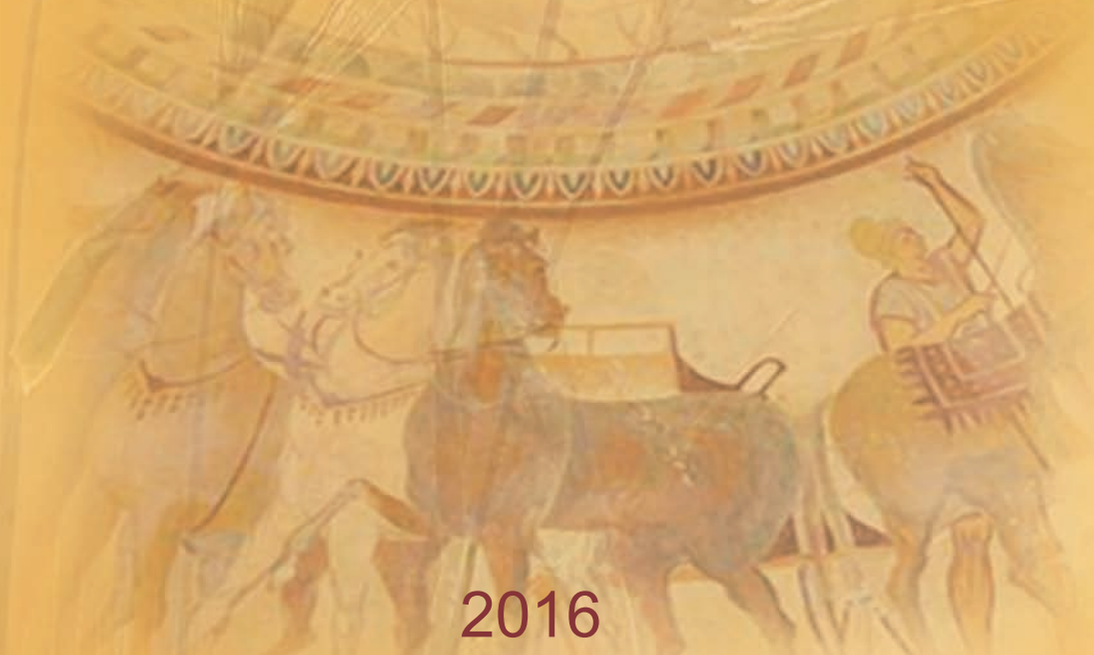
ISSN 1313 - 8820 (print)
ISSN 1314 - 412X (online)
Volume 8, Number 4
December 2016

AGRICULTURAL SCIENCE AND TECHNOLOGY



2016

An International Journal Published by Faculty of Agriculture,
Trakia University, Stara Zagora, Bulgaria

Editor-in-Chief

Georgi Petkov
Faculty of Agriculture
Trakia University, Stara Zagora
Bulgaria

Co-Editor-in-Chief

Dimitar Panayotov
Faculty of Agriculture
Trakia University, Stara Zagora
Bulgaria

Editors and Sections

Genetics and Breeding

Tsanko Yablanski (Bulgaria)
Atanas Atanasov (Bulgaria)
Nikolay Tsenov (Bulgaria)
Max Rothschild (USA)
Ihsan Soysal (Turkey)
Horia Grosu (Romania)
Bojin Bojinov (Bulgaria)
Stoicho Metodiev (Bulgaria)
Svetlana Georgieva (Bulgaria)

Nutrition and Physiology

Nikolai Todorov (Bulgaria)
Peter Surai (UK)
Zervas Georgios (Greece)
Ivan Varlyakov (Bulgaria)

Production Systems

Radoslav Slavov (Bulgaria)
Dimitar Pavlov (Bulgaria)
Bogdan Szostak (Poland)
Banko Banev (Bulgaria)
Georgy Zhelyazkov (Bulgaria)

Agriculture and Environment

Ramesh Kanwar (USA)
Martin Banov (Bulgaria)
Peter Cornish (Australia)

Product Quality and Safety

Marin Kabakchiev (Bulgaria)
Stefan Denev (Bulgaria)
Vasil Atanasov (Bulgaria)
Roumiana Tsenkova (Japan)

English Editor

Yanka Ivanova (Bulgaria)

Scope and policy of the journal

Agricultural Science and Technology /AST/ – an International Scientific Journal of Agricultural and Technology Sciences is published in English in one volume of 4 issues per year, as a printed journal and in electronic form. The policy of the journal is to publish original papers, reviews and short communications covering the aspects of agriculture related with life sciences and modern technologies. It will offer opportunities to address the global needs relating to food and environment, health, exploit the technology to provide innovative products and sustainable development. Papers will be considered in aspects of both fundamental and applied science in the areas of Genetics and Breeding, Nutrition and Physiology, Production Systems, Agriculture and Environment and Product Quality and Safety. Other categories closely related to the above topics could be considered by the editors. The detailed information of the journal is available at the website. Proceedings of scientific meetings and conference reports will be considered for special issues.

Submission of Manuscripts

All manuscripts written in English should be submitted as MS-Word file attachments via e-mail to editoffice@agriscitech.eu. Manuscripts must be prepared strictly in accordance with the detailed instructions for authors at the website www.agriscitech.eu and the instructions on the last page of the journal. For each manuscript the signatures of all authors are needed confirming their consent to publish it and to nominate on author for correspondence.

They have to be presented by a submission letter signed by all authors. The form of the submission letter is available upon from request from the Technical Assistance or could be downloaded from the website of the journal. Manuscripts submitted to this journal are considered if they have submitted only to it, they have not been published already, nor are they under consideration for publication in press elsewhere. All manuscripts are subject to editorial review and the editors reserve the right to improve style and return the paper for rewriting to the authors, if necessary. The editorial board reserves rights to reject manuscripts based on priorities and space availability in the journal.

The journal is committed to respect high standards of ethics in the editing and reviewing process and malpractice statement. Commitments of authors related to authorship are also very important for a high standard of ethics and publishing. We follow closely the Committee on Publication Ethics (COPE), http://publicationethics.org/resources/guidelines

The articles appearing in this journal are indexed and abstracted in: DOI, EBSCO Publishing Inc. and AGRIS (FAO).

The journal is accepted to be indexed with the support of a project № BG051PO001-3.3.05-0001 “Science and business” financed by Operational Programme “Human Resources Development” of EU. The title has been suggested to be included in SCOPUS (Elsevier) and Electronic Journals Submission Form (Thomson Reuters).

Address of Editorial office:
Agricultural Science and Technology
Faculty of Agriculture, Trakia University
Student's campus, 6000 Stara Zagora
Bulgaria
Telephone.: +359 42 699330
+359 42 699446
www.agriscitech.eu

Technical Assistance:
Nely Tsvetanova
Telephone.: +359 42 699446
E-mail: editoffice@agriscitech.eu

ISSN 1313 - 8820 (print)
ISSN 1314 - 412X (online)

Volume 8, Number 4
December 2016

AGRICULTURAL SCIENCE AND TECHNOLOGY

2016

An International Journal Published by Faculty of Agriculture,
Trakia University, Stara Zagora, Bulgaria

AGRICULTURAL SCIENCE AND TECHNOLOGY, VOL. 8, No 4, pp 280 - 282, 2016
DOI: 10.15547/ast.2016.04.053

Production properties of flax (*Linum usitatissimum* L.) cultivated in Strumica region, Republic of Macedonia

P. Vuckov*, M. Ilievski, D. Spasova, L. Mihajlov, N. Markova-Ruzdić

Department for Crop Production, Faculty of Agriculture, University Goce Delchev, 2400 Stip, Republic of Macedonia

(Manuscript received 30 May 2016; accepted for publication 16 September 2016)

Abstract. *The purpose of this research was to determine the production properties of 5 flax genotypes cultivated in agro-ecological conditions in the Strumica region, Republic of Macedonia.The research was conducted in a period of two years (2014 and 2015), on the research fields in Strumica at Uni Service - Agro, Faculty of Agriculture, University Goce Delchev, Stip.The research was conducted on 5 genotypes of flax, 4 of which are domestic intermediate genotypes (transitive) flax (Velusina, Duferin, Belan, Belinka) and one French introduced fiber flax variety (Viking). The experiment consisted of five variants in three iterations, divided by the method of random block system for each genotype.The number of fruit per plant in both years of testing is statistically different among different genotypes. In the first year of the examination (2014), the largest number of fruit per plant had genotype Velusina (156) and the lowest (70.3) genotype Belan. In the second year of the examination (2015), the largest number of fruit per plant had the genotype Velusina (102.3) and the lowest (54.7), genotype Belinka.There is no statistically significant difference in number of seeds in the fruit among the tested genotypes. In the first year of the examination (2014), the largest number of seeds in fruit had genotype Velusina (4.63) and the lowest (2.26) - genotype Viking. In the second year of the examination (2015), the largest number of seeds in fruit had genotype Belan (9.96) and the lowest (7.06) - genotype Duferin. In the first year of the examination (2014), the largest number of seed yield per plant in kg/ha had the genotype Viking (500 kg/ha) and the lowest - genotype Belinka (210 kg/ha). In the second year of the examination (2015), the largest number of seed yield per plant in kg/ha had genotype Velusina (1100 kg/ha) and the lowest - genotype Belinka (780 kg/ha). In both years of research (2014 and 2015) there were statistically significant differences on the level of probability of 0.05 and 0.01 among the examined genotypes. Based on the survey results the most promising genotypes in terms of stability, yielding and quality are proposed to producers and industry, both at home and abroad.*

Keywords: flax, genotypes, fruit, seed, yield

Introduction

It is known that flax was grown by ancient Egyptians, Greeks and Romans, so, it has been familiar to men for more than 5000 years (Šimetić, 2008). Nowadays this culture is an industrial crop that is grown for fiber, seed and combined fiber and seed (Egumenovski et al., 1988). This culture is very suitable for cultivation, having the following advantages: little need of nitrogen (Hocking et al., 1987), harvesting is done by a combine harvester (Casa et al., 1999), successful growth in temperate climate, resistant to short-term drought (Kocjan, 1999). The products obtained are significant for the textile and oil industry.

The production of flax in the Republic of Macedonia is grown on small areas for its seed (as bird food) and in 2005 – 2006 it was grown on the Faculty of Agricultural Sciences and Food in Skopje as a research project (Dimov, 2006). According to the State Statistical Office, flax areas have not been registered in recent years. Georgievski and Klimov (1991) reported that at first flax was grown on about 50 ha, but since 1960 its areas were reduced to only 1 ha in 1972. In many countries around the world flax is one of the most important crops in healthy human consumption, due to the high content of dietary fiber, omega-3 fatty acids and anticancer lignin (Pospišil et al., 2011). The production of flax is unjustifiably neglected, and in recent years cultivation of flax rapidly rises because of growing demand for flax on domestic and foreign markets (Šimetić, 2008). To meet the market needs for seed flax culture, it is necessary to increase yield (Khourang et al., 2012). Increase of flax yield per unit area (ha) can be achieved through: productive varieties and better farming practices (Hussein, 2007; Kocjan and Trdan, 2008; Ibrahim, 2009). Transitional flax grows well in warmer and drier areas, with more sunny days. According to Georgievski and Klimov (1991), transitional flax is grown mainly where the average annual rainfall is between 450 and 750 mm.

In recent years interest in oilseed flax has increased as a result of the increased capacity of oil production. Starting from that point, reintroducing flax areas in the Republic of Macedonia imposed the need for an investigation of the characteristics of certain varieties of flax, their acclimatization and production opportunities.

The purpose of this research was to determine the productive characteristics of the five flax genotypes in agro-ecological conditions of the Strumica region, Republic of Macedonia, and based on the results to suggest most promising genotypes in terms of stability, yield and quality to producers and industry, both at home and abroad.

Material and methods

The research was conducted in field and laboratory conditions. Field examinations were set up at the experimental field in Strumica at UniService-Agro DOOEL, Faculty of Agriculture, University Goce Delchev, Stip, Republic of Macedonia. The research was conducted in the period of two years - 2014 and 2015. As a work material were used five flax genotypes, four of which are domestic intermediate flax genotypes (*Velusina, Duferin, Belan, Belinka*) and one French introduced fiber flax variety (*Viking*).

* e-mail: pavle_vuckov@hotmail.com

The experiment consisted of five variants in three iterations, divided by the method of random block system with the basic dimension of the parcel of 10 m².The distance between the variants was 50 cm, between iterations 100 cm and between rows 30 cm.

The seeding rate was 50 kg/ha or 50 g per parcel. In the two years of testing, a pre-culture of flax was wheat. Soil was prepared in the same way. Primary tillage was plowing at a depth of 35 cm and the area was fertilized with granulated NPK (15:15:15) fertilizer at an amount of 300 kg/ha and also a pre-sowing tillage was performed with a tiller. Sowing was performed manually in rows at a depth of 2 – 3 cm.

After sowing and before germination, parcel treatment with herbicide DUAL GOLD 960 EC was performed, against some annual and perennial broadleaf weeds at an amount of 3 l/ha.

During the vegetation, standard farming practices for field production of flax were used. Number of fruit per plant, number of seeds in the fruit, seed yield per plant (g) were monitored. Before the harvest, 10 plants were taken from each repetition, the average is taken from 30 plants (3x10 plants) and total seed yield (kg/ha).

The results were statistically processed by the method analysis of variance, and differences were tested by LSD- test.

Results and discussion

Number of fruit per plant. In both years of testing, the largest number of fruit per plant had genotype *Velusina* (156 in 2014 and 102.3 in 2015), and the lowest - genotypes *Belan* (70.3 in 2014) and *Belinka* (54.7 in 2015), (Table 1). It can be seen that for the two years of investigation differences between genotypes were statistically significant.

The obtained results for the number of fruit per plant are higher than in the studies by Butorac et al. (2003, 2006a, 2006b, 2009, 2010a, 2010b), Andrassy et al. (2004), Pospišil et al. (2004, 2011) and Šurina et al. (2011, 2012). In our case, genotype *Velusina* gave the highest number of fruit per plant and therefore we recommend it to manufacturers in the Republic of Macedonia and other countries with the same agro-ecological conditions.

Number of seeds in the fruit. Theoretically it should be 10, however, this is a variety characteristic. That parameter depends on fertilization. In the first year of the examination (2014), the largest number of seeds in fruit had genotype *Velusina* (4.63), and the lowest (2.26) - genotype *Viking*. In the second year (2015) the largest number of seeds in fruit had genotype *Belan* (9.96), and the lowest (7.06) - genotype *Duferin.* The differences between the values of that index among the studied genotypes for both years of testing are not statistically proven.

Some previous investigations (Zedan et al., 1999; Butorac et al., 2010) show that number of seeds in the fruit is higher (5 – 6 seeds in the fruit) during the first year and lower during the second year, compared to the results of our study. The papers of other authors also show that the number of seeds in the fruit depends on the flax genotype (Zedan et al., 1999; Butorac et al., 2003, 2006a, 2006b, 2009, 2010a, 2010b, 2010; Pospišil et al., 2004; Andrassy et al., 2004 and Šurina et al. 2011, 2012).

Seed yield per plant. The yield is a changeable and quite variable characteristic. In both years of research, the highest yield of seed per plant had genotype *Velusina* (5.03 in 2014 and 6.32 in 2015), and the lowest one had genotypes *Belan* (0.7 in 2014) and *Duferin* (2.78 in 2015).The established values are higher than in the research by Pospišil et al. (2011), (Table1).The differences in the values among the tested varieties of flax for both years (2014, 2015) are statistically significant.

Total seed yield per plant (kg/ha). From the results for total seed yield in kilograms per hectare (Table 1), it can be noted that it ranges from 210 to 1100 kg/ha. In the first year of the examination (2014), the highest total seed yield (kg/ha) had genotype *Viking (*500 kg/ha) and the lowest - genotype *Belinka* (210 kg/ha). In the second year of the examination (2015), the highest total seed yield in kilograms per hectare had genotype *Velusina* (1100 kg/ha) and the lowest - genotype *Belinka* (780 kg/ha). In both years of testing (2014 and 2015) there are statistically significant differences on the level of probability at P<0.05 and P<0.01 among the different genotypes.

In studies of other authors, results for increase of total seed yield (kg/ha) between the different genotypes are also represented (Butorac et al., 2003, 2006a, 2006b, 2009, 2010a, 2010b, 2010; Andrassy et al., 2004; Pospišil et al., 2004, 2011; Šurina et al., 2011, 2012; Kepic, 2013).

In our research, yield in 2014 was lower compared to the yield in 2015. The results in the studies of Butorac et al. for two years (2004, 2005) of testing of five varieties of flax by three selection institutions: *Viking* (Cooperative Liniere de Fontaine Cany, France), *Venice* (Agritec, Czesh), *Agata, Elektra* and *Ilona* (Cebbeco Seeds bv, Netherlands) on two sites (Zagreb and Pasovski coast, Croatian), great variability in yield also was reported between the year of examination. The highest average yield in both years of testing gave varieties *Ilona* 1.4 t/ha (Zagreb region) and *Electra* 1.2 t/ha (Posavski coast region).

Table 1. Average values of some production properties of flax in years (n=10)

Variance	Number of fruit per plant	Number of seed in fruit	Seed yield per plant (g)	Total Seed yield per plant (kg/ha)
		2014		
Velusina	156	4.63	5.03	380
Duferin	81	3.13	1.16	480
Belan	70.3	2.43	0.7	400
Viking	86.7	2.26	0.8	500
Belinka	90	2.76	1.13	210
LSD 0.05	62.43	n.s	3.54	0.25
0.01	112.17	n.s	6.36	0.46
		2015		
Velusina	102.3	7.6	6.32	1100
Duferin	69	7.06	2.78	1010
Belan	68.7	9.96	4.37	950
Viking	76	8.33	3.91	960
Belinka	54.7	8.6	2.98	780
LSD 0.05	41.69	n.s	3.64	0.25
0.01	74.91	n.s	6.55	0.46

Dervišević et al. (2014) started with the cultivation of flax in Bosnia and Herzegovina in order to increase the yield of seed per unit area (ha). The research was conducted on two sites (Gojluk and Ostruznica) in Split region. Three varieties were used (*Mikael, Belstar* and *x*). The highest average yield in both years of examination (2012 – 2013) had the variety *Belstar* 1600 – 1900

kg/ha (sites Gojluk and Ostruznica). According to Pavelek (2001) and Daenekindt (2003) the average yield of flax is between 1.3 and 1.5 t/ha.

The results obtained give reason to propose genotypes *Duferin, Viking* and *Belan* for flax seed production in Strumica region. They will be a great importance for the future of agricultural production of this crop.

Conclusion

Based on two-year investigations of 5 genotypes of flax in the Strumica region, Republic of Macedonia, the following important findings and conclusions can be made: in both years of examination (2014 and 2015) there is no statistically significant difference between genotypes for number of fruit per plant; the largest number of fruit per plant had genotype *Velusina* (156.0 in 2014 and 102.3 in 2015), and the lowest – genotypes *Belan* (70.3 in 2014) and *Belinka* (54.7 in 2015); there is no statistically significant difference in number of seeds in the fruit between the tested genotypes; the number of seeds in the fruit ranges from 5 to 6 seeds; in 2014, the largest number of seeds in fruit had genotype *Velusina* (4.63), and the lowest (2.26) – genotype *Viking*; in 2015, the largest number of seeds in fruit had genotype *Belan* (9.96), and the lowest (7.06) – genotype *Duferin*. The seed yield per plant in both years of testing is with statistically significant differences among the tested varieties. The highest yield of seed per plant had genotype *Velušina* (5.03 in 2014 and 6.32 in 2015), and the lowest yield per plant - genotypes *Belan* (0.7 in 2014) and *Duferin* (2.78 in 2015); in 2014, the highest total seed yield had genotype *Viking* (500 kg/ha), while the lowest - genotype *Belinka* (210 kg/ha); in 2014, the highest total seed yield had genotype *Velusina* (1100 kg/ha), while the lowest - genotype *Belinka* (780 kg/ha); in both years of testing there are statistically significant differences on the level of probability at $P<0.05$ and $P<0.01$ among the different genotypes. Genotypes *Duferin, Viking* and *Belan* are recommended for the production of flaxseed in the Strumica region.

References

Andrassy M, Pezelj E and Butorac J, 2004. Return to the production of fiber flax. Tekstil, 53, 385-391.

Butorac J, Pospišil M and Mustapić Z, 2003. Analysis of economic and morphological characteristic of fiber flax. 38th Croatian Symposium on Agriculture with International Participation, Opatija, 399-402.

Butorac J, Pospišil M and Mustapić Z, 2006b. Effect of sowing density on some morphological and phenological characteristics of fiber flax varieties. Seed trade Croatian, 23, 447-456.

Butorac J, Pospišil M, Mustapić Z and Duvnjak I, 2009. Evaluation of the agronomic and morphological characteristics of fiber flax cultivars, with and without supplemental feeding. Seed trade Croatian, 26, 119-129.

Butorac J, Pospišil M, Mustapić Z and Marković Z, 2010a. The effect of fertilizer on some morphological and phenological characteristics of fiber flax cultivars. Seed trade, Zagreb, 27, 19-29.

Butorac J, Pospišil M, Mustapić Z and Zorić D, 2006a. Evaluation of important agronomic and morphological properties of fiber flax varieties with different sowing density. Seed trade Croatian, 23, 437-445.

Butorac J, Šurina R, Andrassy M, Augustinović Z and Pospišil M, 2010b. Some agronomic and textile properties of flax cultivated in Croatia (Križevci). 5 th International Textile, Clothing and Design Conference. Dubrovnik, 42-47.

Casa R, Russell G, Lo Cascio B and Rossini F, 1999. Environmental effects on linseed (*Linum usitatissimum* L.) yield and growth of flax at different stand densities. Eur. Journal of Agronomy, 11, 267-278.

Daenekindt A, 2003. Belgian verities of flax 2002. Vlas Berichten, 4, 1-4 (Ge).

Dervišević Selma, Veladžić Mirsad and Jogić Vildana, 2014. Effect of different fertilizers types on flax fibres charakteristic in different cultivars of flax. The 5th International Symposium on Sustainable Development. University of Bihac, 95-101.

Dimov Z, 2006. Opportunities for growing flax in R. Macedonia. Ministry of Education and Science of the Republic Macedonia (Ma).

Egumenovski P, Bocevski D, Fidanovski F and Mitkovski P, 1998. Special Crop production. Skopje, Republic of Macedonia, p. 288.

Georgievski J and Klimov S, 1991. Industrial cultures. University book. Skopje, Republic of Macedonia, 113 (Ma).

Hocking PJ and Pinkerton A, 1992. Phosphorus nutrition of linseed (*Linum usitatissimum* L.) as affected by nitrogen supply. Field Crops Research, 32, 101-114.

Hussein MMM, 2007 Response of some flax genotypes to bio and nitrogen fertilization. Zagazig Journal of Agricultural Research, 34, 815-844.

Ibrahim HM, 2009. Effect of sowing date and N – fertilizer level on seed yield, some yield components and oilcontent in flax. Alex. S. Agricultural Research, 54, 19-28.

Kepic I, 2013. Crop seeds of indigenous flax from Bela Krajina depending on fertilization and harvest time. VII Dipl. delo (VS). Ljubljana, Univ. Ljubljana, Biotechnical Faculty, Department of Agronomy (Cr).

Khourang M, Brumand P and Omidbaigi R, 2012. Effect of some chemical and biological fertilizers on productivity of medicinal flax (*Linum usitatissimum* L.) plant. International Journal of Agronomy and plant Production, 3, 78-83.

Kocjan Ačko D, 1999. Lan, V: Forgotten crops, Ljubljana, Kmečkiglas, 83-99.

Kocjan Ačko, D and Trdan S, 2008. Influence of row spacing on the yield of two flax cultivars (*Linum usitatissimum* L.). Acta agriculturae Slovenia, Ljubljana, Biotehnological engineering, 91, 23-35.

Pavelek M, 2001. New varieties - Venica. Czech Journal Genetics and Plant Breeding, 37, 103-104.

Pospišil M, Butorac J and Gojšić T, 2004. Flax - Forgotten but useful culture. Gazophylacium, 9, 81-86.

Pospišil M, Pospišil A, Butorac J, Škevin D, Kraljić K, Obranović M and Brčić M, 2011. Yield and yield components of investigated linseed cultivar in Northwest Croatia. 46th Croatian and 6th International Symposium on Agriculture. Opatija, Croatia, 728-731.

Šimetić S, 2008. Flax in production and use. Seed trade, Zagreb, 25, 217-221.

Šurina R, Andrassy M and Butorac J, 2012. An interdisciplinary approach to flax research. 12th World Textile Conference AUTEX 2012. Zadar, 181-186.

Šurina R, Butorac J and Andrassy M, 2011. Dependence of properties of the fibers from the properties of the flax plant. Tekstil, 60, 87-101.

Zedan SZ, Kineber ME and Mostafa SH, 1999. Response of flax to potassium and nitrogen fertilization under sandy soil conditions. Egypt Journal of Agricultural Research, 77, 729-743.

CONTENTS 1 / 2

CONTENTS 2 / 2

Instruction for authors

Preparation of papers

Papers shall be submitted at the editorial office typed on standard typing pages (A4, 30 lines per page, 62 characters per line). The editors recommend up to 15 pages for full research paper (including abstract references, tables, figures and other appendices)

The manuscript should be structured as follows: Title, Names of authors and affiliation address, Abstract, List of keywords, Introduction, Material and methods,Results, Discussion, Conclusion, Acknowledgements (if any), References, Tables, Figures.

The title needs to be as concise and informative about the nature of research. It should be written with small letter /bold, 14/ without any abbreviations.

Names and affiliation of authors The names of the authors should be presented from the initials of first names followed by the family names. The complete address and name of the institution should be stated next. The affiliation of authors are designated by different signs. For the author who is going to be corresponding by the editorial board and readers, an E-mail address and telephone number should be presented as footnote on the first page. Corresponding author is indicated with *.

Abstract should be not more than 350 words. It should be clearly stated what new findings have been made in the course of research. Abbreviations and references to authors are inadmissible in the summary. It should be understandable without having read the paper and should be in one paragraph.

Keywords: Up to maximum of 5 keywords should be selected not repeating the title but giving the essence of study.

The introduction must answer the following questions: What is known and what is new on the studied issue? What necessitated the research problem, described in the paper? What is your hypothesis and goal ?

Material and methods: The objects of research, organization of experiments, chemical analyses, statistical and other methods and conditions applied for the experiments should be described in detail. A criterion of sufficient information is to be possible for others to repeat the experiment in order to verify results.

Results are presented in understandable tables and figures, accompanied by the statistical parameters needed for the evaluation. Data from tables and figures should not be repeated in the text. **Tables** should be as simple and as few as possible. Each table should have its own explanatory title and to be typed on a separate page. They should be outside the main body of the text and an indication should be given where it should be inserted.

Figures should be sharp with good contrast and rendition. Graphic materials should be preferred. Photographs to be appropriate for printing. Illustrations are supplied in colour as an exception after special agreement with the editorial board and possible payment of extra costs. The figures are to be each in a single file and their location should be given within the text.

Discussion: The objective of this section is to indicate the scientific significance of the study. By comparing the results and conclusions of other scientists the contribution of the study for expanding or modifying existing knowledge is pointed out clearly and convincingly to the reader.

Conclusion: The most important consequences for the science and practice resulting from the conducted research should be summarized in a few sentences. The conclusions shouldn't be numbered and no new paragraphs be used. Contributions are the core of conclusions.

References:

In the text, references should be cited as follows: single author: Sandberg (2002); two authors: Andersson and Georges (2004); more than two authors: Andersson et al.(2003). When several references are cited simultaneously, they should be ranked by chronological order e.g.: (Sandberg, 2002; Andersson et al., 2003; Andersson and Georges, 2004).

References are arranged alphabetically by the name of the first author. If an author is cited more than once, first his individual publications are given ranked by year, then come publications with one co-author, two co-authors, etc. The names of authors, article and journal titles in the Cyrillic or alphabet different from Latin, should be transliterated into Latin and article titles should be translated into English. The original language of articles and books translated into English is indicated in parenthesis after the bibliographic reference (Bulgarian = Bg, Russian = Ru, Serbian = Sr, if in the Cyrillic, Mongolian = Mo, Greek = Gr, Georgian = Geor., Japanese = Ja, Chinese = Ch, Arabic = Ar, etc.)

The following order in the reference list is recommended:

Journal articles: Author(s) surname and initials, year. Title. Full title of the journal, volume, pages. Example:

Simm G, Lewis RM, Grundy B and Dingwall WS, 2002. Responses to selection for lean growth in sheep. Animal Science, 74, 39-50

Books: Author(s) surname and initials, year. Title. Edition, name of publisher, place of publication. Example:

Oldenbroek JK, 1999. Genebanks and the conservation of farm animal genetic resources, Second edition. DLO Institute for Animal Science and Health, Netherlands.

Book chapter or conference proceedings: Author(s) surname and initials, year. Title. In: Title of the book or of the proceedings followed by the editor(s), volume, pages. Name of publisher, place of publication. Example:

Mauff G, Pulverer G, Operkuch W, Hummel K and Hidden C, 1995. C3-variants and diverse phenotypes of unconverted and converted C3. In: Provides of the Biological Fluids (ed. H. Peters), vol. 22, 143-165, Pergamon Press. Oxford, UK.

Todorov N and Mitev J, 1995. Effect of level of feeding during dry period, and body condition score on reproductive performance in dairy cows,IXth International Conference on Production Diseases in Farm Animals, September 11–14, Berlin, Germany.

Thesis:

Hristova D, 2013. Investigation on genetic diversity in local sheep breeds using DNA markers. Thesis for PhD, Trakia University, Stara Zagora, Bulgaria, (Bg).

The Editorial Board of the Journal is not responsible for incorrect quotes of reference sources and the relevant violations of copyrights.

Animal welfare

Studies performed on experimental animals should be carried out according to internationally recognized guidelines for animal welfare. That should be clearly described in the respective section “Material and methods”.

AGRICULTURAL SCIENCE AND TECHNOLOGY

Volume 8, Number 4
December 2016

Journal web site:
www.agriscitech.eu

Publisher:
www.alfamarket.biz