolated from sugar beet seeds bacteria on the set of morphological, cultural and biochemical, hemotaksonomichnyh attributes identified as members of the species Pseudomonas viridiflava, which are mainly located in epiphytic plants in the state, but under certain conditions can initiate the infectious process.

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BIOLOGICAL FEATURES OF ARSENIC TRANSLOCATION IN CROPS DEPENDING ON FERTILIZER

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The process of arsenic translocation into agricultural crops were investigated. It allowed to define the dependence typical for all studied crops - wheat, rape, soya. The biggest amount of the element was concentrated in the plant rootage, the smallest one was in the generative organs (seed). The fertilizers greatly influenced the As-translocation into the plants. In this case we can clearly see the direct dependence between their amount and volume of arsenic accumulation by the plants.

Arsenic, mineral, organic manures, translocation, agricultural crops.

The plants' absorption of chemicals is the process which is regulated by the organism dependng on the structure and chemical components of cell membranes.

The plant cell membranes are active biocatalysts which provide the directed transport of substances. Chemicals can be transported by the apoplastic and symplastic pathways. The apoplastic pathway is provided to the cell membrane available space due to diffusion and water flow with dissolved substances. This way some random and useless for normal metabolism elements can pass to the plant. The probability of chemical absorption into the plant increases with the increase of their content in the soil solution. Symplastic pathway is optional as the transport of the chemicals takes place in in symplast between cells through plasmodesmata. Chemicals mainly pass in the vegetative parts of plants by the apoplastic transport, while the symplastic transport is common for reproductive organs. The biological filter of symplast protects the plant from the uncontrolled chemicel accumulation. That is the reason why the highest level of chemical substances is mainly observed in the root system of plants, and the lowest level is in stems and leaves, seeds and root crops. Represented by the xylem and the phloem the conducting system of plants provides different routes for metabolites. The chemical substances can pass through the xylem by the apoplastic transport to the plant's organs, and the concentration of elements depends on the xylem vessels amount as well as on the concentration of chemicals in the solution which is in the vessels. According to Y. Alekseiev (1987) the critical arsenic concentration in plants, which reduces its performance by 10%, is 20 mg / kg of dry matter [1,3].

The aim of the research is to explore the processes of arsenic translocation in crops under the influence of organic and mineral fertilizers.

Research materials and methods. The process of arsenic translocation from soil to plants was studied under the conditions of field experiments at the Institute of Agroecology of UAAS. The three-field crop rotation is the following: spring wheat - spring rapeseed - soy. The soil is gray sandy clay loam forest soil. General agriculture cultivation is common for a given soil-climatic zones. The scheme of the experiment was supposed to study these systems fertilization:

- spring wheat: control (without fertilizers); $N_{150}P_{100}K_{100}$; $N_{75}P_{50}K_{50}$ + sideline products + green manure; $N_{10}P_{10}K_{10}$ + sideline products + green manure; organic fertilizers;

- spring rapeseed: control (without fertilizers); $N_{120}P_{100}K_{90}$; $N_{60}P_{30}K_{45}$ + sideline products + green manure; $N_{20}P_{10}K_{10}$ + ssideline products + green manure; organic fertilizers;

– soy: control (without fertilizers); 2) $N_{40}P_{60}K_{60}$; $N_{20}P_{30}K_{30}$ + sideline products + green manure; $N_{10}P_{10}K_{10}$ + sideline products + green manure; organic fertilizers;

Plant samples were taken in the phase of full ripeness, analyzed the underground and above-ground vegetative organs (root, stem, leaves) and generative organs (grain). Soil samples were taken simultaneously with plant samples from 0-20 cm layer. Sampling of soil and plants was performed according to conventional methods.

The arsenic determination in the plant samples was performed after the prior ashing of plant material with the means of photocolorimetric method [ТУ У6- 14005076.041-2000].

The research results. It is known that the fertilizers significantly affect the admission process of the nutrients and toxic elements from the soil to the plant organs. The investigation of the effect of different combinations of mineral and organic fertilizers, which were carried on the gray forest soils, showed a significant influence on the process of translocation and redistribution of arsenic in the crops.

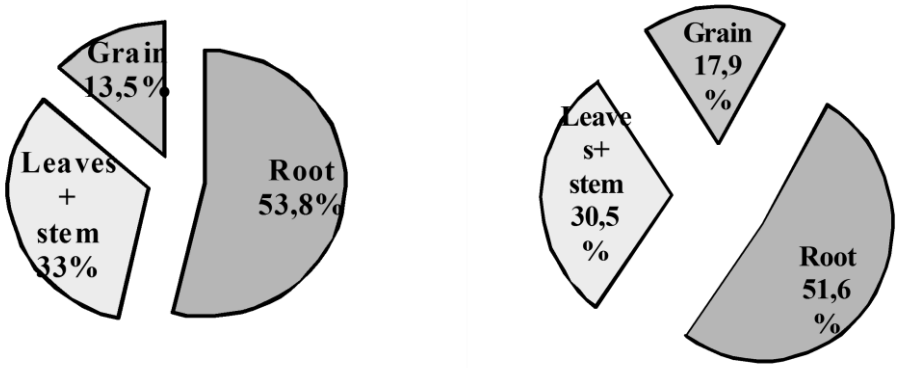
The results of the studies of the arsenic distribution in organs of spring wheat showed that the fertilizers increased translocation activity from the soil. While using the mineral fertilization system (by introducing the maximum dose of fertilizers $N_{150}P_{100}K_{100}$) the arsenic content in the spring wheat roots was 4,9 mg/kg compared to 2,8 mg/kg on the control (no fertilizer). The high content of arsenic was observed in aboveground vegetative and generative organs of wheat. It was 2,9 mg/kg in the leaves and stems, and 1,7 mg/kg in grains compared to 1,7 i 0,7 mg/kg on the control (no fertilizer).

While using the organic and mineral fertilization system ($N_{75}P_{50}K_{50}$ and $N_{10}P_{10}K_{10}$ against a background of green manures) led to the As transition activity reduction from soil to plants, and the content of the element in the root system decreased to 3,9 and 3,2 mg/kg. In the embodiments of the application of mineral fertilizers doses $N_{75}P_{50}K_{50}$ i $N_{10}P_{10}K_{10}$ compatible with the organic content of the element in the leaves and stems were only 2,3 i 1,9 mg/kg, and

1,2 or <0,05 mg/kg in grain.

Thus, the studies have shown that the high doses of fertilizers ($N_{150}P_{100}K_{100}$) stimulated the arsenic absorption in the wheat plants under the influence of the relative content, and the level of arsenic in the grain increased from 13.5% to 17.9%. At the same time the number of elements in the root system and aboveground vegetative organs of wheat decreased, so the fertilizers slightly decreased the protective ability of the root system of wheat plants against the arsenic contamination of the generative organs (picture 1).

The highest capacity for accumulation of arsenic in both underground and overground in the vegetative mass was observed at the spring rapeseed. While using the fertilizers ($N_{120}P_{60}K_{90}$) the arsenic content in the roots increased from 2,1 mg/kg on the control (no fertilizer) to 8,3 mg/kg. The maximum arsenic accumulation in vegetative organs and grain was also observed with the introduction of high doses of fertilizers ($N_{120}P_{60}K_{90}$), the arsenic accumulation increased from 1,3 and 0,6 to 6,1 and 2,1 mg/kg. In general, the use of the high doses of the fertilizers resulted in the higher As content in the root system in 4,0 times, the leaves and stems in 4,7, corn in 3,5. The use of organic and mineral fertilizers helped reduce arsenic transport to plants. So, when making the moderate doses of fertilizers ($N_{60}P_{30}K_{45}$ і $N_{20}P_{10}K_{10}$) the content of arsenic significantly decreased compared to the control (no fertilizer) and was <0,05 mg/kg.



A **B**

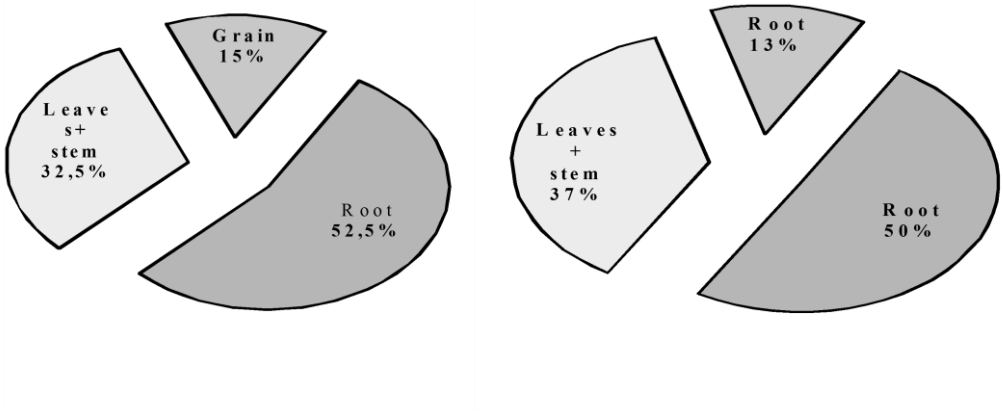
Picture 1. Fertilizers' effect on arsenic distribution in the organs of spring wheat:
A – control (no fertilizer); B – $N_{150}P_{100}K_{100}$

The studying of the fertilizers impact on the As redistribution in the organs of the spring rapeseed showed that the element accumulation in overground vegetative mass is activated under their influence, which is needed to be taken into consideration when using rape to feed farm animals. The As content in the leaves and stems increased from 32,5% to 37,0%, while there was the element decrease in the root system and grain (picture 2).

The soy showed the lowest ability to accumulate arsenic among all the crops that were studied. As was seen only in trace amounts in the grain regardless to the doses of the mineral fertilizers. This is very important because

soy is used for the dietary and baby food manufacture.

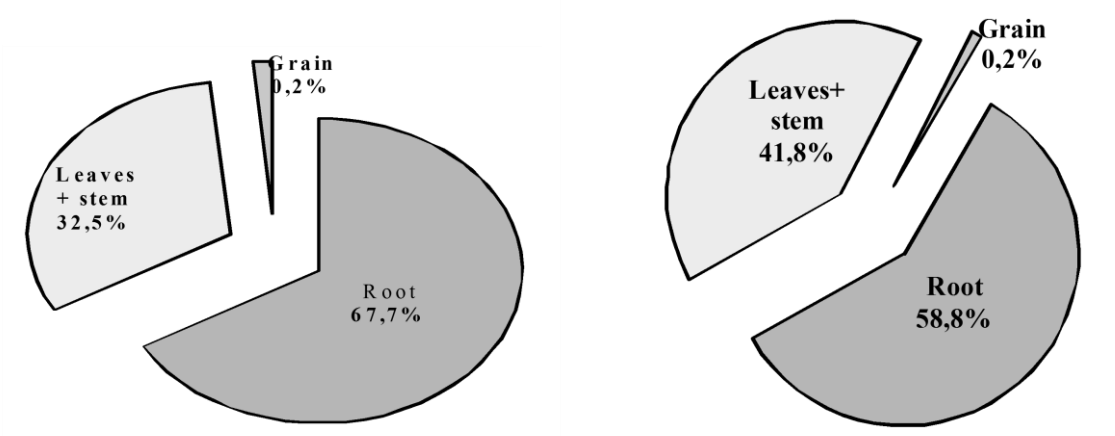
The results of studies of the fertilizers' effect on the element translocation have shown that the content of arsenic in making maximum dose of fertilizers $N_{40}P_{60}K_{60}$ in the soy root system increased in 0,57 times, in 1,3 times in the overground vegetative mass compared to the control (no fertilizer) (picture 3).



A **B**

Picture 2. Fertilizers' effect on arsenic distribution in the organs of spring rapeseed
A – control (no fertilizer), B – $N_{120}P_{60}K_{90}$

The use of organic-mineral fertilization reduced the arsenic transition activity to the soy plants. While using the fertilizers $N_{10}P_{10}K_{10}$ compared to green manure the element content in the vegetative and generative organs of the culture decreased to the trace amounts. The usage of the $N_{40}P_{60}K_{60}$ decreased the protective function of the root system and allowed the accumulation of arsenic in the overground vegetative mass, so that its amount in the leaves and stems increased from 32,5 to 41% (picture 3).



A **B**

Picture 3. Fertilizers' effect on arsenic distribution in the organs of soy
A – control (no fertilizer), B – $N_{40}P_{60}K_{60}$

The studies on the cereal, legume and oil crops (wheat, spring rape and soy) have shown the absolute correlation between the accumulation of arsenic by plants and the use of the mineral and organic fertilizers. In the ecotoxicological research the biological absorption coefficient is used to characterize the process and to show the intensity of the chemical absorption by a plant [2]. The research has found that the arsenic absorption coefficient varied from 0,01 to 0,94, and it was dependent on the crop, plant organs and systems of fertilization (table).

So the studies of the arsenic translocation process in crops have revealed the common dependence of all studied cultures - wheat, rapeseed and soy. The largest number of arsenic was seen in the root system of plants due to their protective function against the toxic substances, and the lowest was in the generative organs (grain). The fertilizers significantly influenced the As translocation in the plants, so that a direct correlation between the number and amount of the arsenic accumulation was observed.

Fertilizers' influence on the arsenic absorption coefficient

Variants	Biological absorption coefficient		
	root	leaves+stem	grain
Spring wheat			
Control (no fertilizer)	0,80	0,49	0,20
$N_{150}P_{100}K_{100}$	0,91	0,54	0,31
$N_{75}P_{50}K_{50}$ sideline products + green manure	0,87	0,51	0,27
$N_{10}P_{10}K_{10}$ + sideline products + green manure	0,94	0,56	< 0,02
Spring rapeseed			
Control (no fertilizer)	0,70	0,43	0,20
$N_{120}P_{60}K_{90}$	0,87	0,64	0,22
$N_{60}P_{30}K_{45}$ sideline products + green manure	0,76	0,40	< 0,01
$N_{20}P_{10}K_{10}$ + sideline products + green manure	0,62	0,38	< 0,01
Soy			
Control (no fertilizer)	0,70	0,33	< 0,02
$N_{40}P_{60}K_{60}$	0,75	0,52	< 0,01
$N_{20}P_{30}K_{30}$ sideline products + green manure	0,75	0,47	< 0,01
$N_{10}P_{10}K_{10}$ sideline products + green manure	< 0,02	<0,02	< 0,02

Conclusion

The studies on the cereal, legume and oil crops (wheat, spring rape and soy) have shown the absolute correlation between the plants' arsenic accumulation and the use of the fertilizers. The greatest ability to accumulate arsenic was observed at the spring rapeseed. According to the results the biological absorption coefficient of the arsenic increased from 0,01 to 0,94,

depending on the crop and fertilization systems.

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Досліджено процеси транслокації миш'яку у сільськогосподарські культури, що дозволило виявити залежності, характерні для всіх культур, що вивчалися – пшениці, ріпаку, сої. Найбільша кількість елемента концентрувалася у кореневій системі рослин, найменша – у генеративних органах (зерні). Добрива істотно впливали на транслокацію As у рослини, при цьому простежувалася пряма залежність між їх кількістю та розмірами нагромадження миш'яку рослинами.

Миш'як, мінеральні, органічні добрива, транслокація, сільськогосподарські культури.

Исследованы процессы транслокации мышьяка в сельскохозяйственные культуры, что позволило установить зависимость, которая является характерной для всех изученных культур – пшеницы, рапса, сои. Наибольшее количество элемента накапливалось в корневой системе растений, наименьшее – в генеративных органах (семенах). Удобрения влияют на транслокацию As в растениях, при этом прослеживается прямая зависимость между их количеством и размерами накопления мышьяка растениями.

Мышьяк, минеральные, органические удобрения, транслокация, сельскохозяйственные культуры.

UDC 582.916.21 (477.41)

COMPOSITION AND DISTRIBUTION OF SPECIES OF THE GENUS VERONICA (*VERONICA* L.) ON THE TERRITORY OF KYIV AND KYIV REGION

I. Shvets

These data about the composition and distribution of the autochthonous species diversity genus Veronica (Veronica L.) in the city of Kiev and Kiev region. were analyzed collections of botanical gardens and the representation of varietal and species range on the market in Kiev and Kiev region.

Veronica L., speedwell, classification, area of distribution, species diversity, diversity of varieties, the autochthonous species

Veronica (Veronica L.) - genus of flowering plants submitted odn-, double and multi-flowering herbaceous plants, rarely shrubs, has about 300 species [13, 6, 1].

The genus Veronica (Veronica L.) belongs to the tribe Veronica (Veroniceae), Fig-wort family (Scrophulariaceae), order Labiatae (Lamiáles), class bipartite (Magnoliópsida), love Flower (Magnoliophyta). The genus is divided into sections: Beccabunga, Chamaedrys, Cochlidiosperma, Derwentia, Hebe, Pellidosperma, Pentasepalae, Pocilla, Pseudolysimachium, Stenocarpon, Synthris, Triangulicapsula, Veronica [13, 6, 12, 4, 2].

For the most common hypothesis genus Veronica has Australian origin [6]. According to this hypothesis, the families and Veronica Hebe (including Parahebe and Pigmaea) descended from common ancestors. They began to form (obviously very early Paleogene) as a separate group from the period when Australia lost ties with New Zealand.

Habitat of the genus Veronica is very large and covers almost half the land of the world, except Antarctica (Figure). He includes almost all of Eurasia, except the far north, northeast and east part of Siberia; Islands of the Pacific and Indian Oceans; Africa within the northern hemisphere; North America, approximately south of 62 °

north latitude; Central and part of South America and Australia to the south of 30 ° south latitude, and Australian habitat fragment isolated from the rest of [6].

Species diversity in the genus Veronica America and Africa insignificant. In North Africa - about 11 species in North America - 15 species [13].

In Australia, the number of species is less than 12 on the Iberian Peninsula about 35, the Apennine Peninsula - 29, Germany - 33 Scandinavia - 22 UK - 19 in the Balkans (Greece and Bulgaria) - 42, in Asia Minor (Turkey) - 47 in Iran - 38, Syria and Lebanon - 22 Pamir-Altai and Tien Shan - 31 Himalayas - 30, China - 24 in Japan - 16 in the European part of the USSR (Crimea) - 37 Caucasus - 49 [6]; in Russia - 79 [3]; in Ukraine - 75 species [10].

The purpose of research - to establish the species and varietal diversity of the genus Veronica (Veronica) and its distribution on the territory of Kyiv and Kyiv region.

Materials and methods research. The study was conducted during 2011-2013. The objects of study were the types and varieties of the genus Veronica in the city. Kyiv and Kyiv region.

According to the literature found the natural habitat of species of Veronica in the world, m. Kyiv and Kyiv region. A comparative assessment of the species composition of the genus. The data on the origin and modern systematic position of the genus Veronica.

Research indigenous species and varietal diversity actual kind of Veronica in the city. Kyiv and Kyiv region conducted by route survey.

Assortment of exotic species of Veronica determined to collection sites of botanical gardens. Kyiv: National Botanic Garden of them. MM Grishko National Academy of Sciences of Ukraine; Botanical garden named after O. Fomin Kiev National University. TH Shevchenko, Ukraine NUBiP Botanical Gardens, Arboretum Syretska.

Conclusions

1. At the m. Kyiv and Kyiv region there are 24 indigenous species of Veronica (Veronica L.), which is about 8% of the total number of species of the genus.

2. The collection of botanical gardens. Kyiv found 12 species of the genus: Veronica chamaedrys (V. chamaedrys L.), Veronica tyrlychna (V. gentianoides Vahl),

Veronica gray (V. incana L.), Veronica longifolia (V. longifolia L .) Veronica officinalis L. (V. officinalis L.), Veronica samosylovydna (V. teucrium L.), Veronica Armenian (V. armena Boiss. & A.Huet), Veronica early (V. praecox All.), spiked speedwell (V. spicata L.), Veronica Crimea (V. taurica Mill.), Veronica double (V. polita Fr.), Veronica plyuscholysta (V. hederifolia L.), which is about 4% of the total number of species of the genus.

3. Types of genus Veronica in the range of garden centers and nurseries are ornamental varieties Veronica spiked (V. spicata), longifolia (V. longifolia) and sessile (V. rrostrata). Varietal diversity of the genus is represented only 1-1.5% of the global range of varieties. Its advisable to increase considerably with the purpose of introduction and widespread use of the test in ornamental horticulture under steppes of Ukraine, as most varieties of species of Veronica global breeding a high level of decoration, winter hardiness and drought resistance.

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COMPARATIVE ANALYSIS OF LOCAL RARE DENDROYEKZOFLOR OF ARTIFICIAL RESERVE PARKS OF FOREST-STEPPE OF UKRAINE

N. P. Stepanenko

The results of the comparative analysis of floral for the rarity dendroekzoflory of objects of artificial origin of the nature reserve fund of the Forest steppe of Ukraine are shown in the article. Figures of the between categorical and intercategorical, regional and interregional correlation links are directed, also the significant correlation interdependence between major objects is demonstrated. The most significant links between the compared dendrosozoflor are selected with the help of the visualization methods of the floral analysis.

Rarity dendroekzofit, correlation links, botanical gardens, arboretums, the Forest steppe of Ukraine, IUCN Red List, the European Red List

An important reason for the separation of floristic regions are the similarities and differences in species composition of plants in some parts of the study area [9]. Method convergent floral zoning static [8] and is based on the account of the flora species with further comparing the ratios Association. On the basis of the number of species of flora and two compared to the number of common species are indicators calculated similarities or differences between these floras. To calculate these indicators in practice, comparative studies of natural flora floral use different factors - Zhakkara,

Czekanowski-Sørensen, Ekman, Stuhrena-Radulesku, Preston et al. [8, 9, 6, 10, 7]. Comparative analysis for rare natural flora spent many researchers [4, 12]. For comparison dendroflora introduced above methodological procedure has not yet been applied.

The objects of our study was the rarity fraction of all species of life forms of woody plants in the broadest sense (trees, shrubs, woody vines, shrubs, shrubs) listed in the official "red list", particularly in the Red List of the International Union for Conservation of Nature and Natural Resources (further IUCN) [13, 14], the European

Red List of animals and plants that are endangered on a global scale [2], the Berne Convention [5]. In general these types of plants we call dendrosozofitamy [3].

The purpose of research - identifying correlations dendroekzoflory rare, because for a long history of introductions botanical gardens, dendrological parks and park monuments of landscape architecture steppes of Ukraine introduced to the culture of a significant number of rare species of woody plants. According to our data [1, 3] on the objects of natural reserve fund (NRF) steppes of Ukraine artificial increases 171 rare species of exotic dendrofitiv protected "red list" of international significance.

Materials and methods research. To determine the correlation dendrosozoflor used statistical method comparison biota (Jaccard index) [8, 9, 6, 10], the data visualized methods of graph similarity [11].

Article written on the basis of introduction as a method of preservation of rare plant species outside their natural habitats. It is known that the cultivation of species of woody plants listed in the international "red lists" artificial protected parks in Ukraine is a part of expansion of introduction habitats. Ultimately, this greatly increases the degree of representativeness and improves security saving the world. Therefore, a comparative analysis of the floristic it is also important to develop theoretical and practical foundations for further introduction dendrorarytetiv ex situ.

Analysis affinity vintage dendroekzoflor possible only in terms of set theory, which is the most mathematically correct parameter called Jaccard index (Sj) (Eng. Jaccard Index) [11]. It shows the ratio of the number of species found in biota both at the same time, the number of species found only in one of the biota. Where a- number of species in one floristic list; b- number of species in other floristic list; c- number of species common to both floristic lists. The limits of this coefficient ranges from 0 to 1. The value of Sj = 1 means that the floristic lists are the same. Our choice for the calculation of this index arithmetic mean similarity for rare dendrosozoekzotiv based on the priority of its development and use, simplicity and convenience for the calculations.

To clarify categorical and mizhkatehorialnyh links dendrosozoflor compiled lists of rare dendroekzofitiv for each object region Research and calculated for each pair of objects coefficient of similarity (Zhakkara). Indicators recorded in pairwise

comparisons of similarity matrix, where comparable dendrosozoflory located in rows and columns, at the intersection where indicated value of similarity between them. The table presents the correlation matrix similarity rerytetnoyi dendrosozoflory for major protected natural reserve fund steppes of Ukraine. To visualize the correlation between the studied parameters listed in the table in Figure shows a graphical representation of this matrix. With the help of graphs mathematical model dendrosozoflor similarities between which there are significant correlations mutual dependence. To construct a two-dimensional scheme - the graph (Figure) dendrosozoflory to be compared, shown as a circle, and the similarity between them - in the form of lines that connect them. The degree of similarity indicates line width. It can express the graph structure of the most important links between comparable dendrosozofloramy.

Conclusions

As a result of comparative analysis of the floristic to meaningful correlation reciprocal relationship between dendrosozofloramy NBS them. MM Grishko National Academy of Sciences of Ukraine and BS them. OVFOMINA Kyiv National Taras Shevchenko University. Found a close correlation between species similarity dendrosozoflor botanical gardens and arboretums steppes of Ukraine. It was observed negligible correlation dependence between dendrosozofloroyu m. Kyiv region and other areas of research.

Mathematical models of similarity dendroekzoflory allow to develop theoretical and practical basis for the further introduction and preserve the world's rare dendroriznomanittya ex situ.

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INTRODUCTION OF NEW KINDS IS A BASIS OF ENRICHMENT BIO-DIVERSITY PLANTS AND SOURCE OF WIDENING CROPS USING IN GARDENING

V. Krasovski

Introduction of Fig ordinary (Ficus carica L.) in the forest-steppe zone of Ukraine is considered as an inalienable link of enriching biological diversity and introduction fruit crops with useful properties. It was given the number of morphological and bioecological special features of the species that favour for growing F. carica in the agronomical climatic conditions of forest-steppe in the unprotected soil as covered crop. It was characterized a root system of the crop in the research region as rather winter durable. The such indicator is essential for organization of the following introduction tests. It was proposed the own way of forming the crown of fig ordinary for covering and protection in the autumn-winter period.

Fig ordinary, introduction, forest-steppe of Ukraine, winter stabling, crown, forming, autumn-winter covering.

Development of Horticulture strongly depends on the introduction of a new culture of fruit plants because of their introduction. Introduction is an important factor enrichment plant resources, including an increase in biological diversity and kulturfitotsenoziv extremely important means of environmental optimization [15].

In carrying out studies of introduction play a big role botanic gardens, including the National Botanic Garden of them. MM Grishko National Academy of Sciences of Ukraine, which recently investigated subtropical fruit crops such as Ziziphus true (Zizyphus jujuba Mill.) And Virginia persimmon (Diospyros virginiana L.) and proved their potential value to the steppes of Ukraine. The new crop of this area belongs to a real fig (Ficus carica L.) with shovkovytsevyh family (Moraceae Link.), Since the last time there much more attempts to grow it in the open ground. This assist further development of the practical application of theory introduction of woody plants [3, 4,

7, 8, 13, 15], the output introduktoramy breeders and more resistant varieties of figs growing conditions [6, 14] and temperature regime change in global climate side warming, which causes plants to survive the winter. Positive effect on plant introduction and urban environment of cities, which in the autumn and winter on the territory of individual fragments formed special microclimatic conditions of the ecosystem due to protection from the wind, and in metropolitan areas - additional heat formed as a result of radiation heating systems, buildings, and industrial equipment transport.

Figs course that is also the name of a fig tree or figs guilty berry - deciduous Tree, and under certain conditions kuschovydna plant with shyrokorozlohoyu crown. The leaves are large, up to 20 cm in length, divided into 3-7 pieces, with wavy edges, alternate. In the leaf axils developing shortened generative shoots, which are formed buds.

Figs characterized by inherent only to it features kvitkuvannya, pollination and fruiting [5, 6, 14].

Fruit - nut odnonasinyy developing in much rozroslomu inflorescence, which form large seed heads. Seed heads are round or pear-shaped, 3 to 8 cm in diameter with a mass of 30 to 150 g color depending on their variety - from white to dark purple. Fig stems solely as a valuable food containing sugars, vitamins, minerals, have a high taste and help treat some diseases [1, 10, 12].

Today there are many varieties of figs, characterized yield, pollination way, shape and size of fruit frost [6].

Propagated by seed and vegetatively figs. Plants grown from rooted cuttings begin to bear fruit in 2 - 3 years.

Homeland figs considered Asia, from where it spread like fruit crops in other subtropical areas. The most common figs came to Turkey, India, Iran, Afghanistan, Pakistan, Central Asia and the Caucasus. In these areas, figs getting enough heat and light necessary for normal growth and fruiting.

Figs was widespread and the south of Ukraine, Crimea and in southern Krasnodar region. In the Krasnodar region not covered figs from Sochi to Taman. In the vicinity of Krasnodar figs grown as vkryvnu culture.

A number of morphological and bio-ecological features figs promote opportunities to cultivate it in the steppes of Ukraine.

First of all figs in their development has a pronounced period of rest, which is a prerequisite for growing in temperate climates. Figs rapidly growing culture, lightweight soil conditions, drought-resistant. Early entry into the fruiting period, durability, high regenerative capacity in the event of damage, the ability to easily transfer Agrotechnical influence on the formation of the crown, invulnerability pests and diseases - these are inherent properties of figs in full compliance with the requirements of modern gardening.

In the absence of a single steppes of Ukraine insects that pollinate fig exercises - small wasps blastofahy (Blastophaga psenes) with family Agaonidae, the process of introduction will provide Parthenocarpic varieties [6, 14], which are widespread in this area as culture under glass.

Figs can withstand without shelter transient decrease in winter temperatures down to minus 15 ° C. When the temperature drops to minus 18 ° C is significant damage to the crown shoots, and at -20 ° C damaged the whole aboveground part of the plant [14] because the low hardiness crown plants grow figs in the steppes of Ukraine is possible only as vkryvnu culture. At the same time we have studied Parthenocarpic varieties of figs Dalmatia, Brunswick, Hybrid Sheferista, Kerch, black Muason have well-developed root system, resistant to low winter temperatures in the region of research. So in the introduction F.carica in steppes of Ukraine unsolved problem is primarily a protection of plants from low temperatures in autumn and winter and the formation of the corresponding crown to make her protection.

The purpose of research - enriching the species composition of fruit crops in the steppe zone of Ukraine through the introduction of Ficus carica L.

Materials and methods research. The object of research - the growth and development of Ficus carica L. and methods of protection against low winter temperatures in the steppes of Ukraine. Methods - formation, phenological observations, biometric measurements.

Conclusions

Improving ways to protect the crown of fig normal low temperature in autumn and winter makes this culture promising for introduction in the steppes of Ukraine, which aims to increase the diversity of plants and a wider variety of fruits with useful properties.

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THE DEVELOPMENT OF MOLECULAR BIOLOGICAL SYSTEM BASED ON POLYMERASE CHAIN REACTION AND OPTIMIZATION FOR DIAGNOSTIC OF POTATO SPINDLE TUBER VIROID

I. Antipov, K. Grynchuk, M. Melnychuk

Polymerase chain reaction (PCR) diagnostic test systems for the identification of potato spindle tuber viroid has been developed. Laboratory research of created PCR diagnostic system has been carried out and the conditions of amplification reaction realization have been optimized.

Diagnostic system, PCR, potato spindle tuber viroid

Viral diseases of potatoes lead to a dramatic reduction in yield and quality of products. Potato virus among the first to have been identified as pathogens of major economic importance [1]. Because now there is no remedy against viral diseases The issue of monitoring and identification to prevent their proliferation [2]. Veretenovydnosti viroids potato (VVBK) was first described in 1922 by WH Martin in the United States. In Ukraine, first identified in 1932. VVBK belongs to the Pospiviroidae, kind Pospiviroid. Viroids presented single-circuit closed circular RNA molecule length of 356-375 nucleotides. Replication occurs in the nucleus [9].

Symptoms depend on the type of plant varieties and environmental conditions [3, 8]. On potato plants are as follows: for

aboveground plant parts are typical thin erect stems and stalks, are longer than healthy plants; smaller share leaf with wavy edges and a tendency to bend inwards; sharper angles between stems and cuttings; leaves near the ground noticeably shorter and erect, contrasting with healthy plants, leaves lying on the ground, have a dark plate [7].

For diagnosis and identification VVBK need to use a set of highly specific methods. Serological methods are not applicable for lack of viroids protein coat, or any

specific proteins and low antigenic properties of RNA [4, 9]. Using electron microscopy also is not a very effective method for diagnosing VVBK [5].

To diagnose VVBK effective methods are those where used as a target gene viroids, one of which is a method using polymerase chain reaction (PCR), thus increasing the number of even small concentrations of specific nucleic acid fragments.

The purpose of research - development kits for diagnosis of viroids veretenovydnosti potato PCR conditions and optimization of reaction amplification.

Materials and methods research. Material for analysis were leaves of potato plants with symptoms selected during the growing season.

For extraction of total RNA using commercial fish set-sorbet-B (AmpliSens, Russia). Reverse transcription reaction was carried out using a commercial set Reverta-L, (AmpliSens, Russia) according to the manufacturer's recommendations. PCR was performed in the reaction mixture volume of 15 ml. Terms PCR: initial denaturation 94 ° C - 5 min; 35 cycles of denaturation: 94 ° C - 30 s, annealing of primers 55 ° C - 30 C, the synthesis of 72 ° C - 30 C, the final synthesis of 72 ° C - 7 min. Electrophoresis was performed in 1.5% agarose gels, which were stained with ethidium bromovym concentration of 0.5 mg / ml, was investigated in the rays of ultraviolet light.

Conclusions

Developed its own test system for the diagnosis and identification veretenovydnosti viroids potato-based PCR, optimized PCR conditions and set optimal performance components and reaction temperature annealing of primers for PCR analysis.

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AUTECOLOGICAL FEATURES OF VARIETIES *LOLIUM PERENNE* L. OF DOMESTIC BREEDING

O. Leshchenko

Reviewed ecological and biological characteristics of plant varieties of Lolium perenne L. of Ukrainian breeding. Definitely the most promising varieties of domestic breeding for creating lawns. The results of the studies found that varieties Andriana-80, Leta and Lytvynivskyy-1 are the best for used as basic components for grass mixtures, varieties Sviatoshynskyi and Orion – for sowing during the repairing of lawn coverage.

Lolium perenne L., the lawn kulturfitotsenoz, variety, grass mixture

Pasture cover embellishment of any of landscape composition, their popularity in gardening populated areas around the world is growing every year. Examples of use in landscaping turf surfaces are known several millennia - descriptions Chinese imperial park Cheu (hundreds of years BC), villas in Tuscany Pliny the Younger (62 - 114 years. BC) and others [2].

By creating a quality kulturfitotsenozu should involve adapted to our climate plants, but in Ukraine there is a fashion pasture grass mixtures foreign selection, which for a short period of time lose their decorative and vitality. L. perenne L. is one of the most important crops for feed as well as for lawn business in temperate regions of the world [9]. In the case of a lawn for various purposes in Ukraine using only 27% of the available range of forage grasses [8], so the creation of turf surfaces with grades of domestic selection is important.

The purpose of research - autekolohichna rating grades L. perenne L. Ukrainian selection.

Materials and methods research. The objects of research served L. perenne L. varieties Ukrainian selection: Adrian, 80, Lytvynivskyy-1, summer, Orion, Svyatoshinskiy. The research (field and laboratory) carried out in 2008-2012. At the

NSC "Institute of Agriculture" NAAS Ukraine. Laboratory studies were performed in the department of plant breeding and seed production of forage crops, field - research in the fields of NSC "Institute of Agriculture" NAAS Ukraine.

Assessment sowing qualities of seeds (weight of 1000 pcs., Germination energy, germination) five grades L. perenne L. conducted in accordance with GOST 12038-84. Seeds in the amount of 100 pieces. each variety were sown in Petri dishes on two layers of moistened filter paper and germinated at a temperature of + 20 ^{0}C.

In the field seeding five grades L. perenne L. conducted a special drill NWT-3.6 in four versions with different rate of sowing in triplicate.

Standard rules seeding served during laying seed crops [7]. Standard rules seeding diploid (Adrian, 80, Lytvynivskyy-1, summer, Orion) and tetraploid (Svyatoshinsky) grades were 20 and 30 g per 1 m2 respectively, continue seeding rate increased 2-4 times in order to analyze the state of dependence turf from sowing density per unit area. Area of research areas amounted to 10.5 m2.

Evaluating the overall decorative turf coverage carried by the degree of closing ground vegetative organs of plants and identified a five-point scale (AA Laptev, 1983) [6].

Analysis destruction of vegetation brown rust performed on a scale E.E.Heshele [4] with modifications: the research area of 10.5 m2 plots diagonally singled to 4 area 0.2 m2 each.

Conclusions

1. The results of the research established that L. perenne L. varieties Ukrainian selection Andrian-80, Lytvynivskyy-1, summer, Orion, Svyatoshinskiy the absolute weight of 1000 grains vidselektovani well. On the basis of "seed germination" all varieties have high seed germination.

2. Assessment of vigor seed varieties 5 L. perenne L. indicates that the total seed germination was high and ranged from 93-95%.

3. Decorative monovydovoyi turf grades 5 L. perenne L. in the first two years of growth was high (5 points) gradually decreased and the quality of the third or fifth years of cultivation placement shoots transformed from a close-diffuse to the single-separate varieties Lytvynivskyy-1 and Orion Shtvchenkovskiy.

4. On the basis of the research can be recommended varieties Andrian-80 as the most stable and summer to brown rust lesions.

5. We determined that L. perenne L. varieties Ukrainian selection suitable for creating high-quality lawn and they can be placed on the following sequence: Adrian, 80, summer, Lytvynivskyy-1 and Orion Shtvchenkovskiy.

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SPECIES DIVERSITY OF THE *FUSARIUM* PATHOGENS OF CHICKPEA ROOT ROT

M. Kyryk, Y. Taranukho, O. Dyachenko

The species composition of Fusarium root rot pathogens of chickpea is defined. Eight species of fungi Fusarium Link are extracted and identified. The frequency of isolation of pathogens regarding to different phases of vegetation of culture is researched.

Chickpea, root rots, pathogens, Fusarium

Legumes are high in grain and forage balance of agriculture. They play a special role in the production of vegetable protein [7]. By this measure chickpeas (Cicer arietinum L.) ranks third in the world after soybeans and peas. Its seeds have high protein content (up 34%) and fat (4-7%) [6]. This culture has low growing conditions. However chickpeas are often amazed by phytopathogenic organisms that cause significant crop shortfall (60%) [10]. Among the pathogens characterized by widespread and lead to rotting of the root system of plants, a significant place belongs soil fungi [12]. At the same time, the complex soil pathogens its life products (mycotoxins) contaminating grain products, so that it is dangerous to use [3].

Depending on the pathogen following types of root rot legumes: afanomitsetna, Fusarium, ryzoktoniozna, and pitiyeva askohitozna basal [5]. Defeat chickpeas fungi of Fusarium Link., and types of Rhizoctonia solani Kuehn, Rh. bataticola (Taub.) Butler, Pythium ultimum Trow. Yet and P. aphanidermatum (Edson) Fitzp. registered in India [15] Poland [14], Spain [13], Pakistan [10] and other countries.

According to the literature of the above types of root rot on Nuti dominated by Fusarium root rot etiology, characterized by broad habitat and exhibit pathogenicity to plants 52 families 200 species quite difficult their control [1, 3].

In Ukraine lesser known chickpea root rot. About these are just some fragmentary information in the references. Therefore, continuous monitoring of disease chickpea root extraction and identification of pathogens is important.

The purpose of research - defining species composition of root rot pathogens of chickpea in terms NUBiP of Ukraine "Agronomy Research Station", as well as the frequency of isolation of pathogens depending on the phase of growth culture.

Materials and methods research. The objects of research were chickpea plants with typical symptoms of root rot. Field experiments were conducted in terms of the unit of the National University of Life and Environmental Sciences of Ukraine (NUBiP of Ukraine) "agronomic research station" Kyiv region. Sampling and analysis of samples was performed by the method of M. Kirik designed to determine the root rot of peas [4].

Isolation root rot pathogens were carried out under conditions in vitro in problem research laboratory "Mycology and Phytopathology" Phytopathology department named after VF Peresypkin NUBiP Ukraine. For this underground stems of affected plants were cut into pieces 1.5-2 cm in length and surface treated 96o alcohol (a few seconds). Then thoroughly disinfected particles washed in distilled water, znevodnyuvaly sterile filter paper and transferred to Petri dishes on potato agar.

At the optimum temperature for development of the fungus in 1-3 days developed mycelium, and the 7-10th - sporification. The identity of the remote fungi was performed 2 weeks after their cultivation on nutrient media, using morphological characteristics of species fungi of the genus Fusarium, presented in the works of VI Bilai [2] VV Kotova and others. [9] M. Stepanova et al. [8]. Objects photographed using a microscope LOMO MYKMED-5 HS 0594.

Conclusions

As a result of studies found that in a NUBiP of Ukraine "agronomic research station" Kyiv region in chickpea crops found Fusarium root rot etiology. Identified 8 species of fungi of the genus Fusarium Link. Among them, the greatest frequency of isolation characterized species Fusarium moniliforme Sheld. (48,9-43,2%) and Fusarium solani (Mart.) App. et Wr. (20,1-24,3%).

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REGENERATION OF SELECTION VALUABLE SUNFLOWER GENOTYPES

M. Parii, S. Sytnik, D. Zhukov's

Regeneration ability for three different explant types of two Ukrainian sunflower genotypes was investigated. Efficiency of regeneration for used culture system was about 8% in case of hypocotyl and cotyledon explants. For root explants regeneration was not achieved. Any of the regenerated shoots developed root system, so the regeneration system for given genotypes needs to be improved.

Sunflower, Helianthus anuus, in vitro culture, regeneration.

Sunflower - one of the most important oilseed Ukraine and the world. Sunflower has little genetic diversity, prompting scientists to its

expand both classical breeding methods, and by means of biotechnological approaches, including genetic transformation and somatic hybridization of wild species. These technologies can provide introduction to cultural forms Sunflower properties such as resistance to fungal and bacterial infections, resistance to pests, increased content of unsaturated fatty acids, etc. [1].

One of the prerequisites for the genetic improvement of plants using biotechnology is the availability of efficient regeneration system in vitro. In general, Cell potency somatic plant cells, ie the ability to differentiation, morphogenesis and formation of a plant depends on plant species plant genotype specific tissues and cell types, etc. That is, different species and genotypes within a species and different cell types of the same plant have different ability to regenerate. Sunflower belongs to the species for which no effective, reproducible and henotyponezalezhnyh regeneration systems. In most cases, the protocol methods developed for a specific genotype is not effective for other forms of sunflower plants, [2]. Therefore, for each new genotype should develop its own system regeneration. Experimental work on obtaining genetically transformed plants such complex forms in terms of in vitro cultivation of

species, sunflower, covering as a necessary preliminary stage regenerative capacity study of patterns, selection of optimal culture conditions, the option of explants, optimization of growth regulators and others.

The purpose of research - selection of efficient regeneration system for the two genotypes of sunflower, not previously used methods involving cultivation in vitro, for their further genetic improvement.

Materials and methods research. The plant material. It uses two genotypes of sunflower plants Helianthus anuus home selection: 1006BHIC and AV02. Both genotypes provided by the All-Ukrainian Research Institute of selection.

To enter the plants in culture in vitro was performed surface sterilization of seeds. Seeds were placed for 1 minute in 70% solution of ethanol, then transferred to 25 minutes in a commercial solution "Lingerie" diluted with distilled water at a ratio of 1: 2 parts water and washed three times for 5 min. in sterile distilled water. Sterile seeds were planted on agar medium MS and germinated in an incubator at 25 ° C.

Cultivation in vitro and regeneration. The experiments were used hipokotylni, kotyledonovi and root explants etyolovanyh three-day seedlings. Regeneration system based on the method described in [3]. In contrast to the report, in our experiments we used silver nitrate as a component of culture media. Explants were placed on three days in liquid medium RMcot this composition: MS salts and vitamins, 30 g / L sucrose, 500 mg / l casein hydrolyzate, 10 mg / L silver nitrate, 1 mg / l benzylaminopurynu (BAP) and 1 mg / L naftylotstovoyi acid (NOC). For 20 explants were cultured in 50 ml conical flasks environment Erlenmeyyera 250 ml at 20 ° C in the light rotary shaker using (90 / min). After culturing in liquid medium explants were transferred to agar medium (12 g / l agar) of the same composition and cultured in the light at 20 ° C. Transfer explants to fresh medium was performed every 10 days. When moving the cut flooded and brown of explants, pasazhuyuchy dense green parts only.

Regenerated shoots were separated from the explants and transferred to MS medium with altered concentrations of phytohormones for their further development and rooting. We used a combination of these phytohormones: 1) 0.15 mg / l NOC and 0.02 mg / l hiberelovoyi acid (HA3) 2) 0.1 mg / l indolylmaslyanoyi acid (IMC) and 0.5 mg / l HA3 3) 1 mg / l IMC and 0.5 mg / l HA3.

Conclusions

Examined genotypes capable of regeneration in vitro, but it is necessary to optimize the system for induction rhizogeny. In further work is necessary to use hipokotylni and kotyledonovi explants, but nekorenevi. The efficiency of regeneration in these experiments was approximately 8%. During further work is necessary to investigate the impact of new factors, developed to optimize system and improve the efficiency of regeneration, as well as attract new genotypes national selection.

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УДК 631.48

THE INFLUENCE OF ANTHROPOGENIC FACTORS ON PROPERTIES OF ORDINARY CHERNOZEM

S. Kramaryov, M. Kosolap

The study of changes in agrochemical properties of ordinary hard loamy black soils under the influence of anthoropogenic factors prolonget action. For this purpose, a comparative assessment of two soil profiles jn arable land and virgin soil was conducted. In the aradle land was seen the agrochemical properties deterioration, especially in the upper layers.

Soil, fertilizer, degradation, fertility

Agricultural activity has long become a human soil-forming factor. Now, from a man depends largely on the fate of arable soils, their development and fertility. This conscious direction impact on soil caused a change in its properties and modes that occur much more rapidly than under the influence of natural soil-forming process [1,5,6,8].

Among all types of soils are the most fertile black soil. These soils are truly a national treasure of the country in which they are available. These countries belong to Ukraine. According to statistics in our country, these soils occupy 44% of the total area of Ukraine, which is 6.7% of world reserves chernozems [3,7].

Black soil on the territory of the steppe zone of Ukraine formed over thousands of years (estimates vary from 5 to 10 thousand. Years ago) in a temperate climate favorable to the flat relief, under the cover of grass, mainly cereal grasses [2,4].

In the view of many people, including professionals in the field of agriculture, there is a perception of very high fertility of black soil. In a popular lecture for zemstvo officials Poltava province in June 1900, VV Dokuchaev called black earth "king of the soil." We also know that in Paris Chamber of Weights and Measures retained soil monolith typical chernozem selected in Poltava province.

The purpose of research - to establish the influence dlitelnorgo agricultural use chernozem soil on the change in the level of fertility in comparison with virgin soils.

Materials and methods of research. Experiments were carried out on an experimental basis of the Institute of Agriculture of the steppe zone of Ukraine NAAS - Erastovskoy Experimental Station, where soils - ordinary black humus loamy loess on. In topsoil humus content of 3.8 - 4.1% (Tyurin method), total nitrogen of 0.22 - 0.23, P 0.12 - 0.13, potassium 2.0 - 2.1%. The reaction of the soil solution neutral (rNvodn. = 7.0). Absorption capacity of 30 - 35 mg. eq. 100 g of soil.

To study the changes that have occurred in the ordinary chernozems under the influence of long-term exposure to anthropogenic factors, it has been two soil rozreza: the first - on the Jilin area near the village Baykovka Piatykhatky Raion Dnepropetrovskoy area, and the second - a distance of 300 m from the first to the field, which is being processed. On the territory of these two sections were placed so that when the sun describe fully lit front wall section.

Starting from the top of the cuts through kozhdo 5 cm and to a depth of 2 m was collected soil samples, which defines the basic agrochemical parameters. Selection, storage and preparation of samples was carried out by standard methods. In a sample of soil humus content was determined by a modification of Turin Simakov, total nitrogen - Kjeldahl method (DSTU 26107-84), total phosphorus - distilyatsionnym method (DSTU ISO 11261-2001) Colorimetric photoelectrocolorimeter CK-2 with the use of ascorbic acid (GOST 26216), the gross potassium – by flame photometer Flafo-5 (DSTU 4288).

The content of mobile phosphorus and potassium were determined by Chirikov, in the first case, the KFK-2, and the second - on the flame photometer Flafo-5. Potentiometric method determines the pH of the aqueous extract.

Statistical analysis was performed by the method of analysis of variance and korellyatsionnogo using standard of Computer programs (Statistica 6.0; Microsoft Office, Excel 2003-2007).

Conclusions

1. Under the influence of long-term treatment of ordinary chernozems they begin to develop the processes of human degradation, which are expressed primarily in reducing the content of humus and nitrogen.

2. The content of phosphorus and potassium in cultivated soils more determined by the system of fertilizer.

3. Given that the current use of organic and mineral fertilizers are carried out in minimal volumes, expect a significant improvement in agro and agro-chemical properties of the soils without changing the existing system of agriculture is not necessary.

4. The above material clearly demonstrate the need for a comprehensive monitoring of the soil condition and of comparing the data obtained with the standard natural (virgin). All these experimental materials will create an objective basis for evidence-based discussions of human evolution ordinary chernozems, management theory and practice agrophysical and agrochemical parameters of soils, their ecological and productive functions.

5. Conduct a similar comparison of agrochemical parameters cultivated areas with virgin needs to be done in addition to the ordinary chernozems and all other types and subtypes of soils of Ukraine.

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CURRENT RADIATION SITUATION ON THE TERRITORY OF SEPARATE SUBDIVISION NULES OF UKRAINE TEACHING AND RESEARCH FARM "VORZEL"

I. Gudkov, V. Illienko, A. Rusavska, O. Pareniuk, M.P. Zhuravel

It is presented the results of the radioecological investigation of teaching and research farm NULES of Ukraine "Vorzel", which were conducted during 2009-2012, namely gamma survey areas of agricultural land, the specific activity ^{137}Cs and ^{90}Sr in soil, crop production, feed, milk; the data about vertical and horizontal migration of radionuclides, representation and quantitative composition of the soil microflora.

Teaching and research farm "Vorzel" gamma survey, ^{137}Cs and ^{90}Sr in soil, plants, feed, milk, migration of radionuclides, soil microflora.

The accident at Chernobyl in Ukraine only been contaminated by radioactive substances in the 53,454 km2 area, where there are 2293 settlements in which the population of 2.6 million people [5, 9]. Agricultural land contaminated to such an extent that pose a risk in agricultural production, reaching 1.3 million hectares. [2]. Today the population living in the contaminated areas, up to 95% of the dose exposure to ionizing radiation gets through the innershnoho exposure of incorporated radionuclides entering the body with food. Among them are the main dozoutvoryuvachamy milk, meat, potatoes and vegetables [4]. By the 4th of radioactive contamination zone - the zone of enhanced radiation monitoring after the accident was attributed NDH "vorzel."

Research radiological state of the economy was conducted only in the first years after the accident under state programs to assess the extent of radioactive contamination of the country in 1986 (Figure 1). Certainly, for 27 years the situation has changed in the direction of improvement due to physical decay of radionuclides, their migration into the thick of soil flushing precipitation [11]. Thus, the study of modern radiation

situation in the economy, where living and working at the university are academic and practical training, students are sufficiently pressing issue.

General characteristics of the NDH "vorzel." The farm is located near the village. Vorzel Kyiv Svyatoshynski district, is one of the central zone of the right-bank Ukrainian Polesie. The total area of land is 785 hectares of arable land which covers 523 hectares, the remaining 262 ha - grasslands and pastures, 10 000 m2 occupied greenhouse. The main activities are the manufacturing sector and the scientific practice of university students, research work on the effects of various factors on the formation of meat productivity of cattle, beef and dairy farming, growing vegetables under glass.

For all Kiev Sviatoshynsky area shyrokohvylyastyy typical valley-type girder vodoeroziynyy relief. Relief economy is slightly undulating plain with a small slope to the south and south-west towards the Dnieper and Desna.

The largest area of the farm occupied by sod-podzol light and medium soils ohleyennya different levels; humus horizon with low humus content (1%) does not exceed 16-20 cm basics saturation is 50-75%, hydrolytic acidity 2.5 mEq / 100 g soil phosphorus and potassium are less than 100 mg / kg soil .

The purpose of research. Evaluation of current radiological situation areas of the economy that suffered the contamination due to the Chernobyl accident.

Materials and methods research. To assess the radiation situation in the NDH was held gamma-defined shooting l37Cs and 90Sr content in samples of soil and plant vegetables and fodder crop rotations, some feed and milk, analyzed the impact of radioactive contamination on soil microflora diversity.

Samples were selected in several selections: winter in February, summer in June 2009, the spring in May, the fall in October 2010, in the summer, in August, the fall in October 2011 sampling points (T1-T10) is shown in Figure 2. When sampling soil and products guided accepted method of sampling for radiometry [8] and in the analysis of the structure and quantitative composition mikrobotsenoziv - methods of conventional microbiology methods [7].

Power background radiation was assessed using the dosimeter "Terra". Determination of radioactivity of samples was performed on 137Cs radiometer Rub

01-P6 and 90Sr - radiochemical method [3]. Statistical analysis of data was performed using the software package Microsoft Office Ehsel 2007.

Coefficient of radionuclide accumulation PhD defined as the ratio between the number of radionuclide per unit mass of the plant and its contents in the same amount of soil and conversion factor KP - as the ratio of the radionuclide per unit mass of productive to its number 1 m2 topsoil in which plants are grown .

Conclusions

1. The environmental radiation survey area NUBiP of Ukraine NDH "vorzel", conducted in 2009-2012., Showed that around power sector background radiation is at 0,09-0,11 mSv / h, which is virtually the pre-accident value of its .

2. The level of soil contamination of agricultural land for 137Cs - basic radionuclide dozoutvoryuyuchym chasyny for this country is mostly below the limit that separates relatively clean and contaminated areas (37 kBq / m2).

3. The specific activity of green mass of vegetables this radionuclide ranged from 28.6 to 199.0 Bq / kg and forage crops - from 57.9 to 109.9 Bq / kg, which is below the acceptable level.

4. The specific activity of milk - a product that is considered a major component of the human diet dozoutvoryuyuchym is 6,3-8,0 Bq / kg, which is much lower than the permissible level (100 Bq / l). The largest contribution to the contamination of milk belongs hay and green mass of plants.

5. Contamination of soil and agricultural products 90Sr relatively small.

6. The number and diversity of microorganisms is higher for meadow ecological community compared to forest biological community. Radionuclide contamination in this case is not the main factor of influence.

7. Current radiation situation in the territory of NDH "vorzel" that after the Chernobyl accident was attributed to the zone of increased radiation monitoring, is not dangerous for crop production and animal husbandry.

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THE USAGE OF LABORATORY POPULATION USCANA SENEX GRESE AND USING IT IN AGRICULTURAL CENOSES

N. Lesovoy

In this article findings about the usage of laboratory population Uscana senex Grese. (Trichogrammatidae) against Bruchus pisorum L. (Bruchidae) on the pea were described. It was shown the difference of biological indexes of laboratory entomophagous and natural population. The optimal biological effectiveness of outlet U. senex against pest in different correlation (Pest:Host P:H) was determined.

Pea, entomophage, phytophagous, biological effectiveness, passage

Today in regulating the number of harmful insect herbivores chemical method takes a leading role. However, progress chemical protection spawned a number of problems associated with the use of pesticides, such as metabolism remains hazardous substances are too dangerous in the chain of plant - animal - people. Successful resolution of these issues is possible with the use of biological methods (using microbiological agents, laboratory breeding and release entomophagous, preserving and promoting natural enemies of insects and pathogens). Benefits specialized entomophagous well known - focus on specific pests harmful to humans, animals and the useful entomofauna and, moreover, does not change the physiology of plants. With regular use biological agents in agrocenoses stabilized value herbivores and entomophagous.

The task of scientists and experts on biological plant protection is continuous monitoring of entomophagous to identify promising new species of beneficial insects [5].

Our attention has been focused on the study of bio-ecological features entomophage Uscana senex Grese.

Uskana is olihofahom and in eggs zernoyida pea, bean feeds on eggs, wikis, clover, and other espartsetovoho zernoyidiv. For the year to develop four generations, each of which lasts 14 - 16 days [6].

We found that the relocation entomophage on crops of peas it is concentrated in the inflorescence Phacelia, sainfoin and other nectariferous plants.If adults uskany flight coincides with the phase formation and flowering pea beans, the contamination of eggs in late June - early July can reach 65 - 85% [2]. After analyzing the domestic and foreign literature, we observed a number of advantages U. senex among entomophagous pea zernoyida, namely:

• infection into harmless pest stages - eggs;

• high biological efficiency, reaching 85%;

• the possibility of laboratory breeding eggs on alternative host - bean zernoyida (Acanthoscelides obtectus Say.) [4].

The purpose of research - the definition of breeding laboratory parameters entomophage Uscana senex Grese. and suitability for release in field conditions for protection against herbivores.

Materials and methods research. For detection and calculation Uscana senex Grese. and other small insects used technique MP Uncles, 1971 [2]. Since cutting entomological net ineffective, we used hidrofotoeklektor: one or two buds placed in Coarse bag, neatly tied around his glass, which put cotton wool soaked. When the sample (inflorescence) pidsyhala, insects moved into a glass. In vitro studies were conducted at the Department ahrobiotehnolohiy NUBiP Ukraine.

In the study of quality indicators parasite determined period of development (after infection before departure adults), actual and potential fecundity of females, adult lifetime, sex ratio and so on.

The biological activity of the parasite determined in field issues in areas 10x15 m in relationships parasite: host (P, X) 1: 5 and 1:10. The biological efficacy was determined by U. senex parazytovanymy eggs bruhusa and damage pea seeds. Plucky performed during a mass revival uskany (in the garden with a parasite put corrugated strip of filter paper (7h10 cm) to accommodate them insects, then carefully removed

with tweezers and tape laying between the main and lateral stems in the middle tier of pea plants.

Conclusions

1. The value of natural populations uskany significant only in the early stages of fruit formation peas and little effect on grain damage of peas during infection of eggs in the phase of wax and full ripeness.

2. In the mass breeding the parasite improved ratio P: X 1:15, and to obtain royal culture - the higher the ratio of P: X (1:30 and 1:45).

3. Passage through the main host eggs (Bruchus pisorum L.) improves performance uskakny laboratory and its mobility.

The biological effectiveness of the parasite in the field Single dose output and favorable weather conditions reaches 57.2% parazytovanyh pest eggs - a foundation for further development of new methods of cultivation uskany in the laboratory and study the rules and terms of issue of the parasite in the field.

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MORPHOECOLOGICAL PLASTICITY OF PERCONIDAE ON CONDITIONS OF GEOGRAPHICH ISOLATION

M. Prichepa

Present compare characteristic morphological and physiological index of perconidae with differ reservoir. The difference of morphological characteristics observed that perch and ruff refer to reproductively isolated populations and are characterized by phenotypical variability. Noted correlative relationship between fatness ruff and ecological conditions of existincs. According to the index of the spleen and liver and fatness pike perch found that the least affluent areas of livelihood is Kakhovskoe reservoir. The difference between fish indicates the presence of reproductively isolated populations of perch fish.

Perconidae, environmental variability, population, morpho-physiological parameters, geographical isolation.

Because regulation of large bodies of water formed a number of new ecosystems, which in terms of geographic isolation began to form different ecological forms of native species [3,14]. Each type has its phenotypic structure that ensures its existence in specific circumstances, but because of isolation may appear different from the parent sample of ecological forms of fish [15,17,19]. A wide phenotypic variability of fish provided the ability to polymorphism [21]. This is manifested in the form of resistance to changing environmental conditions exist. Therefore, the diagnosis of aquatic ecological systems should be used species that occupy a large area, and are found in waters of various types. They should also be accessible objects of study because of its size [5 - 7,10,13,14,15, 19]. It should be noted that perch fish are sensitive to the environmental factors clearly and react to them [4, 5, 11, 12, 18]. Assessment of natural populations for morphological and physiological characteristics of fish, which vary in proportion to the degree of influence of environmental conditions exist, allowing the opportunity to show their adaptation to the existing factors [5, 14].

The purpose of research - evaluation of morphological and physiological characteristics of metric and perch fish for the diagnosis and prediction of the quality of the aquatic environment.

Materials and methods research. Catches of fish was carried out in July and spinning rod. Study area were estuarine area was. Teteriv rates Forest-Vodice, Kiev Reservoir (p. Lebedivka) Dog Bay estuary and near the city. Rzhyschiv (Kanev Reservoir), pp. Ross (m. White Church), Kakhovske reservoir (m . Kahovka). The water temperature in the studied reservoirs ranged from 23.6 to 26.7 ° C, dissolved oxygen content of 6.8 to 8.8 mg O / dm3 pH of 6.7 to 7.8. For the morpho-physiological studies were selected fish that had a length of 12.8 to 14.6 cm and weight from 34.8 to 42.9 g (bass); 34,0-35,5 cm, 497- 498 g (perch); 11,25-13,25 cm 31,65- 43.02 g (ruff). Morpho-metric analysis was performed by the method Pravdina [7]. It was investigated 19 plastic and 6 (for ruffe 5) merystychnyh signs using symbols: ab - total length of the fish, jj - number of scales in the lateral line, D1 - number of rays in the first dorsal fin; D2 - number of spiny rays in the first dorsal fin; D3 - thornless number of rays in the second dorsal fin, A1 - number of spiny rays in the anal fin; A2 - thornless number of rays in the anal fin, AO - head length, lm - head height, an - long snout, np - eye diameter, po - part-time distance on his head, a1a2 - length of maxilla, k1l1 - Mandible length, gh - the maximum height of the body, ik - the smallest body height, fd - the length of the tail stem, aq - antydorsalna distance, qs - length foundations of the first dorsal fin, q1s1 - length foundations of the second dorsal fin, tu - height of the first dorsal fin, t1u1 - the height of the second dorsal fin , yy1 - long anal fin bases, ej - the height of the anal fin, rd - postodorsalna distance p - width pectoral fins.

Morphometry was performed using calipers. For statistical processing plastic signs equated to the length of its body, and measurements on the head - to the length of the head. Comparison of sample estimates of mean values was based on Student's t-test. Morphological indices, ie indices of internal organs studied using standard methods [20], equating to a lot of body weight of fish. Fatness by Clark and Fultonom determined according to the conventional method [7]. Processing of statistical data was performed using «Excel» with MS Office package and program Statistica 5.5.

Conclusions

In the study of 6 samples revealed a significant difference perch on plastic index within 6-12 features. This suggests that the geographical isolation perch distinguished by phenotypic variability and environmental multiagency depending on the environmental conditions of the environment. Established a significant difference on the index in liver specimen's bass with respect Kakhovsky reservoir fish caught in other regions.

In the study of 3 samples ruff marked difference in plastic index in the range of 6 to 8 signs. At the physiological level shown mizhpopulyatsiynu reliable difference in fatness, liver and spleen index, indicating that environmental variability of this species relative to environmental conditions. This indicates the ecological plasticity in morphological level ruff.

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EUROPEAN EXPERIENCE CREATION AND OPERATION OF ENVIRONMENTAL NETWORK "NATURA 2000"

W. Sobczyk, A. Kowalska, O. Nagorniuk, O. Riabushenko

Are described European and, in particular, the Polish legal acts ensuring safety regulation, reproduction and use of biodiversity within the ecological network "Natura 2000". Been characterized causes of the flexible coordination acts in the network "Natura 2000" and the principles of careful handling in her.

Ecological network "Natura 2000", biodiversity, environmental protection, environmental education.

Environmental protection is one of the main objectives of environmental policy in many European countries. Established in the EU ecological network "Natura 2000" is an important system of protection of rare species of plants and animals and their places of residence, which aim to preserve the natural values in Europe. A characteristic featureEuropean network "Natura 2000" is that in its area can be carried out necessary socio-economic activities. However, the European community is constantly regulates the rational approach to development projects or plans of and impact on habitats of plants and animals that are endangered. For this purpose they conduct a rigorous impact assessment on the network "Natura 2000". Intensive development of civilization significant impact on the environment. And to this day all over the world, it causes many negative changes, including significantly reduced biodiversity and ecosystems are disappearing targets fragments. Excessive use of natural resources and the continuous pollution can have catastrophic consequences for all mankind, because economic development - is not the only goal of the society. Today, environmental protection - one of the main objectives of environmental policy in many European countries.Gradually, the European community the opportunity to get noticed socio-economic benefits from the exploitation of natural areas in other ways without

destroying and not destroying them. Thus, it was possible to develop a common legal framework in this area.

The purpose of research - the coverage ratio of the European Community in their national natural resources, assessment of nature conservation in general and wildlife in particular in Ukraine

Materials and methods research. The first in this legal framework included: Ramsar Convention (1971), which drew attention to the protection and support of intact areas of wetlands, with particular emphasis on waterfowl populations living in these areas or temporarily placed in them [1], Bonn Convention (1979), whose purpose is to protect migratory wildlife and the Berne Convention (1979) on the conservation of wild flora and fauna and their habitats, with special emphasis on the protection of rare and endangered species. Observations showed that the result of these international agreements made his own, although a small positive effect of conservation. And yet it was completed a number of documents related to the fundamental principles of social and economic policy of environmental protection. To achieve these goals within the European Community in 1979 adopted the so-called Directive on the conservation of wild birds, and in 1992 in Rio de Janeiro - the Convention on Biological Diversity, to set out a common point of view for its protection, reproduction and use [2-4].

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DEVELOPMENT OF ІКРИ AND SURVIVAL OF EMBRYOS OF CARP ARE FOR ACTIONS OF ALBENDAZOL

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Albendozol proven inhibitory effect at concentrations 0.020 mg/dm^3 and 0.040 mg/dm^3 in the water on the development of carp eggs. When the concentration in the water albendozol 0.005 mg/dm^3 its effect on embryonic development of fish, expressed to a much lesser extent.

Eggs, carp embryos, albendazol.

Application albendozynitiv for the prevention and treatment of parasitic diseases of farm animals helps them flow in large amounts in the environment, including in natural waters [4,3,9,10]. The spread of invasive animal diseases makes use for their treatment and prevention of a large number of pharmacological agents dingy and ecologically dangerous for the body. These tools with a wide range of actions are among karbamatbenzymydazol and its derivatives - mebendazole and albendazole, which is very effective. Albendazole is used against nematodes (both mature and immature forms), cestodes and trematodes (mature forms) in pigs, sheep, goats, cattle, wild ruminant animals, dogs, birds and fish [8].

Research has established that drug at a dose of 25 mg / kg body weight and higher suppresses leucopoesis, is embryotoxic and teratogenic effects. For long-term use of high doses in animals developed fatty degeneration of hepatocytes, disturbed genome stability established immunosuppressive effect on the body of fish, including carp [3, 9, 10].

These pharmacological agents are not metabolized, and excreted in the feces of animals with and enter the wastewater, soil and water open water. Their presence in water and found industrial fishing. So there is always a danger of their negative impact on the development of aquatic organisms, including fish and [2].

The purpose of research - the study of albendazole action on the development of eggs and embryos preservation carp.

Materials and methods research. Effect of albendazole on the development of embryos of freshwater fish studied the newly fertilized eggs carp usual method [Napivstatystychnyy method. ISO 12 890; 1999, IDT].

The fertilized eggs obtained from one female was placed in a Petri dish with pond water, which previously added different doses of albendazole. Control was clean pond water. The concentration of albendazole in water with carp roe first experimental group was 0.005 mg / dm3, the second - 0.020 mg / dm3 third - 0,040 mg / dm3. duration of the experiment - 72 hours. In controls during the experiment, observed the development of eggs by counting the number of dead embryos and larvae emerged.

Research results obtained were processed statistically using a special program using computer technology [5].

Conclusions

Studies indicate negative impact albendozolu in concentrations 0.020 mg / dm3 and 0,040 mg / dm3 in water on survival of embryos carp. According to domestic and foreign scientists [6,7,11,12] albendazole action associated with the violation of protein synthesis, blocking the processes of replication, transcription and translation, which causes anomalies in embryo development and in further their death. For albendozolu water content of 0.005 mg / dm3 its effect on embryonic development of fish is much less pronounced.

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MAIN ASPECTS TRANSFER FOREIGN GENES IN THE GENOME OF SPERM JAPANESE QUAIL (*COTURNIX JAPONICA*)

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This paper describes a process of transferring genetic construction (pEGFP-N1 vector) into the genome of Japanese quail sperm using dimethyl sulfoxide (DMSO). Transfer and expression of the introduced genetic information was evaluated by the characteristic fluorescence of transfected spermatozoa due to expression of the green fluorescent protein (GFP) and by PCR analysis.

Japanese quail, sperm, genetic constructions, ejaculate, transfection.

In recent years, developed a number of methods for transgenic animals. methods consist of: microinjection into pronuclear, somatic cell nuclear transfer and transduction using retroviruses. Last most widely used, however, retroviral method has several disadvantages, such as restrictions on the size of the built-gene and the dangers of using this technique. An alternative and inexpensive method is the introduction of foreign DNA in the sperm to fertilize. Although transgenic animals were obtained from the use of sperm-mediated gene transfer (sperm- mediated gene transfer (SMGT)), though the effectiveness of this technique was Lo-tuple that was caused poor penetration of exogenous DNA in sperm. The lack of SMGT effectiveness was associated with activation of protective mechanisms of sperm and seminal plasma, resulting in degradation of exogenous DNA took place.
The purpose of research - an increase ektyvnosti transfection of sperm from the use of dimethyl sulfoxide (DMSO) and composites for washing of DNA-polymerase.

Materials and methods research. To determine the effect of seminal plasma on the intensity of incorporation of exogenous DNA in sperm samples were combined and washed with 109 sperm vidmyvayuchym solution tsentryfuhuyuchy at 600 g six times. After each wash, the supernatant was removed for testing DNKaznu activity, which was measured by horizontal gel electrophoresis (1% agarose -a) using imaging

DNA 0.5 mg / ml ethidium bromide. Mobility and sperm activity was assessed by phase-contrast microscopy before and after each washing.

Exogenous DNA adsorbovuvalas on the surface of sperm treatment removed 20 U DNA-polymerase I (Invitrogen, USA) for 30 min and three washes in phosphate-buffered saline (PBS) at 600g for 5 minutes.

Isolated from sperm DNA was analyzed by PCR for detection of internalization (learning) of exogenous DNA.

Conclusions

Thus, the use of ejaculate of DNA-polymerase and subsequent transfection using DMSO enable effective mobile and get transfected fertile sperm.

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