

AGRICULTURAL SCIENCES

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PRE-SOWING SEED TREATMENT AND SEEDING RATE OF JACOB OATS

Cespitose medium podzolic loamy soil of the Middle Urals had been studied for the effect of presowing treatment of seeds and norms of seeding on the productivity of Jacob oats. Effectiveness of presowing seed treatment with preparations Lamador, Plaques, vial Trast, JUSS had been proved. Significant increase in yield by 0,18-0,34 t/ha has been reached by all variants followed by presowing treatment of seeds with these preparations. The optimum seeding rate of Jacob oats, the highest yield by 2.84-2,88 t/ha has been reached at the seeding rate of 5-7 million viable seeds per 1 ha. Correlation was settled between grain yield of Jacob oats and the elements of its composition: straight strong – with the productivity of inflorescences ($r=0.75$) and weight of 1000 grains ($r=0,72$), a straight medium – grain content of panicles ($r=0.67$) and with plant height ($r=0,65$).

Key words: oats; presowing seed treatment; seeding rate; yield; productive stems; plant height; grain number in ear; the productivity of the inflorescence; weight of 1000 grains; nature of grain; filminess; correlation.

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COMPARATIVE ELEMENT COMPOSITION OF THE CROP CARYOPSES

The chemical composition of the winter crop caryopsis (zernovka) presented as triticale in Izhevskaya 2, summer barley Raushan and a spring-sown wheat Iren' is identified, grown up in the conditions of the Central Cis-Urals on cespitose-medium- and the hard podzolic medium loam soils. Comparative analysis of a chemical composition of grain of identical cultures on 70 elements has been carried out. By results of the conducted research, it has been revealed that the winter triticale, barley and a spring-sown wheat element compositions differ. Wheat caryopses differ sufficiently in the big content of lead, mercury, cadmium, barium and aluminum comparing with the identical concentration in caryopses triticale and. Caryopses triticale contains less arsenic, cobalt and chrome, than in caryopses of barley and wheat. Barley caryopses accumulated less zinc and manganese, related to grain triticale and wheat. Content of the 1st class elements of toxicity in the caryopses of the cultures analyzed does not exceed officially admitted levels of concentration.

Key words: caryopsis; triticale; barley; wheat; grade; chemical elements.

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HARVESTING METHODS AND SEED YIELDS OF SPRING RAPE IN THE CONDITIONS OF THE MIDDLE URALS

In 2014-2015s. on soddy medium-podzolized soil, as the most widespread in the arable lands of the Middle Urals there some studies have been conducted on the effect of influence of the method and harvesting time on productivity of the spring rape Accord. The seed yields have been also determined which is justified by the experiences held with the mass variations of plant seed mass of 1000 seeds. The seed loss has been determined in the run of the two- and single-phase harvesting at different times. The research results of 2014-2015s showed that the average seed yield obtained from the experience was 6, 20 metric centner/ha and 8, 78 metric centner / ha, respectively. Differences in seed yields in 2014 between the studied harvesting methods were not identified. In the conditions of 2015, with a single-phase harvesting method, a large seed yield had been obtained (9, 28 metric centner/ha), compared with the yield (8, 28 metric centner/ ha) with the two-phase method used. In average, within two years the highest yield (7, 82 metric centner/ ha) with the two-phase rape harvesting had been obtained, seeds humidity being 20% -25%. Conducting one-phase harvesting of seeds with humidity content of 20% -25%, 15% -20%, 10% -15% contributed to obtaining a higher yield (8,02-8,22 metric centner/ha). Yield advantage received with the above variants is determined by the formation of higher plants and the seed weight and of mass of 1000 seeds. No differences in seed losses have been identified with the harvesting methods mentioned. In 2014 and in 2015 the lowest losses of seeds (31-42 and 39-43 kg / ha, respectively) had been found out when the two-phase method had been provided, with seed humidity content of 4% -45%, 35% -40% and 30% -35%, a single-phase method (25 and 44 kg / ha, respectively)being used, and harvesting at seed humidity content of 15% -20%.

Key words: rape; single-phase, two-phase harvesting; seed yield; weight of 1000 seeds; seed weight plants.

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EVALUATION OF THE COMPLEX USE OF BIORESOURCES AND MINERAL FERTILIZERS IN THE CROP ROTATIONS WITH CLOVER DIFFERENT YEAR OF USE

Experiments were carried out in 2001-2008 to examine the effectiveness of biological resources to ensure high productivity of crop rotations. The task of the research was to study the effectiveness of fallow-used types, green manure crops, and straw, combined with mineral fertilizers in crop rotations with the use of varying years of clover growing. Driving experience: factor A - crop rotations with the fallow-used types: 1 - clean, 2 – involved with (pea-and-oats in the crop rotation of the two years of clover use); 3 – green manure (pea-and-oats in the rotation with two years of clover-use); 4 - green manure (pea-and-oats in the rotation with one year of clover use); 6 - green manure (pea-and-oats in the rotation with one year of clover use). Cultures in crop rotations 1-3: fallow, winter rye, barley, clover of 1 and 2 years of use, winter rye, barley, oats. The rotations 4-6: fallow, winter rye, barley, spring wheat, clover of 1 year of use, winter rye, barley, oats. Factor B - organic fertilizers: without manure, manure 40 t/ha. Factor C – mineral fertilizers, straw: non-fertilized; N1PK; N2PK; straw; straw + N1PK; straw + N2PK. Soil – soddy medium-podzolized medium-loamy medium-cultivated. Green manure and engaged fallows had not differed much in productivity, but a tendency had been shown to increase their effectiveness in relation to crop rotation with clean fallow. In rotation with one year of clover use the efficiency of pea-and-oats green manure fallow was higher than in the crop rotation with two years of use. Straw at joint application with NPK had increased the crop rotation productivity: with the 1st dose of nitrogen by 18,1% (in the non-manure and manure background), with the 2nd dose – 22,8 and 21,7% by respective backgrounds. The coefficient of energy efficiency in crop rotations with green manures made up 2, 74-2,92. Relative-net income per hectare had reached as much as 9,47-11,78 thousand rubles, and the cost per a tonne of grain units - 1,35-2,33 thousand rubles, thus profitability being reached 116-276%. Fertilizer payback had reached in values 4,8-9,2 kg grain unit / kg NPK.

Key words: crop rotation; green manure pairs; straw; manure; fertilizers; efficiency.

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ASSESSING THE IMPACT OF ENERGY AND PROTEIN-AND- MINERAL FEED ADDITIVES ON DIGESTIBILITY AND UTILIZATION OF NUTRIENTS IN DAIRY COWS' DIETS IN YAKUTIA MANAGEMENT

The article presents data from a study of the impact of energy-protein-mineral feed additives on ruminants' organism. It has been proved that the local brewers' grains 19%, and locally produced combine fodder, enriched with "Felucia" (Energetic Shokk), 20% for the purpose of nutritiousness, has provided nutritiousness of the ration ECE 11,8, 1408.2 g of digestible protein per 1 head per day. This high level of digestibility for the cows of the 2nd experimental group compared to the control, and the 1st ones has been also set up as per dry matter by 1.35% and 0,30% respectively; crude protein by 7.42% and 0,28% respectively; crude fiber by 3.48% and 1.76%, respectively. Researches on the use of calcium showed no significant differences between animals of the above-mentioned groups, though cows from experimental groups were getting used to it better, and have settled in the body 55, 64... 80.7 g. It has been also found out that inorganic phosphorus has been utilized by the same amount of milking cows. All animals have shown positive utilization, and thus made 39.4 ... 39.8 g. Improving digestibility for most nutrients per ration is explained by the fact feed additives (brewer's grain and animal feed enriched UVMKK 'Felucia') have caused a stimulating effect on the development of the rumen microflora and the increase of the enzymatic level for the processes in animals proventriculus, and thus intensified the process of metabolism in the cows, organisms.

Key words: simmental breed; diet; brewer's grains; felucen; digestibility.

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THE PROBLEM OF REPRODUCTION IN DAIRY FARMING AND THE WAYS OF ITS SOLVING

Enriched reproduction of cattle and preservation of young animals as a whole are the key terms for sustained development of the dairy industry in the cattle breeding. But there are some preventive factors identified as the females' genital organs' diseases. The aim of the present study is to develop a complex of measures to correct reproductive ability of cows. Monitoring of indicators of reproductive disorders in cows of the Udmurt Republic were conducted according to veterinary reporting, and it showed that in entire republic gynecological diseases had been identified in more than 40% of cows. Study of therapeutic drugs endometrial, oxalat, EAP effects on reproductive qualities of cows of black-motley breed in the stud farm of LLC "Rus", Karakulinsky district of the Udmurt Republic has revealed that to improve reproductive function of cows in loose housing it is necessary to use endometrioma and EAP, with tethering content - oxalat.

Key words: dairy cattle; reproductive qualities; gynecological diseases; frequency of insemination; fertility.

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DETERMINING METHODS FOR ACETHYLHOLINESTERASE ACTIVITY ZONES IN ANIMALS' NEUROMUSCULAR SYNAPSES

Article describes possibility of free software application in the detection of parameters of the acetylcholinesterase (AChE) activity zones in animals' neuromuscular synapses. One of the study methods to be used for synaptic connections research nowadays is histochemical analysis of the above mentioned activity zones. One of the most popular option to proceed with the analysis is using the thioacetic acid. All the articles referring to the matter suggest to determine the AChE activity parameters manually. Therefore, the main purpose of this research is to search for partially automated method and increase inaccuracy of synapses characteristics measurements. For the purpose, possibility of free and proprietary software implementation has been analyzed in the process of morphometry of skeletal muscles histology cuts under protocol of histochemical determination of the AChE activity zones. For the first time assessment of ImageJ software application has been tested for the purpose. Algorithm of AChE activity zones area detection has been also suggested. The possibility of applying ImageJ software for establishing the histochemical reaction of product severity by the method with thioacetic acid involved. As the object of investigation longitudinal cut and frozen sections of male mongrel white rats muscle have been used, which undergone histochemical reaction method with thioacetic acid modified by G.M. Nikolaev and V.V. Shilkin. As a result, different options of morphometric analysis have been researched on base of slices shots, obtained with the means of the ImageJ software programme. The suggested method enables significantly accelerate the procedure of morphometry of the AChE activity zones exactly in sections of skeletal muscle, and improve its accuracy without any special equipment and costly software involved.

Key words: ImageJ; skeletal muscle; neuromuscular synapse; acetylcholinesterase; thioacetic acid; morphometry; computer analysis.

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TECHNICAL SCIENCES

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MATHEMATICAL MODEL OF POTATO TUBER MOTION THROUGH SIZING SCREEN

Calibration of potato tubers is one of the most important operations in the production of potatoes. The process of calibration essentially depends on the laws of motion of the sieve, which should provide high performance due to the rapid exit from the gauge surface of the coarse fraction of tubers. The choice of law can only be made by the results of the study tuber movement over the gauge surface. Further, on we consider the motion of the tuber after hitting it in the slot-like opening, the longitudinal plastic elements of which have relatively high stiffness, and the transverse elements are made of an elastic cord. Analysis of a machine functions and the relationships between the design elements that perform the above functions allow to highlight the most significant problems, resolution of which can provide increase of technological parameters - high performance and precision of size calibration. Analysis of the results of single-factor experiments with physical models and potato tubers has allowed to establish dependence of the accuracy of sorting upon changes in the basic factors that affect the process of sorting, and to determine the limits of variation for these factors to obtain a mathematical model to describe the cumulative effect of the studied factors on the effective operation of sizing screen classifier with a flexible working surface, and to determine the optimal combination of them in the field of experimentation.

Key words: calibration; tuber; sizing screen qualifier; elastic surface; fraction; over-tail; vibrations; separation.

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CHANGES IN ESTIMATION VALUES: FEATURES OF REFLECTION OF THE NON-CURRENT ASSETS VALUE ADJUSTMENT IN ACCOUNTING

Accountants from economic enterprises very often ignore and do not fully implement some of the individual standards of accounting regulations that hinders to achieve the completeness and accuracy of accounting information. In the present article the authors have substantiated the position that reflection of the results of fixed assets revaluation and intangible assets should not be looked upon as a change in the method of assets evaluation associated with the change of accounting policies, but as the changes in estimated values. Based on the study and systematization of various authors' opinions there is a number of different variants of reflection proposed in the accounting estimates. Presented is there an accounting correspondence on reflection of the estimates changes in the accounting. Expressed is there a view of the significant influence of information on estimating values upon the formation of indicators of the accounting (financial) statements of the organization. Methodological basis of the work are regulations, scientific works of Russian specialists on accounting financial accounting, as well as of the authors of the article. In the process of research, the following methods were used: modeling, comparison, systematization of methods, and synthesis of theoretical aspects and practical recommendations for the modeling and implementation of the proposed measures for the improvement of accounting in the organization. Based on critical reflection and systemic evaluation of the works of contemporary scientists and economists various aspects of the reflection in the accounting and reporting changes in these estimates have been studied as a result of changes in the value adjustments of non-current assets.

Key words: estimates; financial statements; adjustments to the value of the asset; the adjustment value of the asset; changes in estimates.

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PECULIARITIES OF THE STATE SUPPORT OF AGRICULTURAL PRODUCT MANUFACTURERS AND CONTROL OF ITS INTENDED UTILIZATION IN RUSSIA AND CENTRAL EUROPIUAN COUNTRIES

State support of agricultural production in the countries of Central Europe (Poland and Czech Republic) and in Russia is considered in the article. Comparison of agricultural production condition in abovementioned countries and analysis of the state support has been done. Poland is characterized by the highest productivity and intensity of agriculture especially in the dairy industry. Russia is a leader in grain production. At the same time, Russia has the lowest grain yield per 1 hectare. State support is in two directions, i.e. direct subsidies for agricultural products manufacturers and through-refund of bank rate in credits for agricultural manufacturers. Poland has quite substantial subsidy for agriculture: annual subsidies reach up to \$5 bln USD. There exist two government agencies - one of which provides national budgetary support, and another one from the European Union. In Czech Republic agriculture is supported both by the government of the country and by the European Union. Annual amount of support reaches \$2,5 bln USD. The most frequent way of support practice in Russia is subsidies through the bank rate. Thus, the total scope of annual support is \$3,4 bln USD. In Russia Ministry of Agriculture provides control of subsidies whereas in the Central Europe control is exercised by specially authorized agencies. An example of effective control over subsidies is the state support system in Poland. If a manufacturer violates the terms of subsidies provision, he will lose all the privileges. Those banks crediting agricultural manufacturers under the state subsidy rate are also subjected to steady and everlasting control. Due to absence of a proper system of control over the state support to the abovementioned countries, some methodological recommendations and indexes of control, demonstrating efficiency of utilization of the state support in agricultural enterprises have been also developed.

Key words: management analysis; Poland; Czech Republic; agricultural company; efficiency; government support; control; the Agency for restructuring and modernisation of agriculture; index of gross output; the index of investment; the growth rate of investment in fixed assets.

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MANAGEMENT OF EFFECTIVNESS OF POTATO PRODUCTION BASED ON THE ANALYSIS OF POSSIBILITIES OF THE SOIL NATURAL FERTILITY

The priority development of agricultural production is the increase in crop production due to optimization of the structure of sown areas and crop improvement including increased production of potato growing by increasing its effectiveness. The article analyzes the impact of the level of plowed farmland and land quality on the efficiency of potato production and the ability to increase the yield of potatoes due to natural soil fertility. With the increasing level of tilled farmland there is a tendency for productivity increase observed, and reducing production costs. Thus, between the level of plowed farmland and yield can be traced a proportional relationship, and between the level of plowed farmland and potatoes cost there exists an inverse relationship. To evaluate the impact of land quality on productivity and the cost of potatoes there is used a technique developed at the Department of Accounting, Finance and Audit in the Izhevsk State Agricultural Academy, based on the evaluation of the quality grading of soils based on the crop yield indicators. Score soil quality assessment can be used to calculate the potential yield increase and the reduction of production cost in different categories of households, as well as to assess the degree of effectiveness of use of natural soil fertility.

Key words: system analysis; plowed farmland; soil quality; utilization possibilities of arable land; adaptive technology.

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