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Knowledge FOR Resilient soCiEty

SCL METHODOLOGY IN PROFESSIONAL MASTER PROGRAMME PROTECTION ENGINEERING

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Sad*

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As part of **WP 3 Improve teaching methodologies and embed the ICT in learning material**, WBC staff have been trained in teaching methodology on the K-FORCE project, through a combination of study visits to EU partner institutions, workshops held and literature provided on the project website.

In the VTSNS, the process was particularly intensified in 2017 with the accent on blended learning intending to prepare grounds for the launch of the ICT platform in the following school year. Then, in the beginning of the summer semester of 2018/2019 school year, with the aim to enhance student-centred learning in the form of problem-based learning, VTSNS professors teaching courses in the professional master programme Protection Engineering were asked to consider the possibility of applying the two methods in their teaching activities.





Course selected

The idea was to select one or two courses and implement the SCL method to see the student reaction to this teaching approach. The teacher most willing to enrich his teaching methodology in this way was Prof. Sasa Spaic, assistant director for teaching in the VTSNS.

*He was introduced to SCL and PBL during his visit to Danish partners DTU and ALU in 2017. His course **Investigation of causes, phases and consequences of fire**, is also very suitable for this kind of experimentation.*





SCL methodology applied

- *Students grouped in four-person teams.*
- *Topics for project assignments were suggested by the teams.*
- *Teacher acted as a mentor and provided literature, theoretical grounds and consulting, but most of the work was done by the students themselves .*
- *Team tasks were evenly distributed among team members.*
- *A member not contributing to the realisation of the assignment could have been excluded, but it did not happen, as they all did their share of work.*
- *Each team had six weeks to prepare a paper and a presentation for discussion with other teams and their teacher.*
- *The assignment was assessed and all team members got the same grade.*



Topics addressed

- *Landfill fires*
- *Grain crop stubble fires*
- *Fires of agricultural and construction machinery*
- *Total number of fires and silo fires*
- *Road vehicle fires*



Each of the topics was discussed and developed within one project, so there were five projects altogether, and they all included recent data referring to the South Backa District of the Autonomous Province of Vojvodina, where the VTSNS is situated. The area of the District is approximately 4,000 km², and there are more than 600,000 inhabitants.





Tasks accomplished

To explore the selected topic, student teams had to do the following:

- *Gather, select and study available literature resources in paper and e-form;*
- *Collect required data;*
- *Data analysis;*
- *Define and discuss the causes of fires;*
- *Determine phases of fires and their characteristics;*
- *Discuss consequences of fires; and*
- *Propose fire safety improvement.*





Outcomes achieved

To prepare the **formal project outcomes** (paper, PowerPoint presentation and viva defence), it was necessary to acquire, apply and demonstrate certain skills, abilities, knowledge and values, which make **student centred learning outcomes** enabling team members to jointly deliver projects. They comprise:

- *Mastering academic content;*
- *Ability to recognize the valid and reliable source of information;*
- *Data collection;*
 - *The above are based on math, information, media, and technology skills;*
- *Analytic and systematic assessment;*
- *Collaborative working, which requires:*
 - *Communication skills;*
 - *Responsible decision-making; and*
 - *Project management.*



Paper presentations



The image shows the cover of a brochure for a Professional Master Programme in Protection Engineering. The cover is light green with a white border. At the top left is the logo of the Higher Education Technical School of Professional Studies, Novi Sad. At the top right is the text 'Co-funded by the Erasmus+ Programme of the European Union' next to the European Union flag. In the center is a circular logo with 'K-FORCE' inside. Below the logo, the text reads: 'Professional Master Programme PROTECTION ENGINEERING', 'Course: Investigation of causes, phases and consequences of fire', 'Strukovni master program INŽENJERSTVO ZAŠTITE', and 'Predmet: Istraživanje uzroka, faza i posledica požara'. At the bottom, it says 'VISOKA TEHNIČKA ŠKOLA STRUKOVNIH STUDIJA U NOVOM SADU'. A small disclaimer at the very bottom states: 'The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.'

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K-FORCE

**Professional Master Programme
PROTECTION ENGINEERING**

Course: Investigation of causes, phases and consequences of fire

**Strukovni master program
INŽENJERSTVO ZAŠTITE**

Predmet: Istraživanje uzroka, faza i posledica požara

**VISOKA TEHNIČKA ŠKOLA STRUKOVNIH STUDIJA U
NOVOM SADU**

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Five papers on topics on fire safety were produced during March 2019.

The presentation of student achievements was organised on April 14, 2019.

The defense of papers in front of the entire group was dynamic and all team members participated.



Master students and their teacher before the presentation of papers



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Landfill fires in South Backa District in 2014-2018

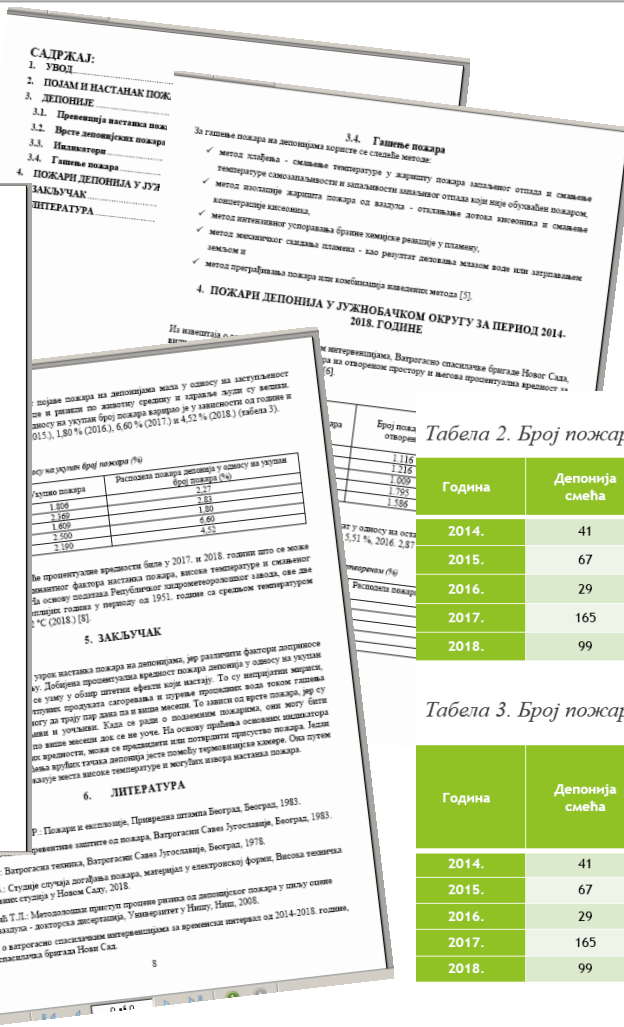
ВИСОКА ТЕХНИЧКА ШКОЛА СТРУКОВНИХ СТУДИЈА У НОВОМ САДУ
ОДСЕК: ЗАШТИТА
МАСТЕР СТУДИЈСКИ ПРОГРАМ: ИНЖЕЊЕРСТВО ЗАШТИТЕ
ПРЕДМЕТ: ИСТРАЖИВАЊЕ УЗРОКА, ФАЗА И ПОСЛЕДИЦА ПОЖАРА

ПОЖАРИ ДЕПОНИЈА НА ТЕРИТОРИЈИ ЈУЖНОБАЧКОГ ОКРУГА ЗА ПЕРИОД ОД 2014-2018. ГОДИНЕ

Студенти:
Адељсја Николић, МБЗ 59/18
Дражана Драча, МБЗ 57/18
Дражана Пасковић, МБЗ 33/18
Карилина Палан, МБЗ 66/18

Професор:
др Саша Спахић

Нови Сад, април 2019.



Табела 2. Број пожара депонија у односу на пожаре на отвореном (%)

Година	Депонија смећа	Укупно пожара на отвореном	Расподела пожара депонија у односу на пожаре на отвореном (%)
2014.	41	1.116	3,67
2015.	67	1.147	5,84
2016.	29	978	2,97
2017.	165	1.739	9,49
2018.	99	1.555	6,37

Табела 3. Број пожара депонија у односу на укупан број пожара (%)

Година	Депонија смећа	Укупно пожара	Расподела пожара депонија у односу на укупан број пожара (%)
2014.	41	1.806	2,27
2015.	67	2.369	2,83
2016.	29	1.609	1,80
2017.	165	2.500	6,60
2018.	99	2.190	4,52



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Monitoring of grain crop stubble fires in South Backa District in 2014-2018



5. ПОСТУПАК У СЛУЧАЈУ ПОЖАРА И ТАКТИКА ГАШЕЊА ПОЖАРА

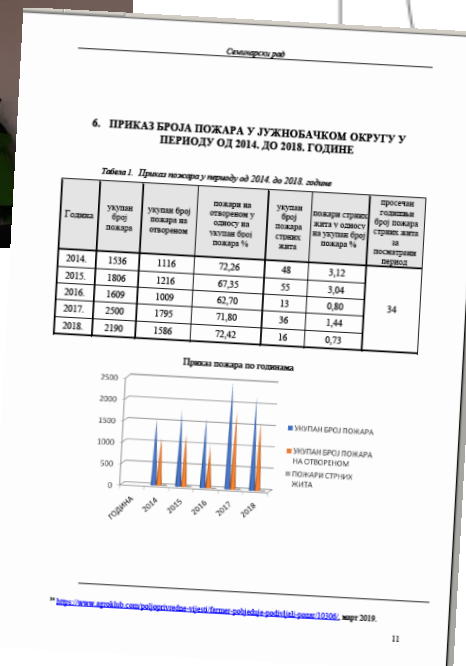
У случају да дође до пожара исти се објављује гласом:
„ПОЖАР – ГОРИ ЖИТО“ или „ПОЖАР – ГОРИ КОМБАЈН“



Слика 9. Жито у пламену⁸



Слика 10. Комбајн у пламену⁹



ВИСОКА ТЕХНИЧКА ШКОЛА СТРУКОВНИХ СТУДИЈА У НОВОМ САДУ
 ОДСЕК ЗАШТИТА
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МОНИТОРИНГ ПОЖАРА СТРИХ
 ТЕРИТОРИЈИ ЈУЖНОБАЧКОГ ОКР
 ПЕРИОДУ ОД 2014. ДО 2018. ГОД

Семпларски рад

Студенти:
 Бранимир Оскарди, МБЕЗ 37/18
 Карамелић Милошвар, МБЕЗ 52/1
 Наташа Ђоковић, МБЕЗ 44/18
 Срђан Николић, МБЕЗ 38/18

Нови Сад, април 2019.



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Fires of agricultural and construction machinery in South Backa District in 2014-2018

ЗАКОНСКА РЕГУЛАТИВА

- Правилник о подели моторних и прикључних возила и техничким условима за возила у саобраћају на путевима ("Сл. гласник РС бр.40/12,102/12,19/13 и 41/13")
- Правилник о техничким нормативима за безбедност од пожара и експлозија постројења и објеката за запаљиве и гориве течности и о ускладиштавању и претакању запаљивих и горивих течности (Сл. бр.114/2017)

ВИСОКА ТЕХНИЧКА ШКОЛА СТРУКОВНИХ СТУДИЈА У НОВОМ САДУ
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ПОЖАРИ НА ПОЉОПРИВРЕДНИМ И ГРАЂЕВИНСКИМ МАШИНАМА
У ЈУЖНОБАЧКОМ УПРАВНОМ ОКРУГУ ЗА ПЕРИОД 2014.-2018.
ГОДИНА

Никола ЈОВАНОВ¹, Петар ЈОВАНОВ², Силва МИЛКУШЕВИЋ³, Жељко КАРАПАЊИЋ⁴

Резиме: У првом делу рада обрађени су појмови пожара пољопривредних и грађевинских машина у укупном и ширем смислу, као и њихове заједничке карактеристике пожара. У раду је приказана и законска регулатива које уређује област код горена пољопривредних и грађевинских машина. Затим су приказане превентивне мере заштите од пожара наведених машина, као и узроци и спољашње манифестације пожара пољопривредних и грађевинских машина. У практичном делу рада приказани су подаци о пожарима на наведеним машинама за период 2014-2018. године, који су специфичним интервенцијама на пожар израчунати су удео сваког пожара у спашивачким јединицама, обрађено њихов

Кључне речи: пожари пољопривредних управних окуп

1. УВОД

Пожар јесте неконтролисано горење животе, природу и изживља материје управљиво у заштити од пожара и регулатива која ће кроз вођење д технолошких мера смањити на најмањој последице уколико настане пожар и њ свету врше се велика уплагања у безбед радним средствима, где наравно спада

Један од последњих пожара који је асфалта у Враној десно се 02.05.20¹ машина је радити у току целог дана на узрока приликом вештачења узели с стране непоштатни интервалца. Штета

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³Сав. струк. акад. др. студиј друге гашење мисте струковне школе у Новом Саду, е-маил: sava@ptf.nis.edu.rs

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ВИСОКА ТЕХНИЧКА ШКОЛА СТРУКОВНИХ СТУДИЈА У НОВОМ САДУ
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Слика 3. Гашење пожара на запаљеном возилу¹



Код горена пољопривредних машина, први задатак јесте, уколико возило поседује заштитни перест, да се прелине воза и удаљи запаљиви материјал од упалишне машине. На овај начин се спречава даље ширење пожара на околину. Код напоменутог је веома битна правремена реакција возача или ватрогасно-спасивачке јединице, јер постоји и шанса да се превали нешта.²

5. ПОЖАРИ НА ПОЉО МАШИНАМА У ЈУЖНОБАЧКОМ 2014-2018. ГОДИНЕ

Седиште наведеног округа је у Палимак Бачки Петровци, Сремски Врбас, Жабаљ и Србобран. У то проценат интервенција на гашењу машинама.³

Разлози код учесталијих пожара на пољопривредним машинама управно грађевинских радова, поготово губ

Разлози за учесталије пожаре на летњих месеци често самозапалење се машине паркирају управно у об

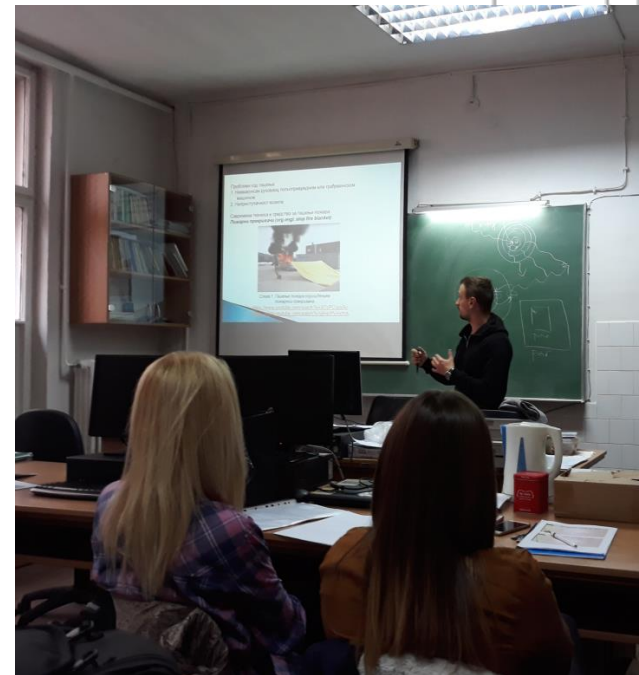
¹http://www.dobro.com/medijeni/ptf-nis-na-izvoznim-vozilima-izgorelo-2018-05-02-45282M.архивирано: Април 2019.

²Бодино Т., Потовац В.: Преглед управно вештачења и процене Новом Саду.

³Извештај о ватрогасно спасивачким интервенцијама.

Анализа броја пожара у Јужнобачком округу

Анализирана година	Пожари на пољопривредним машинама	Пожари на грађевинским машинама	Укупно	Којих је било учесталије
2014 година	8	0	8	на пољопривредним машинама
2015 година	12	5	17	на пољопривредним машинама
2016 година	3	1	4	на пољопривредним машинама
2017 година	10	1	11	на пољопривредним машинама
2018 година	10	5	15	на пољопривредним машинама



Road vehicle fires in South Backa District in 2014-2018

ПРИМЕР ПОЖАРА НА ВОЗИЛУ КОЈЕ ЈЕ БИЛО ПАРКИРАНО

Последица пожара на аутобусу је потпуно уништење овог возила. Возило је било паркирано у кругу предузећа. Претходни дан је било у редовној експлоатацији у саобраћају без икаквих уочених недостатака. Прегледом места настанка пожара, утврђено је да је пожар био јаког интензитета и да је захватио крошње дрвећа које су биле удаљене од возила око 10 m, а пламен се развијао у висини преко 9 m.



На земљи која се налазила испод аутобуса, уочени су трагови гаражи различитог интензитета као и расутог стакла, а највећи интензитет је уочен испод задњег десног дела. Са ових места узети су узорци гаражи и земље ради испитивања, и искључивања узрока пожара. У узорцима гаражи су уочени следећи елементи:

наивно већа температура. На овим местима треба објектно пламену на енергетске трговке топлина, проклаувања улаз на пожење [2].

3.4 Пример из праксе - пожар на возилу које је било у покрету

По путевима долази до пожара на возилу је око 2000 до 2500 X и саопштеним возилама. Пожарна глава мотора је измакла изван возила (максимално из општег возила). Возило је изгубило возило и дошло до максимално турбулентног возила. Возило је изгубило возило и дошло до максимално турбулентног возила. Возило је изгубило возило и дошло до максимално турбулентног возила.

Након извршене расчлаве, испитивања стана возила, утврђено је да је први узрок пожара измакла глава мотора. Ибо након стана возила, утврђено је да је први узрок пожара измакла глава мотора. Ибо након стана возила, утврђено је да је први узрок пожара измакла глава мотора.



Слика 2. Пожар на возилу које је било у покрету [2]

3.5 Пример из праксе - пожар на возилу које је било паркирано

На аутобусу који је био паркиран избио је до пожара око 01:30 часова после поноћи. Пожарна глава мотора је измакла изван возила. Возило је изгубило возило и дошло до максимално турбулентног возила. Возило је изгубило возило и дошло до максимално турбулентног возила.



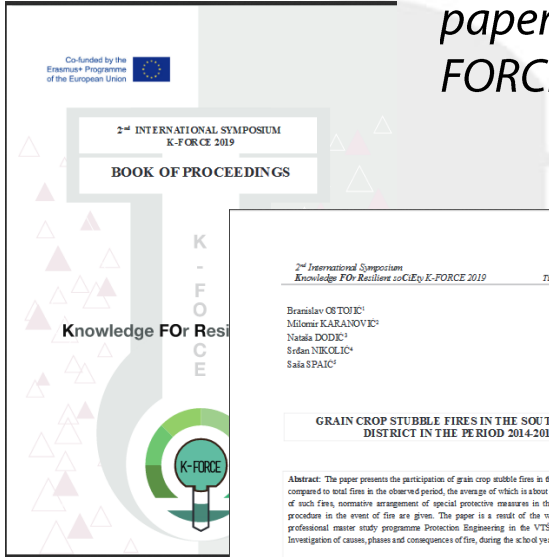
ПОЖАРИ НА ДРУМСКИМ САОБРАЋАЈНИМ ВОЗИЛИМА У ЈУЖНОБАЧКОМ ОКРУГУ ЗА ПЕРИОД 2014-2018. ГОДИНЕ

Година	Број интервенција ВСБ	Број пожара	Процент	Интервенције на саобраћајним средствима	Интервенције на друмским саобраћајним средствима	Процент
2014.	2 211	1 536	69,47%	181	174	96,13%
2015.	2 369	1 806	76,23%	249	228	91,57%
2016.	2 060	1 609	78,11%	224	214	95,54%
2017.	3 007	2 500	83,14%	272	236	86,76%
2018.	2 762	2 190	79,23%	226	211	93,36%
Укупно	12 409	9 641	77,69%	1 152	1 063	92,27%



Student papers at the 2nd K-FORCE Symposium

As a result of the applied SCL methodology two group student papers were selected and presented at the poster section of the 2nd K-FORCE Symposium in Tirana, in September 2019.



2nd International Symposium
Knowledge FOR Resilience coCIEy K-FORCE 2019
Tirana, September 9, 2019

2nd INTERNATIONAL SYMPOSIUM
K-FORCE 2019
BOOK OF PROCEEDINGS

Knowledge FOR Resilience

K
-
F
O
R
C
E

Branislav OS TOJIC¹
Milosav KARANOVIC²
Nana DODIC³
Srdan NIKOLIC⁴
Sasa SPAIC⁵

GRAIN CROP STUBBLE FIRES IN THE SOUTH BAČKA DISTRICT IN THE PERIOD 2014-2020

Abstract: The paper presents the participation of grain crop stubble fires in the compared to total fires in the observed period, the average of which is about 2% of such fires, normative arrangement of special protective measures in its procedure in the event of fire are given. The paper is a result of the work of students in the professional master study programme Protection Engineering in the VTSNS. Investigation of causes, phases and consequences of fires, during the school year

Key words: grain crop stubble fire, South Bačka District

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145



2nd International Symposium
Knowledge FOR Resilience coCIEy K-FORCE 2019

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Božana MAJKIC³
Branislav PANJAK⁴
Sasa SPAIC⁵

NUMBER OF TOTAL FIRES AND SILO FIRE S IN BAČKA DISTRICT IN THE PERIOD 2011-2019

Abstract: The paper presents total number of fires, caused deliberately, negligence, natural phenomenon and unknown cause, as well as silo fires in compared to total fires. The causes of fire in grain silos and measures to prevent them. The percentage of silo fires in the total number of fires is small, but a proportion of fires of unexplained cause have been observed in relation to which is a worrisome finding. The paper is a result of the work of students in the professional master study programme Protection Engineering in the VTSNS, within the course phases and consequences of fire, during the school year 2018/2019.

Key words: total fires, silo fires, South Bačka District

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152

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GRAIN CROP STUBBLE FIRES IN THE SOUTH BAČKA DISTRICT IN THE PERIOD 2014-2018

INTRODUCTION

The paper presents the participation of grain crop stubble fires in the South Bačka District, compared to total fires in the observed period, the average of which is about 2%. The characteristics of such fires, normative arrangement of special protective measures in this area, as well as the procedure in the event of fire are given. The paper is a result of the work of students in the professional master study programme Protection Engineering in the VTSNS, within the course investigation of causes, phases and consequences of fires, during the school year 2018/2019.

CORE IDEA OF THE RESEARCH

FIRES IN THE SOUTH BAČKA DISTRICT IN THE PERIOD FROM 2014 TO 2018

Table 1 - Number of fires in the period from 2014 to 2018

Year	Total number of fires	Total number of fires in the observed period (%)	Share of fires in the observed period in total number of fires (%)	Total number of grain crop stubble fires	Share of grain crop stubble fires in total number of fires (%)	Average annual number of grain crop stubble fires in the observed period
2014	1756	1116	72,65	48	5,13	
2015	1860	1256	67,53	55	3,05	
2016	1689	1009	62,71	13	0,81	141,76
2017	2560	1765	71,80	56	1,44	
2018	2190	1580	72,42	16	0,73	

In the area of the South Bačka District, outdoor fires represent the dominant type of fire, with a percentage share of 49-76%. The share of grain crop stubble fires in the total number of fires for the observed period ranges between 0-4%, on an average of about 2%. The largest number of grain crop stubble fires (29) was recorded in 2015, with some fires and average fire (2), while the largest number of fires in open areas (1795) and the total number of fires (2200) was recorded in 2017, which was warm and dry (D) in the territory of the Republic of Serbia, 2018 was the hottest year in the period from 1951 to the present one, which is most parts of Serbia in 2018 there was average normal (N), which to some extent correlates with the number of fires in open spaces (126) and with the total number of fires (2190), but with the number of grain crop stubble fires (16). Namely, in addition to weather conditions, other factors such as the number of grain crop stubble fire, the fire under these crops, the application of fire protection measures, the use of modern agriculture machinery with built-in fire protection mechanisms.

The analysis of the grain crop stubble fires on the territory of the South Bačka Administrative District was performed. Precautionary measures for fire protection during grain crop stubble harvest, as well as fire fighting tactics are listed. The causes of the grain crop stubble fire are presented.

The overall number of fires is mostly influenced by the level of implementation of preventive fire protection measures established by legal acts and by laws in the field of fire protection. The most common cause of grain crop stubble fires is the failure of agricultural machinery involved in harvesting.

In the period from 1989 until now, the number of grain crop stubble fires that have occurred has been relatively small, with a tendency of continuous decline. Reduction in the number of grain crop stubble fires has been contributed by the measures now granted with grain crop stubble (which is a longer strategic agricultural product, as well as the purchase of new agricultural machinery of foreign production, which mainly has built-in fire protection measures, starting with open area and in the actual fire to necessarily built-in - instead the extinguishers. The unnecessary negligence in reducing the number of fires and the damage caused by grain crop stubble fire has the work of expert committees for inspection of agricultural machinery that through direct fire inspection draw attention to the users to irregularities in equipment from the aspect of fire protection, in addition to pointing out irregularities, the committee provides instructions for resolving them. An important aspect of the work of the committee is the training of practitioners in the harvest, which is carried out during the inspection of mechanization.

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NUMBER OF TOTAL FIRES AND SILO FIRES IN THE SOUTH BAČKA DISTRICT IN THE PERIOD 2014-2018

INTRODUCTION

The paper presents total number of fires, caused deliberately, and by negligence, natural phenomenon and unknown cause, as well as silo fires in the South Bačka District, compared to total fires. The causes of fire in grain silos and measures to prevent the silo from fire are given. The percentage of silo fires in the total number of fires is small, less than 1%, however, a high proportion of fires of unexplained cause have been observed in relation to the total number of fires, which is a worrisome finding. The paper is a result of the work of students in the professional master study programme Protection Engineering in the VTSNS, within the course investigation of causes, phases and consequences of fire, during the school year 2018/2019.

CORE IDEA OF THE RESEARCH

TOTAL NUMBER OF FIRES AND FIRES IN SILOS IN THE SOUTH BAČKA DISTRICT FOR THE PERIOD 2014 - 2018

For more detailed fire fighting it is necessary to determine their causes. Observing the cause of the fire helps knowledge of its emergence, to know where to focus. Answers to these questions are provided for the analysis, and on the basis of statistical data on the causes of fire, expert preparation is carried out in order to take the necessary preventive measures.

On the basis of the records on the fighting measures for the period 2014-2018, in the territory of the South Bačka Administrative District, data for total fires and fires in silos were given. Table 1 - The total number of fires for the observed fire was recorded to 2018, also there were only 107 fires of silos, indicating that the fires of silos are not as common as others. There were most fires in 2017, in an area of 2,900 fires (15) between 2017 were most and extensive, with the highest losses, it is not surprising that in 2017 there were most fires, although high atmospheric temperatures do not always have to be responsible for the occurrence of fire (12).

As far as silos are concerned, there is an increase in their significant participation in the total number of fires. The facts presented this way could indicate that the preventive measures were implemented to the maximum and that this is the result for such favourable conditions. However, if the data on the total number of silos in the territory of the South Bačka District were available, so that the participation of these silos which burning would be excluded, the numbers would probably not be negligible. It would be interesting to see the statistical situation of silo fires, bearing in mind the importance of silos in the total number of fires, which should be noted that 2018, with 16 fires of silos, was not in connection with the reference period 1981-2018, and 2018, with 16 fires of silos, was achieved only in relation to the reference period 1981-2018. While the striking increase in the total number of fires in the field of silos, it is obvious that it correlates negatively with the total number of fires that have been in the mentioned time period (11).

Year	Total number of fires	Total number of fires in the observed period (%)	Share of fires in the observed period in total number of fires (%)	Total number of grain crop stubble fires	Share of grain crop stubble fires in total number of fires (%)	Average annual number of grain crop stubble fires in the observed period
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When looking at the data on the representation of the method of causing total number of fires, Table 2, it can be noticed that the cause of most numbers of fires was determined from 1912, then they passed to negligence (49%), deliberate (26%), child negligence (13) and natural phenomenon (9). The finding that there is such a large number of fires in the area of an extensive area is worrisome. This points to the fact that not enough attention is given to the problematic, especially the prevention. The maximum application of currently available knowledge of the prevention, accompanied by adequate and effective legislation, as well as constant analysis of statistical data from the field, is the only way to improve the current bad situation in this field.

The paper presents fires and silo fires and fires in the South Bačka Administrative District for the period 2014-2018. The results for the occurrence of fires in silos have been described and detailed presented. The number of fires of silos in the observed period is negligible in relation to the total number of fires, which would give the impression that the maximum level of prevention and protection has been achieved. However, due to the fact that the data on the total number of silos and the measures to prevent them, the statistical data will be interpreted accordingly.

The paper also presents the results of the analysis of the causes of fires in grain crop stubble, which is a longer strategic agricultural product, as well as the purchase of new agricultural machinery of foreign production, which mainly has built-in fire protection measures, starting with open area and in the actual fire to necessarily built-in - instead the extinguishers. The unnecessary negligence in reducing the number of fires and the damage caused by grain crop stubble fire has the work of expert committees for inspection of agricultural machinery that through direct fire inspection draw attention to the users to irregularities in equipment from the aspect of fire protection, in addition to pointing out irregularities, the committee provides instructions for resolving them. An important aspect of the work of the committee is the training of practitioners in the harvest, which is carried out during the inspection of mechanization.

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The conclusion

The student-centred approach in learning takes more time and effort of both teachers and students than traditional teaching methods where students are more or less consumers of what is presented by the teaching staff, but the results of such an engagement are far more rewarding.

Its use in the VTSNS has been sporadic so far, but teachers should be encouraged to apply it, particularly in courses where the number of students allows it. And our master courses, with about 30 students, are ideal for the implementation of SCL in teaching.





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Thank you
for your attention

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