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YIELDING CAPACITY OF SHALLOT VARIETIES DEPENDING ON THE PLANTING MATERIAL

The purpose of the research was to determine the yielding capacity of shallot varieties depending on the planting material. The objective of the research was to study the effect of planting material on the yielding capacity of shallot varieties and its structure. The results of studies of planting material (small (10–15 g), large (20–30 g), half of large) of local shallot varieties (2/16, 3/16, 4/16, 5/16, 6/16) under the conditions of the Udmurt Republic are presented. The division of a large planting bulb into two parts provided an increase in the total weight of the bulb by varieties by 8.4–14.0 g, however, on average over two years of research the total yield was obtained by 0.90–1.44 kg/m^2 lower due to the formation of a smaller number of bulbs in the nest by 2.3–3.4 pcs. During both years of research on small and large planting material the commercial yield capacity was at the same level and amounted to 3.06 and 3.08 kg/m^2 in 2016, 1.15 and 1.36 kg/m^2 in 2017, respectively.

Key words: shallots; varieties; planting material; yielding capacity.

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VETERINARY AND SANITARY EXAMINATION OF DIFFERENT HONEY VARIETIES

The purpose of the research was the veterinary and sanitary examination of three samples of floral honey for compliance with the requirements of the current GOST and the exclusion of possible falsification. The results of determining the quality of honey by organoleptic and physical-chemical parameters are analyzed. The color, consistency, aroma, and taste are characteristic features of these honey varieties. There are no mechanical impurities and signs of fermentation. All honey samples have fine-grained crystallization as a result of prolonged storage. The mass fraction of water is in sample № 1 – 14.5 %, № 2 – 20.6 %, № 3 – 14.1 %, the content of the diastase enzyme is 8.0 %, 10.4 % and 12.4 %, respectively. Admixtures of honeydew, beetroot and starch molasses were not detected. The analysis and generalization of the results confirmed that

all the main quality indicators were within the normal range except for overestimation of the total acidity in all samples.

Key words: veterinary and sanitary examination; organoleptic indicators; physical-chemical indicators; falsification; floral honey.

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EFFECT OF THE SOWING PERIOD ON BIOCHEMICAL PARAMETERS OF CHINESE RADISH ROOT CROPS

It is necessary to study the issues of the cultivation technology of Chinese radish (lobo) for increasing its area of cultivation under the conditions of the Udmurt Republic. The aim of the research was to identify the optimal sowing time for varieties of Chinese radish while growing in the Udmurt Republic. The article presents the results of studies of biochemical parameters of Chinese radish root crops at different sowing dates under the conditions of the Udmurt Republic. It was found that a significant increase in the dry matter content by 0.9 % was noted at the sowing date of June 20 and amounted to 11.7 %. The content of water-soluble sugars in Chinese radish root crops was not affected by varietal features and sowing dates, their content ranged from 4.5 to 7.0 %. It was noted that Zavtrak Gurmana variety increased the ascorbic acid content by 9.0 mg/100 g and amounted to 38.1 mg/100 g. A decrease in nitrates by 164 mg/kg compared to the control variant was noted at the sowing date of June 20.

Key words: Chinese radish; lobo; yielding capacity; sowing time; biochemical parameters; Udmurt Republic.

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GROWTH CHARACTERISTICS AND YIELDING CAPACITY OF TOMATO HYBRIDS IN THE UDMURT REPUBLIC

Due to the introduction of new tomato varieties and hybrids the study of their growth, development, productivity and adaptation to the conditions of protected ground in the Udmurt Republic is relevant. The aim of the research is a comparative assessment of new indeterminate tomato hybrids of protected ground. The research was carried out in the AO Zavyalovsky Greenhouse Plant of the Udmurt Republic in 2019–2020. Various tomato hybrids were taken as the target of research (Admiro F1, Torero F1, Arkaim F1, Crescendo F1, Macho F1, Baloven F1). During the seedling period the plants of different hybrids developed at the same level. In the fruiting phase in 2019 the Admiro F1 tomato showed a long leading shoot which was 502.9 cm. In 2020 the Admiro F1 tomato was also 69.5 cm higher than the Torero F1 tomato hybrid. The best yielding capacity was also obtained when growing the F1 Admiro hybrid, it was 28.2 kg/m^2. This indicator increased due to the weight gain of the fruitery in the F1 Admiro hybrid – 161.6 g.

Key words: protected ground, tomato hybrids, biometric indicators, productivity.

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YIELDING CAPACITY AND QUALITY OF ONION VARIETIES DEPENDING ON THE PLANTING DATE

The results of two-year studies of the effect of the planting time of onion sets on the growth characteristics, development, yielding capacity and quality of onion varieties are given. The research was carried out under open-ground conditions of the Udmurt Republic. The experiments studied onion varieties (factor A): Stuttgarter Riesen (k) and F1 Centurion; planting dates (factor B): early spring, in 5 days and in 10 days. Onions were grown according to the adopted zonal technology. The agrochemical soil analysis before trial establishment, phenological observations, biometrical studies, and yielding capacity records were conducted as part of the research. After harvesting a qualitative assessment of the bulbs for the content of water-soluble sugars, dry matter,

vitamin C and nitrates was carried out. The studies have revealed that the StuttgarterRiesen onions were significantly superior in the number of leaves, diameter and bulb weight. The weight of bulbs depended on the variety and was 80 g in the StuttgarterRiesen, 63 g in the F1 Centurion on average. Planting of onion sets in the early spring period led to a significant increase in the yielding capacity of onions to 2.45 kg/m^2 on average. It was found out that the highest yield while growing StuttgarterRiesen onions was obtained when planting onion sets at the latest period – 3.09 kg/m^2. The bulbs contained water-soluble sugars in the range of 8.5–13.5 %, Vitamin C – 6.0–9.6 mg/100 g. Onions in Udmurtia should be planted at the earliest possible time.

Key words: bulb onion; variety; planting date; yielding capacity.

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EDIBLE PEA CULTIVATION IN CERTIFIED ORGANIC ENTERPRISE "ECOFERMA DUBROVSKOYE"

The agrotechnical significance of edible peas includes the improvement of nitrogenous nutrition of crops, the nitrogen balance of the soil, increasing its biological activity, its phytosanitary condition, and soil fertility; the increase in yielding capacity and product quality of subsequent crops; rational use of humus. In organic farming the ban on the use of chemical crop protection products against diseases, pests and weeds, as well as the ban on the use of mineral chemical fertilizers, leads to the fact that meteorological and soil conditions determine the yield level in a greater degree than in traditional farming. The purpose is to study the management of edible pea cultivation in the organic farming under the conditions of a certified organic enterprise "Ecoferma Dubrovskoye" of the Kiyasovsky district of the Udmurt Republic. In 2015–2020 the yield of edible pea grown according to the requirements of organic farming was higher than regional indicators by 15–113 % (2.3–13.5 c/ha), and higher than the average republic indicators by 4–90 % (0.8–12.0 c/ha), except for 2018. It is necessary to observe and improve the quality of the conducted agricultural practices for providing the high stable yielding capacity of high-quality grain in future.

Key words: organic farming; edible pea; yielding capacity; grain quality; Udmurt Republic.

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MILK PRODUCTIVITY AND MILK QUALITY UNDER DIFFERENT MANAGEMENT METHODS OF COWS

The research of effect of cow management on milk productivity is relevant as the adoption of the appropriate method of keeping cattle should take place in specific economic conditions of the particular dairy plant. The purpose of the research was analysis of the milk productivity, as well as the quality and technological properties of cows' milk with tethered and loose housing methods in the conditions of the agricultural production co-operative "Udmurtia" in the Udmurt Republic. To study milk productivity groups of cows were formed according to the pair-analogue principle; technological characteristics of milk were studied by applying sample analysis of bulk milk. Standard procedures were applied for the research. Mature tethered cows outperform loose-housed cows in terms of milk yield per 305 days of lactation by 130 kg, fat content by 0.26 %. The mass fraction of protein in the milk of cows in tethered and loose housing is at the same level. The milk obtained in the SPK collective farm "Udmurtia" both with tethered cows and loose cows meets the requirements of TR TS 033/2013 "On the safety of milk and dairy products", but according to GOST 52054-2003 "Raw cow's milk. Specifications" does not always meet the requirements of the highest grade. The main reason for the decrease in grade is the increased content of somatic cells in milk – 438.8 ths/cm^3 yearly average. Milk produced on the farm can be recommended for the production of fermented milk products and products that require milk with high thermal stability.

Key words: method of keeping cows; stationary milking machine; milking parlour; cow milking technology; milk productivity; milk quality; technological properties of milk.

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DETERMINING THE SPRAY ANGLE OF ELECTRODE WIRE AT HIGH SURFACING RATES

The problem of collecting small molten metal electrode droplets on the surface of the restored cylindrical part at high surfacing speeds is relevant. The purpose of the study was to determine the spray angle of the electrode material, the density of droplet distribution in the spray cone and the justification of the diameter of the filler rod-screen. It is necessary to establish what part of the metal of the electrode wire can be used in the weld deposition process at linear speeds of 0.8...1.1 m/s. Analysis of the results obtained confirms the assumption that the densest flow of droplets in the jet of the cone makes an angle of 60...700 at distance from the electric arc to the screen of 16 mm where 60 % of the electrode metal is captured. Consequently, replacing the screen with a metal rod and bringing it as close as possible to the electric arc at a distance of 3...9 mm, the possibility of catching drops increases to 75...80 %. Metal losses due to waste and spatter are commensurate with welding in a protective gas environment. Thus, the introduction of the welding rod-screen into the arcing zone provides the collection of droplets of the electrode wire; it also provides the alloying of the layer and the formation of the deposited metal in combination with the electrode wire of various chemical composition and hardness.

Key words: surfacing; high rates; wire; flight; metal; drop; rod; angle; spray; spatter; location; electrode; collection; screen; formation; layer.

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IMPROVING TECHNOLOGICAL PROCESS OF DOSING OF COMBINED FEED INGREDIENTS

The effect of the vibrating dispenser on the working process with the mass variation of the vibration system, which includes the mass of the working body and the dosed material has not

been fully studied. The purpose of the research is to develop and study the working process of a vibrating grain dispenser. To achieve this goal the following tasks are solved: to develop the design of a vibrating dispenser; to conduct laboratory studies of the dependence of the mass of the vibration system on the amplitude and frequency of vibrations, power and energy consumption. The design and technological scheme of the dispenser has been developed for the physical simulation of the process of vibration dosing. As a result of the research it was found that the mass of the vibration system produced the most significant effect on vibrations in the Y plane. The uniformity of dosing meets the zootechnical requirements for dispensers of concentrated feed while preparing feed mixtures within wide ranges of the amplitude of vibrations. The frequency of vibrations, power consumption and specific energy consumption increase with the increase of the vibration system mass.

Key words: grain; dispenser; vibration; vibration system; mass; vibrations; frequency; amplitude; power.

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ECONOMIC EFFICIENCY OF VARIOUS METHODS FOR RESTORING AND HARDENING TILLAGE TOOLS BY THE EXAMPLE OF CULTIVATOR SWEEP

The article provides the assessment of the efficiency of restoration of the working bodies of tillage machines by applying various methods. The most widespread and available at agricultural repair enterprises are the following restoration methods: HFC-surfacing, plasma spraying and electric arc surfacing. Surfacing is carried out with wear-resistant materials providing the opportunity to increase the life of the working body of the machine. The aim of the research is an analytical study of the choice of a cost-effective method for restoring the cultivator sweep. In accordance with the target goal the following tasks are solved: cost calculation of restoration of the considered methods using three different wear-resistant deposited materials; study of the efficiency of restoration by applying considered methods in comparison with a new product depending on the coefficient of wear-resistance of the material used for restoration. A methodology for calculating the cost of restoration and the efficiency of restoration was selected for the study. It follows from the findings that carrying out restoration operations, in particular surfacing, has a positive effect on the cost of soil cultivation using restored working bodies, while it should be noted that the cost of restoration by applying all methods proposed for restoration is much lower than the cost of a new part. Taking into account the coefficient of wear-resistance of the applied materials, the efficiency of restoration of the cultivator sweep increases and the most effective method of restoration is electric arc surfacing with the T-590 electrode.

Key words: HFC; spraying; surfacing; Sormite-1; efficiency; cost; sweep; cultivator; wear-resistance; coefficient; restoration; electrode; powder; wire; T-590.

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