Abstracts of articles

GENERAL AGRICULTURE, PLANT SCIENCE AGRONOMICS AND PROTECTION OF PLANTS

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INFLUENCE OF FERTIGREYN BIOSTIMULATORS APPLICATION FOR THE YIELD STRUCTURE AND EFFICIENCY OF PEAS AND CHICKPEA

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Keywords: chick-pea, peas, processing, seeds, biostimulator, growth, productivity.

The purpose of researches – is increasing of peas and chick-pea efficiency on the basis of biogstimulator application of Fertigreyn group. Results of researches for 2013-2014 with an assessment of yield structure factor, productivity and fodder value of peas and chick-pea at different methods of preseeding processing of seeds and yields are given by biogrowth factors Noktin and Fertigreyn. Entered two-factor experiment of preseeding processing influence for seeds and yields of peas and chick-pea: processing of seeds: Noktin+fertigreyn Start, Rizotorfin+fertigreny Start (factor And); yield processing for vegetation in a phase of 4-6 leaves and in blossuming phase is preparation Fertigreyn Foliar, and also the yield push-push processing in phase of 4-6 leaves + in blossuming phase (a factor In). By researches it is revealed that all seeds and yields increase options productivity processings of peas and chick-pea. The greatest productivity of peas – 2.26-2.28 t/ha and chick-pea – 2.21-2.62 t/ha are reached for the yields processed by preparation Fertigreyn Foliar ina phase of blossum and at double processing in a phase 4-6 a sheet + blossum against processing of seeds preparations Noktin+fertigreyn Start and Rizotorfin+fertigreyn Start.

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FEATURES OF AMARANTH CULTIVATION AGROTECHNOLOGY IN SAMARA VOLGA AREA

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Keywords: amarant, technology, cultivation, harvest, rate, seeding.

The purpose of researches is to develop the basic technological methods of amaranth cultivation in Samara-Volga region. The most important and main sources of plant raw materials are the traditional kinds of grasses. However, not only they should be used for feed production. A certain value are high yielding, broad agro-ecological sustainability of non-traditional fodder plants. One such crop is a multi-purpose amaranth. The culture can afford in the short term to increase the productivity of forage production and significantly improve the quality of the feed. Amaranth was balanced protein with high content of lysine in it, a high yield of green mass and seeds, intensive growth, unpretentious to the soil, resistance to diseases, pests, drought and salt tolerance, which is important in dry conditions, the Trans-Volga region of Samara. Along with high yield and high protein in all phases of the growing season, amaranth is characterized by good otafest, which makes it indispensable in the flax and raw material conveyors. One of the reasons hindering the widespread introduction of amaranth in the production of and does not prevent it from fully realizing its potential is the imperfection of development of technology of cultivation and lack of proper equipment. In SSRI «Volga Science Research Institute of selection and seeds production of P. N. Konstantinov» as a result of years of research on the basis of agro-climatic conditions of the region and the biological features of plants developed theoretical and practical basis for the formation of highly productive agriculture amaranth in Samara-Volga region. In this article the complex of agrotechnical methods, allowing you to get a guaranteed in the arid conditions of the region the yield of green mass to 60 tons/ha of seeds to 2.5 tons/ha.

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PARAMETERS FOLIAGE APPLE-TREE DEPENDING ON THE TERM OF THE CONTOUR PRUNING

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Keywords: apple, time, crop, leaf, machine.

The purpose of researches is improving the performance of leaf apparatus. The study scientifically substantiated and proved that leaf apparatus of apple trees in the first place depends on a methods and terms of crown pruning. Pruning was cut in winter or in winter and early summer (for 10 leaves on growth) manually (control), with the formation of the fruit wall of 0.8 m width in a lower part and 0.5 m in a top part, annual shortening increment on the periphery of crown, and contour with the manual completion. Study periods contour pruning started in the spring of 2011 from 18 variants a fourfold repetition of variants with five accounting trees on a plot of planting with varieties Golden Delicious and Jonaveld with spindle crown in Uman National University of Horticulture in 1995 landing on rootstock M9 T337 scheme 4x1 m. The system of the content of the soil between rows of sod in tree trunks bands - herbicide couples; drip irrigation. It was found that the pruning contour (with manual completion) leaf apple sorts Golden Delicious and Jonaveld in irrigated garden on rootstock M.9 14% thicker, and its execution in early summer leaf area and leaf surface increase of 6%. Method trimming a significant effect on leaf area (impact factor 74%), foliage of trees (57) and the thickness of the leaf blade (46), and the term of pruning – on the area of the leaf blade (12%).

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EFFICIENCY AND FODDER ADVANTAGES OF PEAS YIELD WITH FODDER CULTURES IN THE MIXED CROPS FOR GRAIN-HAYLAGE

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Keywords: barley, oats, peas, grain-haylage, high-quality mix, protein.

The purpose of researches is increase an assessment to efficiency and yield quality of barley and oats with peas kinds and variety mix (a moustached morphotype) with grain-haylage usage at the different levels of a mineral delivery in chernozem ordinary in the conditions of the forest-steppe of Central VolgaAarea. Perfecting of cultures and their mixes selection, specification of parameters and methods of their cultivation is carried out. The fodder mixture consisting of barley of peas and oats contain all principal components of a diet: concentrates, in the form of not ripened grain, a rough forage, in the form of cereal hay and juicy, in the form of green material. Results of of efficiency researches assessment both kinds and varieties mixes fodder value the haylage of the cultures capable to form the planned crop of 3-4 thousand/hectare fodder units at the different levels of a mineral delivery in the conditions of the forest-steppe of Central Volga area are given. Were included in two-factor experience: various grades of barley, oats and peas is Vakula and Bezenchuksky 2 barley, Konkur and Allur oats, Flagman 9 and Flagman 12 peas, their mixes at various norms of seeding (a factor B) and application of fertilizers for the planned crop (a factor A). On average during researches from 2012 to 2014, when cleaning on зерносенаж the most fruitful there were options barley (Vakula + Bezenchuksky 2) + oats (Konkur + Allur) + peas (Flagman 9 + Flagman 12), having provided an exit of 14.8-18.7 t/hectare. On average for 2012-2014 when cleaning on зерносенаж mixes provided an exit of 3.64-5.86 thousand fodder units with 1 hectare. Mixes with peas participation differed in the best security with digested protein. The maximal collecting the fodder proteinf units and an exchange energy was provided with application of fertilizers on the second hum noise. On these indexes mixes with peas – 6.83 thousand/hectare and 75.50 GDZh/hectare respectively differed in the highest value.

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PRODUCTIVITY, QUANTITATIVE CONTENT OF PROTEIN AND STARCH IN THE WINTER WHEAT POVOLZHSKAYA GRADE 86

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Keywords: wheat, nitrogen, fertilizer, yield, protein, starch.

The purpose of researches is to identify changes in crop yields and quantitative content of protein and starch in the grain of wheat on the background of pre-sowing treatment by microfertilizers ZhUSS and nitrogen dressings. Winter wheat is one of the most valuable crops in our country. Formation of high yield and accumulating it economically valuable part is the end result of a number of complex physiological and biochemical processes. Yields were determined by harvesting the accounting area of plots (50 m^2) selective harvester «TERRION» in the phase of full ripeness. The protein content was determined by biuret microdefining by Biurett. The starch content was determined according to the procedure by N. I. Yastrembovich and F. L. Kalinina. The experiments were accompanied by research in triplicate. Mathematical processing of data held productive dispersion method of Dospehov V.A. Results of the effect of pre-sowing treatment drugs ZhUSS-1 ZhUSS-2, 3-ZhUSS and feeding nitrogen fertilizer during the growing season for crop yields, protein and starch in the grain of winter wheat Volga 86 varieties over 3 years of research. Productivity increased more on the background of pre-sowing treatment by drug ZhUSS-1 in combination with a dressing of ammonium nitrate to 31.14%. The largest increase in the total amount of protein – at 19.69% – grain wheat noted in the embodiment with the pre-sowing seed treatment formulation ZhUSS-3 in combination with a dressing of the ammonium nitrate. The amount of starch in the grain of wheat increased more on the background of micronutrient ZhUSS-2 fertilizing ammonium nitrate and ZhUSS-2 with ammonium sulfate at 20.50 and 20.08%, respectively. Probably, the increasing of the studied parameters related to the microcells that are part of ZhUSS drugs in an active form, which effectively use both separately and in combination with nitrogen dressings.

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VARIETY STUDY OF FLAX IN CONDITIONS OF NORTHERN KAZAKHSTAN DRY STEPPE ZONE

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Keywords: flax, variety sample, vegetation, period, oil content, yield.

The purpose of researches is to increase the productivity and selection of optimally adapted to the conditions of the dry steppe zone of Northern Kazakhstan the variety samples of oil flax. In recent years, interest was increased in the cultivation of oil flax. Introduction in manufacture of new varieties of flax, yielding linseed oil food are similar in chemical composition to sunflower, is relevant to the state and will allow to fully meet the country's demand for vegetable oil for food industry. Flax is one of the most highly efficient crops, as all parts of the plant are used in industry as food for humans. Experimental research data was carried out in 2012-2014 in Kostanay research Institute of Agriculture (Republic of Kazakhstan). In the competitive strain testing was investigated 48 samples of oil flax. Accounting area plots of 40 m^2. Repeated experience – 3-fold control were placed in 3 plots. Seeding rate – 6 million viable seeds per hectare. In the competitive strain testing (2012-2014) highest yielding were the following varieties: K-1556 – 16.3 C/ha; 447 – 16.3 C/ha; d-14 – 22.3 kg/ha; 757 – 29.5 t/ha; a to 17.8 kg/ha. the oil content in the seeds of the accessions: 704(5) – 41.30%; 120 – 41.0%; with 101 – 41,2%; 1143 – 41.2%; with 1107(2) – 41.9%; a to 42.8%. Found that the most precocious are the following entries: 81 – 79 day; 45 – day 79; 101 – 78 day; 1143 – 79 days.

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IMPROVING THE EFFICIENCY OF ARUGULA CULTIVATION IN THE CONDITIONS OF SMALL-VOLUME HYDROPONICS AND SOIL CULTURE

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Keywords: arugula, hydroponics, cultivar, efficiency.

The purpose of researches is to increase the efficiency of arugula cultivation as intermediate additional culture in winter greenhouses in the conditions of small-volume hydroponic culture and traditional soil cultivation. During pilot studies, the research of arugula different grades cultivation agrobiological aspects in the conditions of small-volume hydroponic culture and traditional soil cultivation is carried out (S nutrition plant = 400 cm² with placement 25 rast./m² the hothouse area, the registration area of an allotment – 4,8 m², frequency in experience – 4-fold). It is established that for the complex of biometric indicators of plant grown on mineral mats at hydroponic way, were characterized by more active apikal and radial growth, formed root system of bigger weight. The plants which grew on soil culture were more leaffull and formed the main root of bigger length. Efficiency of cultivation of arugula as intermediate additional culture in the glazed greenhouses on mineral wool is shown. The yield of lettuce in hydroponic method of growing next, kg/m^2: grade Spartak – 1,706; grade Victoria – 1,695; grade Solitaire – 1,646; grade Poker – 1,650. When grown in soil mixture the yield amounted arugula, kg/m^2: grade Solitaire – 1,476; grade Poker 1,442; grade Spartak – 1,511; grade Victoria – 1,498. The obtained results can serve as a basis for the development of agro-technological regulations the use arugula as an additional culture for growing of main crops protected ground, such as cucumber or tomato.

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IMPACT FOR THE MICROFERTILIZERS ZHUSS GLUTEN PROTEIN FRACTIONS ACCUMULATION IN WINTER WHEAT

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Keywords: wheat, nitrogen, fertilizers, gluten, protein, fraction.

The purpose of researches is to justify the use of preseeding processing of seeds by microfertilizers and early-spring top dressing of nitrogen fertilizer deposits. The most valuable proteins that determine baking quality of flour and nutritional value of products derived from wheat, are gliadin and glyutenin groups proteins whose content in wheat grain depends on environmental factors during the growing season, from fertilizer use and agricultural practices in general, as well as the varietal characteristics. Isolation of the protein fractions was performed according to the method described fix. The protein content was determined by microdefining by Biuret photoelectrocolorimeter CK-2. According to the results of studies, for the accumulation of gluten protein fractions in the grain of winter wheat largely influenced pre-sowing seed microfertilizers ZhUSS ZhUSS-2 and-3, increasing performance at 2.12-2.16%, to lesser extent ZhUSS-1, increasing the value of 1.60% compared to control. The greatest influence of nitrogen application during the growing season without the use of pre-sowing treatment to gluten protein fractions observed in variants with urena, increase in the average age of 1.83% in comparison with the control. Effectively complex action microfertilizers ZhUSS-3 with ammonium nitrate and ZhUSS-2 with urea to education gluten protein fractions with the addition of up to 2.73% compared with the control.

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TIME OF SOWING, SEED RATE, GROWTH FACTORS INFLUENCE FOR PLANT DEVELOPMENT OF OIL FLAX IN NORTHERN KAZAKHSTAN

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Keywords: flax, oilseeds, term of sowing, norm of seeding, stimulator, growth, phenology.

The purpose of researches is increasing the yield of flax in the conditions of Northern Kazakhstan through the application of growth stimulators. In Kostanay Region in 2014 the sown area under oilseeds was only 360.3 thousand ha, including oilseed flax took 145.1 thousand ha. Practice shows that the yield of linseed is determined to apply the technology of its cultivation. Significant impact for the productivity and quality of seeds have such technological methods as sowing, seeding rate, the availability of plant nutrients and varietal characteristics. The research program includes 2 field experiments. In the first experiment sowing and flax seed rate for oilseeds was studied. In the second experiment the efficacy of bio-stimulants was detected during processing of crops linseed: 1 – control; 2 – Prosper plus 3 – Zircon. Sowing seeds of varieties carried out with high-quality linseed Kustanaiskiy Yantar. Experiment is laid on the herbicidal couple, the preparation of which is carried out with the use of soil conservation water saving technologies. The duration of the growth and development phases and interphase periods in 2012-2014 were varied considerably depending on the meteorological conditions and cool growing season and explore options. In 2013, which is characterized by good moisture supply crops (205.8-212.2 mm during the growing season), marked by the maximum length of the growing season in all versions. Seeding rates did not have significant impact for the length of the growing period. The use of growth stimulants and Prosper plus Zircon favorably affected the growth and development of plants linseed.

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UDK 635.22:[631.82+631.847.211+631.86]

INFLUENCE OF FERTILIZER AND MELIORANTS FOR THE FORMATION OF POTATO TUBERS YIELD AND QUALITY IN ASKERAN REGION NKR

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Keywords: potatoes, fertilizers, meliorants, growth, yield, quality.

The purpose of research is increasing the yield of potato by effective system of fertilizers usage. The impact for the growth characteristics, development, chemical composition and yield of tubers were studied . To conduct the experiment, nitrogen, phosphate, potash, fertilizers, as meliorants had been used and treated dacite tuff (OTD), bentonit and gypsum, and from bacterial fertilizers - germ-micron (MM).As a result of the experiment the lowest expectancy of vegetation and plant growth were observed in the control variant, where the plant height is 41 cm, the number of stems of bush are 3.3 pcs., weight tops are 325 g, and the time from germination to natural withering away of the tops was 89 days. The highest results were recorded in those cases where as potassium fertilizer and soil improver ODT was used ,and on this background the MM-biofertilizers (version N90P90K90 (OTD) 600kg / ha and N90P90K90 (OTD) 600 kg/ha + MM), where the plant height is 52 cm, the number of stems are 5.0 pc., weight tops are 470 g, and from time of germination to natural withering away of the tops is 106 days. By years tuber yield ranges from 136 to 195 kg/ha, the average yield – in the range 157 kg/ha. According to the experiment higher yield of potatoes produced in the background N90P90K90 (CCT) in the application of bio-fertilizers and MM - 241 kg/ha, which is in relation to control above 84 kg/ha (53.5%), in relation to N90P90K90 (KCl) – 51 kg/ha (26.8%), and in relation to an embodiment N90P90K90 (OTD) – 23 kg/ha (10.6%). It was found that the use of fertilizers had a positive effect on tuber quality of indicators.

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THE WHEAT TRIPS DYNAMICS IN CROP ROTATION

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Keywords: wheat, trips, winter, spring, wheat, barley, crop rotation.

The purpose of research is to justify the need for crop protection from wheat thrips. Adults and larvae of the pest damage plants of the Poaceae family. The studies were conducted in 2008-2010 in Kinel district of Samara Region. The object of study is wheat thrips, the subject of study is winter wheat (Povolzhskaja 86), spring wheat (Kinelskaja 59), barley (Povolzhskiy 65). Wheat thrips met in the rotation crops in winter and spring wheat, barley. Proximity fields allow pest to migrate from one field to another. The largest number of adults observed in winter wheat crops in the smallest barley. The average number of of research years phytophage in winter wheat was 710 ind./100 sweeps in spring wheat – 490.5 ind./100 strokes, in crops of barley – 178.7 ind./100 strokes. Most of the pest was observed in all the studied crops sowings in 2010. The number of eggs laid in the middle in winter wheat crops in 2009 ranged from 20.4 to 23.7 ind./spike, in 2010 from 27.9 to 46 8 ind./ spike. In spring wheat the average number of eggs in 2009 was 6.2 ind./spike, in 2010, 9.0 ind./spike. The number of larvae in winter wheat crops in 2009 averaged 4.4 ind./spike, in 2010 32.5 ind./spike. In spring wheat the number of larvae in 2009 ranged from 9.1 to 15.9 ind./spike, in 2010 from 16.1 to 25.8 ind./spike. The number of larvae in the ears of winter wheat in 2010 exceeded the economic threshold of 1.6 times. The damage of wheat grain wheat thrips in 2010 was higher than in 2009. The average damage of winter wheat pest during the studies was 68.4%, of spring – 58.2%.

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STUDY OF FRUIT TREES SPRING VACCINATIONS IN THE MIDDLE VOLGA AREA ENVIRONMENT

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Keywords: gardening, breeding, rootstocks, grafting, fruit, trees.

The purpose of research is improvement of the spring vaccinations technology, increase the yield of fruit seedlings, stone fruit crops per unit area of the nursery. Objects of research: seed rootstocks of stone fruit trees – Magalebskaya cherry and wild plum, Anis apple stocks, V. I. Budagovsky clonal rootstocks 54-118, 62-396 and pears – the stocks of forest pear. On these rootstocks planted cuttings zoned and promising varieties of apples, pears, cherries, plums and apricots, made in the State Register of the Middle Volga Area, by the method of improved copulation. The survival rate of grafting on all fruit trees was high and did not depend on the breed. From the stone fruit varieties the survival rate of grafting was better on cherry and merry trees, and slightly worse – on plums. The survival rate of grafting depends on the stock, plant, variety, weather conditions during the fusion of grafted components. Especially effective is spring grafting during reproduction of stone friut trees, as the output of stocks compared with budding has been greatly increased. Out of stone fruit trees the most problematic in breeding is apricot. However, the spring grafting provides a sufficiently high survival rate of the breed. The stocks winter conditions overcoming can also have a significant impact on the survival rate of grafting made on them. In our case, in all the years of observations, winter conditions overcoming were up to the norm and did not affect the quality of the rootstocks.

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STABILITY OF SPRING BARLEY VARIETIES TO LOOSE SMUT

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Keywords: barley, spring, dusty smut, resistance.

The purpose of research is to justify the possibility of varieties and lines of the spring barley world collection using in the selection when creating new high-yielding and resistant to stress factors varieties. Spring barley is early maturing and plastic crop. The research was carried out in 2013-2014 in the fields of the laboratory of selection and grain forage seeds production FSBI «Volga NIISS» 77 26 varieties and lines of the world collection native (origin – Samara, Belgorod, Moscow, Rostov, Saratov, Volgograd, Orenburg, Tambov, Omsk and Chelyabinsk regions, the Altai territory, the Krasnodar territory) and foreign (origin – USA, Canada, Germany, Austria, France, Denmark, Hungary, Turkey, Ukraine, Belarus, Kazakhstan) selection. The object of study – spring barley, the subject of the research – the loose smut of barley (Ustilago nuda (Jens.) Kell. et Sw.). In 2013, the head smut of barley was observed on the varieties of Kinelskij 61 and Zemlyak, in 2014 the disease was met at the

hulless varieties of Omskij baregrain 2 and Zernogradskij 35. The prevalence rate amounted to 1.0%. The loose smut affects the growth and development of barley plants. Thus, affected plants in the study years decreased height (3.6-14.4 percent), length of main spike (22.6-44.4 per cent), the total number of shoots (16.7-50.0%) and the number of productive shoots (13.0-44.4 percent). The prevalence of the disease on average in 2013-2014 was 0.5%, it is a direct loss, so the yield of the studied cultivars decreased by 0.13 t/ha (variety Kinelskij 61), of 0.16 t/ha (variety Zemlyak), of 0.07 kg/ha (cultivar Omskij baregrain 2), 0.17 t/ha (cultivar Zernogradskiy 35). Varieties Kinelskij 61, Zemlyak, Omskij baregrain 2, Zernogradskiy 35 have practical resistance to loose smut. Varieties Submedikum 2149/02, Povolzhskij 22, Nutans 553, Margret, Ilek 16 combined field resistance to loose smut with high efficiency.

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ORDINARY CHERNOZEM BIOLOGICAL ACTIVITY UNDER SPRING WHEAT CULTIVATION

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Keywords: microorganisms, actinomyces, enzymes, polyphenoloxidaza, peroxidase.

The purpose of research is monitoring the status of soil fertility and biological activity of soils. Studies of biological activity of the soil was carried out in crops of spring wheat experimental field of the Department of «Agriculture, soil science, Agrochemistry and land cadastre» in the period 2011-2013. Three variants of main soil tillage in crop rotations were studied with clean and steam green manure: plowing on 20-22 cm; tillage at 10-12 cm; without autumn machining. Isolation and counting of microorganisms in soil was carried out by culture of the soil mash of sterile solid nutrient medium in three terms according to method I. Sega. The breath of the soil in field was determined by the method of V. I. Statnov in two terms. The activity of enzymes peroxidase and polyphenoloxidase was determined by the method of A. S. Galstyan, A. I. Chuunderova. The influence of soil microorganisms for the maintenance and reproduction of soil fertility in the development of new technologies in agriculture was studied. Data of primary tillage influence for the number of soil microorganisms different groups (micromycetes, bacteria, actinomycetes), the process of respiration intensity and carbon dioxide release from the plow layer of the soil and the rate of change of its enzymatic activity; defined the conditional coefficient of humification. The increase in the number of soil microorganisms in crops of spring wheat depends on the method of tillage and to lesser extent from its predecessors. The study of oxidoreductase class enzymes activity and the calculation of the conditional coefficient of humification allows to judge about the intensity of humus formation and increase of these indices in the variants with the hoeing and plowing.

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OPTIMIZATION OF SOYBEAN CULTIVATION TECHNOLOGY IN THE MIDDLE VOLGA STEPPE REGION

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Keywords: soybean, tillage, herbicides, productivity.

The object of research is to determine optimal basic techniques, seedbed preparation and herbicide application in the technology of soybean cultivation in the steppe of the Middle Volga region. The research was carried out in 2012-2014. The experimental setup consisted inspect three factors in triplicates. The results of addition density determination of soil after sowing of soybean showed that after plowing the figure was in the layer 0-30 cm 1.07 g/cm^3. In the deep and shallow subsurface primary processing has value-density. The soil layer was higher by 0.03 and 0.09 g/cm^3, respectively. Application of herbicides at dump core processing enabled to largely reduce the weeds number for many years, than at subsurface primary treatment (average of 0.7 units/m^2 when plowing, 2.1 and 1.3 PCs./m^2 in shallow and deep subsurface core processing). Pre-sowing soil treatment methods depending on the weapon had no effect for the infestation of weeds in quantitative structure. On average over the study years in control of the crude fat in soybeans content came in very low rate (for 17.5-17.9 per cent) compared with the use of herbicides (18.5-19.6%). In the absence of herbicides, the main tillage for soybean in the STU-PI of the Middle Volga region should be plowing to a depth of 25-27 cm, followed pre-sowing tillage CSR is 10.5. The combination of deep subsurface tillage and primary seedbed Catros tillage with the spraying by herbicides Pivot and the Pulsar was more effective techniques in the technology of soybean cultivation to destroy weeds and obtaining high yield.

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PROCESSING TECHNOLOGY, STORAGE AND PROCESSING OF AGRICULTURAL PRODUCTS

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THE INFLUENCE OF ORGANIC ADDITIVES FOR MUSHROOMS AGARICUS BISPORUS CHEMICAL COMPOSITION

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Keywords: beerable, substrate, mycelium, champignons, bisporus, foodable, value.

The purpose of research is improving the nutritional value of mushrooms champignons duospore model by the use of organic additives, and optimization of the method of their application. The authors identified the effect of the type of organic supplements method application to grow vegetive and animal origin for the chemical composition and nutritional value of mushrooms shampinyon. It is noted that the nutrient content of mushrooms depends not only on the type and method of organic additives application, but also time of the substrate preparation. When grown on the substrate prepared in the winter time, the greatest content of crude protein in mushrooms is celebrated in all the ways of entering into the substrate of a beer pellet, meat and bone meal under the second stirring of the substrate, and grit from soybean seeds or husks under-sun in covering the soil. When making sunflower husk in the surface soil, crumbs from the grain of millet beneath the second mixing of the substrate in the mushrooms white button mark the lowest content of crude fiber. On the substrate prepared in the summer time, ensures the two waves of harvest of the mushrooms white button mushroom. Mushrooms grown on a synthetic substrate prepared in the summer time, have better nutritional value than mushrooms, are obtained on the substrate prepared in the winter time. The highest content of crude protein in the mushrooms first and second wave of the harvest can be obtained by introducing into the substrate during the laying of the organic additives is 3.0% of spent grains. The content of mineral substances in mushrooms white button mushroom also depends not only on the type and method of application of organic additives, but also from waves of fruiting, and time of preparation of the substrate. The mushroom harvest of the first wave, grown on the substrate prepared in the summer time, as a rule, contain more mineral substances than the mushrooms from the substrate prepared in the winter time.

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MULTIFUNCTIONAL COMPOSITE WITH HIGH CONTENT OF DIETARY FIBER

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Keywords: extrudate, wheat, seeds, food, fiber, functional properties.

The purpose of research – is to substantiate the main technological parameters and to assess their impact for the process of multifunctional composite of wheat and pumpkin seeds mixture producing. Experimental studies were carried out using a single-screw extruder press, additionally equipped with equipment that allows to realize the thermal vacuum effect for e machine exiting extrudate. The object of the study was milled wheat and unrefined pumpkin seeds are coextruded for 15-20 s at a temperature of 100-105° C, followed by exposure to exiting the extruder die matrix raw material reduced pressure of 0.05 MPa. Rotational speed of the extruder screw press was 7.5 s^{-1}, the diameter of the extruder matrix – 4 mm. As the factors studied were selected percentage of pumpkin seeds and the moisture content of the extruded mixture of its constituent ingredients. During the test the quality of the multifunctional composite index was adopted by extrudates expansion (coefficient of explosion). The experiment was performed in triplicate. As a result of statistical processing of the experimental data the mathematical model of the second order, adequately describes the dependence of the index extension extrudates of factors were studied. Analysis of the model suggests that the decrease in the proportion of pumpkin seeds in mixture of 20-25% expansion of the extrudate index increased to 3.4-3.6. Thus, the quality criterion derived multifunctional composite depends significantly by RHR-carrying humidity extruded wheat grains and pumpkin seeds, and the humidity of the extruded mixture as a whole. For a composite from the mixture of polyfunctional wheat and pumpkin seeds with an acceptable coefficient of explosion (3.0-3.2) as a filler can use wheat with 14-15% moisture in an amount of 75-80% of the extrudable mass. When this moisture processed pumpkin seed, is within 32-35% in order to ensure that the water content of the extrudable mixture in an amount of 18-20%.

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GROWTH REGULATORS EFFECT FOR THE CHEMICAL COMPOSITION OF MUSHROOMS AGARICUS BISPORUS

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Keywords: foodable, value, regulators, mushroom, bisporus, substrate, covering.

The research purpose – is improving the quality of bisporus mushroom fungi at the expense of growth regulators and timing of their application with soil. irrigation covering The authors found that in the preparation of synthetic substrate in the winter time is mainly based on one wave-the harvest of mushrooms. Most raw-theine in the fruit bodies contains in the cultivation of white

bisporus mushroom with splash in the blood of the soil 0.005% aqueous solution of growth regulator «Baikal EM-1», «Sodium HUMATE» and «Mival-agro», and the maximum amount of mineral substances in the application of growth regulators «HB-101». For the cultivation of white bisporus mushroom by the substrate prepared in the summer time, ensures the two waves of harvest of the mushrooms. It is revealed that the mushroom harvest of the first wave, collected with the substrate prepared in the summer, the content of crude protein, crude fiber and crude fat more than in mushrooms grown on substrate prepared in the winter time. The maximum number observed crude protein in the dry matter of fruiting bodies in the application of growth regulator «Baikal EM-1». The highest content of mushrooms crude fiber in the first wave of fruiting differ for the cultivation of white bisporus mushroom by using of growth regulator «Baikal EM 1» and «HB-101» and the mushrooms of the second wave in application of 0.005% aqueous solution of growth regulator «sodium HUMATE». Dry matter of mushrooms harvest of the first wave, grown on the substrate using growth regulators, a few more also contains raw ash, phosphorus, calcium, magnesium and sodium, especially when watering cover soil with an aqueous solution of the drug «Baikal EM-1».

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MULTICOMPONENT EXTRUDATE ON THE BASIS OF WHEAT AND THISTLE SEED

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Keywords: extrudate, wheat, milk thistle, spotted, vacuum, camera, index.

The aim of the study is to substantiate the technological parameters of the extrusion process and to assess their impact on receiving polycomponental extrudate from mixture of the wheat and Thistle seeds grain. The experiments were carried out using a single screw press extruder, modernized according to the patent №RU 2561934 for the invention of «Extruder with vacuum chamber». Object of research is mixture of wheat wet-STU 14% and Thistle seeds with a water content of 22%. Used in studies of wheat varieties Saratovskaya 36 was characterized by the following indicators: mass of 1000 seeds was equal to 34.2 g; the content of starch, protein, fiber and lipids contains respectively 52.6; 12.4; 10.2% and 2.2%. The weight of 1000 seeds of milk Thistle can get the stains out-wait grade Debut amounted to 26.8 g; lipid content, protein and fibre in the seeds was respectively, 24.8; 22.3 and 33.0%. The ratio of Thistle seeds and wheat in experiments were varied so as to obtain an extrudate with a lipid in an amount of 13.5 to 4.5%. A mixture of whole wheat grains and thistle seeds were extrudibly spotted within 15-20 s at a temperature of 100-105^{0}C with subsequent impacts on emerging from the die the matrix of the extruder the product at atmospheric or reduced pressure air in a special machine chamber. The rotational speed of the screw press-extruder was 7,5 s^{-1}, a spinneret diameter of the matrix is 4 mm. The experiment was conducted in triplicates. Statistical processing of experimental data using correlation and regression analysis in Microsoft Excel 2010 and Statistica 10, allowed to obtain the mathematical models of the second order, adequately describing the dependence of the expansion index (coefficient explosion) from the studied factors. The analysis of the model shows that when the moisture content of the processed mixture of 18-21% porous extrude-explosion ratio above 1 under conditions of atmospheric pressure can be obtained in the case that use raw materials containing lipid not more than 13.5%. Acceptable coefficient of the extrudates explosion (3,0-3,5) in the processing of raw materials with content of lipids more than 7% ensured through the establishment of the special extruder chamber in air pressure below atmospheric.

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ADDITIONAL RAW MATERIALS USAGE BY BAKERY PRODUCTS OF THE FUNCTIONAL PURPOSE PRODUCTION

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Keywords: bread, quality, indicators, protein, pectin, medicinal, plants.

The aim of researches is theoretical and experimental ground of grain-growing components application, pectin substances and medicinal application in the purposed bread baking. Enrichment of bakery products was made in the following directions: increase of biological value at application of grain components with the increased protein content; increase the preventive value at use of pectin contained raw materials and giving the treatment-and-prophylactic value from extracts of wild-growing medicinal herbs application. Introduction of flour from haricot grain in the bread compounding in 4% of the flour mass promotes increase of protein content in bread, increase of biological value of bread without deterioration of organoleptic, physical and chemical indicators of its quality. By production of bakery products we recommend to apply the pectin contained residue from lemon and apples, their introduction in number of 3% of the flour mass is optimum. At production of bread with use of wild-growing medicinal raw materials the best results which can be recommended to the enterprises, were received on options with use of powder from devysilum high root and herbs of thyme in number of 1%, and torments from chicory root in number of 3% of the of premium wheat flour mass.

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COMPARATIVE ANALYSIS OF FOODS FROM CHOPPED MEAT WITH RECYCLED OAT PRODUCTS

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Keywords: oats, cereals, oatmeal, extrudate, meat, minced, semi-finished products.

The research purpose is to substantiate rational methods of oat flakes preparation and application, oatmeal and oat extrudate for meat chopped semi-finished products. Hydration of recycled oat products is reasoned and put into practice for guarantee technological functionality and high organoleptic characteristics of worked out products. Vegetable ingredients should be covered with cold water for modifying: oat flakes should be put in ratio 1:1.5-2 for followed by swelling period of 15-20 min, oat flour should be put in ratio 1:4 for followed by swelling period of 5 min, oat extrudate should be cut very small and soaked in water at 80-85°C 1:3 ratio of 10-20 minutes duration. Comparative analysis of chemical characteristics of semi-finished product with products of recycled oat indicated that the highest content of moisture observed in samples of semi-finished products with oatmeal, the content of the mass fraction of protein and leach – in the semis with extrudate. Oat extrudate has the highest pH value of considered fillers that is why semi-finished products with the filler also have higher pH that causes mass loss during the heat treatment. Partial replacement of raw meat product with has positive effect for complete product output. Samples with the oat extrudate have the lowest weight loss during the heat treatment. Researches of microbiological properties of finished products and complete products revealed that all products meet performance regulations.

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INFLUENCE OF MILLET SEEDS GERMINATION PROCESSES ACTIVATION MODES FOR CONSUMER PROPERTIES OF GRAIN

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Keywords: millet, millet, grain, sprouting, quality.

The purpose of researches is improving the nutritional value of cereals from sprouted millet grain. The object of research are the millet grain Zaryan varieties, which is included in the state Middle Volga Region register (7) for growing in the Samara region and included in the list of spells by the varieties quality . The experiment scheme options have been sprouting grains at temperatures of 5-7 15-18°C and from 6 to 48 hours depending on the temperature and duration of germination changes of technological properties and chemical composition of millet grain, due to the intensity of respiration and growth processes. Especially noticeable decrease is in their mass of 1000 grains and the increase of the mass fraction of crude protein, fat and fibre in duration of germination over 24 h. Increased content of essential amino acids in the temperature range from 5 to 18°C occurs only in the period until 24 h of germination. Based on these data, the optimum conditions for germination were recommended: temperature ranging from +5 to +120°C; the duration of the germination – no more than 24 h. The grain obtained under such conditions, has rich content of proteins, essential amino acids, and also useful for digestion of fiber. Porridge from cereals, obtained from germinated seeds under the recommended conditions, has performance similar to the control that the rise

in food value makes the cereal more preferred in the production than millet, the obtained by traditional technology (without sprouting).

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SMALL-PIECES BAKERY PRODUCTS WITH HIGHER NUTRITIONAL VALUE

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Keywords: products, small-pieces products, bakery, wholemeal, cereal, wild, rice.

The research purpose is increasing of nutritional value of small-pieces bakery products by using prescription composition, consisting of wheat flour wholegrain, premium grade wheat flour, oatmeal, wild rice. The objects of research are small-pieces bakery products. For the study were prepared five samples of grain and flour mixtures with different content of recipe components, on the basis of which were created recipe of dough for small-pieces bakery products. When developing recipes margarine has been replaced with vegetable oil, and studied its effect for the specific volume of the dosage. Best specific volume had products with the dosage of sunflower oil 10% by weight of flour. Replacement of sugar by molasses has positive effect for the reaction of melanoidins creation that acknowledges receipt of brightly colored crust of products with pronounced aroma. To determine the indicators of finished products quality have been number of pilot baking by unleavened way developed recipes with samples of formulated №1-5. To improve the nutritive value of the developed products wild rice was used, which was added in boiled form in the amount of 5-25%. According to organoleptic characteristics, it was found that the addition of boiled wild rice more than 15% leads to the crumb moisture and decrease in volume. Therefore, for dough preparation used 10% boiled rice relative to the mass of grain and flour mixture. Analysis of the nutritional value of products shows that the developed bakery small-pieces products have higher nutritional value relatively similar products from first-class flour. It may be noted that the content of vitamins and minerals is reduced with a reduction in the formulations of mixtures amount of whole grain flour. There was a significant increase in the developed products the content of elements such as magnesium, phosphorus, iron, vitamins B_1, B_2, PP. It was also analyzed growth of vitamins and minerals content, which gives adding wild rice to products. The data showed that when added to the product wild rice increases the content of potassium 5.45%, calcium – at 9.38%, magnesium – 8.43%, phosphorus – 6%, iron – on 0,96%, zinc – 19,11%. The content of vitamin B_2 will increase by 1.14%, vitamin PP – 7%, folic acid – 7%.

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