

РЕЗЮМЕТА

на научните публикации и трудове на Доц. д-р Христофор Кирчев Кирчев от *катедра "Растениевъдство"* при *Аграрния университет* – Пловдив, които не повтарят представените за придобиване на ОНС „доктор” и академичната длъжност „доцент”

В3. Хабилюционен труд - научни публикации (не по-малко от 10) в издания, които са реферирани и индексирани в световноизвестни бази данни с научна информация (показател В3 от ППЗРАСРБ)

1. Тритикале. Монография. ISBN 978-619-90861-5-5 *Uchy media and design*, Пловдив, 2019, 112 стр. [Национален регистър](#)

Монографията представя обобщени научни изследвания, свързани със значението, разпространението, морфологичните особености, растежа и развитието, систематиката, сортовия състав и агротехниката на тритикале – изкуствено създадена зърнено-житна култура. Разработката е предназначена за специалисти, работещи в областта на селското стопанство, като може да се използва и като учебно пособие за студенти, обучаващи се в агрономическите факултети.

Г7. Статии и доклади, публикувани в научни издания, реферирани и индексирани в световноизвестни бази данни с научна информация (показател Г7 от ППЗРАСРБ)

1. Kirchev, H., I. Penov. 2019. Estimation of the optimal nitrogen fertilizer application for different input/output prices and varieties of triticale (*×Triticosecale* Wittm.) in Bulgarian Thracian plan and Dobruja region. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 19, Issue 2, 221-226. [Web of Science](#)

Abstract

Triticale is known for its high grain yield potential. This man-made plant is interesting also because of its nutritional value which exceeds those of wheat and rye. Triticale breeding studies focus on productivity, green mass, nutritional content, etc. These studies showed the importance of nitrogen fertilizer optimization for triticale. This article focuses on the economic issues of such experiments and provides a systematic approach for studying these aspects. First, the production function is constructed, estimated and the main issues related to this process are discussed. Second, the maximum yield is determined, considering: the variety of triticale; the differences in the regions where the experiments were conducted; and the weather conditions. Third, the yield that maximizes the profit is calculated using the current prices of triticale and nitrogen fertilizer. Finally, the demand for nitrogen fertilizer is estimated. The presented frame can be expanded and to include more parameters.

Г8. Статии и доклади, публикувани в нереперирани списания с научно рецензиране или публикувани в редактирани колективни томовете (показател Г8 от ППЗРАСРБ)

2. Kirchev, H., A. Muhova, R. Georgieva. 2018. Approach for organic triticale (*x*

Triticosecale Wittm.) farming I. Genotypic specific in the accumulation of biomass. *Research Journal of Agricultural Science*, 50 (1), 101-106

Abstract:

A field experiment was set in the period 2014-2017 on the experimental field of the Research Institute of Field Crops of the Agricultural Academy, Chirpan. Three triticale varieties were used – the standard Colorit, and the other two varieties created at Dobrudja Agricultural Institute – Gen. Toshevo, Bulgaria: Boomerang and Respect. The experiment consisted of a randomized complete block design after two predecessors – sunflower and durum wheat with four replication and plots of 10 m² planted at a sowing rate of 550 viable seeds m⁻². To achieve the aim of the study, during the vegetation of the triticale, fresh plants were taken by stages as follows: Tillering – leaves; Spike emergence – leaves, stems, spikes; Maturity – straw (leaves+stems), spikes, grains, glumes. After the two predecessors in the phase of spike emergence, the stems are the largest share of the plant, followed by the leaves and the spikes. However, the stems have a larger share after sunflower, and the share of leaves and spikes is close to the two predecessors. Although the relative share of the spikes is close after the two precursors, in the maturity phase, the relative share of the grain after durum wheat is 6.3% less than after sunflower, and the share of the glumes is 17.4% more.

3. Иванова, Д., **Х. Кирчев**. 2018. Качество на сортове обикновена пшеница с различен произход, отглеждани в екологичните условия на Мизия. *Аграрен университет – Пловдив, Научни трудове*, т. LXI, кн. 1, 13-18.

Abstract

The following varieties of common wheat: Enola (standard); Balaton; Diamant and Andino has been tested. The following qualitative indicators were used to characterize grain quality during the three years of the study: test weight, the mass of 1000 grains, wet gluten yield, and gluten relaxation. The highest test weight forms the Enola variety and the lowest – Diamond. The highest absolute mass is the grain of the Balaton variety, and the lowest 1000 grain mass is the grain of the Enola variety. The amount and quality of gluten depending on the weather conditions, and it decreases and is highly relaxed when it is heavily moistened during the grain forming period. The highest yield of wet gluten is in the Balaton variety, and the lowest amount of wet gluten forms the Enola variety.

4. Dobрева, S., **Н. Кирчев**, A. Muhova. 2018. Grain yield of triticale varieties depending on the foliar fertilization in the conditions of increasing norms of fertilization of the soil with nitrogen. *Research Journal of Agricultural Science*, 50 (4), 122-126.

Abstract:

In the period 2014-2017, a three-factor field experiment has been conducted in the field of the Institute of field crops, Chirpan, Bulgaria. It has been studied both the independent influence of nitrogen fertilization and the combination of foliar fertilization on four triticale varieties: Kolorit (standard), Attila, Boomerang and Respect. The experiment is based on the fractional plot method in four replications with a plot size of 12 m². Grain yields of triticale varieties are determined directly from each plot using the Wintersteiger micro combine harvester. The results are calculated to standard grain moisture of 13%. A dispersion analysis (ANOVA) was applied to identify statistically significant differences between variants, and three-factor dispersion analysis (MANOVA) was used to establish the independent action of the factors. From the study, it was found out that the combination of mineral and foliar fertilization increases the grain yield in all varieties. On average, for the three years, the highest yield was the Boomerang variety - 568.1 kg/da, which is 78.5% higher than the standard, with fertilization with nitrogen N18 and in combination with leaf fertilization. The increase in yield for other varieties compared to the standard Kolorit is: for Attila with 66.5% and for Respect with 31.5%.

5. Dobрева, S., **H. Kirchev**, A. Muhova. 2018. Influence of nitrogen fertilization in combination with foliar fertilization on the structural elements of the spike in triticale varieties (x *Triticosecale* Wittm.). *Research Journal of Agricultural Science*, 50 (4), 116-121.

Abstract:

In the experimental field of the Institute of field crops, Chirpan, Bulgaria, during the period 2014-2017, a field experiment has been carried out with four triticale varieties: Colorit (standard), Attila, Boomerang and Respect. The experiment was based on the fractional plot method in four replications with a plot size of 12 m². The effect of nitrogen fertilization in combination with leaf fertilizer has been studied. The following structural elements of the spike has been studied - mass of the spike, g; grain mass in spike, g; spike length, cm; number of grains in spike and harvest index of the spike, calculated as the ratio between the mass of the grains in the spike and the mass of the whole spike. In order to establish statistically significant differences between the variants, a dispersion analysis (ANOVA) was applied, and three-factor dispersion analysis (MANOVA) was used to establish the independent action of the factors. The study found out that the combination of mineral and foliar fertilization raises the structural elements of the spike in all varieties. In the study of the structural elements of the spike, with the longest spike of 12,6 cm and the largest number of grains - 81,5 is the Respect variety, and with the largest mass of grains is Attila - 3,91 g.

6. Georgieva, R., **H. Kirchev**. 2018. The effect of PGRs and different fertilization levels on the dry matter formation and phenological development of triticale varieties. *Proceedings of the IX International Agricultural Symposium "Agrosym 2018"*, 134-138.

Abstract

The biologically active substances known as plant growth regulators (PGRs) are steadily gaining popularity because they are harmless and ecologically friendly. Their application is not only easy and economically profitable but also improves the action of the fertilizers, the mineral balance of the plant and leads to yield increase. In order to establish whether the PGRs would influence the phenological development of triticale, a biennial field experiment (2016-2018) was carried out on the experimental field of the Crop Science Department at the Agricultural University of Plovdiv using the block method in three replications, with a plot size of 10 m². The action of the PGRs Vitafer Algi and Vitafer Green on three triticale varieties (Trismart, Musala, and Kolorit (standard)) was conducted under two different fertilizer levels N6P5K2 and N12P10K4. The PGRs were applied at the beginning of stem elongation (BBCH31). The results showed that both PGRs treatments combined with higher fertilizer levels increased the specific growth rate and dry matter accumulation of the tested plants compared to the untreated variants and the variants treated with lower fertilization rates in combination with PGRs. The beneficial interactive effects of PGRs and fertilization levels on the phenological development of triticale are worthy of further exploration.

7. **Kirchev H.**, R. Georgieva. 2018. The accumulation of biomass in triticale varieties depending on the treatment with PGRs and different fertilization levels. *Proceedings of the IX International Agricultural Symposium "Agrosym 2018"*, 103-108.

Abstract

A field experiment was conducted during 2016-2018 growing season in the experimental field of the Crop Science Department at the Agricultural University of Plovdiv (Bulgaria). The experiment was arranged using the block method as split plot in three replications and a plot size of 10 m². Comparative assessment of the biological productivity of the tested Trismart, Musala and Kolorit (standard) varieties was made between the variants with an application of PGRs under the action of lower and higher fertilizer rate. The foliar application of the PGRs followed in BBCH 31. During the vegetation of triticale, fresh plants were taken at stages: tillering-leaves, spike emergence-leaves, stem, spikes, maturity- straw, spikes

grains, glumes. The results from the study showed, that the effect of the mineral fertilizer at stage stem elongation on the biomass accumulation of triticale was better expressed than the differences between the varieties. The lowest biological productivity at this growth stage during the years of the study was detected in all varieties treated with the lower fertilizer levels. The higher fertilizer level itself led to a 7-8% increase of the dry biomass accumulation during the years of the study. A similar percentage increase was observed in the variants treated with higher fertilizer levels in combination with the plant growth regulators. In the analysis of the varieties regarding the different fertilizer levels, there were no differences in the organ distribution compared to the total biological yield and by all treatments, the straw occupied the largest share, followed by the grain and glumes. The biological yield of triticale at maturity during the period 2016-2018 was mainly formed by the straw, whose share by the different treatments and varieties varied from 47.15 to 50.28 %.

8. **Kirchev, H.**, A. Muhova. 2018. Phenological development of triticale varieties depending on the weather conditions. *XXIII International Symposium on Biotechnology, 9-10 March 2018, Faculty of Agronomy, Čačak, Serbia*, 57-62.

Abstract:

A field experiment was set in the period 2014-2017 on the experimental field of the Research Institute of Field Crops of the Agricultural Academy, Chirpan. Three triticale varieties were used: Colorit, Boomerang, and Respect. With the aim of establishing the effect of the temperature and precipitation conditions of the year on the phenological development of triticale varieties, the sum of the active temperatures, the average temperature for the period and the sum of precipitation were calculated for each stage period. From a tillering to a maturity stage within the different varieties, different duration of the growth stage periods is observed. These differences contribute to a better clarification of the biological requirements of the studied varieties.

9. Nedkov, N., R. Zaykov, A. Matev, A. Ovcharova, **H. Kirchev**. 2017. Yield Modeling of Oil-Bearing Rose Depending on Irrigation Regime. *Advanced Research in Life Sciences*, 1(1), pp. 32-37.

Abstract

The aim of this study is to be investigated "Yield - irrigation depth" relationship for white breeding rose in the conditions of Kazanlak's Valley (south part of Bulgaria). The field experiment was carried out during 2009 – 2011 period with the following variants: 1) without irrigation; 2) irrigation with 50% of the irrigation depth; 3) irrigation with 75% of the irrigation depth; 4) full irrigation (100% of calculated irrigation depth). This relationship is established in two directions – for blossom and for oil, using the degree equation: $Y_i = 1 - (1 - Y_d) \times (1 - x_i)^n$, (where Y_i is the yield by irrigation depth x_i , Y_d - yield without irrigation, x_i – relative irrigation depth and n - exponent). The results show that the used equation presents very accurately the change of the yield depending on the level of the irrigation depth. The value of "n" is from 1.0 to 1.2 and $R > 0.94$. There is a linear relationship (by $R^2 > 0.8$), which allows predicting the yield of oil by data for the yield of blossom.

10. **Kirchev, H.**, S. Dobрева, A. Muhova. 2017. Productivity and quality of durum wheat (*Triticum durum* Desf.) at increasing rates of nitrogen fertilization under long-term accumulation of nutrients in Pelic Vertisols. *XXII International Symposium on Biotechnology, 10-11 March 2017, Faculty of Agronomy, Čačak, Serbia*, Vol. 1, 165-169.

Abstract:

In a stationary fertilizing field trial, initiated in 1966 at the Institute of Field Crops – Chirpan, Bulgaria, the influence of different rates of a nitrogen fertilizer on the productivity and quality of durum wheat (*Triticum durum* Desf.) have been investigated. As a result of long-term mineral fertilization data for grain yield have been reported. The physical grain properties and some technological qualities have been determined. In the first year of the study, grain

yield was generally lower compared to 2015, which was better provided with precipitation. The reaction of durum wheat to the increased rates of the nitrogen fertilizer, however, is different during the two years. Differences in qualitative traits both depending on weather conditions and on changes in the level of nitrogen fertilization have been recorded.

11. **Kirchev, H.**, N. Semkova. 2016. Investigation on some morphological and biological characteristics of einkorn wheat (*T. monococcum* L.) depending on nitrogen fertilization. *Journal of Agricultural, Food and Environmental Sciences*, 69, 69-74.

Abstract

The aim of this study is to investigate some quantitative and qualitative indicators of einkorn wheat (*T. monococcum* L.). A three-year field experiment has been carried out at the experimental field of the Department of Crop Science in Agricultural University - Plovdiv. To compare the performance, Sadovo1 common wheat (*T. aestivum* L.) is used as a standard. Both wheat species have been grown on two nitrogen fertilization levels – 80 and 160 kg.ha⁻¹ nitrogen. The phenological development of the plants was recorded at the onset of the main phenophase. The inter-phase period has been calculated (number of days). Grain yield (t ha⁻¹) is accounted indirectly by ¼ m² plot. The main structural elements of plants have been established. It has been found that the phenological development stage of tillering occurs at the same time for both wheat species. Following the start of spring vegetation, common wheat enters a phase earlier than the einkorn. Common wheat is high-yielding einkorn, that puts both proven wheat varieties in different groups. Einkorn has a high tiller appearance but it has a low productive tillering than common wheat. Einkorn form lower grain in the spike and lighter grain per spike. Nitrogen fertilization significantly increased harvested grain in common wheat. In einkorn it has no significant impact on yield.

12. **Kirchev, H.** 2016. Genotypic specifics of triticale varieties (*x Triticosecale* Wittm.) as a function of the nitrogen fertilization level. *VII International Scientific Agriculture Symposium „Agrosym 2016“*, Jahorina, October 06 - 09, 352-358.

Abstract

A field experiment was conducted during three growing seasons, from 2012 to 2014, at the experimental field of the Department of Crop Science in Agricultural University – Plovdiv. The experiment consisted of a randomized complete block design after predecessor rapeseed with three replicates and plots of 10 m² planted at a sowing rate of 550 viable seeds m⁻². Three triticale (*x Triticosecale* Wittm.) cultivars, one Bulgarian and two Spanish were studied – Rakita, Bulgarian standard, breeding at the Dobruja Agricultural Institute – Gen. Toshevo, Trujillo and Senatrit, created in Spain. Three nitrogen fertilization level has been studied – N0, N80 and N160 kg ha⁻¹ nitrogen expressed as ammonium nitrate – 1/3 of nitrogen was introduced after sowing, and the remaining 2/3 in early spring. To establish the productivity of the tested varieties of triticale under the influence of nitrogen fertilization were determined following parameters: grain yield, after plots were harvested at ripening and yield was expressed on a 13% grain moisture basis; number of spikes per m²; plant height, cm; spike length, cm; number of spikelets per spike; number of grain per spike; mass of grain per spike, g; weigh of glumes per spike, g and spike harvest index, calculated as: (spike grain yield/total spike biomass) x 100.

13. **Kirchev, H.**, E. Penchev, R. Georgieva. 2016. Yield plasticity and stability of triticale varieties (*x Triticosecale* Wittm.) under increasing nitrogen fertilization norms. *Research Journal of Agricultural Science*, 48 (2), 65-68.

Abstract:

Used were three years data for the yield of grain from triticale varieties with a different genotype, cultivated under conditions on an experimental field of the Crop Science Department at Agricultural University – Plovdiv: AD-7291 (standard), Sadovec and Zaryad (wheat type), Rakita and Rojen (rye type). With the increase of the nitrogen fertilization

norm, the variation of the plasticity index between the varieties is the lowest and in all of them, bk values are about a zero. Average values of plasticity coefficient define varieties Rakita and Sadovec as ecological plastic. The lowest ecological plasticity manifests the standard AD-7291. Almost all varieties show the highest stability coefficient at the highest fertilization norm, except variety Zaryad, where the most stable yield was determined by fertilization with N120. Rye type varieties manifest higher stability than wheat triticales sorts.

14. **Kirchev, H.** 2016. Comparative study of early and mid-early grain maize hybrids in the conditions of southern Dobrogea. *Research Journal of Agricultural Science*, 48 (1), 63-69.

Abstract:

The experiment was conducted through the period 2007 - 2009 in the region of the town Gen. Toshevo, Dobrogea, Bulgaria. The test was conducted in the block method in four repetitions with the size of the experimental plot - 25 m². The tested corn hybrids are divided into 2 groups – early (FAO 200-299) and mid-early (FAO 300-399). In years with unfavorable weather conditions, grain yields were almost equal in both maize groups. In years with favorable conditions for the development of the crop, yields on mid-early hybrids have proven different, but early hybrids did not show different productivity. The height of the formation of the first cob is affected to a greater extent on the conditions of the year. At high temperatures and drought, due to the early development of the culture, the index is at lower values. In comparison with a year, where the genotype has less influence. Early hybrids released moisture more rapidly, especially in hot and dry conditions and are harvested at a lower moisture level than the standard. Middle-early hybrids were harvested at higher moisture than standard 13%.

15. **Kirchev, H.** 2016. Agronomic performance of rye-type triticales varieties, grown in agroclimatic conditions of Southern Bulgaria. *Формирование организационно-экономических условий эффективного функционирования АПК: сборник науч. статей 8-й Междунар. науч.-практ. конф., Минск, 26-27 мая 2016 г. - Минск: БГАТУ, 2016. - С. 81-84.*

Abstract:

The experiment has been carried out in the experimental field of Agricultural University - Plovdiv. Studied are 7 varieties of triticales. Differences in genotypes of triticales, measured by average yield of grain allows them to be displayed in the following ascending order - Alter <Rakita <Frontera <Scudo <Kolorit <Attila <Accord.

16. **Kirchev, H.** 2016. Agronomy performance and biological characteristics of Khorasan wheat (*Triticum turanicum* Jakubz.) as a function of the nitrogen fertilization level. *Актуальные проблемы формирования кадрового потенциала для инновационного развития АПК. Материалы 3-й Международной научно-практической конференции Минск, 9-10 июня 2016 г.* 43-50.

Abstract:

The aim of this study is to investigate some quantitative and qualitative indicators of Khorasan wheat (*T. turanicum* Jakubz.) A three-year field experiment has been carried out at the experimental field of the Department of Crop Science in Agricultural University – Plovdiv. To compare the performance, Sadovo1 common wheat (*T. aestivum* L.) is used as a standard. Both wheat species have been grown on two nitrogen fertilization levels – 80 and 160 kg.ha⁻¹ nitrogen. The phenological development of the plants was recorded at the onset of the main phenophase. Inter-phase period has been calculated (number of days). Grain yield (t ha⁻¹) is accounted indirectly by ¼ m² plot. The main structural elements of plants have been established. It has been found that the phenological development stage of tillering occurs at the same time for both wheat species. Following the start of spring vegetation, common wheat enters a phase earlier than the Khorasan. Common wheat is a

high-yielding Khorasan, that puts both proven wheat varieties in different groups. Khorasan has a high tiller appearance but it has a low productive tillering than common wheat. Kamut forms lower grain in the spike and lighter grain per spike. Nitrogen fertilization significantly increased harvested grain in common wheat. In Khorasan wheat, it has no significant impact on yield

17. Delibaltova, V., **H. Kirchev**. 2016. Productivity of common wheat (*Triticum aestivum* L.) depending on predecessor and the level of nitrogen fertilization. *International Journal for Research in Agricultural and Food Science*, 2, 6, 1-10.

Abstract:

In a field experiment during the period of 2005-2008 in south-east Bulgaria for estimation of the influence of different predecessors (sunflower, stubble, coriander, and sorghum) and the rate of nitrogen fertilization on the productivity of the common winter wheat variety Prelom. The analysis of the results shows that the predecessor and nitrogen rate in combination with meteorological conditions during the years of the study were decisive factors for the expression of the productivity of common winter wheat variety Prelom. The most suitable predecessor for the wheat under the conditions of south-east Bulgaria is the coriander, followed by sunflower and stubble. The sorghum was an unsuitable predecessor. The most effective fertilization rates are N120P80 with predecessor coriander and N160P80 with sunflower and stubble.

18. **Kirchev, H.**, V. Delibaltova. 2016. Genotypic specific features of common wheat varieties (*Triticum aestivum* L.). Yield and quality of grain. *International Journal for Research in Agricultural and Food Science*, 2, 2, 13-23.

Abstract

The field experiment was conducted in the selected area of Dobruja region. The experiment was performed by means of a block method with four replications with predecessor sunflower. The aim of the study was to establish the grain yield and quality of four Bulgarian bread wheat varieties, grown in the region of Dobruja. The analysis of the results showed that the highest grain yield was obtained from Carat variety – 6.000 t ha⁻¹, followed by Albena – 5.300 t ha⁻¹ and the lowest one – from Enola variety 5.130 t ha⁻¹. The test weight of the investigated varieties is close values, which indicates that it is in effect – largely on the weather conditions of the year, rather than the variety. The mass of 1000 grains and wet gluten content of Albena variety were highest (50.7g and 28.0%) and lowest of Enola – (46.51g and 26.0%). The lowest values of relaxation of gluten reported with the variety Albena – 7.3 mm and the highest – with the Carat variety – 9.8 mm.

19. **Кирчев, Х.**, А. Матев, В. Делибалтова. 2015. Зависимост между допълнителния добив от зърно и нормите на азотно торене при сортове тритикале за района на Пловдив. *Юбилейна научна конференция с международно участие „Традиции и предизвикателства пред аграрното образование, наука и бизнес“ Аграрен университет – Пловдив, Научни трудове*, т. LIX, кн. 2, 51-58.

Abstract

This study used data on yields of grain triticale grown in a three-year field trial conducted in the experimental field of the Department of Crop Science at the Agricultural University - Plovdiv. The experiment was carried out after grain maize as a predecessor in four replications with an experimental plot size of 15 m². The following varieties of triticale were used for the purpose of the study – AD-7291, Rojen, Sadovec, Rakita, and Zaryad. Four nitrogen rates were tested – N0; N6; N12 and N18. The grain yield was determined directly from the harvested plots of 10 m² equated to a standard humidity of 13%. Having used the data for relative grain yield and relative fertilization rates, the degree of dependency for each of the studied varieties of triticale was established at R > 0.8. The change of the relative yield along with the increased rate of nitrogen fertilization could be traced by means of the

resulting dependence, thus to make possible a more accurate economic analysis and precise fertilization of the crop. The mathematical processing of the results was carried out using the specialized computer program YIELD®.

20. Semkova, N., **H. Kirchev**. 2015. Investigation on productivity parameters of new durum wheat varieties by genotype and nitrogen fertilization. *Symposium proceedings, 2nd International Symposium for Agriculture and Food, 7-9 October 2015, Ohrid, Republic of Macedonia*, 915-920.

Abstract

The aim of the study was to investigate the productivity parameters of 5 varieties of durum wheat by genotype and 4 levels of nitrogen fertilization. The study was performed at the Institute of Field Crops in Chirpan during the period 2004-2007. Varieties Progress, Neptun2, Beloslava Saturn1, and Prosperity were tested. Structural elements of the crop - number of tillers, number of spike stems, productive tillering and plant height were taken as components of yield and as components of spike - spike length, number of grains and grain weight per spike. By increasing of fertilizer rate up to N18 productive tillering increases as well as structural elements of the spike of all tested varieties of durum wheat during the first two years of study, while under the conditions of 2007 fertilizer rate N12 adversely affects these indicators. Nitrogen fertilization is a factor with a strong influence on the formation of leaf area of durum wheat. Compared to the impact of the variety, the effect of nitrogen fertilization on leaf area formation of durum wheat is more pronounced in the three phenological phases (phase of the stem, ear formation, and lactic ripeness).

21. Кунева, В., Р. Калайджиева, А. Матев, **Х. Кирчев**. 2015. Оценка на факторите торене и поливен режим върху добива от царевица на базата на математико-статистически анализ. *Растениевъдни науки*, 5, 79-83

Abstract

The purpose of the present work is based on two-factor analysis of variance conducted factors – rates of fertilization and irrigation regime to assess the significance and power of influence of the factors on the yield of corn. Experience is displayed during the period 2004 – 2007 year of Agricultural University – Plovdiv. Variants of factor A are norms of fertilization with nitrogen 0, 8, 16, 24 kg/da active substance; variants of irrigation in factor B – without irrigation, irrigation by 25, 50, 75 and 100% of the calculated optimum irrigation rate. As a result of analysis of variance was found dominant influence factor (B) – Irrigation regime, as most strongly expressed in 2007 by 96 %. Significantly less is the influence of factor (A) – norms of fertilization. The relationship between the interaction of factors in considers indicator „yield“ has not proven statistically.

22. **Кирчев, Х.**, А. Матев, И. Янчев, З. Златев. 2014. Продуктивност и нейните елементи на сортове тритикале в зависимост от азотната норма. *Управление и устойчиво развитие*, 3: 46, 67-70.

Резюме

В полски опит, заложен през 2002 г. в опитното поле на Аграрен университет – Пловдив се изследват продуктивността и нейните параметри на 5 сорта тритикале при нарастващи нива на азотно торене. Изпитвани са сортове, създадени в различни селекционни центрове. Мексиканския АД7291 (стандарт), Ракита и Заряд, селекционирани в Добруджанския земеделски институт (ДЗИ) – Ген. Тошево; Садовец и Рожен от Института по растителни генетични ресурси (ИРГР) – Садово, отглеждани при нива N0, N6, N12 и N18 на фон Р10К5. Изследвани са структурните елементи на добива и биологичен добив от пробен сноп от $\frac{1}{4}$ m², добива на зърно от реколта на парцел 15 m². Установено е, че продуктивността на изпитваните генотипи се влияе в различна степен от нивото на азотното торене, като при всички сортове добива нараства пропорционално с нарастването на нивото на азотно торене. Най-нисък добив е

получен от стандарта АД7291. Сортовете ръжен тип са по-продуктивни, което се дължи на формирането на по-голям и озърнен клас. Делът на зърното в общата биомаса е най-нисък при неторените варианти, което е следствие на формирането на по-малък брой зърна в клас с ниска маса.

23. Янчев, И., Н. Йорданова, **Х. Кирчев**, А. Матев. 2014. Ефект на азотното торене върху продуктивността и качеството на сортове обикновена пшеница, отглеждани самостоятелно и в лентов посев със слънчоглед. *Управление и устойчиво развитие*, 3: 46, 56-60.

Резюме

Проучено е влиянието на азотното торене върху продуктивността и качеството на сортове обикновена пшеница: Садово 1 (стандарт); Пловдив; Гея 1 и Садово 772, отглеждани самостоятелно и в лентов посев със слънчоглед. Четирите сорта пшеница са отглеждани върху алувиално-ливадна почва на опитното поле на катедра „Растениевъдство” в района на Пловдив. Изпитвани са следните варианти на азотно торене: N_0 , N_8 , N_{16} и N_{24} на фон $P_{15}K_{10}$. Установено е, че с нарастване на азотната торова норма до 16 kg N/da, продуктивността и качеството на зърното се увеличават при всички изпитвани сортове. Внасянето на 24 kg N/da е икономически неоправдано, тъй като не води до съществено увеличаване на количеството и качеството на продукцията. Приложеното лентово отглеждане на изследваните сортове повлиява положително узряването и продуктивността на сортовете обикновена пшеница, но не оказва съществено влияние върху качеството на зърното.

24. Златев, З., М. Каймаканова, А. Матев, И. Янчев, **Х. Кирчев**. 2014. Физиологична реакция на ечемик при почвено засушаване. I. Растеж, листен газообмен и водообмен. *Управление и устойчиво развитие*, 3: 46, 51-55.

Резюме

Засушаването и свързаният с това воден дефицит в растенията са сред най-често срещаните причини за компрометиране на реколтата. В световен мащаб над 50% от загубите на продукция се дължат на тези стресови фактори. Способността да запазят фотосинтетичната си активност при воден дефицит е от огромно значение за толерантността на растенията към този стрес. В съдови вегетационни опити е проучена физиологичната реакция на два сорта ечемик (*Hordeum vulgare* L.) – Обзор и Радул при почвено засушаване. Целта на изследванията е да се определи адаптивността на културата към воден дефицит в почвата по основните физиологични показатели. Относителното водно съдържание (ОВС) и относителната скорост на растежа (RGR) са понижени в по-голяма степен при растенията от сорт Радул – с 32% и с 49%, съответно. Значително понижена е и фотосинтеза-та – с 82% при сорт Радул и със 76% при сорт Обзор. Въз основа на установените сортови различия в скоростта на растежа, параметрите на листния газообмен и показателите на водообмена и в резултат на проведенния анализ сорт Обзор е определен като по-толерантен към засушаване, а сорт Радул – като по-чувствителен.

25. Матев, А., **Х. Кирчев**, И. Янчев, З. Златев, Р. Калайджиева, Н. Лозанова. 2014. Влияние на големината на поливната норма върху абсолютното и хектолитровото тегло на семената при соята. *Управление и устойчиво развитие*, 3: 46, 46-50.

Резюме

Целта на настоящата разработка е да се установи влиянието на регулирания воден дефицит, постигнат чрез напояване с намалени поливни норми, върху абсолютното и хектолитровото тегло на семената от соя, отглеждана в района на Пловдив. Опитът е проведен през периода 2004–2006 година в района на Пловдив със сорт „Мира”. Изпитани са следните варианти: 1) без напояване; 2), 3) и 4) напояване съответно с 25, 50 и 75% от поливната норма, изчислена при оптималния вариант; 5) оптимално

напояване при предполивна влажност 75% от ППВ за слоя 0–80 cm. Оптимизирането на почвената влажност увеличава масата на семената от изпитания сорт соя средно с 8,8%. При напояване с 25% m нарастването на стойностите е средно с 4,2%, като масата на семената при този вариант представлява средно 95,8% от максималната за условията на опита. При реализиране на 50% от поливната норма нарастването на стойностите е с 5%, достигайки 96,5% спрямо максимума. Разликата между вариантите 4 и 5 е още по-малка – средно 2,4% (3,7g). Редуцирането на нормата с 25% води до нарастване масата на семената спрямо ненапояваната соя с 3,6–9,3%. Съществува зависимост от втора степен между масата на семената и напоителната норма, която е представена графично чрез изпъкнала парабола отговаряща на уравнението: $Y=0,92+0,116x-0,04x^2$, при $R^2=0,933$. Съществува линейна зависимост между масата на семената и добива от соя при $R^2=0,65$. Поливният режим не оказва еднопосочно влияние върху хектолитровата маса на семената от изпитания сорт соя. Разликите между вариантите са под 3% и не се доказват статистически.

26. Matev, A., **H. Kirchev**, R. Petrova, R. Popova. 2013. Comparative Evaluation of Formulas for Establishment of "Yield – Irrigation Depth" Relationship Parameters for Soybean. *Scientia Agriculturae*, 8, 3, 126-132.

Abstract:

The aim of this work is to establish parameters of relationship "Yield-irrigation depth" for soybean (grown in region of Plovdiv), using some different equations as follows: /1/ $y=ax^2+bx+c$; /2/ $y=y_0+2(1-y_0)x-(1-y_0)x^2$; /3/ $Y=1-(1-Y_0)(1-x)^n$. The source data used for the study are from a field experiment, carried out in the region of Plovdiv (Bulgaria) on alluvial-meadow soil, with soybean variety "Mira". Variants of the field experiment are: 1 – without irrigation; 2, 3, 4 and 5 – irrigation with 25, 50, 75 and 100% of irrigation rate, determined by optimal variant (pre irrigation soil moisture 75% of FC for the layer 0 – 80 cm). The results show that equation /3/ is most suitable, from a mathematical point of view and at the same time corresponding well with the biology of the crop. Variations of calculated yields using this equation to experimental yields are from – 9.9 to + 8.2% and in more than 50% of cases they are less than $\pm 2\%$. The following parameters are established: $n=1.3$ (from 1.1 to 1.7) and $R=0.987$ (from 0.935 to 0.992). The comparison between the formulas /1/ and /2/ shows, that the first one is mathematically more accurate and the second one – more accurately to the biology of culture in relation to growing it in a different water deficit.

27. **Kirchev, H.** 2014. Genotype specific of grain qualities of triticale (*xTriticosecale* Wittm.) grown in two different ecological points. *Scientia Agriculturae*, 8: 2, 95-98.

Abstract

The aim of the present study is to determine the effect and the interaction of the factors variety and nitrogen fertilization on the biological and agronomic characteristics of the triticale varieties, depending on the agro-ecological conditions. To realize the aim and tasks of the investigation, two parallel field trials were initiated, in Plovdiv (Thrace region), and in the town of General Toshevo (Dobrogea region), respectively. The standard AD-7291 was used in the study, as well as two varieties established in each of the two triticale breeding centers in Bulgaria: Rojen and Sadovec, developed in the Institute of Plants and Genetic Resources – in the town of Sadovo, Rakita and Zaryad, developed in Dobrogea Agricultural Institute – in the town of General Toshevo. Although the triticale varieties differed slightly with regard to the mean content of crude protein in grain, the varieties of the rye type Rojen and Rakita could be identified as having a higher content of proteins. The application of high nitrogen rates affected positively the content of crude protein in grain, regardless of the effect on the grain yield. Triticale grain was characterized by powdery grain splitting, but the varieties established under the conditions of South Bulgaria possessed higher vitreousness.

The increased nitrogen rate enhanced 3-4 times the vitreous splitting of triticale grain.

28. Matev, A., V. Kuneva, R. Kalaydjieva, **H. Kirchev**. 2014. Correlation between the structural elements of soybean yield grown in the conditions of different humidity. *Science & Technologies*, 4: 6, 1-5.

Abstract:

The purpose of the development is to analyze, by the application of correlation analysis, the dependencies between biometric parameters characterizing plant soybeans, which are changed to a different extent under the influence of irrigation regime applications. Data for the extraction and its structural elements in soybeans is used, derived from field experiments to study the irrigation regime, held in the period 2004 - 2006 in the experimental field of Agricultural University - Plovdiv. The variants of the experiment are the following: 1) free irrigation; 2) optimum irrigation at 75% of the FC (field capacity) for the layer of 0 - 80cm; Variants 3, 4, 5, and 6 are with reduced irrigation rates, respectively 25, 50 and 75%. Variant 6 is irrigated in the groove (50% reduction in the rate per unit area). A very high statistical proven correlation is established ($r > 0.9$) between the yield and the number of nodes per plant, number of pods per plant, number of pods per node and plant height. Statistically, the correlation between extraction and height of the first follicle is not proven, as well as the number of plant's taps.

29. Yanchev, I., T. Kolev, **H. Kirchev**, I. Alexiev. 2014. Study on sugar sorghum (*Sorghum vulgare* var. *saccharatum*) cultivated for green fodder. *Journal of Mountain Agriculture on the Balkans*, 17: 4, 970-982.

Abstract:

The study was conducted during the period 2011 – 2013, in UEVB of AU – Plovdiv. Sugar sorghum used is native forms of so-called black brooms, at a density within the crop per 50 000 plants harvested per decare. The aim is to get green, succulent food and fodder in the dry hot summer months. The technology used is the emphasis on quality soil preparation, sowing precision and protection of crops from weeds. Are considered important for the growth of biometric indicators. Harvesting is done in phase start tessling. The plants are very tender and juicy with a penchant for lodging. Harvesting of crops provides 9 – 10 tons of fresh green mass per decare. The nutritional value per unit mass as expressed KEM is around 1.1 – 1.12 and expressed as the ERC is in the range of 1:15 to 1:18.

30. Matev, A., R. Kalaydzhieva, **H. Kirchev**, V. Delibaltova, I. Yanchev, Z. Zlatev. 2014. Formation of Soybeans evapotranspiration for different soil layers depending on irrigation regime. *Journal of Mountain Agriculture on the Balkans*, 17: 4, 933-947.

Abstract:

The purpose of this study is to find the contribution of individual soil layers in formation of evapotranspiration of soybeans grown under conditions of different water provisions. The experiment was held in the period 2004 – 2006 in the experimental field of the Agricultural University – Plovdiv with the following options: 1) no irrigation, 2) irrigation with 25% of the irrigation norm calculated for the optimal option (25%*m*), 3) irrigation with 50%*m*, 4) irrigation with 75%*m* and 5) optimal irrigation (100%*m*). Evapotranspiration of soybeans is most intensive at the surface soil layer 0 – 20 with an average of 48%. Under irrigation, the average aggregate water consumption of this layer exceeds 200 mm and forms from 47 to 55% of the total value for 0 – 100cm. 20 – 25% aggregate evapotranspiration is formed in layer 20 – 40 cm. Layer 40 – 60 cm is also very important for the water provision of soybeans and its share in evapotranspiration is 16 – 19%. The irrigation regime practically does not affect evapotranspiration in layer 60 – 80 cm. Values fall within the range of 30 – 40 mm or 6 – 11%. These results give reasons to believe that soybean roots located in depths below 60 cm do not significantly contribute to the water provision of plants and moisturizing soil below this depth in irrigation is useless. Results are analogous for layer 80

– 100 cm and here values are even lower.

31. Delibaltova, V., **H. Kirchev**, A. Matev, A. Sevov. 2014. Investigation the predecessor and fertilization influence on the productivity of six rowed barley variety Gerlah. *Journal of Mountain Agriculture on the Balkans*, 17: 3, 590-601.

Abstract:

In a field experiment during the period of 2010 – 2013 in south-east Bulgaria estimation the influence of predecessor and fertilization on the productivity of six-rowed barley variety Gerlah was researched. The randomized complete block design with 4 replications and 25 m² plot size was applied. The growing of plants was performed in compliance with the standard technology. The sowing was made with 450 seeds/m² after three predecessor – sunflower, wheat and coriander and three rates of fertilization – N₈₀P₈₀, N₁₂₀P₈₀, N₁₆₀P₈₀ and control N₀P₀. The investigation aim was to establish the effect of predecessor and rates of fertilization on the structural elements and the yield of six-rowed barley variety Gerlah in south-east Bulgaria. For the purpose of determining the quantity dependence between the studied indicators, the experimental data were processed according to the Anova Method of dispersion analysis, and the differences between the variants were determined by means of the Duncan's Multiple Range Test. The analysis of the results shows that the most suitable predecessor for six-rowed barley variety Gerlah under the conditions of south-east Bulgaria is coriander, followed by sunflower and wheat. The most effective fertilization rates are N₁₂₀P₈₀ with predecessor coriander and N₁₆₀P₈₀ with sunflower and wheat.

32. **Kirchev, H.**, P. Zorovski, T. Georgieva. 2014. Productivity of winter Oat varieties, grown in the conditions of the Plovdiv region. *Journal of Mountain Agriculture on the Balkans*, 17: 2, 346-356.

Abstract:

In order to establish the productivity of oat varieties grown for grain, a three-year field experiment has pledged in the experimental field of the Department of Crop Science at the Agricultural University – Plovdiv. The experiment was performed in a block method in four replications after predecessor sunflower. The study used varieties Dunav1 - standard, Sonar and Primula, created in the selection company PRO.SE.ME. – Italy. As a result of the experiment were established the basic structural elements of yield, grain yield, as well as correlations between different indicators.

33. Kolev, T., I. Yanchev, **H. Kirchev**, I. Petrova. 2014. Productivity of the Triticale under the effect of new growth regulators. *Journal of Mountain Agriculture on the Balkans*, 17: 2, 336-345.

Abstract:

During the period 2008 – 2011 a field experiment is carried out in the Research, Experimental and Implementation base of the Department of Plant Growing of Agricultural University of Plovdiv, which explores the effect of the growth regulators: Salvit in dosages of 500 and 1000 ml/ha, Trisalvit in dosages of 500 and 1000 ml/ha, Tritimil in dose of 300 ml/ha on the productivity of the triticale variety Musala. The treatment is done in the phase of tillering. The experiment is carried out after sunflower as a predecessor, according to the block method, repeated 4 times, with the size of the experimental field 15 m². The results of the experiment are: The tested regulators influence positively the productivity of the triticale variety Musala. The highest yield increase is achieved when the rye is treated in the phase of tillering with the growth regulator Trisalvit (1000 ml/ha), in this variant the increase of the harvested yield averagely for the experimental period is with 450 kg/ha (10.0%) more than the untreated crop field. The next follow the variants of treatments with Tritimil (300 ml/ha) averagely for the experimental period with 350 kg/ha (7.8%); Trisalvit (500 ml/ha) with 290 kg/ha (6.5%); Salvit (1000 ml/ha) with 200 kg/ha (4.5%) and Salvit (500 ml/ha) with 120 kg/ha (2.7%) more than the control crop field. The growth regulators help for the increase of

the values of the structural elements of the yield, such as: number of ears, number of grains and weight of the grains of one plant, as well as the indicators - the weight of 1000 grains and hectoliter weight.

34. **Kirchev, H.**, V. Delibaltova, A. Matev, T. Kolev, I. Yanchev. 2014. Analysis of productivity of triticale varieties grown in Thrace and Dobrudja depending on nitrogen fertilization. *Journal of Mountain Agriculture on the Balkans*, 17: 2, 328-335.

Abstract:

In order to differentiate varietal specificity in the formation of economic production under the influence of nitrogen fertilization is made regression analysis of data on grain yield of triticale grown in Thrace and Dobrudja. Used data from two parallel three-year field experiments, pledged respectively in the experimental fields of the Department of Crop Science at the Agricultural University – Plovdiv and Section Agrotechnology in Dobrudja Agricultural Institute – General Toshevo. The study used the standard AD-7291 and varieties Rojen Sadovec, Rakita and Zaryad. Tested four nitrogen rates - N_0 ; N_6 ; N_{12} and N_{18} . Triticale grown in the conditions of Thrace shows greater responsiveness of increasing nitrogen fertilization, in terms of Dobrudja was previously established within N_{12-16} .

35. Делибалтова, В., И. Янчев, **Х. Кирчев**, Ст. Георгиев. 2014. Влияние на азотното торене и посевната норма върху продуктивността на кориандър (*Coriandrum sativum* L.) сорт Марокан, отглеждан в района на Пловдив. *Аграрни Науки*, 6: 16, 79-85.

Abstract

The field experiment was carried out on the Scientific-Experimental and Introductory Facility of the Department of Plant Growing at the AU – Plovdiv in the 2008-2011 period. The experiment was performed by means of a block method with four replications; experimental field area - 15 m². The effect of four nitrogen (0, 80, 120 и 160 kg/ha) and five sowings (150, 200, 250, 300 and 350 g.s./m²) rates on the coriander yield and yield components of the Marokan variety were determined. The analysis of the results showed that the experimental factors (nitrogen fertilization and sowing rate) in combination with the meteorological conditions during the years of the study had a significant influence on the coriander yield and yield components of the Marokan variety. During the study period (2008-2011) the maximum values of the coriander yield components (number of umbels per plant, seed weight per plant, 1,000-seed weight) and the highest seed yield (2,492 kg/ha) was recorded for the incorporation of 120 kg N /ha and sowing rate of 250 g.s./m², while the lowest ones were for the variant without nitrogen fertilization and sowing rate of 150 g.s./m². The most suitable nitrogen rate for the Marokan variety of coriander – 120 kg/ha and the most effective sowing rate of 250 g.s./m² is recommended for the Plovdiv region.

36. Матев, А., Р. Петрова, **Х. Кирчев**, В. Делибалтова, И. Янчев, Ж. Живков, Н. Лозанова. 2014. Влияние на водния дефицит върху структурните елементи на добива при царевица. II. Еднократни поливки по фази. *Сб. Доклади II Научна Конференция „Теория и практика в земеделието“ 22-24.11.2013 Юндола, ЛТУ*. 255-262.

Abstract

The purpose of this study was to establish the impact of single irrigation through one of the vegetative stages on the yield components of corn for grain: 1000 seeds weight and test weight. The experiment was carried out during 2005-2009 period in the experimental field of Agriculture University - Plovdiv, with hybrid „KN-613“. Variants of the experiment: 1) without irrigation; 2) optimum irrigation by 75 % of FC; 3) only first irrigation; 4) only second irrigation; 5) only third irrigation; 6) only fourth irrigation; The optimum irrigation regime increases the value of 1000 seeds weight. There are no significant differences between variants with irrigation canceling about the test weight.

37. **Кирчев, Х.**, А. Матев, В. Делибалтова, И. Янчев. 2014. Фенологично развитие на соя (*Glycine max* L. Merr.) в зависимост от генотипа и агро-метеорологичните условия. Сб. Доклади II Научна Конференция „Теория и практика в земеделието“ 22-24.11.2013 Юндола, ЛТУ. 138-146.

Abstract

The experiment was carried out during 2004 - 2006 period in the experimental field of Agriculture University - Plovdiv. Tested varieties are Mira and Biser. Phenological development of soybean varieties is recorded in the event of major phenophases. Used codes of each phase by Munger. Mira variety has a shorter growing season than Biser. Conditions affecting the year less the length of the growing season than variety. Mira variety needs less temperature sum than Biser. Despite differences in the number of days per year, temperature differences between the three years amounts are insignificant.

38. Делибалтова, В., **Х. Кирчев**, А. Матев, И. Янчев, Ц. Московска. 2014. Сравнително проучване на сортове обикновена пшеница (*Triticum aestivum* L.) в района на Югоизточна България. Сб. Доклади II Научна Конференция „Теория и практика в земеделието“ 22-24.11.2013 Юндола, ЛТУ. 70-76.

Abstract

A field experiment of five common winter wheat varieties was carried out during the period of 2008-2011 in south-east Bulgaria. The varieties of winter wheat Sadovo 772, Enola, Diamant, Todora, and Yunak were studied. The investigation aim was to establish and compare the elements of productivity and the grain yield of five varieties common wheat in south-east Bulgaria. The results show that the highest values of productive structural elements of the tested varieties demonstrated Todora. The average production values of the three experimental years displayed that Todora exceeds the other examined varieties and it can be recommended for breeding in the conditions of south-east Bulgaria.

39. Янчев, И., А. Матев, **Х. Кирчев**, В. Делибалтова. 2014. Продуктивност и качество на сортове обикновена пшеница отглеждани след различни предшественици. Сб. Доклади II Научна Конференция „Теория и практика в земеделието“ 22-24.11.2013 Юндола, ЛТУ. 56-63.

Abstract

The experiment was carried out on the Training and Experimental fields of the Department of Crop Science at the Agricultural University - Plovdiv whit cultivars: Vjara, Faktor and Laska provide from Agronom Company in the town of Dobrich during the period 2009-2011 years. Analyzed different predecessors: sunflower, soy and alfalfa and there influence over the quality and productivity of some varieties of wheat. The following characteristics were determined: test weight, grain weight, wet gluten yield, crude protein in dry matter, sedimentation number and grain yield in kg/ha. The results showed different productivity of the cultivars depending on the using predecessor, while the quality characteristic varies in the separate indicators. With high productivity after predecessor sunflower is variety Vjara followed from Laska and Faktor. With better quality, there are varieties of Faktor and Laska. The v. Faktor produced the highest yield till 591 kg/da after predecessor soy and after predecessor alfalfa, yet lowest indicators.

40. Ivanova, A., **H. Kirchev**. 2014. Agronomy performance of new triticale varieties (*xTriticosecale* Wittm.) grown under different regions. *Global Journal of Scientific Researches*. 2 (3): 71-75.

Abstract

In three years of field trials (2009-2011) carried out in parallel in the experimental fields of the Dobroudja Agricultural Institute - General Toshevo (DAI) and the Department of Crop Science, Agronomy Faculty at the Agricultural University - Plovdiv (AU) tested two new varieties of triticale - Kolorit and Accord. Experiments are included after predecessor

sunflower, using the fractional plots in four replications. The size of the experimental area is 10 m². In the investigation fertilization is in the ratio N:P:K=12:6:6 and N0P0K0 (control). Analyzed the influence of fertilization and environment of the region on the formation of grain yield (GY) and some quality parameters - the mass of 1000 grains (TKW) and a specific weight (TestW) in the new triticale varieties. Studied triticale varieties Kolorit and Accord are formed higher productivity for the environment in the region of Dobroudja Agricultural Institute - General Toshevo. The mineral fertilization in the ratio N:P:K=12:6:6 has a greater effect on agro-environmental conditions in the area of the Department of Crop Science, Agronomy Faculty at the Agricultural University – Plovdiv and results in a greater increase in the productivity of Kolorit and Accord. The new triticale variety Kolorit is characterized with maximum values of the studied parameters – grain yield (GY), mass of 1000 grains (TKW) and specific weight (TestW) in the environment of Plovdiv and under environment of DAI Kolorit has a high grain yield (GY), mass of 1000 grains (TKW) and Accord – with a maximum specific weight (TestW).

41. **Kirchev, H.** 2014. Productivity of grain maize hybrids with different vegetation period in the conditions of Dobroudja and Thrace, Bulgaria. *International Journal of Farming and Allied Sciences*, 3 (4): 399-401.

Abstract:

The experiments have been carried out in two regions – Dobroudja, North Bulgaria and Thrace, South Bulgaria. The study included six hybrids with different vegetation periods - Victoria, Anjou 292, Ademio, Agrister and Coventry. The grain yield, kg ha⁻¹ was reported from the harvested plots and calculated to standard moisture content (13%). Determined yield components are: height of the plants, cm; the number of the rows per cob, number of the grains per row, 1000 grain weight, g. In both investigated areas higher yields are obtained from a hybrid Coventry. In the three years of investigation and average for the period higher yields were obtained in Dobroudja region.

42. **Kirchev, H.** 2014. Agronomic performance of durum wheat varieties (*Triticum durum* Desf.) as a function of the nitrogen fertilization level. *Scientia Agriculturae*, 1, 3, 118-120.

Abstract

A three-year field experiment for determination of the agronomy performance of durum wheat varieties have been carried out in the experimental field of the Department of Crop Science in Agricultural University – Plovdiv. The experiment has been conducted in block method in 4 repetitions after predecessor sunflower. The study used varieties Catervo, Colosseo, Concadoro, and Simeto, created in the breeding company PRO.SE.ME. - Italia, grown under two levels of nitrogen fertilization - 60 and 180 kg.ha⁻¹ nitrogen. As a result of the experiment has been established the main structural elements of the yield, grain yield and some quality parameters of grain, depending on the variety and nitrogen fertilization level.

43. Matev, A., R. Petrova, **H. Kirchev.** 2014. "Additional yield – irrigation depth" relationship parameters for soybean. *Scientia Agriculturae*, 1, 2, 61-66.

Abstract

The aim of this work is to establish parameters of relationship "Additional yield-irrigation depth" for soybean (grown in the region of Plovdiv), using some different equations as follows: /1/ $y=ax^2+bx$ /2/ $Y=1-(1-x)^n$. The source data used for the study are from a field experiment, carried out in the region of Plovdiv (Bulgaria) on alluvial-meadow soil, with the soybean variety "Mira". Variants of the field experiment are: 1 – without irrigation; 2, 3, 4 and 5 – irrigation with 25, 50, 75 and 100% of irrigation rate, determined by optimal variant (pre irrigation soil moisture 75% of FC for the layer 0 – 80 cm). Equation /1/ gives high mathematical precision ($R^2=0.974$). For the experimental conditions, the type of equation is $Y= 1.158x - 0.110x^2$. The results show that equation /2/ is more suitable, from a

mathematical point of view and at the same time corresponding well with the biology of the crop. The following parameters are established: $n=1.3$ (from 1.0 to 1.5) and $R=0.989$ (from 0.939 to 0.996).

44. Матов, А., Р. Петрова, **Х. Кирчев**. 2014. Параметри на връзката допълнителен добив – напоителна норма при слънчоглед за района на Пловдив. *Аграрни Науки*, 6: 15, 47-54.

Abstract

The aim of the present work is to establish the parameters of the relationship additional yield – irrigation depth for sunflower grown in the region of Plovdiv, using different equations of the following kind: /1/ $y=ax^2+bx$; /2/ $Y=1-(1-x)^n$. The source data used for the study are from a field experiment, carried out in the region of Plovdiv (Bulgaria) on alluvial-meadow soil, with the sunflower hybrid PR-64-E-83. Variants of the field experiment are: 1 – without irrigation; 2, 3 and 4 – with irrigation, applying 50%, 100% and 150% of the irrigation rate, determined by the optimal variant (pre-irrigation soil moisture 75% of FC for the 0 – 80 cm layer). If we accept that the relative irrigation depth is 1.000 in variant 4, then the relative irrigation depth in the other variants is as follows: var.1 – 0.000, var.2 – 0.333 and var.3 – 0.667. The results show that equation /1/ is most suitable from a mathematical point of view. The representative type of equation /1/ is: $Y=2.743x-1.745x^2$ by $R^2=1$. The variations of the calculated yields using this equation to experimental yields are from -10.2 to +6.8% ($R=0.998$). Equation /2/ is also very accurate from a mathematical point of view and at the same time corresponding well with the biology of the crop. The variations of the calculated yields using this equation to experimental yields are from -8.4 to +15.8% ($R=0.993$). The following parameters are established: $n=3.37$ (from 2.34 to 4.67) and $R=0.997$ (from 0.986 to 1.000). All established parameters of the relationship yield– irrigation depth in this paper are valid when moistening the 0–100 cm layer and 75% FC pre-irrigation soil moisture is maintained for the soil layer of 0 to 80 cm.

45. Иванов, В., И. Янчев, **Х. Кирчев**. 2013. Влияние плотности посева и азотных удобрений на продуктивность Базилика лекарственного. *Международной научно-практической конференции „Климат, Экология, Сельское Хозяйство Евразии“*. Иркутск, 147-154.

Abstract

The experiment was laid in the period 2007-2009, at the block method in four replications in the experimental field at the Department of Crop Science, Agricultural University - Plovdiv in the wheat predecessor. Were tested basil varieties - Local, Thrace and Jubilee, which were grown under three levels of nitrogen fertilizer and the two densities seating. Low seed yield is formed from Thrace, and varieties of Local has the highest yield. The application of nitrogen fertilizer increased the yield of dry medicinal plants relative to control without fertilizer. Increasing fertilizer rates but reduces the effect of fertilizer. Double to increases density planting has the greatest impact on the accumulated biomass to increases in the average level of fertilizer nitrogen at all three studied varieties.



ПОДПИС:

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