ВЕСТНИК

Ижевской государственной сельскохозяйственной академии

Научно-практический журнал

№ 1 (42) 2015

RESPONSE OF WINTER RYE FALENSKAYA 4 TO ABIOTIC CONDITIONS IN THE MIDDLE CIS-URAL REGION

Authors:

Fatykhov Ildus Shamilevich – Doctor of Agricultural Sciences, Professor, E-mail: nir210@mail.ru

Izhevsk State Agricultural Academy, Izhevsk

From 1990 till 2013 the planting acreage of winter rye in the Udmurt Republic decreased by 5.4 times, and it takes 12.5-12.8% of cereals and grain legume crops in the crops structure. The average grain yield of winter rye was not more than 15.8 dt/ha in 1996-2013. The response of winter rye Falenskaya 4 resulting in grain yield formation to abiotic conditions on state crop testing sites of the Udmurt Republic during the research periods was different. Under relatively optimal abiotic conditions the average yield was 38.7-39.0 dt/ha. The response of winter rye Falenskaya 4 to relatively unfavorable abiotic conditions on Balezinsky, Sarapulsky, Glazovsky state crop testing sites resulted in the yield formation at the level of 23.0 dt/ha, on Uvinskiy state crop testing site – 14.8 dt/ha. In the north cool agroclimatic region the growth season of winter rye Falenskaya 4 was longer for 14-21 days, the mass of 1000 grains was bigger by 3.7 – 4.7 g and plant height was taller by 11.2-12.5 cm. The snow mold lesion of winter rye Falenskaya 4 reached 92-95% at the hardiness 4.2-4.5 points in some years.

Key words: state crop testing site; winter rye; variety; Falenskaya 4; productivity; response; abiotic conditions; vegetation period; height of plants; winter hardiness; snow mold.

COMPARATIVE CHEMICAL COMPOSITION OF GRAIN OF OAT VARIETIES

Authors:

Kolesnikova Vera Gennadevna – Candidate of Agricultural Sciences, Assistant Professor, E-mail: kvg389@mail.ru;

Ryabova Tatyana Nikolaevna – Candidate of Agricultural Sciences, Assistant Professor, E-mail: ryabova.tatyana@inbox.ru;

Fatykhov Ildus Shamilevich – Doctor of Agricultural Sciences, Professor, E-mail: nir210@mail.ru

Izhevsk State Agricultural Academy, Izhevsk

The chemical composition of hulled oat Ulov and Konkur and naked oat Vyatskiy grown in the experimental field of JSC «Experimental training farm Iyulskoe of IzhSAA» was studied in competitive variety trial. The soil of experimental plot is sod, medium-podzolic, medium-loamy with average degree of cultivation. Research results revealed that the chemical composition of the grain of oat varieties has differences in 37 elements. Naked oat Vyatskiy compared with hulled cultivars had the high content of magnesium, total phosphorus, total sulfur, nickel, copper, zinc, gallium and cesium. Differences in the chemical composition of hulled oat grain were also specified. The grain of hulled oat Konkur contained more elements such as sodium (72 mg/g), silica (770 g/d), potassium (5950 mg/g), calcium (1300 mg/g), manganese (81 mg/g), rubidium (2.8 mg/g), strontium (4.8 mg/g), silver (0.009 mg/g), neodymium (0.006 mg/g) and gadolinium (0.0011 mg/g). The oat grain Ulov differed by relatively high content of boron (9.3 mg/g), alumina (11.7 g/d), titanium (1.33 mg/g), chromium (0.63 mg/g), zirconium (0.032 mg/g, molybdenum (1.53 mg/g) and samarium (0.0015 mg/g). The hulled and naked varieties did not show the differences in the content of 33 chemical elements. The heavy metal content did not exceed the limit values. The grain obtained can be used for food production including children and dietary products.

Key words: hulled oat; naked oat; chemical composition; variety; grain.

INFLUENCE OF SEEDING METHODS AND SEEDING RATES ON SEED PRODUCTIVITY OF TETRAPLOID RED CLOVER

Authors:

Kasatkina Nadezhda Ivanovna – Candidate of Agricultural Sciences

E-mail: ugniish@yandex.ru;

Nelyubina Zhanna Sergeevna – Candidate of Agricultural Sciences

E-mail: ugniish@yandex.ru

FSBSI Udmurt Agricultural Research Institute, s. Pervomayskiy, Udmurt Republic

Tetraploid varieties of red clover obtained on the base of polyploidy differ by their significant morphological and physiological characteristics which determine some special aspects of their seed breeding technology in comparison with seed growing of diploid varieties. One of the advantages of tetraploids is a relatively high autogamy, i.e. the ability to set seeds from self-pollination. However, even the best tetraploid varieties have lower contamination of inflorescences than diploid varieties. In this regard the improvement of seeding methods of tetraploid red clover in cultivation for seeds is of great importance. Field experiments studying the influence of seeding methods and seeding rates on seed yield of tetraploid red clover Kudesnik were carried out in 2013-2014 on sod-podzolic medium-loamy soil in accordance with the methodology of experimental work. Seed yield of red clover Kudesnik was in range of 76.1-139.5 kg/ha. The seeding method of tetraploid red clover Kudesnik had a significant impact on its seed production. The wide-row way of seeding provided a significantly higher seed yield than conventional drill seeding (control). It was re-

vealed that using the sowing in broad drills and reducing the seeding rate to 2-3 million viable seeds per 1 ha resulted in significant decrease of red clover Kudesnik seed productivity. Increasing of seeding rates to 6 million with this method of sowing did not influence seed yields. Applying drill seeding of red clover Kudesnik, both the decrease of seeding rates up to 2-3 million viable seeds per 1 ha and the increase to 6 million reasonably reduced yields. The highest seed productivity of red clover (139.5 kg/ha) was provided by proper plant density formation with the following parameters: quantity of stems – 240 pcs/m², quantity of heads – 626 pcs/m², mass of 1000 seeds – 2.36 g. It was revealed that seeding rates affected the thickness of stand and the number of heads in a greater degree, both the seeding method and seeding rate influenced productivity of red clover inflorescences.

Key words: tetraploid red clover; seeding method; seeding rate; seed yield; yield structure.

PROMISING NUMBERS FOR CREATION OF WINTER WHEAT VARIETIES

Authors:

Tuktarova Nadezhda Grigorievna – Candidate of Agricultural Sciences

E-mail: ugniish@yandex.ru

FSBSI Udmurt Agricultural Research Institute, s. Pervomayskiy, Udmurt Republic

The long-term studies in Udmurt Agricultural Research Institute as well as the work of the State Commission for crop variety testing have shown that the problem of winter wheat cultivation under the conditions of the Udmurt Republic cannot be solved without the development of new varieties which differ from the current sorts by higher winter hardiness and equal to them in terms of yield and other economic traits. More than 600 lines and numbers of breeding material are studied annually to identify the varieties with high productivity and resistance to adverse weather conditions. In the early stages of breeding work the selection of parental forms, hybridization and testing of received hybrid offspring are carried out. In the later stages starting with the collection nursery the numbers with a similar seeding rate are tested on the provocative ground to study their stability to stress conditions. As a standard we used the variety Moskovskaya 39 entered on the national register of the Udmurt Republic. The studies were conducted under field and laboratory conditions according to methodical instructions of the All-Russian Research Institute of Plant Breeding, methods of strain testing of crops. At all stages of breeding work we selected high-productive material with the stable addition to the standard, with resistance to lodging - 8- 9 points, resistance to major diseases (snow mold, sclerotinia, brown rust) - 7- 9 points. According to the results of assessments on the natural and provocative ground for creating new winter wheat varieties adapted to soil and climatic conditions of the Udmurt Republic 11 numbers were selected in the control nursery, number 7.05/26 - in nursery of preliminary strain testing, numbers 4.01/6/5, 15.05/5 - in competitive strain testing.

Key words: variety; breeding; winter wheat; productivity; overwintering; grain quality.

INSECT- AND FUNGICIDES EFFECTIVENESS IN PRE-PLANT TREATMENT OF POTATO TUBERS OF DIFFERENT MATURITY GROUPS

Authors:

Mukhametshin Ilnaz Galievich – Head of Meristematic Laboratory

E-mail: ilnaz_8@mail.ru;

Vlasevskiy Dmitriy Nikolaevich – Head of Potato Growing Department

E-mail: vlasevsk10@mail.ru

FSBSI Udmurt Agricultural Research Institute, s. Pervomayskiy, Udmurt Republic;

Fatykhov Ildus Shamilevich – Doctor of Agricultural Sciences, Professor

E-mail: nir210@mail.ru

Izhevsk State Agricultural Academy, Izhevsk

Udmurt Agricultural Research Institute has conducted the research on the response of potato varieties to pre-plant treatment of potato tubers since 2012. The influence of pre-plant treatment of tubers on yield of potato varieties, factors of its structure and product quality have been studied for three growing seasons. Early potato variety Chajka had yielding ability 38.7 t/ha exceeding the yield of early and middle-early varieties (Nevsky, Udacha). On the average variants with pre-plant treatment of tubers (Prestige, KS, Kruyzer, KS+Maxim, KS + microelements (copper sulfate, zinc, cobalt, ammonium molybdate, boric acid) provided a significant increase in productivity in 2012 – 2014. Potato variety Chajka had the highest yields of tubers - 42.1 t/ha being treated before planting with Prestige in combination with microelements. Increase in yield was due to the formation of larger mass of tubers per plant. Pre-plant treatment of tubes with Prestige, Kruyzer+Maxim or microelements, as well as their combination increased tuber weight per plant by 0.053…0.128 kg (NSR_{05} - 0.021 kg) compared with the same index of the tubers with water treatment - 0.565 kg. Early variety Udacha was characterized by the high content of dry matter in the tubers (22.5%), tubers of Udacha and Chajka had the higher content of starch - 13.2%.

Key words: potatoes; potato varieties; treatment of tubers; insectofungicide; microelements; yield; dry matter; starch.

FEATURES OF PHOTOSYNTHETIC PIGMENTS DYNAMICS OF CONIFEROUS IN URBAN PLANTATIONS

Authors:

Bukharina Irina Leonidovna – Doctor of Biological Sciences, Professor

E-mail: buharin@udmlink.ru;

Pashkova Anna Sergeevna – Postgraduate

E-mail: elena7108@yandex.ru
Izhevsk State Agricultural Academy, Izhevsk

The urban environment is characterized by diversity of ecological factors leading to significant changes in the environment. Some species of woody plants are resistant to urban conditions, they can be models for studying adaptive responses and can be used more widely to create plantations in technogenic territories. The aim of research was to study ecological and biological features and adaptive potential of species Spruce under the conditions of urban environment to create urban plantations. Research scientific novelty focuses on the study of the formation of adaptive responses of coniferous species in the urbanized environment. The woody plants under study grew in different ecological plantations and had anthropogenic load of various degrees. The content of photosynthetic pigments was studied in the dynamics applying the quantitative determination of chlorophylls *a*, *b* and carotenoids in the spruce needles on the spectrophotometer SF-200. The research identified species features of response of pigmentary system of two coniferous species to technogenic environment which indicated the increase in the concentration of pigments with antioxidant activity of the blue spruce *(Picea pungens*, *Engelmann*). The chlorophyll *a* content in Norway spruce needles was significantly lower than that of blue spruce in both years of the research in all plantations. We believe that one of the reasons of Norway spruce sustainability under the urban conditions is the stability and high content of chlorophyll *a*.

Key words: coniferous; adaptation; urban ecological system; photosynthetic pigments; chlorophyll; growth and development of plants.

DIMENSIONAL CHARACTERISTICS IN PHASE TRANSITIONS

Authors:
Korablev Grigory Andreevich – Doctor of Chemical Sciences, Professor
E-mail: korablevga@mail.ru;
Strelkov Stanislav Mikhailovich – Candidate of Technical Sciences, Associate Professor
E-mail: Stas.Strelkoff@yandex.ru
Izhevsk State Agricultural Academy, Izhevsk;
Kodolov Vladimir Ivanovich – Doctor of Chemical Sciences, Professor
E-mail: kodol@istu.ru
Izhevsk State Technical University named after M.T. Kalashnikov, Izhevsk

In phase transitions the radii of atomic-molecular interactions change between separate crystal systems under external actions. In aqueous solutions such sphere radius is approximately three times larger than the atomic radius. It is demonstrated that in general case this radius can be assessed via the effective main quantum number, and the system interaction degree can be calculated applying the idea of spatial-energy parameter (P-parameter). Such

parameter is a complex characteristic of the most important atomic values responsible for interatomic interactions and having the direct link with the electron density of valence orbitals. The application of such approach to the evaluation of surface diffusion in the system C→Cu is given. At the same time, the number of interacting particles in the surface layer is recorded via their relative number in comparison with their total amount in the interaction area. The identical graphs of carbonization rate and degree of structural interactions on the coefficient of structural interaction α are obtained. Such graphs are similar to the entropic nomogram previously obtained.

Key words: phase transitions; nomogram; spatial-energy parameter; carbonization; surface diffusion.

METHODICAL PECULIARITIES OF ORGANIZATION AND IMPLEMENTATION OF EXCHANGE DIFFERENCE AUDIT

Authors:
Ostaev Gamlet Yakovlevich – Candidate of Economic Sciences, Associate Professor
E-mail: ostaeff @yandex.ru;
Kontsevoy Grigoriy Rolanovich – Postgraduate
E-mail: guss-91@mail.ru
Izhevsk State Agricultural Academy, Izhevsk

The article discusses the need for significant improvement of the organization and implementation of audit of exchange rate differences in companies. To achieve the objective the auditor forms the main task: to identify specific areas of verification including the areas of increased risk of distortion. While conducting the audit of foreign exchange transactions, the auditor is governed by the Federal Law of 10.12.2003 No. 173-FZ «On currency regulation and currency control», RSA 3/2006 «Accounting of assets and liabilities denominated in foreign currency». The auditor conducts a general analysis of the accounting (financial) statements in order to determine the volume of operations involving the use of foreign currency. Value of assets and liabilities denominated in foreign currency on the accounts is to be recalculated in rubles at the exchange rate of the Central Bank of Russia as on the date of the transaction. All organizations monthly recalculate assets and liabilities in foreign currencies at the rate of the Bank of Russia as on the reporting date, last quotation in the reporting period. The currency exchange difference between ruble value and value of foreign currency should be credited to the account 91 «Other incomes and expenses» in correspondence of the respective accounts as taking them to accounting.

Key words: audit; verification; foreign currency; exchange rate difference; currency rate.

STRATEGIC DEVELOPMENT OF INTERNAL CONTROL IN AGRICULTURE

Authors:

Ostaev Gamlet Yakovlevich – Candidate of Economic Sciences, Associate Professor

E-mail: ostaeff @yandex.ru

Izhevsk State Agricultural Academy, Izhevsk;

Kontsevaya Stanislava Rolanovna – Candidate of Economic Sciences, Associate Professor

E-mail: s.kontsevaya@mail.ru

Russian State Agrarian University – Moscow Agricultural Academy named after K.A. Timiryazev, Moscow

The article discusses the strategic development of the control system and its essential properties in agriculture. The elements of organization and development of control in agriculture are given. The solutions of each of them are based on answers to practical questions. The audit objects are financial transactions, business processes and the facts of economic life of enterprises and organizations reflected in the primary documents, accounting registers, forms of accounting and statistical reporting, and other sources of information. Applying and objectively evaluating them in the process of inspection, auditors observe the technological, financial, payment and calculation discipline, as well as the reliability, validity, appropriateness and economic efficiency of financial and economic activity of the monitoring company. The audit object is also the managerial activity of the audited agricultural organization. The organization of selection and placing personnel of current control monitoring the execution of orders and instructions, the organization of reviewing letters, applications, complaints and proposals, internal control of structural units of the organization are to be studied. Control measures in the organization can be of tactical or operational, strategic or long-term nature. Control measures at the operational level are aimed primarily at the correcting negative processes which have already begun.

Key words: control; audit; responsibility centre; profit centre; controlling; organization; management.

STRATEGY OF QUALITY GROWTH OF PORK PRODUCTS IN THE UDMURT REPUBLIC

Authors:

Shumkova Tamara Nikolaevna – Candidate of Economic Sciences, Assistant Professor

E-mail: tamara369@mail.ru

Izhevsk State Agricultural Academy, Izhevsk;

Shumkov Nikolay Vladimirovich – Auditor

E-mail: snvrus@mail.ru

LLC «Izh-Engineering», Izhevsk

The article considers topical issues of influence of the pork products quality on the strategic development of the industry as a whole. The authors investigated the reasons of the agriculture crisis in Russia, including the Udmurt Republic. Analysis of the quality of the livestock sold (pigs) for the experimental period from 2009 till 2013 suggests that some areas of the Udmurt Republic manage to bring the carcass weight of pigs sold to the optimal point. However, the pork production quality remains low. We need to work in order to improve this indicator as Udmurtia has all necessary reserves. On the territory of the Udmurt Republic there are opportunities to produce pork as an environmentally friendly product that requires additional cost but it is necessary to have the support of the state in the form of various incentive levers. We managed to construct a tree of problems of creating the market for green products which allows us to determine the reasons for the lack of manufacturers' interest in the production of organic products in the Udmurt Republic. Based on identified issues the study represents the system of the strategic objectives aimed at the solution of the problems. To achieve the objectives a set of necessary activities divided into successive stages is proposed. Implementation of strategic decisions of the creation of environmentally friendly and qualitative products in pig industry on the territory of the Udmurt Republic requires the development of a mechanism of actions with the algorithm of its decisions. Such mechanisms are developed and a set of proposed actions is presented. Thus, the pig industry should constantly improve the technology of production, maintain its quality in order to occupy a leading position in the target market.

Key words: strategy; product quality; ecologically clean production; tree of problems; implementation mechanism; the costs of production; efficiency.