



University of Novi Sad - Univerzitet u Novom Sadu  
Faculty of Agriculture - Poljoprivredni fakultet



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CONTEMPORARY AGRICULTURE / SAVREMENA POLJOPRIVREDA

# CONTEMPORARY AGRICULTURE *SAVREMENA POLJOPRIVREDA*

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*Srpski časopis za poljoprivredne nauke*



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## CONTENTS / SADRŽAJ

### A. Original scientific papers / Originalni naučni radovi

#### WEED FLORA OF THE PANČEVAČKI RIT

*KOROVSKA FLORA PANČEVAČKOG RITA*

M. Lj. Nestorović ..... 1

#### TESTING OF PEPPER VARIETIES INTENDED FOR THE PRODUCTION OF AJVAR

*TESTIRANJE PAPRIKE U CILJU STVARANJA SORTI ZA SPRAVLJANJE AJVARA*

Đ. Gvozdenović ..... 12

#### INTENSITY OF BOAR SPERM UTILIZATION IN VOJVODINA AND POSSIBILITY OF ITS INCREASE

*INTENZITET ISKORIŠTAVANJE SPERME NERASTOVA U VOJVODINI I MOGUĆNOST NJEGOVOG POVEĆANJA*

B. Stančić, P. Grafenau, Jr., I. Radović, Milica Petrović, A. Božić ..... 19

#### EFFECTS OF SOW NUTRITION DURING THE FIRST STAGE OF GESTATION ON THE LITTER SIZE

*EFEKAT ISHRANE KRMAČA U PRVOJ FAZI SUPRASNOSTI NA VELIČINU LEGLA*

S. Kovčín, B. Pejin, Vidica Stanačev, B. Stančić, M. Beuković, Z. Korovljević, V. Stanačev ..... 27

#### ANATOMICAL AND HISTOLOGICAL CHARACTERISTICS IN EARLY PUERPERIUM AND ESTROUS OF SWEDISH LANDRACE AND GREAT WHITE (YORKSHIRE) CROSS-BREDS UTERUS

*ANATOMSKE I HISTOLOŠKE KARAKTERISTIKE MATERNICE SVINJA KRIŽANACA ŠVEDSKOG LANDRASA I VELIKOG JORKŠIRA U RANOM PUERPERIJU I ESTRUSU*

N. Varatanović, Amela Katica, S. Prašović, Nadžida Mlačo, T. Mutevelić, E. Hamzić, M. Kadrić ..... 33

#### VEGETATION OF THE CLASSES HYDROCHARI-LEMNETEA OBERD. 1967 AND POTAMETEA TX. ET PRSG. 1942 IN THE CANAL BAČKI PETROVAC-KARAVUKOVO

*VEGETACIJA KLASA HYDROCHARI-LEMNETEA OBERD. 1967 I POTAMETEA TX. ET PRSG. 1942 U KANALU "BAČKI PETROVAC-KARAVUKOVO"*

Dejana Džigurski, Slobodanka Stojanović, A. Knežević, Ljiljana Nikolić, Branka Ljevnaić ..... 40



<b>MOLECULAR EVOLUTION OF NEWCASTLE DISEASE VIRUS IN UKRAINE</b> <i>MOLEKULARNA EVOLUCIJA VIRUSA NEWCASTLE BOLESTI U UKRAJINI</i> <b>A. Gerilovych, A. Potkonjak</b> .....	46
<b>THE DEVELOPMENT OF FERTILE BRANCHES OF PEACH CULTIVARS DEPENDING ON THE POSITION IN THE TREE CONOPY</b> <i>RAZVIJENOST RODNIH GRANČICA BRESKVE U ZAVISNOSTI OD POLOŽAJA NA STABLU</i> <b>Nada Zavišić, Lj. Radoš</b> .....	56
<b>SOW FERTILITY AFTER CONVENTIONAL AI WITH INSEMINATION DOSES OF VARIOUS VOLUMES AND SPERMATOOZA NUMBER</b> <i>FERTILITET KRMAČA POSLE KLASIČNOG VO INSEMINACIONIM DOZAMA RAZLIČITOG VOLUMENA I BROJA SPERMATOOZIDA</i> <b>B. Stančić, I. Radović, A. Božić, M. Gagrčin</b> .....	62
<b>ECONOMIC RESULTS OF TABLE EGG PRODUCTION ON SMALL FAMILY FARMS IN SERBIA: AN ESTIMATE OF THE EFFECTS OF IMPLEMENTING THE EU REGULATIONS</b> <i>PROCENA UTICAJA PRIMENE EU REGULATIVE NA EKONOMSKE REZULTATE PROIZVODNJE KONZUMNIH JAJA NA MALIM PORODICNIM FARMAMA</i> <b>Vesna Rodić, Lidija Perić, Mirjana Đukić Stojčić</b> .....	67
<b>EFFECTS OF INCORPORATING AMELIORATIVE SUBSTANCES ON CATION EXCHANGE CAPACITY IN SOLONETZ SOIL</b> <i>UTICAJ UNOŠENJA AMELIORATIVNIH SREDSTAVA NA KAPACITET IZMENLJIVIH KATJONA SOLONJECA</i> <b>Ana Gajić, M. Belić, Maja Manojlović, Ljiljana Nešić</b> .....	73
<b>CALCIUM, PHOSPHORUS AND MAGNESIUM CONTENT IN THE BLOOD SERUM OF COWS WITH DIFFERENT MILKING ABILITY</b> <i>SADRŽAJ KALCIJUMA, FOSFORA I MAGNEZIJUMA U KRVNOM SERUMU KRAVA RAZLIČITE MLEČNOSTI</i> <b>J. Stojković</b> .....	80
<b>EFFECT OF PROBIOTIC ON PERFORMANCE OF BROILER CHICKENS</b> <i>EFEKAT PROBIOTIKA NA PERFORMANSE BROJLERSKIH PILIČA</i> <b>S. Bjedov, Mirjana Đukić Stojčić, Lidija Perić, D. Žikić, Marina Vukić Vranješ</b> .....	86

<p><b>THE EFFECT OF GENOTYPE, AGE, SEX AND COMPOSITION OF FEED ON CONTENT OF ABDOMINAL FAT IN CARCASS OF BROILER CHICKENS</b>  <i>UTICAJ GENOTIPA, STAROSTI, POLA I SASTAVA HRANE NA SADRŽAJ ABDOMINALNE MASTI U TRUPOVIMA BROJLERSKIH PILIĆA</i>  <b>Nedeljka Nikolova, Elena Eftimova, N. Pacinovski, Zlatica Pavlovski, N. Milošević, Lidija Perić</b> .....</p>	92
<p><b>EFFECT OF DIFFERENT HOUSING SYSTEMS ON THE PRODUCTIVE PERFORMANCE OF LAYING HENS</b>  <i>UTICAJ RAZLIČITIH SISTEMA DRŽANJA NA PROIZVODNE OSOBINE NOSILJA KONZUMNIH JAJA</i>  <b>Lidija Perić, N. Milošević, Mirjana Đukić Stojčić, S. Bjedov</b> .....</p>	101
<p><b>HORSERADISH ROOT YIELD DEPENDING ON ORGANIC AND MINERAL FERTILIZERES</b>  <i>PRINOS KORENA RENA U ZAVISNOSTI OD ORGANSKIH I MINERALNIH ĐUBRIVA</i>  <b>Z. Perlaki, M. Đurovka</b> .....</p>	106
<p><b>ECONOMIC ANALYSIS OF AGRICULTURAL BUDGET ASSETS OF AUTONOMOUS PROVINCE OF VOJVODINA IN 2007-2009</b>  <i>EKONOMSKA ANALIZA SREDSTAVA AGRARNOG BUDŽETA AUTONOMNE POKRAJINE VOJVODINE U PERIODU OD 2007. DO 2009. GODINE</i>  <b>Petrana Odavić, N. Novković</b> .....</p>	112
<p><b>BASIC PARAMETERS OF ARTIFICIAL PRODUCTION OF PHEASANT (PHASIANUS COLCHICUS L.) WITH THE MEASURES PROPOSAL</b>  <i>OSNOVNI PARAMETRI PRI VEŠTAČKOJ PROIZVODNJI FAZANA (PHASIANUS COLCHICUS L.) SA PREDLOGOM MERA</i>  <b>Z. Ristić, V. Marković, M. Đorđević, V. Barović</b> .....</p>	120
<p><b>DEVELOPMENT TENDENCIES OF AGRICULTURE THE REPUBLIC OF SERBIA</b>  <i>RAZVOJNE TENDENCIJE POLJOPRIVREDE REPUBLIKE SRBIJE</i>  <b>R. Pejanović, Mirela Tomaš, G. Maksimović, Adrijana Radosavac</b> .....</p>	128
<p><b>FINDINGS OF STREPTOCOCCUS AGALACTIAE IN COW UDDER, PROPOSAL OF CONTROL AND ERADICATION</b>  <i>NALAZ STREPTOCOCCUS AGALACTIAE U VIMENU KRAVA, MERE KONTROLE I ERADIKACIJE</i>  <b>M. Radinović, S. Boboš, Marija Nešić, Mira Mihajlović Ukropina, V. Kujača</b> ..</p>	136

Production has begun in a first half of 20<sup>th</sup> century, using pheasant chicks under hens, and in second half of 20<sup>th</sup> century production modernized. Modernization of production included incubators for pheasant eggs, nurturing pheasant chicks after hatching in batteries or on the floor system, nurturing in houses until six weeks old and after that nurturing in “getting wild” enclosures with adequate space.

## **MATERIAL AND METHODS**

Material for this investigation was obtained at one of our largest pheasant farms - “Ristovača” near Bač, for 14-year period. Complete evidention was precisely saved, as well as statistics regarding whole production process and comparisons of results with other similar pheasant farms in the state and abroad. Method of work was statistical processing at every stage of production, and calculating mean values and average per stages.

## **RESULTS AND DISCUSSION**

In order to achieve the best possible results, it is necessary:

- To provide optimal living space for reproduction flock (3 to 5 m<sup>2</sup> per bird), to provide concentrated food for pheasant hens for a month before formation of reproduction flock, to provide concentrated food during whole egg laying period, to do a quality selection in February not only according to phenotype, but also a genotype, and with obligatory inoculation.
- To do a complete disinfection, disinsection and deratization of all objects within the pheasant farm.
- To repair and complete all necessary equipment before start of the production at a farm.
- To employ a veterinary doctor at every pheasant farm in order to provide preventive protection, as well as other qualified staff, since raising pheasant chicks is one of most sensitive stages in production of pheasants at pheasant farms.
- In the first stage, it is necessary to considerably enhance hygiene, as well as temperature regulation and ventilation.
- Obligatory selection in one-day chicks.

When completing production plans, it is recommended that pheasant farms use following parameters:

- Mating ratio in established flock should be 1:8 to 1:10 in favor of females, and in families 1:8;
- minimal area within “getting-wild” enclosure should be 3 m<sup>2</sup> per bird;
- average number of unfertilized eggs is 12.75%;
- average dying of embryos is 21.84% from total fertilized eggs and 19.05% from total deposited eggs;
- average mortality of pheasant chicks in batteries is 7.16% (up to 14 days old);
- average mortality in raising houses is 7.69% (from 14 to 42 days).

These parameters must be rounded upwards, for instance 12.75% becomes 13% in order to facilitate calculations when production plans are made.

In the second stage, raising houses for pheasant chicks must be perfected in order to reduce influence of weather and all other external factors. This stage is directly connected to the third one, which is raising in shelters of hunting societies, in order to enable pheasants for independent life in hunting grounds.

Today we have a number of pheasant farms where pheasants are produced in obsolete incubators, without even minimal conditions for first or second stage, let alone for raising adult pheasants. Only several farms are able to provide all conditions for raising adult pheasants.

If all these recommendations are fulfilled, we are certain that survival rate of artificially bred pheasants will be higher than it presently is. This is the basic task and the aim to be sought. Today in our hunting grounds, number of pheasant chicks introduced is several times lower than fifteen years before. Reasons are numerous. It is necessary that newly introduced pheasants are healthy and of high quality, and this is often not the case. This production is liable to large improvisation, and that is unacceptable.

### **Reproduction flock**

The most important prerequisite for successful pheasant production in farms is a good and healthy reproduction flock. It is formed in February, and sometimes in March - depending on climate conditions. The reproduction flock is formed from the "material" that is being bred for this purpose. Choosing pheasants for reproduction flock is very important. Only the strongest pheasant chicks of highest quality are being left from first batches in production, and with no external flaws. When individuals are being caught and transferred to egg-laying enclosure, they are inoculated against plague and cholera, and they get goggles to prevent pecking the eggs. The reproduction flock may be kept in "families" or in large groups in separated enclosures: 1 rooster and 7-10 hens. In this way, number of eggs and their fertility are somewhat higher, but larger groups (90 to 120 individuals per enclosure) are more practical and more often used than families. In group enclosures, space of 3 to 5 m<sup>2</sup> per individual is being used.

In group enclosures in "Ristovača", groups were formed with 80 hens and 8 roosters with area of reproduction enclosures of 270 m<sup>2</sup> or 3.07 m<sup>2</sup> per bird. At pheasant farm „Ristovača“ group enclosures were used, so from 1982 to 1992 average mating ratio was 8.52 hens per a rooster. The maximum was noted in 1986, when this ratio was 1:10.67, and minimum was in 1992 with 1:7.31.

In period between 1993 and 2006 group enclosures were still used, with average mating ratio 1:9.63; maximum was 1:10 in period from 1995 to 2005, and minimum was 1:8.00 in 1993, 1994, and 2006. Laying eggs is being planned before laying period (using Gauss laying curve) on the basis of data from previous years that include time when laying begun, frequency of laying and planned time when laying will stop, usually at the end of May, or until mid-June. On the basis of this plan, plans are made to put eggs into incubators, hatching and raising chicks. Graph is made at a paper with Gauss curve, and during a season, a real number of laid eggs is added. Jovetić (1957) in group enclosures 26 by 10 m uses mating ratio 1:12, and in his investigations he even used 1:16 and 1:20 so

he recommends 1:16 ratio. Andrašić (1970) recommends 1:7 as a mating ratio for pheasant hens in mobile group enclosures 1.5 by 3.5 m. 1:7. Trpkov (1971) recommends mating ratio 1:7. Jovetić says he used mating ratio 1:2 with average annual number of 30 eggs. Andrašić (1970) had average number of 33.91 eggs between April 1st and June 30th. Trpkov (1971) in pheasant farm “Trubarevo” had 54 eggs in average. Jovetić (1957) had average fertilization of 85% with mating ratio 1:12. Andrašić (1970) says he had average fertilization, with mating ratio 1:7, between 81.60% and 84.94%. Trpkov (1971) says that, with different dietary regimes for hens, had average fertilization between 79.00% and 89.96%, with mating ratio 1:7.

### **Deposition of eggs, ovoscopy and hatching**

In order to rationally use all stages of hatching and raising chicks, eggs are not put into incubator all at once, i.e. they may not all be with the same date, but in accordance to previously established program. Eggs depositing program mostly takes into account capacity of hatching equipment and warm batteries, but it also counts for total number of eggs available. Therefore “batches” are formed. In pheasant farm “Ristovača” batches were 8,820 eggs, 17,640 eggs, 25,032 eggs, 26,880 eggs, 30,574 eggs, 32,424 eggs. All this must be coordinated with present hatching equipment where eggs are transferred after 21 days in pre-hatching equipment. Ovoscopy of eggs is being done after 6 and 14 days in pre-hatching equipment. In larger pheasant farms, as in “Ristovača”, it is done only at 14 days after deposition. The percent of unfertilized eggs varies during laying period, mostly between 10 and 17%. At pheasant farm “Ristovača” during period observed there was total of deposited 2,691,050 eggs, from which unfertilized eggs were 343,093 or 12.75%. The lowest percent during period observed (1993–2002) was 10.63% in 1996.

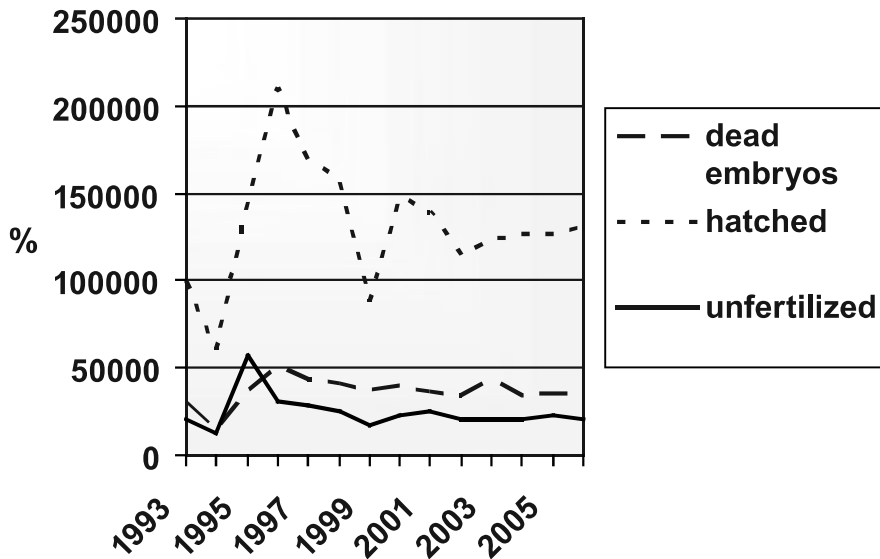
For 10 years of investigating production in Croatia, Darabuš (1980) established percent of unfertilized eggs at 17.95%. In investigations of Pekić (1969) in pheasant farm “Dobanovački zabran”, percent of unfertilized eggs was between minimal 5% and maximal 22% or averagely 15.50%. Investigations of Gajić and Jović (1969) in pheasant farm “Dobanovački zabran” infertilization between 12.11% and 16.79% was found, or in average 14.52% for period observed. Investigations in Czechoslovakia by Hanuš and Fišer (1975), in incubation using hens, hatching is 65% (from number of eggs deposited). Same investigators found that in artificial hatching, in incubator, 80 to 85% pheasant chicks are hatched from fertilized eggs, and eggs fertilization in artificial production must be between 85% and 95% (unfertilized eggs were between 5% and 15%). Average percent of fertilized eggs from total deposited eggs in “Ristovača” pheasant farm during period observed (1993-2006) was 87.25% (2,347,957 fertilized eggs from total of 2,691,050 deposited), while minimum was noted in 1995 (76.18%) and maximum in 1996 (89.97%).

### **Embryo mortality and hatching of one-day chicks**

Embryo mortality during incubation is expressed as a percent from total number of deposited eggs or from number of fertilized ones. Biologically, it has more sense to take into account only a percent of dead embryos from number of fertilized eggs.

In period observed, in pheasant farm “Ristovača” (1993-2006) total of 512,727 dead embryos were found (Graph 1). Average percent of dead embryos from number of fertilized eggs was 21.84%. Average annual percent of dead embryos from total deposited eggs was 19.05%. Gajić and Jović (1969) found that average percent of dead embryos from total of deposited eggs at pheasant farm “Dobanovački zabran” was 18.47%. During period observed (1993-2006) in pheasant farm “Ristovača” total of 1,835,230 one-day pheasant chicks were hatched, which is in average 78.28% from number of fertilized eggs (2,347,957) or 68.30% from number of deposited (2,691,050) eggs. The minimal percent of hatched eggs was in 1995 (60.69%) and maximum was in 1996 ( 71.74 %). On the basis of investigations by Jović, between 1957 and 1960 percent of chicks hatched was between minimal 50.28% and maximal 81.39% or averagely 72.48% from number of fertilized eggs.

In Croatia, Darabuš (1980) found that percent of eggs hatched was 64.19% from total deposited eggs. At the time, present incubation equipment enabled reaching up to 70% hatching from total deposited eggs, and somewhat lower hatching was consequence of increased nonfertilization, and also in human factor regarding incubator operation.



Graph. 1. Relationship between chicks, nonfertilized and fertilized embryos

### RAISING PHEASANT CHICKS

In raising pheasant chicks between day one and 6 weeks old, data were collected regarding number of chicks introduced (in batteries and in raising houses), number of chick mortality in the first and second stage of raising, and number of chicks raised until 6 weeks old, when they are ready to be delivered to hunter’s societies with appropriate shelters (Pekeč et al. 2008). For period observed (1993-2006) in pheasant farm

“Ristovača” total of 1,837,865 one-day pheasant chicks was produced. In first 14 days, when chicks were in batteries, mortality was 131,535 chicks or averagely 7.16%. Investigations by Jović (1964) in pheasant farm “Dobanovački zabran”, during three years observed average loss percent was 7.92% for first 20 days. In the first stage (floor and battery system) in investigations by Darabuš (1980) for 1969-1979 period, mortality was 7.89% in average, but losses may be brought to only 3-6%. This percent has been reached by certain pheasant farms in Croatia and it must be the future goal.

In raising houses in “Ristovača” pheasant farm, during 1993-2006 period, total of 1,706,330 pheasant chicks was introduced when 14-15 days old, or 92.84% from total hatched one-day chicks. In these houses, 131,138 chicks died, being old between 14 and 42 days. Average mortality in raising houses was 7.69%.

In second stage, Darabuš (1980) found mortality of 12.96% and concluded that this is still very high. Such high mortality is a consequence of climate influence and of human factor. In “Ristovača” 1.575.192 pheasant chicks were raised until 6 weeks old, which is 58.53% from total eggs deposited (2.691.050). Corresponding percent in Croatia, after investigations by Darabuš (1980), is 50.10%. Darabuš concludes that this is a low percentage and that all flaws must be removed in order to increase it in following period.

## CONCLUSION

Researches were conducted in one of largest pheasant farms in Europe, and in the largest one in Serbia, “Ristovača”, in 1993-2006 period, with the aim to establish exact parameters in production and to keep production economically worthwhile. When saying “worthwhile” we must not think of the cheapest production. On the contrary - in the last ten or so years this is one of most important elements in decision to buy pheasant chicks. The pheasant quality is the paramount objective and it was proposed to think about introducing standards in all categories of pheasant chicks and adult pheasants that are being sold to hunters’ societies. Unfortunately, very few pheasant farms have such plans, and without plans there is no real calculation in prices. Pricing is done flat-rate, without any data and without real calculation.

Monitoring of results in pheasant production in pheasant farm “Ristovača” begun in 1993, and was finished in 2006. In the pheasant farm, following parameters were monitored: optimal time of separating the reproduction flock (last decade in February and first decade in March), mating ratio in reproduction flock ( 1:8 to 1:10 in favor of hens), minimal space per bird in reproduction enclosure (3 do 5 m<sup>2</sup>, and if pheasants wear goggles it may be reduced even up to 50%), losses in reproduction flock from forming to dissolving (do 10%), total number of eggs laid per hen (up to 45), total number of eggs laid annually for whole reproduction flock (planned 42 to 45 per hen), total number of fertilized eggs (between 83 and 90%, average 87.25%), percent of unfertilized eggs (between 10 and 17%, average 12.75%), total number of dead embryos, percent of dead embryos from total of deposited eggs (19.05%), percent of dead embryos from total fertilized eggs (21.84%), total number of chicks hatched (78.28% from number of fertilized eggs or 68.30% from total number of deposited eggs), losses in raising batteries and corresponding percentage (7.16%), losses in raising houses and corresponding percentage

(7.69%). All these parameters are necessary in production of pheasant game in order to establish plans that will be realistic management plans in such production.

## REFERENCES

- ANDRAŠIĆ, D. : Značenje intenziteta nesjenja za određivanje kapaciteta inkubatora u umetnom uzgoju fazana. Doktorska disertacija, Šumarski fakultet, Zagreb, str. 21-96, 1968.
- ANDRAŠIĆ, D. : Mortalitet fazanskih nesilica u umjetnom uzgoju inkubatorskom metodom kod uzgojnog centra „Kompas“ Petrovci. Šumarski fakultet, Zagreb, str.43, 1970.
- GAJIĆ, I., JOVIĆ, V.: Aktivnost fazana u toku 24 časa. Saopštenje na IX kongresu Međunarodnog saveza biologa za divljač u Moskvi, Jelen, 8, str. 22-29, 1969.
- GAJIĆ, I., JOVIĆ, V.: Uticaj broja fazana u boksu i njegove površine na nosivost, oplodjenost jaja i smrtnost embriona. Saopštenje na IX kongresu Međunarodnog saveza biologa za divljač u Moskvi, Jelen, 8, str.34-43,1969.
- HANUŠ V., FIŠER Z.: Bažant - Fazan, Prag, 1975. Fazan gajenje i lov, Beograd, 1983.
- DARABUŠ S.: Prihvat i podivljavanje umjetno uzgojenih fazana. Lovački vjesnik, str.38, Zagreb,1980.
- JOVIĆ, V.: Prilog poznavanju reprodukcije fazana u veštačkom odgajalištu, Lovno-šumsko gazdinstvo „Jelen“, Beograd. Operativno-naučni centar „Bilje“, Beograd, str. 7-22, 1969.
- JOVETIĆ, R.: Veštačka proizvodnja fazana u lovištu Poljoprivredno-šumarskog fakulteta u Skoplju. Separat iz „Lovačkog lista“, 6, 57, 1957.
- PEKEČ, S., POPOVIĆ, Z., BEUKOVIĆ, M., KOVAČEVIĆ, B.: Proizvodnja fazana u periodu od šest nedelja zatvorenim načinom gajenja. Savremena poljoprivreda, 57(1-2)213-218, 2008
- PEKIĆ, B.: Ekologija i dinamika populacija fazana u Dobanovačkom zabranu. XXVII(1)18-19, 1969.
- RISTIĆ, Z.: Fazan (*Phasianus colchicus colchicus* L.) plemenita divljač naših lovišta. Lovačke novine, I(2)696-697, 1994.
- RISTIĆ, Z.: Aktuelni trenutak lovstva i razvoj u narednom periodu. Zbornik radova V susreta gorana Vojvodine, Temerin, str, 35 – 39, 1998.
- RISTIĆ, Z.: Proizvodnja fazana 1999. godine. Lovačke novine, IV, XXXVIII, 14, 1999.
- RISTIĆ, Z.: Reprodukcijska fazana u prirodi - koka ima pravo izbora. Lovačke novine V-VI,760, 22, 1999.
- RISTIĆ, Z.: Monografija „Fazan“. Prirodno-matematički fakultet, Novi Sad, 2005.
- TRPKOV, B.: Optimalna starost na matičnite jata fazani i mogućnost za supstitucija na životinjske so rastitelni proteini vo nivnata ishrana. Doktorska disertacija, Zemlj.-šum.fakultet na Univerzitet. vo Skopje, Skopje,1971.

## OSNOVNI PARAMETRI PRI VEŠTAČKOJ PROIZVODNJI FAZANA (*PHASIANUS COLCHICUS L.*) SA PREDLOGOM MERA

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### Izvod

Proizvođači fazanske divljači radi ekonomičnosti proizvodnje potrebno je da krajem godine izrade planove proizvodnje za narednu godinu. Da bi dobili realne planove



potrebno je da koriste uprosečene gubitke po fazama, do kojih smo došli na osnovu dugogodišnjeg istraživanja i na osnovu velikog uzorka. Na osnovu dobijenih parametara predlažemo da pri izradi planova proizvodnje (koje treba uraditi u decembru predhodne za narednu proizvodnu godinu) koriste po fazama sledeće proseke. Preporuke prilikom proizvodnje fazana u fazanerijama da se kao planske veličine uzimaju: da matično jato bude sa odnosom polova 1:8 do 1:10 (u korist koke) u grupnim volijerama i 1:8 u porodicama; da minimalna površina volijere za reprodukciju - parenje mora biti oko 3 m<sup>2</sup> po svakoj jedinki; da prosečna neoplođenost jaja se planira sa procentom od 12,75%; da prosečna smrtnost embriona se planira sa procentom od 21,84% od broja oplodjenih jaja, odnosno 19,05% od ukupnog broja uložjenih jaja; da su prosečni gubici u baterijama (do 14-og dana starosti) sa smrtnošću od 7,16% i da su prosečni gubici u kućicama za odgoj (od 14-42 dana starosti) sa smrtnošću od 7,69%.

**Ključne reči:** fazan, matično jato, odnos polova, oplodnja jaja.

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## DEVELOPMENT TENDENCIES OF AGRICULTURE THE REPUBLIC OF SERBIA

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*SUMMARY: Authors considered developing problems of agriculture of the Republic of Serbia. The agriculture takes, traditionally, the leading place in the structure of the industry of the Republic of Serbia. For development of this branch of industry there are natural and human potentials. However, indicators of development in the time of transition show that there are serious limitations of development of this activity. The biggest limitation is wrong economic and agrar politics of the state and the second period of development neglects this activity, does not invest enough in it, which has negative consequence on the agriculture, which stays behind the potential possibilities of development, and to villages which are involved in the proces of depopulation, deagrarisation and senilisation.*

**Key words:** *agriculture, agrar politics, development, the Republic of Serbia, limitations, transition.*

### INTRODUCTION

Agriculture of Serbia went through different phases through the historical period: from agrar overpopulation, through deagrarisation up to agriculture in transition where it is today. However, in whichever phase it is, our agriculture was always in the inconvenient position and insufficient investment from the state, and also bad position of this branch, whose basic task was to secure social peace and feed the population (Pejanović and Tica, 2005).

Starting hypothesis in this paper is that the agriculture of the Republic of Serbia is in permanent crises which just had different shapes through history. Problem is considered

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