УНИВЕРЗИТЕТ У ПРИШТИНИ
ПОЉОПРИВРЕДНИ ФАКУЛТЕТ
www.kq.ac.yu/agrolesak
agrolesak@ptt.yu

ZBORNIK ABSTRAKATA

SIMPOZIJUM SA MEDJUNARODNIM UCEŠĆEM
UNAPREDJENJE POLJOPRIVREDNE PROIZVODNJE NA TERITORIJI KOSOVA I METOHIJE

Vrnjacka Banja, 26 -29 jun, 2006

BOOK OF ABSTRACTS

OF THE SYMPOSIUM WITH INTERNATIONAL PARTICIPATION
IMPROVEMENT OF AGRICULTURAL PRODUCTION IN KOSOVO AND METOHIA

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MEDONOSNI POTENCIJAL KOSOVA I METOHIJE ZA GAJENJE MEDONOSNE PČELE

Mića Mladenović[1], Valentina Simeonova[2]

[1]Poljoprivredni fakultet, Zemun, [2]Poljoprivredni fakultet, Lešak

Medonosna pčela se gaji radi dobijanja meda, matičnog mleča, vosla i drugih pčelnjih proiyvoda, kao i oprašivanja biljnih kultura. Za dobijanje ovih proizvoda uz primenu apitehničkih mera veliku važnost imaju meterološki uslovi. Oni ocezbedjuju prisustvo raynovrsne i obilne medonosne flore. Za uspešno gajenje medonosne pčele, kao i za uspešnu produktivnost pčelnjih društava, neophodno je pre svega poznavanje medonosnog bilja kao i glavne odlike pčelnjih paša. Klima i meterološki faktori deluju snažno na biocenozu i medjusobni saživot biljnog i životinjskog sveta.
Cilj rada je utvrdjivanje medonosnog potencijala Kosova i Metohije.
U radu su obradjeni agro'meterološki faktori i to srednje mesečne i godišnje temperature u pojedinim delovima Kosova i Metohije. Obradjen je i medonosni potencijal kao i zastupljenost medonosnih vrsta bilja glavne i uzdržne paše.
Ključne reči : medonosna pčela, medonosno bilje, Kosovo i Metohija

MELLIOFEROUS POTENTIAL OF KOSOVO AND METOHIA FOR KEEPEENG MELLIFEROUS BEE

A melliferous bee is kept with the aim of producing honey, bee milt, propolis, wax a other bee products, as well as for pollination of plant cultures. In getting these products with the application of modern agrotehnical measures, an important role is played by meteorological conditions. They provide the presence of various and abundant melliferous flora. For successfu keepeeng of Melliferous bee and successful productivity of a bee colony, it is necessary above all to be well acquainted with melliferous plants and with main characteristics of bee pasture.The climate and meterological factors influence strongly the biocenosis and mutual cohabitation of flora and fauna.
The goal of the study is to establish the melliferous potential of Kosovo and Metohija.
The study examines the agro-meteorological factors, especially average monthly and annual temperatures, as well as average monthly and annual precipitation in certain areas of Kosovo and Metohija. The study also examines the melliferous potential, as well as the presence of melliferous kinds of plants in main and restrained (stimulative) pasture.
Key words: melliferous bee, melliferous plants, Kosovo and Metohija.

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LATINSKI PRAVOUGAONIK I NJEGOVA PRIMENA U ORGANIZACIJI EKSPERIMENTA U POLJOPRIVREDI

D. M. Ranđelović, M.D. Ranđelović
Poljoprivredni fakultet Priština u Lešku

Uslovi egzistencije kombinatorne konfiguracije blok-šeme su u teorijskoj osnovi određivanja mogućnosti organizacije nekog eksperimenta u mnogim naučnim disciplinama pa i u poljoprivredi.
Blok-šemom $B(v,r_1,\ldots r_v,b,k_1,\ldots,k_b,\lambda_{12},\ldots, \lambda_{v-1,v})$ kao jednom vrstom kombinatorne konfiguracije se može prezentovati organizacija eksperimenta u kojem učestvuje konačan broj v elemenata nekog osnovnog skupa, koje treba organizovati u b blok- šema od određenog broja k_b elemenata iz osnovnog skupa pri čemu se svaki od tih elemenata osnovnog skupa pojavljuje u r_v blok-šema i svaki par različitih elemenata iz osnovnog skupa se javlja u $\lambda_{v-1,v}$ blok-šema.
Značajnu primenu u organizaciji eksperimenta imaju specijalne uže klase takozvanih uravnoteženih nepotpunih blok-šema-BIBDs (npr. sistema Štajnera, simetrične itd.) a među njima posebno mesto zauzima latinski pravougaonik tj. kvadrat.
U ovom radu su razmatrani su uslovi prezentacije i egzistencije latinskog pravougaonika i kvadrata kao i primer njihove primene u organizaciji ogleda u poljoprivredi.

LATIN RECTANGLE AND ITS APPLICATION IN THE AGRICULTURAL EXPERIMENT ORGANIZATION

Presentation, construction and conditions of existence one combinatorial configuration–design is in the base of determining the possibility some experiment organization in many science discipline and also in agriculture. With the design $B(v,r_1,\ldots,r_v,b,k_1,\ldots,k_b,\lambda_{\{12\}},\ldots,\lambda_{\{v-1,v\}})$,like one combinatorial configuration, can be presented organization one's experiment in which participate finite number v elements some basic sets, which should organise in the b designs from defined number k_b elements from this basic sets, but so that every of this elements are exactly inr r_v designs and every pair of this different elements is in $\lambda_{\{v-1,v\}}$ designs.
Important application in agricultural experiment organization have the special "narrower" classes of designs so-called balanced incomplete block designs – BIBDs (Steiner systems, symmetrical block desihns,...) and between they a special place haves the Latin rectangle i.e. square.
In this paper are considered the conditions of presentation and existence Latin rectangle and square and one example of their application in agricultural experiment organizat

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D. M. Ranđelović, M.D. Ranđelović

Agricultural faculty Priština in Lešak

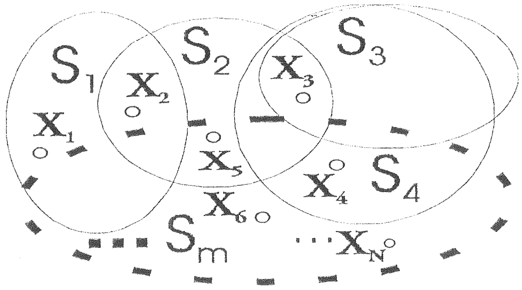
ABSTRACT

Abstract: Presentation, construction and conditions of existence one combinatorial configuration–design is in the base of determining the possibility some experiment organization in many science discipline and also in agriculture. With the design $B(v,r_{\_1},\ldots,r_{\_v},b,k_{\_1},\ldots,k_{\_b},\lambda_{\{12\}},\ldots,\lambda_{\{v-1,v\}})$,like one combinatorial configuration, can be presented organization one's experiment in which participate finite number v elements some basic sets, which should organise in the b designs from defined number $k_{\_b}$ elements from this basic sets, but so that every of this elements are exactly in$r_{_v}$ designs and every pair of this different elements is in $\lambda_{\{v-1,v\}}$ designs.Important application in agricultural experiment organization have the special "narrower" classes of designs so-called balanced incomplete block designs – BIBDs (Steiner systems, symmetrical,...) and between they a special place haves the Latin rectangle i.e. square.In this paper are considered the conditions of presentation and existence Latin rectangle and square and one example of their application in agricultural experiment organization.

Key Words: BIBDs, Latin rectangle and square

1. Introduction

Definition 1.1 Suppose that M is determinate or infinite set. Every set of subsets, which consist elements of set M, is called configuration over the set M, it is marked with J and it is represented in form $=\{ S_1,S_2,\ldots,S_m\}$(every subset S_1 contains random number of elements). Configuration can be graphically represented so that we assign a points of plane to the elements of the set $M = \{x_1, x_2,\ldots, x_n\}$ and every point, which belongs to set S_1, can be circled with a curve line like on picture 1.



Picture 1.

The configuration can be given with a graph where the points of plane (like elements of set M) are connected with appropriate circle in planes that represent subsets S_i.

Because of elaborated matrix-calculation the configuration is represented by so called: incident matrix. Suppose that $J=\{S_1, S_2, \ldots, S_m\}$ is configuration over set $M=\{x_1, x_2, \ldots, x_n\}$. For element x_j, $j=1,2,\ldots,n$, we say that he is in incident with subset S_i $i=1,2,\ldots,m$, if $x_j \in S_i$. Rectangular (0,1)-matrix $A=\{a_{ij}\}$, in form [m x n], which elements are defined with

$$a_{ij} = \begin{cases} 1 & \text{if } x_j \in S_i \\ 0 & \text{if } x_j \notin S_i \end{cases} \quad \forall i=1,2,\ldots,m \wedge \forall j=1,2,\ldots,n$$

It is called incident matrix of configuration J over set M.

Because the configuration over set is given by subsets and element's in those subsets are not organized and form of subsets in the configuration is not important, so we can say that different notices of elements as in basic set as and subsets in configuration are possible.

It leads us to the conclusion that one configuration can be corresponded by more incident matrix. The question is: in which form we should give the configuration, and the answer is very clear, we should change the configuration so that we get trivial form of incident matrix.

Definition 1.2 By block-schema we allude any configuration $B=\{B_1, B_2, \ldots, B_b\}$ over determinate set $V=\{a_1, a_2, \ldots, a_v\}$, where b i v are natural numbers. Block-schema can be defined like orderly pair (V,B) where $V=\{a_1, a_2, \ldots, a_v\}$, determinate set of elements, and $B=\{B_1, B_2, \ldots, B_b\}$ set of subsets of different elements from V, or we can say set of block.

(we allude that $B_i \neq B_j$ for $i \neq j$).

Let we have block-schema (V,B). For element a_j, $a_j \in V$ $j=1,2,\ldots,v$ we can say that he is incident to block B_i, $B_i \in B$ $i=1,2,\ldots,b$ if $a_j \in B_i$. With k_j, $j=1,2,\ldots,b$ we will mark total number of elements a_i, $a_i \in V$ $i=1,2,\ldots,v$ which is incident to block B_{-j}.

Total number of blocks B_j, $j=1,2,\ldots,b$, incident to element a_i, $i=1,2,\ldots,v$, we will mark with r_i. With λ_{it} we will mark the total number of elements of the set $\{B_j | a_i, a_t \in B_j\}$ for every $i=1,2,\ldots,v$ and $t=1,2,\ldots,v$, $i \neq j$. Because of disorderly of the elements of the block we can say that $\lambda_{it}=\lambda_{ti}$, so it is valid to only to observe cases $i< t$. The numbers v, b, r_i, kj, λ_{it}, are called argument of given block-schema.

The use of this kind of configuration in solving the combinatory problems is very complicated. That is way will only observe balanced, uncompleted block-schemas marked with (v,r,b,k,λ) - configurations over determinate set

V, assembly V consists of v mutual different elements, configuration B is made of b blocks, every block is made of exactly $k< v$ elements from V, and every element from V appears in exactly $r<b$ blocks and every pair of different elements from V appears in exactly λ blocks.

It can be proved that if one (v,r,b,k, λ)-configuration over determinate set of elements V exists, than two arguments are in the roundly servitude of permanent three:

(1.1) $$bk = vr$$

and

(1.2) $$r(k-1) = \lambda(v-1).$$

Coditions 1.1 and 1.2 gives necessary but not enough conditions for existence of block schema's. Namely, if some of arguments v,r,b,k, λ satisfied relations 1.1. qnd 1.2, we are not sure that suitable configuration really exists: also, since the arguments are natural numbers, by emit three, sometimes it is not possible to define permanent two only by using relations 1.1 and 1.2.

The large number of testing in existence of block-schemas has been performed, thanks to the evolution of the computers, depending on some arguments that could satisfied conditions 1.1 and 1.2 it is decided :

- for large values of argument v, balanced uncompleted block schemas always exists and for small values it never does.
- for $k = 3$ and $k = 4$ theorem gives enough conditions for appropriate configuration, but not for $k = 5$.

Let we have some (v,r,b,k, λ)-configuration over determinate set of elements V and we know its incident matrix $A=\{a_{ij}\}$, which is rectangular, in form $[b \times v]$. Every hers column contains r units, and every hers rows contains k units. Scalar product of two mutual different vector-columns is equal to the number of appearance of the pair of different elements from V in configuration, namely equals λ. The scalar product of any vector-column with himself equals argument r, namely equals the number of appearance of any elements V in block schema. Those obvious attributes of incident matrix of (v,r,b,k, λ)-configuration, enable us to get necessary and enough conditions of its existents which are given with the next theorem which will be instigated without proof.

Theorem 1.1 Rectangular (o,1) matrix $A=\{a_{ij}\}$, in form $[b \times v]$ is incident matrix of some (v,r,b,k, λ)-configuration over determinate set of elements V. Then are next equality correct

(1.3) $$A^T A = (r - \lambda) I_v + \lambda J_v ,$$

and

(1.4) $$A J_{v \times 1} = k J_{b \times 1}.$$

Vice versa is also correct.
Unfortunately, for appropriation of the arguments using the theorem 1.1, it is necessary to solve suitable matrix equality and that is not possible without corresponding mathematics method which is until now not developed.
Therefore we must take interest in other criterion, if they are not to complicated, for appreciation necessary and enough conditions of existence of some block-schema and also we can caught sight of some block-schema category attribute, for which is easier to ascertain conditions of existence. The most famous one is Latin rectangle.

2. Latin rectangle

Interesting class known as Latin rectangle.
Definition 2.1 Latin rectangle is
Theorem 2.1 Necessary and enough condition for the existence ...
Remark 2.1 Condition ...

3. Results and diskusion

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Example 3.1 Inquire if organization of the experiment is possible in case of sway pesticide on 15 new sort of fruit review. The sway must be applied on 3 groups of fruit, which will consist of 3 different sorts, and every sort must be treated in the group with the other fruit.
It is visible that solution or experiment review lies in wording of balanced uncomplete block-schema with argument $v=15, r=7, b=35, k=3, \lambda=1$ i.e. {15,7,35,3,1}-configuration over assembly $V=\{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15\}$.
The blocks of system Steiner's group of three are :
B1={1,8,15},B2={2,3,5},B3={4,10,13},B4={6,9,14},B5={7,11,12}
B6={2,9,15},B7={3,4,6},B8={5,11,14},B9={7,8,10},B10={1,12,13},
B11={3,10,15},B12={4,5,7},B13={6,8,12},B14={1,9,11},B15={2,13,14},
B16={4,11,15},B17={1,5,6},B18={7,9,13},B19={2,10,12},B20={3,8,14},
B21={5,12,15},B22={2,6,7},B23={1,10,14},B24={3,11,13},B25={4,8,9},
B26={6,13,15},B27={1,3,7},B28={2,8,11},B29={4,12,14},B30={5,9,10},
B31={7,14,15},B32={1,2,4},B33={3,9,12},B34={5,8,13},B35={6,10,11}.

The solution of this configuration is possible using the following equality :
from (2.1) $bk=vr \Rightarrow b=v(v-1)/6 \Rightarrow 35=15*14/6=35$
and
from (2.2) $r(k-1)=\lambda(v-1) \Rightarrow r=(v-1)/2 \Rightarrow 7=(15-1)/2=7$.
Because and necessary end enough conditions from equality (3.1) are also fulfilled :

from (3.2) $v \equiv 3(mod6)$ => $15=3(mod6)$,
therefore the solution that represent the weekly schedule of pesticide treatment is:

β1={B1,B2,B3,B4,B5,}
β2={B1,B2,B3,B4,B5,}
β3={B1,B2,B3,B4,B5,}
β4={B1,B2,B3,B4,B5,}
β5={B1,B2,B3,B4,B5,}
β6={B1,B2,B3,B4,B5,}
β7={B1,B2,B3,B4,B5,}.

4. Conclusion
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