ISSN 1313 - 8820
Volume 8, Number 1
March 2016

AGRICULTURAL SCIENCE AND TECHNOLOGY

2016

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

Volume 8, Number 1
March 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 1, pp 41 - 45, 2016
DOI: 10.15547/ast.2016.01.007

Energy productivity, fertilization rate and profitability of wheat production after various predecessors II. Profitability of wheat production

Z. Uhr[1]*, E. Vasileva[2]

[1]Institute of Plant Genetic Resources, 2 Druzhba, 4122 Sadovo, Bulgaria
[2]University of Agribusiness and Rural Development, 78 Dunav, 4000 Plovdiv, Bulgaria

(Manuscript received 27 July 2015; accepted for publication 13 October 2015)

Abstract. *In the course of our study on the adaptation of modern genotypes common winter wheat (Triticum aestivum) to the requirements of sustainable agriculture data were received concerning the influence of the predecessor and nitrogen fertilizer rate on energy efficiency and recyclable nitrogen fertilization and profitability of productivity.We share these data with the scientific community, as they are up-to-date and informative in both theoretical and practical aspects. The analyses are based on data from field experiments fertilizer derived after predecessor cereals – regular crop of sorghum, millet, maize and legumes after predecessor - separate sowing of chickpeas. Energy efficiency of nitrogen fertilization was calculated as the ratio between the energy supplied in the additional grain yield and energy input in the form of fertilizers. Refundable efficiency of nitrogen fertilization is the additional amount of nitrogen accumulated in the grain, with respect to the applied nitrogen fertilization. Economic profitability of production is evaluated by coefficient R = P/Ra (ratio of benefits/costs). The results show that energy efficiency and recyclable nitrogen fertilization are on average five times higher after cereal than after legumes predecessor, and decreased with increasing the fertilizer rate, the decrease was statistically significant only for the first item (exponent). Profitability ratio of production after the introduction of legumes predecessor in crop rotation increases by an average of 42% and retains maximum values of fertilization levels 0.06, 0.12 and 0.18 t/ha nitrogen. Profitability of wheat production using pre-legumes crop is not determined by the parameters nitrogen fertilizer rate and energy efficiency of nitrogen fertilization and refundable efficiency of nitrogen fertilization.*

Keywords: wheat (*Triticum aestivum*), energy efficiency, refundable efficiency, profitability, nitrogen fertilization, predecessor

Introduction

One of the methods for assessing the sustainable development of agriculture is the method of energy flow. The agro-technical factors of fertilization are about 30% of the energy inputs into the production of wheat, an average of 30% of the increase in yields and around 40% of greenhouse gases (Naydenov and Zaharinov, 2012; Azarpour, 2012; Ghahderijani et al., 2013; Shahan et al., 2008). According to some authors, the introduction of precision farming systems, reducing the levels of nitrogen fertilization and improvement of technologies for drying of crops, are comparable in the size of their effect measures to protect the environment and improve energy efficiency in wheat production, but the decrease in fertilizer rates suggests economic loss that is unlikely to be implemented by farmers unless they are forced to do so (Meyer-Aurich et al., 2012). Other authors also agree that the intensity of the energy consumed in the production of wheat is not proportional to the size of the final product. Different studies show that the minimization of some investments, combined with the rationalization of crop rotation, give the best results (De Stefanis et al., 2012; Rahimizadeh et al., 2010; Shamabadi, 2012). Ziaei et al. (2013) conclude that factors such as the total agricultural policies, the market for buying and selling, socioeconomic characteristics, including the main food of the population in different regions, and the definition of strategic culture have great influence on the choice of farmers in their production program. In our country, with the traditional costs for growing crops, the profitability of wheat production is the lowest in comparison with those of other grains. The main financial purpose of farms must be aimed at achieving long-term profitability. The Common Agricultural Policy of the European Union promotes a shift to extensive crop production and low costs, which in the future can be expected to complicate the problem of irrational structure of production in the agricultural sector. However, considering the economic analysis in the next twenty years in Bulgaria, agriculture is expected to become one of the leading sectors in the GDP of the country and to require high cost investments (Vasilev, 2009; Ivanov, 2010; Lyubenova 2012; Uzunova-Kostova, 2013).

The aim of this study was to establish the influence of predecessors and nitrogen fertilizer rate on energy and recyclable efficiency, but also on the production profitability under condition of IPGR Sadovo.

Material and methods

The analyses are based on data from field experiments fertilizer derived during the period 2005 – 2010 in the experimental field of Institute of Plant Genetics Resources (IPGR), Sadovo on Pellic Vertisol. The methods of initiating and finalizing the experiment and recording biometric indicators are described in our previous publications. Yields and chemical composition of production are subjected to mathematical processing of the results obtained. Genotypes included in the study have been created by different breeding methods during a long period of time – from 1972 to 2008: Sadovo 1 (♀ Jubilejna x ♂ Bezostaja-1, 1972), Pobeda (♀ Triticum sphaerococcum var. rotundatum x ♂ [(Triticum durum x Secale montanum) x Bezostaja-1 x Meksikan], 1984), Zdravko (♀

* e-mail: zlatinapg@abv.bg

Charodejka x ♂Sadovska ranozrejka 3, 1995), Sadovo 772 (♀Skitija x ♂ Sadovo 1, 1996), Diamant (♀ Jubilejna x ♂ Sadovo 1, 1997), Borjana (♀№ 4373/9855 x Momchil, 1999), Geja 1 (♀(FD 6405(Fr.) x Zg. 720-1, 2005) x ♂Sadovo 1), Ljusil (♀ Yantar x ♂Medven, 2005), Guinness (created by physical mutagenesis by Katja, 2006), Zarevez (♀ Zebrec x ♂ Katja, 2008), and Yoana (7/5 P – 8 – M/370, created by physical mutagenesis by Pobeda).

During the period between 2005 and 2007 as a predecessor was used joint row sowing of cereals - sorghum, millet and maize, and between 2009 and 2010 – separate sowing of chickpeas. Agro-meteorological conditions are with no significant deviations from the climatic norm for the area and enable us to compare the effect of different predecessors (Vasileva and Uhr, 2012; Vasileva and Uhr, 2013; Stankov, 2012).

The following parameters were analyzed:

- Energy efficiency of nitrogen fertilization, calculated as the ratio of the energy in the additional grain yield and energy input in the form of fertilizers, based on the following energy equivalents: 17.26 MJ/kg grain, 15.80 MJ/kg straw, 80 MJ/kg nitrogen (Balaur and Tetyu, 1983; Kirchev, 2005; Kostadinova and Panayotova, 2002, 2013; Koteva, 2002; Kadrev, 1984; Mineev, 2006; Todorov, 1990; Tonev, 1997; Hristov et al., 2010).
- Refundable efficiency of nitrogen fertilization – additional amount of nitrogen accumulated in the grain is estimated, with respect to the applied nitrogen fertilization.
- Economic profitability of production – coefficient R = P/Ra (ratio of benefits/costs). The calculations of revenues and costs of production are data as of 2010 (Agricultural Report, 2010; Agrostatistics MAF, 2010).

Results and discussion

Energy efficiency of nitrogen fertilization

The results show that the energy efficiency of nitrogen fertilization is an average of five times higher after cereal than after legumes predecessor and significantly decreased with an increase of the fertilizer rate corresponding to that established by other authors (Rahimizadeh et al., 2010). Polynomial model of the dependence of the energy efficiency of fertilization on nitrogen fertilizer rate showed that in cereal predecessor by increasing the nitrogen fertilizer 0.001 t/ha energy efficiency increases as the step of the regression is 0.4. Maximum value of energy efficiency of fertilization is reported at 0.12 t/ha fertilizer nitrogen, followed by a decrease in values with step 0.2. After legumes predecessor energy efficiency of fertilization was the highest at the lowest fertilizer rate – 0.06 t/ha fertilizer nitrogen. With the increase of fertilizer nitrogen fertilization energy efficiency of fertilization decreases more steeply than the other parameters – the regression coefficient is 1.3. (Figure 1). The above results are confirmed by the analysis of variance which varies according to the energy efficiency of nitrogen fertilization on fertilization rates of the variety and its predecessor is high in all variants of fertilization. Statistically significant negative differences between the versions are established of the variations with 0.18 t/ha fertilizer nitrogen at P = 5% and 0.24 t/ha fertilizer nitrogen at P = 1% (Table 1). The total variation of the energy efficiency of nitrogen fertilization after cereal predecessor of variety and nitrogen fertilizer rate is medium in strength (R = 29), the legumes predecessor – high (R = 98). The difference between the two variants is statistically significant at P = 0.1% (Table 2).

Refundable efficiency of nitrogen fertilization

The polynomial model of dependence of the recyclable efficiency of nitrogen fertilization on nitrogen fertilizer rate is similar to the regression analysis for energy efficiency and shows the same 5-fold difference in refundable efficiency in crop after different predecessors and the same levels of extremes in the values of the investigated parameter. After cereal predecessor by increasing the nitrogen fertilizer by 0.001 t/ha efficiency initially increases. The step of the regression is 0.09, and the maximum value is at fertilization

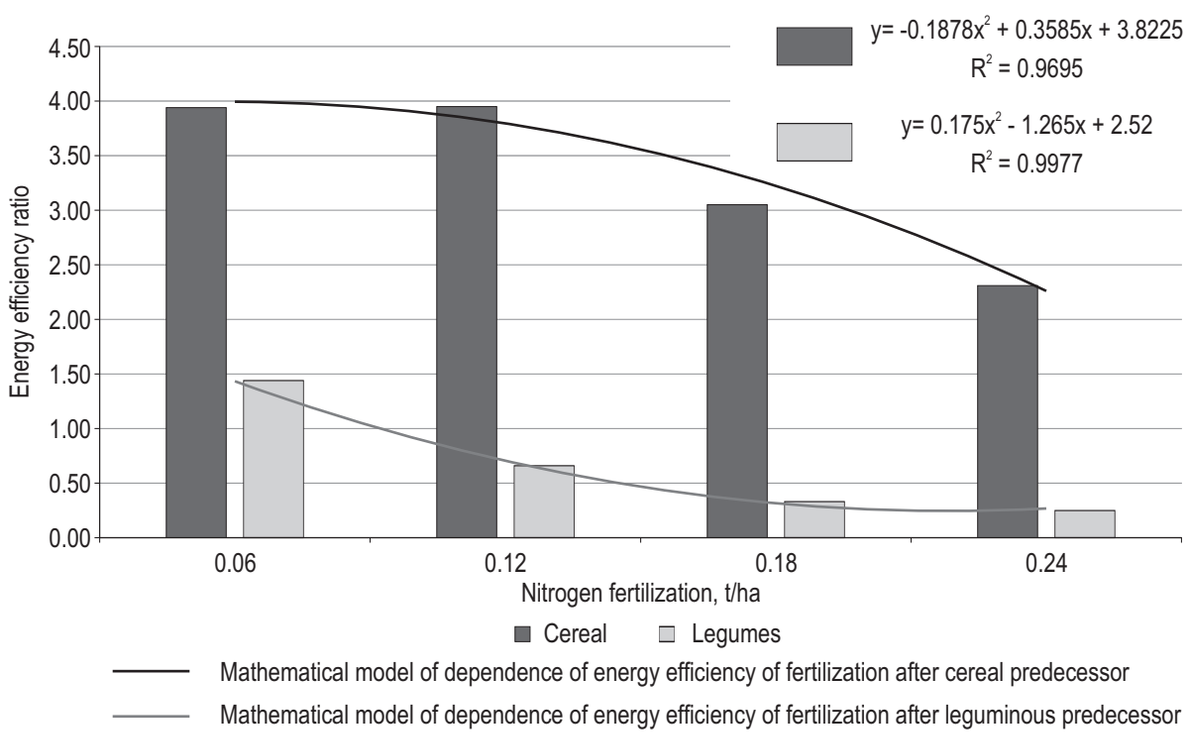

Figure 1. Energy efficiency of fertilization after various predecessors

Table 1. Grain yield obtained from different precursors and levels of fertilization, t/ha

Variety	Nitrogen fertilizer,t/ha									
	0		0.06		0.12		0.18		0.24	
Predecessor	Cereal	Leguminous	Cereal	Leguminous	Cereal	Leguminous	Cereal	Leguminous	Cereal	Leguminous
Sadovo 1	1.95	5.1	3.42	5.22	4.6	5.46	4.97	4.89	4.93	4.88
Diamant	1.5	4.1	2.87	5.31	3.46	5.23	3.78	4.92	3.91	5.04
Sadovo 772	1.43	4.99	2.8	5.33	3.76	5.34	3.67	5.2	4.22	4.67
Borjana	2.32	4.68	4.3	4.91	5.73	4.87	6	5.29	5.83	4.34
Geya 1	1.48	5.43	2.85	4.78	3.9	4.82	4.38	5.07	4.29	4.54
Guiness	1.54	5.24	2.83	5.83	4.32	6.02	5.07	5.58	4.21	5.87

Table 2. Variance analysis by fertilizer rates, variation in the energy and recyclable efficiency of nitrogen fertilization

Fertilizer rates, t/ha	M	S	R	Sm%	M	S	R	Sm%
	Energy efficiency				Recyclable efficiency			
0.06	2.9	1.7	59	15	0.4	0.3	69	17
0.12	2.6	1.9	72	18	0.4	0.2	63	16
0.18	1.9-	1.5	77	19	0.3	0.2	73	18
0.24	1.5--	1.2	82	20	0.3	0.2	66	17

rate 0.12 t/ha fertilizer nitrogen. After bean predecessor the refundable efficiency of fertilization was the highest at the lowest fertilizer rate – 0.06 t/ha fertilizer nitrogen (Figure 2). The results of analysis of variance also copy this energy efficiency of fertilization, as those statistically significant differences between the variants are not established. Fluctuation of refundable efficiency of nitrogen fertilization on fertilization rates of variety and predecessor is high at all levels of fertilization (Table 3). The total deviation of refundable efficiency of nitrogen fertilization after cereal predecessor of variety and nitrogen fertilizer rate is with average strength (R = 24), and after legumes predecessor – high (R = 98) (Table 2).

Profitability of production

The polynomial model of the dependence of the profitability of production on nitrogen fertilization shows a totally different picture compared to the above indicators. The profitability ratio in the

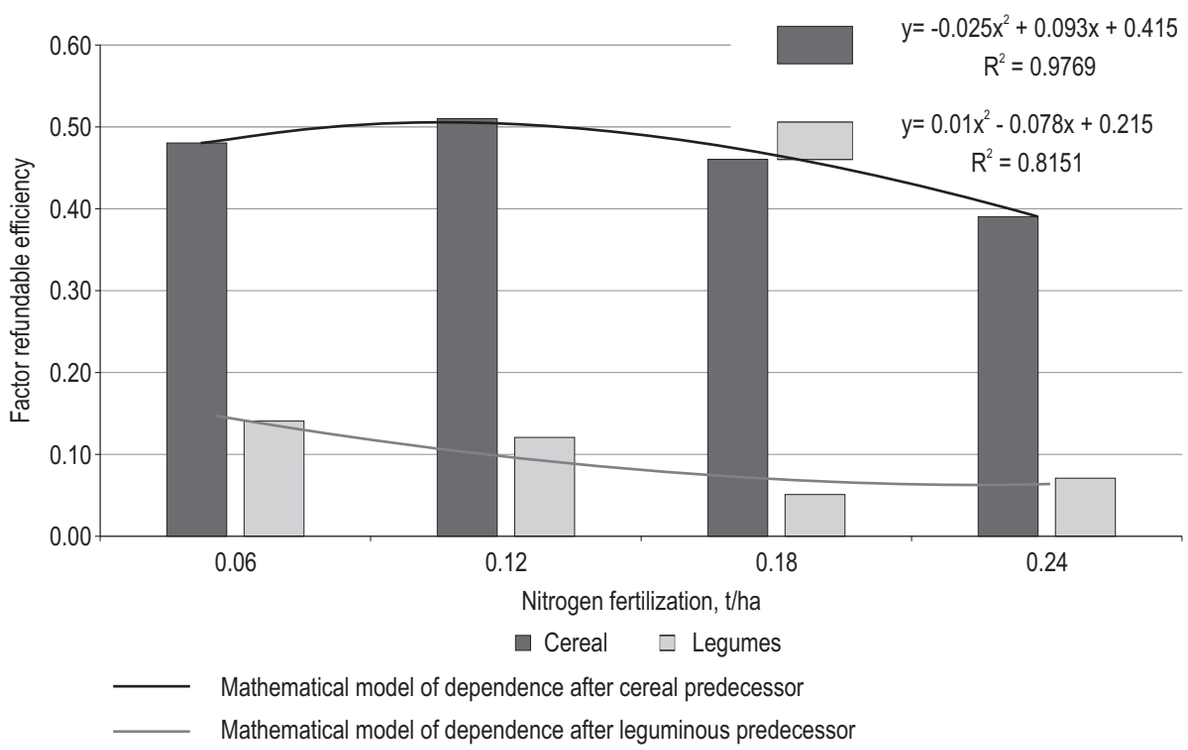

Figure 2. Refundable efficiency of nitrogen fertilization after various predecessors

Table 3. Variance analysis by previous culture, variation in the energy efficiency, recyclable efficiency and the production profitability of fertilization

Indices	Cereal	Leguminous	Cereal	Leguminous	Cereal	Leguminous
	The energy efficiency		Recyclable efficiency		The production profitability	
M	3.4	0.5---	0.5	0.1	1.4	2.0+++
S	1.0	0.5	0.1	0.1	0.4	0.2
R	29	98	24	98	32	9
Sm%	4	13	3	13	4	1

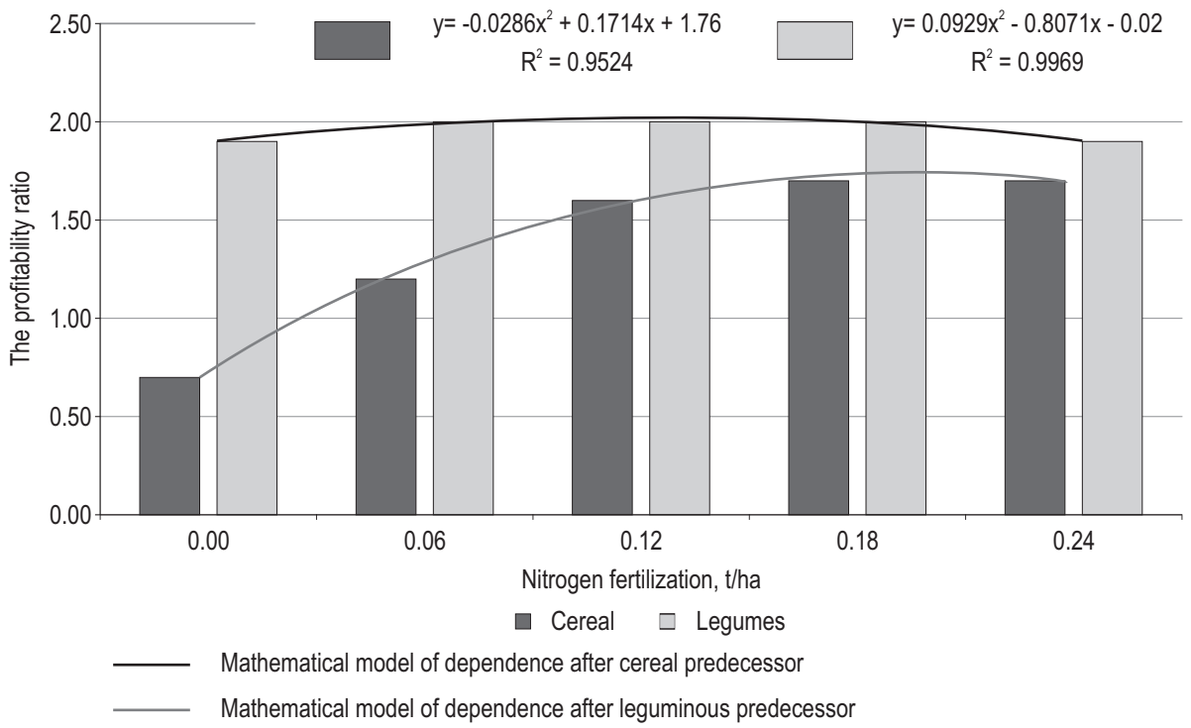

Figure 3. Profitability of production after various predecessors

introduction of bean predecessor in crop rotation increases by an average of 42%. Maximum values remain at levels of fertilization 0.06, 0.12 and 0.18 t/ha N, which indicates that the profitability in this case is determined by the level of fertilization (Figure 3). This result is supported also by variational analysis, according to which the overall variation of production profitability after cereal predecessor of variety and nitrogen fertilizer rate predecessor is high (R = 32), and after legumes predecessor – slight (R = 9). The difference between the two variants is statistically significant at P = 0.1% (Table 3). The comparison of regression analyses also shows case independence of profitability of production from energy and refundable efficiency of nitrogen fertilization, irrespective of the predecessor. After cereal predecessor higher regression coefficient was observed with an increase in nitrogen fertilizer 0.001 t/ha profitability of production increased by 0.8 step, and maximum values of the coefficient of profitability reported at the highest fertilization rates 0.18 ÷ 0.24 t/ha active substance. Variation in the profitability of production in fertilization rates of the variety and the predecessor is higher in the control sample without fertilization (R = 55) and low by fertilizer rate 0,06 t/ha fertilizer nitrogen (R = 32), average power is at 0.12 t/ha fertilizer nitrogen (R = 18) and 18 kg/da nitrogen fertilizer (R = 15) and low at 0.24 t/ha nitrogen fertilizer (R = 14). The following positive statistical differences of variants of the control without fertilization are established: about 0.12 t/ha fertilizer nitrogen at P = 1%, about 0.18 t/ha fertilizer nitrogen at R = 0.1% and about 0.24 t/ha fertilizer nitrogen in P = 0.1% (Table 4).

Table 4. Variance analysis by fertilizer rates, variation in the production profitability

Fertilizer rates, t/ha	M	S	R	Sm%
0.0 st.	1.2*	0.6	55	14
0.06	1.5	0.5	31	8
0.12	1.7++	0.3	18	5
0.18	1.8+++	0.3	15	4
0.24	1.8++	0.2	13	3

Conclusion

Energy efficiency and refundable efficiency of nitrogen fertilization were on average five times higher after cereal than after legumes predecessor, and decreased with increasing the fertilizer rate, the decrease was statistically significant only for the first

parameter. Profitability ratio of production after the introduction of legumes predecessor in crop rotation increases by average of 42% and retains maximum values at fertilization rates 0.06, 0.12 and 0.18 t/ha nitrogen. Profitability of wheat production by using pre-bean crop is not determined by the parameters of nitrogen fertilizer rate, energy and refundable efficiency of nitrogen fertilization.

References

Agricultural Report, 2010. Annual report on the status and development of agriculture, MAF (Bg).

Agrostatistics, MAF, 2010. http:// www.mzh.government.bg/ MZH/bg/ShortLinks/SelskaPolitika/Agrostatistics/Farm_accounting_information.aspx (Bg).

Azarpour E, 2012. Determination of energy balance and energy indices in wheat production under watered farming in North of Iran. Journal of Agricultural and Biological Science, 7, 250-255.

Balaur NS and Tetju AV, 1983. Application of energy analysis to assess the effectiveness of technologies of cultivation of field crops. Express - Mold Information. NIIT, UDC 631, 15 (Ru).

De Stefanis E, Sgrulletta D, Pucciarmati S and Codianni P, 2012. Effect of Cultivar and Nitrogen Fertilizer on agronomic and quality traits of durum wheat under organic management. Cereal Research Communications, 40, 423-435.

Ghahderijani M, Hassan S, Komleh P, Keyhani A and Sefeedpari P, 2013. Energy analysis and life cycle assessment of wheat production in Iran,.African Journal of Agricultural Research, 8, 1929-1939.

Hristov I, Davidkov E, Georgiev D, Angelova V, Petrov P and Tsvetanova G, 2010. Yield of dry mass and energy productivity of crops in five field rotation depending on fertilization. 20th Anniversary International Scientific Conference, 3-4.06.2010, Stara Zagora, t.I. Agricultural Science, Plant studies, 154-159 (Bg).

Ivanov V, 2010. http://www.investor.bg/ikonomika-i-politika/332/a/ (Bg).

Kadrev TG, 1984. Energy analysis - a major factor in assessing the effectiveness of the technology in plant breeding. Plant Physiology, 4, 56-61 (Bg).

Kirchev H, 2005. Research on biological and economic characteristics of new triticale varieties depending on agroecological conditions and nitrogen fertilization. Thesis for DSc (Bg).

Kostadinova S and Panayotova G, 2002. Energetical Efficiency of Durum Wheat Fertilization. Bulgarian Journal of Agricultural Science, 8, 555-560.

Kostadinova S and Panayotova G, 2013. Energy efficiency of fertilizing systems at durum wheat. 15th DKMT Euroregion Conference on Environment and Health with satellite event LACREMED "Sustainable agricultural production: restoration of agricultural soil quality by remediation". University of Novi Sad, Faculty of Technology, Novi Sad, Serbia, 16-17 May 2013, 123-129.

Koteva V, 2002. Influence of mineral fertilization on energy nutrition of winter wheat, Jubilee Scientific Session "Breeding and farming practices of field crops", 01.06.2001, Dobrich, II, 689-695 (Bg).

Lyubenova A, 2012. Analysis of the financial status of agricultural firms in Bulgaria. Scientific University of Rousse, 51 series 5.1., 165-168 (Bg).

Meyer-Aurich A, Ziegler T, Jubaer H, Scholz L and Dalgaard T, 2012. Implications of energy efficiency measures in wheat production, Journal Energy, biomass and biological residues. International Conference of Agricultural Engineering - CIGR-AgEng 2012: Agriculture and Engineering for a Healthier Life, Valencia, Spain, 8-12 July 2012pp. C-0700 http://www.cirg.ageng2012.org/images/fotosg/tabla_137_C0700.pdf

Mineev V, 2006. Agrochemistry, Moskovsky University, Moscow, 477-482 (Ru).

Naydenov J and Zaharinov B, 2012. 724 ESCB Pollution of soils and impacts on ecosystems, http://ebox.nbu.bg/pol12(Bg).

Rahimizadeh M, Kashani A, Zare-Feizabadi A, Koocheki AR and Nassiri-Mahallati M, 2010. Nitrogen use efficiency of wheat as affected by preceding crop, application rate of nitrogen and crop residues. Australian Journal of Crop Science, 4, 363-368.

Shahan S, Jafari A, Mobli H, Rafiee S and Karimi M, 2008. Energy use and economical analysis of wheat production in Iran: A case study from Ardabil province. Journal of Agricultural Technology, 4, 77-88.

Shamabadi Z, 2012, Evaluation the effect of reduced tillage on irrigated wheat yield and energy Efficiency. International Journal of Agriculture and Crop Sciences, 4, 1508-1511.

Stankov I, 2012. State of the autumn crops and upcoming care for them. Agriculture Plus, 26-28.

Todorov N, 1990. I. Assessment of feed. Agricultural Science, 1, 47-58 (Bg).

Tonev T, 1997. Gross energy productivity of different types of grain crop rotations in Dobrudzha. Plant Sciences, 3-4, 58-63 (Bg).

Uzunova-Kostova V, 2013. Management of the investment process in agriculture. Thesis for PhD, Autoreference (Bg).

Vasileva E and Uhr ZI, 2012. the efficiency of fertilization of wheat (Tr. Aestivum) in case of some items in agrotechnics: I.. Grain yield, Scientific Works of the Union of Scientists, Series B Equipment and Technologies, Plovdiv, IX, 301-310 (Bg).

Vasileva E and Uhr ZI, 2013. The effectiveness of wheat breeding compared to modern requirements for sustainable development of agriculture. I. Energy productivity of crops, new knowledge (in press) (Bg).

Vasilev V, 2009. http://www.investor.bg/imenata-na-biznesa/114/a/ (Bg).

Ziaei SM, Mazloumzadah SM and M Jabbary, 2013. A comparison of energy use and productivity of wheat and barley (case study). Journal of the Saudi Society of Agricultural Sciences, www.ksu.edu.sa - acc. 21 April 2013.

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 1
March 2016

Journal web site:
www.agriscitech.eu

Publisher:
www.alfamarket.biz