MENDEL UNIVERSITY OF AGRICULTURE AND FORESTRY BRNO
Faculty of Agronomy

MENDELOVA ZEMĚDĚLSKÁ A LESNICKÁ UNIVERZITA V BRNĚ
Agronomická fakulta

MendelNet´07 Agro

Proceedings of International Ph.D. Students Conference
Sborník z mezinárodní konference
posluchačů postgraduálního doktorského studia

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Contents

Obsah

Section Plant Production - Sekce Fytotechnika

EFFECT OF SULPHUR NUTRITION ON YIELD AND QUALITY OF MALTING BARLEY

VLIV SIRNÉ VÝŽIVY NA VÝNOS A KVALITU SLADOVNICKÉHO JEČMENE

BABIÁNEK P., RYANT P. 21

DYNAMICS OF CHANGE OF NUTRITION CONTENT IN DRY MATTER OF WINTER BARLEY BARCELONA AND BABYLONE VARIETES

DYNAMIKA ZMIEN KONCENTRÁCIE ŽIVÍN A POMEROV JEDNOTLIVÝCH ŽIVÍN V SUŠINE NADZEMNEJ BIOMASY JAČMEŇA OZIMNÉHO ODRÔD BARCELONA A BABYLONE

BENČÍKOVÁ M., SLAMKA P. 22

INFLUENCE OF GROWTH STRUCTURE, VARIETY AND YEAR ON NUMBER OF TILLERS AND YIELD OF ORGANICALLY GROWN WINTER WHEAT

VLIV STRUKTURY POROSTU, ODRŮDY A ROČNÍKU NA POČET ODNOŽÍ A VÝNOS U EKOLOGICKY PĚSTOVANÉ PŠENICE

BICANOVÁ E., CAPOUCHOVÁ I. 23

ROOT SYSTEM SIZE OF WINTER WHEAT VARIETIES IN RELATION TO QUALITY

KVALITA ODRŮD PŠENICE OZIMÉ VZHLEDEM K VELIKOSTI KOŘENOVÉHO SYSTÉMU

DOSTÁL V., CHLOUPEK O. 24

INFLUENCE OF UNTRADITIONAL ORGANIC FERTILIZERS AND NPK TO PHYTOMASS OF SUNFLOWER

VPLYV NETRADIČNÝCH ORGANICKÝCH HNOJÍV A NPK HNOJÍV NA FYTOMASU SLNEČNICE ROČNEJ

GALLIKOVÁ M., KOVÁČIK P. 25

CHANGES OF SPECIES COMPOSITION IN GRASS VEGETATION ASSOCIATION SANGUISORBA-FESTUCETUM COMUTATAE

ZMĚNY DRUHOVÉ SKLADBY TRAVNÍHO POROSTU ASOCIACE SANGUISORBA-FESTUCETUM COMUTATAE

HEGER P., SKLÁDANKA J., HRABĚ F. 26

DEVELOPMENT AND USING OF SOILCLIM SOFTWARE

VÝVOJ A VYUŽITÍ SOFTWARU SOILCLIM

HLAVINKA P., TRNKA M., BALEK J., ŽALUD Z., DUBROVSKÝ M., SEMERÁDOVÁ D., BARTOŠOVÁ L., EITZINGER J. 27

SPECIES DIVERSITY OF SCALE INSECTS (COCCOIDEA) IN GREENHOUSES IN THE CZECH REBUPLIC

DRUHOVÁ DIVERZITA SKLENÍKOVÝCH ČERVCŮ (COCCOIDEA) V ČESKÉ REPUBLICE

HLAVJENKOVÁ I., ŠEFROVÁ H. 28

CHANGE OF YIELD AND EVAPOTRANSPIRATION AT PERMANENT GRASSLAND IN CONSEQUENCE CLIMATE CHANGE

ZMĚNA VÝNOSŮ A EVAPOTRANSPIRACE U TRVALÝCH TRAVNÍCH POROSTŮ V DŮSLEDKU KLIMATICKÉ ZMĚNY

HONSOVÁ D., DAŇHELKA J. 29

BALANCE OF NUTRIENTS IN INTEGRATED AND ECOLOGICAL FARMING SYSTEM

BILANCIA ŽIVÍN V INTEGROVANOM A EKOLOGICKOM SYSTÉME HOSPODÁRENIA NA PÔDE

JAKUB P., LOŽEK O. 30

THE CLIMATE NICHES OF COLORADO POTATO BEETLE AND POTATO LATE BLIGHT IN CENTRAL EUROPE IN 2050

DOPADY ZMĚNY KLIMATU NA KLIMATICKOU NIKU MANDELINKY BRAMBOROVÉ A PLÍSNĚ BRAMBOROVÉ VE STŘEDNÍ EVROPĚ V ROCE 2050

KOCMÁNKOVÁ E., ŽALUD Z., TRNKA M., SEMERÁDOVÁ D., DUBROVSKÝ M., MOŽNÝ M., JUROCH J. 31

ARGYRESTHIA THUIELLA AND A. TRIFASCIATA (LEPIDOPTERA: YPONOMEUTIDAE) – BIONOMICS AND CONTROL POSSIBILITIES

MOLOVKA ZERAVOVÁ A M. JALOVCOVÁ (LEPIDOPTERA: YPONOMEUTIDAE) – BIONOMIE A MOŽNOSTI REGULACE

KONEČNÁ H., ŠEFROVÁ H. 32

GREEN MASS OF BARLEY PLANTS AS A SOURCE ANTIOXIDANT ENZYMES

ZELENÁ HMOTA ROSTLIN JEČMENE JAKO ZDROJ ANTIOXIDAČNÍCH ENZYMŮ

KOPÁČEK J., EHRENBERGEROVÁ J., MACUCHOVÁ S. 33

EFFECT OF MULCHING ON THE DOMINANCE OF IMPORTANT PLANT SPECIES IN THE STAND

VLIV MULČOVÁNÍ NA DOMINANCI VÝZNAMNÝCH ROSTLINNÝCH DRUHŮ V POROSTU

KRAUSOVÁ A., HRABĚ F. 34

EFFECT OF SOWINF RATE ON YIELD OF HYBRID WHEAT

VLIV VÝŠE VÝSEVKU NA VÝNOS HYBRIDNÍ PŠENICE

KVAPIL R., CAPOUCHOVÁ I. 35

EFFECT OF COMBINED CHLORIDE FREE FERTILIZER „DUSLOFERT EXTRA 14-10-20-7S“AT GRAPE-VINE GROWING IN VINECULTURE REGION OF TOKAJ

ÚČINNOSŤ BEZCHLORIDOVÉHO KOMBINOVANÉHO HNOJIVA „DUSLOFERT EXTRA 14-10-20-7S“ PRI PESTOVANÍ VINIČA HROZNORODÉHO VO VINOHRADNÍCKEJ OBLASTI TOKAJ

MARČEK M., LOŽEK O., VARGA L., KREMPA P. 36

THE CHEMICAL PROPERTIES OF THE TOPSOIL AND SUBSOIL AND THE INFLUENCE OF THIS CHANGES ON CROP AND QUALITY OF THE SUGAR BEET

VLIV CHEMICKÝCH VLASTNOSTÍ ORNICE A PODORNIČÍ NA VÝNOS A KVALITU CUKROVKY

MARTINEC J., POKORNÝ E. 37

CONTENT OF NITROGEN AND CARBON IN HOT WATER EXTRACTION DEPENDING ON DIFFERENT SYSTEMS OF FERTILIZATION

OBSAH DUSÍKU A UHLÍKU V EXTRAKTU HORKOU VODOU V ZÁVISLOSTI NA RŮZNÝCH SYSTÉMECH HNOJENÍ

NEDVĚD V., BALÍK J., KULHÁNEK M., ČERNÝ J., BALÍKOVÁ M. 38

THE INFLUENCE OF CONTROL MANAGEMENTS AGAINST EUROPEAN CORN BORER (*OSTRINIA NUBILALIS*) ON APHIDS AND THEIRS NATURAL ENEMIES IN MAIZE STANDS

VLIV TYPU OCHRANY PROTI ZAVÍJEČI KUKUŘIČNÉMU (OSTRINIA NUBILALIS) NA POPULACE MŠIC A JEJICH PŘIROZENÝCH ANTAGONISTŮ V POROSTECH KUKUŘICE

PSOTA V. 39

IMPACT AFTER APPLICATION OF VARIOUS SULPHUR ON YIELD AND QUALITY OF MEADOW FORAGE

VLIV APLIKACE RŮZNÝCH FOREM SÍRY NA VÝNOS A KVALITU LUČNÍ PÍCE

ŠENKYŘÍKOVÁ A., RYANT P. 40

STRUCTURE OF TURF SOD ON GREEN AND RELATIONSHIP TO WATER CIRCULATION

STRUKTURA TRAVNÍHO DRNU JAMKOVIŠTĚ A VZTAH KE KOLOBĚHU VODY

VRZALOVÁ J., KNOT P. 41

Section Animal Production - Sekce Zootechnika

COMPARISON OF TWO WEANING METHODS OF JUVENILE PIKEPERCH (*SANDER LUCIOPERCA*) FROM NATURAL DIET TO COMMERCIAL FEED

SROVNÁNÍ DVOU METOD PŘEVODU JUVENILNÍHO CANDÁTA OBECNÉHO (*SANDER LUCIOPERCA*) Z PŘIROZENÉ POTRAVY NA KOMERČNÍ KRMIVO

BARÁNEK V., DVOŘÁK J., KALENDA V., MAREŠ J., ZRŮSTOVÁ J., SPURNÝ P. 45

THE EFFECT OF LOWERED LEVEL OF MANGANESE AND ZINC IN ORGANIC AND INORGANIC FORM ON CHICKEN GROWTH

VLIV SNÍŽENÉ DÁVKY ORGANICKY A ANORGANICY VÁZANÝCH MIKROPRVKŮ ZN A MN NA RŮST KUŘAT

BUBANCOVÁ I., LICHOVNÍKVÁ M. 46

PRODUCTION EFFECT OF DIFFERENT COMMERCIAL FEEDS ON JUVENILE TENCH (TINCA TINCA) UNDER THE INTENSIVE REARING CONDITIONS

PRODUKČNÍ EFEKT KOMERČNĚ VYRÁBĚNÝCH KRMNÝCH SMĚSÍ PŘI ODCHOVU JUVENILNÍHO LÍNA OBECNÉHO (*TINCA TINCA* L.) V KONTROLOVANÝCH PODMÍNKÁCH

CILEČEK M., MAREŠ J., KOPP R., BARÁNEK V., VÍTEK T. 47

EVALUATION INFLUENCE STRESS – SENSIBILITIES BOARS BREEDING PIETRAIN TO FRAGMENTARY INDICES CARCASS VALUES CROSSBREED PIGS

VYHODNOCENÍ VLIVU STRESCITLIVOSTI KANCŮ PLEMENE PIETRAIN NA DÍLČÍ UKAZATELE JATEČNÉ HODNOTY FINÁLNÍCH HYBRIDŮ PRASAT

HADAŠ Z., ČECHOVÁ M. 48

EFFECT OF DIFFERENT WATER HARDNESS ON GROWTH, SURVIVAL AND SWIM BLADDER INFLATION OF PIKEPERCH (*SANDER LUCIOPERCA*) LARVAE

VLIV RŮZNÉ TVRDOSTI VODY NA RŮST, PŘEŽITÍ A NAPLŇOVÁNÍ PLYNOVÉHO MĚCHÝŘE U LAREV CANDÁTA OBECNÉHO (*SANDER LUCIOPERCA*)

KALENDA V., BARÁNEK V., DVOŘÁK J., KOPP R., MAREŠ J., SPURNÝ P. 49

COMPARISON OF INFLUENCE OF ORGANIC AND ANORGANIC ZINC SULEMENTATION FORM ON LABORATORY RATS GROWTH

POROVNÁNÍ VLIVU ANORGANICKÉ A ORGANICKÉ FORMY DOPLŇKU ZINKU NA RŮST LABORATORNÍCH POTKANŮ.

KRATOCHVÍLOVÁ P., VEČEREK M., VAŠÁTKOVÁ A., ZEMAN L. 50

THE EFFECT OF FEEDING MIXTURE CONTAINING LINSEED OIL ON CONTENT OF FA IN POULTRY MEAT

VLIV ZKRMOVÁNÍ SMĚSI OBSAHUJÍCÍ LNĚNÝ OLEJ NA OBSAH MASTNÝCH KYSELIN V DRŮBEŽÍM MASE

KŘÍŽOVÁ Š., ZELENKA J., MRKVICOVÁ E. 51

DYNAMIC OF FATTY ACID SPECTRUM CHANGES IN COMMON CARP MUSCLE DURING INTENSIVE REARING

DYNAMIKA ZMĚN SPEKTRA MASTNÝCH KYSELIN SVALOVINY KAPRA OBECNÉHO BĚHEM INTENZIVNÍHO ODCHOVU

KUKAČKA V., FIALOVÁ M., MAREŠ J. 52

DYNAMIC VISCOSITY OF THE STALLION EJAKULATE

DYNAMICKÁ VISKOSITA EJAKULÁTU HŘEBCŮ

MAMICA O., MÁCHAL L., SEVERA L. 53

INFLUENCE OF STAGE OF LACTATION ON THE TECHNOLOGICAL PROPERTIES OF SHEEP MILK AND ON RENNET CURD QUALITY

VLIV LAKTAČNÍ FÁZE NA TECHNOLOGICKÉ VLASTNOSTI OVČÍHO MLÉKA A NA JAKOST SÝŘENINY

NOVOTNÁ L., KUCHTÍK J. 54

THE GENETIC DIVERSITY OF THE POPULATION OF AKHALTEKE HORSES IN CHOSEN COUNTRIES

GENETICKÁ DIVERZITA POPULACÍ ACHALTEKINSKÉHO KONĚ VE VYBRANÝCH STÁTECH

PRAUSOVÁ M., JISKROVÁ I. 55

HOLSTEIN CATTLE – EMBRYONIC MORTALITY

HOLŠTÝNSKÝ SKOT – EMBRYONÁLNÍ MORTALITA

PUKLOVÁ P., ŠUBRT J., SKRIP D. 56

THE EVALUATION OF INFLUENCE OF MORNING AND EVENING MILKING ON THE SELECTED MILK PARAMETERS

ZHODNOCENÍ VLIVU RANNÍHO A VEČERNÍHO NÁDOJE NA VYBRANÉ PARAMETRY KRAVSKÉHO MLÉKA

SKÝPALA M., FALTA D., CHLÁDEK G. 57

THE EVALUATION OF SPORT´S EFFICIENCY OF CZECH WARMBLOOD HORSE ON THE BASE OF RESULTS IN THE BREEDING COMPETITIONS

VYHODNOCENÍ SPORTOVNÍ VÝKONNOSTI ČESKÉHO TEPLOKREVNÍKA NA ZÁKLADĚ VÝSLEDKŮ V CHOVATELSKÝCH SOUTĚŽÍCH

ŠAROVSKÁ L., WALTEROVÁ L., JISKROVÁ I. 58

FREQUENCE OF OCCURRENCE OF SPERM MORPHOLOGICAL CHANGES IN COCKS OF THREE INITIAL LAYING LINES

FREKVENCE VÝSKYTU MORFOLOGICKÝCH ZMĚN SPERMIÍ U KOHOUTŮ TŘÍ VÝCHOZÍCH SNÁŠKOVÝCH LINIÍ

ŠVÁBOVÁ L., MÁCHAL L. 59

INFLUENCE OF LEVEL OF FABA BEAN (*VICIA FABA*) IN EXPERIMENTAL FEED MIXTURES FOR CHICKENS

VLIV OBSAHU BOBU KOŇSKÉHO V POKUSNÝCH KRMNÝCH SMĚSÍCH PRO KUŘATA

VAŠÁTKOVÁ A., KRATOCHVÍLOVÁ P., SIKORA M., ZEMAN L. 60

THE EFFECT OF SILAGE ADDITIVE ON FERMENTATION QUALITY ON BREWERS GRAINS WITH ABSORBENT MATTER

VLIV SILÁŽNÍHO ADITIVA NA KVALITU FERMENTAČNÍHO PROCESU SILÁŽE PIVOVARSKÉHO MLÁTA S PŘÍDAVKEM SORBENTU

VYSKOČIL I., DOLEŽAL P., DOLEŽAL J., PYROCHTA V. 61

TEMPERATURE EFFECT IN THE STABLE ON MILK YIELD OF HOLSTEIN COWS ON 2ND LACTATION

VLIV TEPLOTY VE STÁJI NA PRODUKCI MLÉKA HOLŠTÝNSKÝCH DOJNIC NA 2. LAKTACI

WALTEROVÁ L., ŠAROVSKÁ L., CHLÁDEK G. 62

THE ACCOUNT OF THE THOROUGHBRED OF THE BREEDING OF SPORT HORSES BREEDS

VÝZNAM ANGLICKÉHO PLNOKREVNÍKA VE ŠLECHTĚNÍ SPORTOVNÍCH PLEMEN KONÍ

ZÁRUBOVÁ L., JISKROVÁ I. 63

USING BLUP – ANIMAL MODEL TO ESTIMATE THE BREEDING VALUES OF SHOW JUMPING HORSES IN SLOVAK REPUBLIC

BLUP – ANIMAL MODEL V ODHADE PLEMENNÝCH HODNÔT PARKÚROVÝCH KONÍ NA SLOVENSKU

ZUROVACOVÁ B., JISKROVÁ I. 64

Section Environmental Technologies - Sekce Enviromentální techniky

SEASON CORRECTION OF CATION EXCHANGE CAPACITY DYNAMIC IN TOPSOILS OF CHERNOZEMS

KOREKCE SEZÓNNÍ DYNAMIKY KATIONTOVÉ VÝMĚNNÉ KAPACITY ORNIC ČERNOZEMNÍCH PŮD

BRTNICKÝ M., FOUKALOVÁ J., POKORNÝ E. 67

MONITORING OF SELECTED BIOLOGICAL PROPRIETIES OF CHERNOZEMS IN SOUTH MORAVIA REGION

SLEDOVÁNÍ VYBRANÝCH BIOLOGICKÝCH VLASTNOSTÍ ČERNOZEMÍ V OBLASTI JIŽNÍ MORAVY

FOUKALOVÁ J., BRTNICKÝ, M., POKORNÝ E. 68

ANTICORROSIVE RESISTANCE OF WATER DILUTES SINGLE-LAYER ANTICORROSIVE ENAMELS

KOROZNÍ ODOLNOST JEDNOVRSTVÝCH VODOUŘEDITENÝCH NÁTĚROVÝCH HMOT

HANUŠ J., ŠČERBEJOVÁ M. 69

POWER OF THE SELF-IGNITION MOTOR FOR PURE PLANT OIL

VÝKON VZNĚTOVÉHO MOTORU NA ČISTÝ ROSTLINNÝ OLEJ

HLAVENKA T., FAJMAN M., ČUPERA J. 70

THE EFFECT OF PHYSICAL FEATURES OF MINERAL FERTILISERS ON EVEN APPLICATION OF FERTILIZERS

VLIV FYZIKÁLNÍCH VLASTNOSTÍ MINERÁLNÍCH HNOJIV NA ROVNOMĚRNOST APLIKACE HNOJIV

HRŮZA M., RYANT P., BAUER F. 71

POSSIBILITIES OF THE LEAN LANDFILL GAS UTILIZATION ON THE CLOSED LANDFILL SITE

MOŽNOSTI VYUŽITÍ ZBYTKOVÉHO SKLÁDKOVÉHO BIOPLYNU UZAVŘENÉ SKLÁDKY

KAMARÁD L., GRODA B. 72

CONDITIONS OF ORGANIC FARMS DEVELOPMENT IN POLAND AND MALOPOLSKA AREA

PODMÍNKY VÝVOJE EKOLOGICKÉHO HOSPODAŘENÍ V POLSKU A OBLASTI MALOPOLSKA

KLIMEK A, BARAN A. 73

ECONOMIC EVALUATION OF WOOD MATERIAL UTILIZATION POSSIBILITY FROM BIOLOGICAL LANDFILL RECLAMATION FOR ENERGY PURPOSES

EKONOMICKÉ ZHODNOCENÍ MOŽNOSTI VYUŽITÍ DŘEVNÍ HMOTY Z BIOLOGICKÉ REKULTIVACE SKLÁDKY PRO ENERGETICKÉ ÚČELY

KRÁL V., KOTOVICOVÁ J. 74

ABRASIVE WEAR OF AG, CU, SN, HG ALLOYS

OPOTŘEBENÍ SLITIN AG, CU, SN, HG

LEV J., ČERNÝ M. 75

THE APPLICATION OF 2 – MERCAPTOPHENOL FOR PRECONCENTRATION AND DETERMINATION OF MERCURY SPECIES IN SEDIMENTS AND WATERS

VYUŽITÍ 2 – SULFANYLFENOLU PRO PREKONCENTRACI I STANOVENÍ CHEMICKÝCH FOREM (SPECIÍ) RTUTI V SEDIMENTECH A VE VODÁCH

MARGETÍNOVÁ J., HOUSEROVÁ-PELCOVÁ P., KUBÁŇ V. 76

THE EVALUATION OF SHAPEABLE ATTRIBUTES OF ZINC COATINGS

HODNOCENÍ TVÁRNÝCH VLASTNOSTÍ ZINKOVÝCH POVLAKŮ

PEJČOCH M., CHRÁST V. 77

RELATIONSHIP BETWEEN FRACTIONAL COMPOSITION OF HUMUS AND COLOR INDEX

VZTAH MEZI FRAKČNÍM SLOŽENÍM HUMUSU A BAREVNÝM INDEXEM

PETRÁŠOVÁ V., POSPÍŠILOVÁ L. 78

THE UTILIZATION OF DIGITAL VISUALIZATIONS IN DECISION MAKING PROCESS ON OPTIMIZING PROPOSAL OF BILLABONG REVITALIZATION

VYUŽITÍ DIGITÁLNÍCH VIZUALIZACÍ V PROCESU ROZHODOVÁNÍ A OPTIMALIZACI NÁVRHU REVITALIZAČNÍHO ZÁMĚRU ODSTAVENÝCH RAMEN

POKORNÝ J., KUPEC P., MIKITA T. 79

THE INFLUENCE OF AUTOMATIC SHIFTING ON TRACTOR ENGINE LOAD IN THE TRANSPORT

VLIV AUTOMATICKÉHO ŘAZENÍ NA ZATÍŽENÍ TRAKTOROVÉHO MOTORU V DOPRAVĚ

PREČ M., SEDLÁK P., BAUER F., ČUPERA J., ŠMERDA T. 78

THE NEW POSSIBILITIES OF USAGE THROUGHOUT OF ANIMAL BY-PRODUCTIONS IN FERTILIZATION MAIZE

NOVÉ MOŽNOSTI VYUŽITÍ ZPRACOVANÝCH VEDLEJŠÍCH ŽIVOČIŠNÝCH PRODUKTŮ PŘI HNOJENÍ KUKUŘICE

RADA V., RYANT P. 81

COMPARISON OF PHYTOPLANKTON COMMUNITIES DYNAMICS AND WATER CHEMISTRY OF THE PLUMLOV RESERVOIR AND THE BRNO RESERVOIR

SROVNÁNÍ DYNAMIKY FYTOPLANKTONNÍCH SPOLEČENSTECH A CHEMIZMU VODY PŘEHRADNÍCH NÁDRŽÍ BRNĚNSKÉ A PLUMLOVSKÉ

STRAKOVÁ L., KOPP R., ZIKOVÁ A. 82

THE REGIME OF GROUNDWATER IN THE AREA OF MASARYK TRAINING FOREST ENTERPRISE AT KRTINY

REŽIM PODZEMNÍ VODY NA ÚZEMÍ ŠKOLNÍHO LESNÍHO PODNIKU MASARYKŮV LES KŘTINY

SYNKOVÁ J., KUBOVÁ K., TLAPÁK V. 83

READING OF CALIBRE AE

SNÍMÁNÍ HODNOT AE

ŠOCH Z., ČERNÝ M. 84

PASSIVE AIR SAMPLERS FOR A DETERMINATION OF POPS IN THE AIR

PASIVNÍ VZORKOVAČE PRO STANOVOVÁNÍ POPS V OVZDUŠÍ

URBANOVÁ P. 85

ENERGY BALANCE IN ORGANIC AND CONVENTIONAL CROPPING SYSTEM AS AN INDICATOR OF SUSTAINABLE FARMING

BILANCE ENERGIE V EKOLOGICKÉM A KONVENČNÍM SYSTÉMU ROSTLINNÉ PRODUKCE JAKO JEDEN Z INDIKÁTORŮ TRVALE UDRŽITELNÉHO HOSPODAŘENÍ

VALTÝNIOVÁ S., KŘEN J. 86

POSSIBILITIES OF APPLICATION OF CLEANER PRODUCTION INDICATORS AT KLATOVY - ŠTĚPÁNOVICE LANDFILL

VÝZKUM VYUŽITÍ INDIKÁTORŮ ČISTŠÍ PRODUKCE V OKOLÍ SKLÁDKY V KLATOVECH - ŠTĚPÁNOVICÍCH

VAVERKOVÁ M., KOTOVICOVÁ J. 87

PHYTOPLANKTON DEVELOPMENT OF SELECTED PONDS INHERED IN SOUTHERN MORAVIA IN DEPENDENCE ON POND MANAGEMENT INTENSITY

ROZVOJ FYTOPLANKTONU VYBRANÝCH RYBNÍKŮ JIŽNÍ MORAVY V ZÁVISLOSTI NA INTENZITĚ HOSPODAŘENÍ

ZIKOVÁ A., KOPP R., MAREŠ J. 88

Section Food Technology - Sekce Technologie potravin

THE OCCURENCE OF PHTHALIC ACID ESTERS IN FEEDSTUFFS

VÝSKYT ESTERŮ KYSELINY FTALOVÉ V KRMIVECH

KRÁTKÁ L., JAROŠOVÁ A. 91

MICROBIAL CHARAKTERISTICS OF VEGETABLE JUICES TREATED BY HIGH - PRESSURE PASTEURIZATION

ZMĚNY V MIKROBIÁLNÍM OSÍDLENÍ U ZELENINOVÝCH ŠŤÁV OŠETŘENÝCH VYSOKOTLAKOU PASTERACÍ

KVASNIČKOVÁ B., KALHOTKA L., HIANIKOVÁ M. 92

THE INFLUENCE OF DLS ON THE OESTRUS OF RABBIT DOES

VPLYV DLS NA ESTRUS SAMÍC KRÁLIKA

LADYKOVÁ M., BULLA J., RAFAY J., ONDRUŠKA Ľ. 93

THE INFLUENCE OF AGEING PERIOD TO EDAMS SENZORY QUALITY

VLIV ZRÁNÍ NA SENZORICKOU KVALITU EIDAMŮ

LUŽOVÁ T., NEDOMOVÁ Š., ŠUSTOVÁ K. 94

THE EFFECTS OF ADDING AMARANTH TO FODDER MIXTURE ON SELECTED QUALITIES OF CHICKEN MEATENGLISH TITLE

VLIV PŘÍDAVKU AMARANTU DO KS NA VYBRANÉ VLASTNOSTI KUŘECÍHO MASA

MATOUŠOVÁ Z., NEDOMOVÁ Š., PISAŘÍKOVÁ B., ZRALÝ Z. 95

SCREENING OF STARTER AND PROBIOTIC CULTURES INTENDED FOR PROCESSING OF FERMENTED MEAT PRODUCTS FOR THEIR ABILITY TO PRODUCE BIOGENIC AMINES

SKRÍNING STARTOVACÍCH A PROBIOTICKÝCH KULTUR URČENÝCH PRO VÝROBU FERMENTOVANÝCH MASNÝCH VÝROBKŮ NA SCHOPNOST TVORBY BIOGENNÍCH AMINŮ

SLÁDKOVÁ P., KOMPRDA T., BURDYCHOVÁ R. 96

OPTIMIZATION OF FROZING PERIOD RAW MATERIALS TO PROCESS HEAT UNTREATED MEAT PRODUCTS

OPTIMALIZACE DOBY MRAŽENÍ VSTUPNÍ SUROVINY PŘI VÝROBĚ TEPELNĚ NEOPRACOVANÝCH MASNÝCH VÝROBKŮ

ŠULCEROVÁ H., JAROŠOVÁ A., BURDYCHOVÁ R. 97

Section Plant Biology - Sekce Biologie rostlin

REGULATIONS OF PHOSPHOENOLPYRUVATE CARBOXYLASE FROM SEEDS OF MAIZE AND THEIR POSSIBLE ROLES IN GERMINATION

REGULACE FOSFOENOLPYRUVÁTKARBOXYLASY ZE SEMEN KUKUŘICE A JEJICH MOŽNÝ VÝZNAM PŘI KLÍČENÍ

ČERNÝ M., RYŠLAVÁ H. 101

THE CHANGES OF ABSCISIC ACID LEVEL AND ETHYLENE PRODUCTION DURING TUBER FORMATION OF POTATO (SOLANUM TUBEROSUM L.) IN VITRO

ZMĚNY OBSAHU KYSELINY ABSCISOVÉ A PRODUKCE ETYLENU V PRŮBĚHU TVORBY HLÍZ BRAMBOR (SOLANUM TUBEROSUM L.) IN VITRO

DUNDÁLKOVÁ L., ŠTĚPÁN Z., BRADÁČOVÁ A., KLEMŠ M., VÍTKOVÁ H., FIŠEROVÁ H. 102

MAIZE β-GLUCOSIDASE ZM-P60.1 AND ITS MUTANT FORMS: OPTIMISATION OF PURIFICATION PROCEDURE

OPTIMALISACE PURIFIKACE KUKUŘIČNÉ β-GLUKOSIDASY A JEJÍCH MUTANTNÍCH FOREM

FILIPI T., BRZOBOHATÝ B. 103

UTILIZATION OF *OGU*-INRA HYBRID SYSTEM IN WINTER RAPESEED BREEDING

VYUŽITÍ HYBRIDNÍHO SYSTÉMU *OGU*-INRA PŘI ŠLECHTĚNÍ ŘEPKY OZIMÉ

KOPRNA R., MACHÁČKOVÁ I., HORÁČEK J., EHRENBERGEROVÁ J. 104

THE INFLUENCE OF LONG-TERM ORGANIC FERTILIZERS APPLICATION ON SULFUR CONTENT AND ARYLSULFATASE ACTIVITY IN RAPE RHIZOSPHERE

VLIV DLOUHODOBÉ APLIKACE ORGANICKÝCH HNOJIV NA OBSAH SÍRY A AKTIVITU ARYLSULFATASY V RHIZOSFÉŘE ŘEPKY

KOTKOVÁ B., BALÍK J., NEDVĚD V., ČERNÝ J. 105

EFFECT OF PLANT DEFENSE ELICITORS ON THE LEVEL OF PHYTOHORMONES

VLIV ELICITORŮ OBRANNÉ REAKCE NA HLADINU FYTOHORMONŮ

MAREČKOVÁ M., HAVEL L. 106

FUSARIUM MYCOTOXINS IN THE GRAIN OF BARLEY

FUSARIOVÉ MYKOTOXINY V ZRNU JEČMENE JARNÍHO

MARKOVÁ J., LANCOVÁ K., EHRENBERGEROVÁ J., VACULOVÁ K. 107

IMPROVED METHOD FOR DIRECTED ENZYME EVOLUTION

VYLEPŠENÁ METODA PRO ŘÍZENOU EVOLUCI ENZYMŮ

MAZURA P., BRZOBOHATÝ B., JANDA L. 108

DIFFERENT REACTIONS OF DHN GENES IN PLANTS OF BARLEY EXPOSED TO SHORT/LONGTERM DROUGHT

ROZDÍLNÉ REAKCE DHN GENŮ V ROSTLINÁCH JEČMENE VYSTAVENÝCH NÁHLÉMU A DLOUHODOBÉMU SUCHU

MIKULKOVÁ P., HOLKOVÁ L., CHLOUPEK O. 109

THE CONTENT OF GLUCOSINOLATES IN RAPESEED COTYLEDONS AND PATHOGEN *LEPTOSPHAERIA MACULANS*

OBSAH GLUKOSINOLÁTŮ V DĚLOŽNÍCH LISTECH ŘEPKY OLEJKY OZIMÉ A PATOGEN *LEPTOSPHAERIA MACULANS*

PLACHKÁ E., POKORNÝ, R. 110

THE EFFECT OF INTERACTION BETWEEN LIGHT QUANTITY AND INCREASED LEVEL OF CYTOKININS ON *ARABIDOPSIS THALIANA* SEEDLINGS PHOTOMORPHOGENESIS

VLIV SPOLUPŮSOBENÍ SVĚTELNÉ INTENZITY A ZVÝŠENÉ HLADINY CYTOKININŮ NA FOTOMORFOGENEZI SEMENÁČKŮ *ARABIDOPSIS THALIANA*

REKOVÁ A., BRZOBOHATÝ B. 111

DETECTION OF VIRUS PATHOGENS OF GLADIOLUS IN THE CZECH REPUBLIC BY ELISA

DETEKCE VIROVÝCH PATOGENŮ MEČÍKŮ V ČESKÉ REPUBLICE METODOU ELISA

SELVARAJ G.D., POKORNÝ R. 112

UTILIZATION OF WHEAT AND RYE SSR MARKERS IN TRITICALE

VYUŽITÍ SSR MARKERŮ PŠENICE A ŽITA U TRITIKALE

SLEZÁKOVÁ K., NEVRTALOVÁ E., VYHNÁNEK T. 113

EXPRESSION OF STORAGE PROTEINS IN RELATION TO CONTENT OF ABSCISIC ACID IN DESICCATED PEA ZYGOTIC EMBRYOS IN VITRO

EXPRESE ZÁSOBNÍCH PROTEINŮ VE VZTAHU K OBSAHU KYSELINY ABSCISOVÉ U DESIKOVANÝCH ZYGOTICKÝCH EMBRYÍ HRACHU IN VITRO

SOLNICKÁ P., KLEMŠ M., SLÁMOVÁ Z., MIKUŠOVÁ Z., GRIGA M. 114

CHANGES OF LEVEL OF ENDOGENOUS PHYTOHORMONES AS NEW MARKER OF ENVIRONMENTAL LOADING

ZMĚNY OBSAHU ENDOGENNÍCH FYTOHORMONŮ JAKO NOVÝ UKAZATEL ENVIRONMENTÁLNÍHO ZNEČIŠTĚNÍ

VÁŇOVÁ L., KUMMEROVÁ M. 115

MECHANISM OF REGULATION OF *NICOTIANA BENTHAMIANA* DOMIN GERMINATION

REGULAČNÍ MECHANISMY KLÍČENÍ SEMEN *NICOTIANA BENTHAMIANA* DOMIN

WÜNSCHOVÁ A., BEŇOVÁ V., VLAŠÍNOVÁ H., HAVEL L. 116

Section Animal Biology - Sekce Biologie živočichů

MICROSATELLITE DIVERSITY OF HORSE BREEDS IN CZECH REPUBLIC

DIVERZITA MIKROSATELITNÝCH MARKEROV U PLEMIEN KONÍ V ČESKEJ REPUBLIKE

BURÓCZIOVÁ M., ŘÍHA J. 119

DYNAMIC DEVELOPMENT OF ZOOBENTHOS IN PONDS OF LEDNICE

DYNAMIKA ROZVOJE ZOOBENTOSU LEDNICKÝCH RYBNÍKŮ

HEIMLICH R., SUKOP I. 120

ALLELE FREQUENCY OF KIT GENE ASSOCIATED WITH TOBIANO SPOTTING PATTERN IN PAINT HORSE BREED

FREKVENCE ALEL GENU KIT ASOCIOVANÉHO SE STRAKATOSTÍ TOBIANO U KONÍ PLEMENE PAINT HORSE

CHALUPOVÁ P., DĚDUCHOVÁ V., KNOLL A. 121

HEAVY METAL CONTAMINATION OF FISH FROM MIDDLE COURSE OF THE JIHLAVA RIVER

MONITORING OBSAHU TĚŽKÝCH KOVŮ VE STŘEDNÍM TOKU ŘEKY JIHLAVY

MAKOVSKÝ J., SPURNÝ P. 122

GENETICKÁ ANALÝZA VÝVOJOVÝCH VAD ČÍNSKÉHO CHOCHOLATÉHO PSA

GENETIC ANALYSE OF EVOLUTIONARY DEFECT IN CHINESE CRESTED DOG

NESVADBOVÁ M., DVOŘÁK J. 123

TOXICITY AND GENOTOXICITY OF HALOGENATED ALIPHATIC HYDROCARBONS IN *DROSOPHILA MELANOGASTER*

TOXICITA A GENOTOXICITA HALOGENOVANÝCH ALIFATICKÝCH UHLOVODÍKŮ U *DROSOPHILA MELANOGASTER*

PAVLŮ J., CHROUST K. 124

DETECTION OF SNP IN MSTN GENE OF GASCONNE CATTLE BREED

DETEKCE SNP V GENU MSTN U PLEMENE GASCONNE

STEHLÍK L., DVOŘÁK J. 125

THE CHOICE OF THE MOST SUITABLE TECHNIQUE FOR ISOLATION OF NUCLEIC ACIDS AT DEPARTMENT OF ANIMAL MORPHOLOGY, PHYSIOLOGY AND GENETICS

VÝBĚR NEJVHODNĚJŠÍHO ZPŮSOBU IZOLACE NUKLEOVÝCH KYSELIN NA ÚSTAVU MORFOLOGIE, FYZIOLOGIE A GENETIKY ZVÍŘAT

SVOBODOVÁ K., BÍLEK K., KNOLL A. 126

ANALYSIS OF GENOMIC MARKER CSN2 IN COW'S MILK

ANALÝZA GENOMICKÉHO MARKERU CSN2 V MLÉCE SKOTU

ŠRUBAŘOVÁ P., DVOŘÁK J. 127

FOLLOWING DYNAMIC OF DEVELOPMENT OF WATER INVERTEBRATES ON LOWER REACH DYJE

SLEDOVÁNÍ DYNAMIKY ROZVOJE VODNÍCH BEZOBRATLÝCH DOLNÍHO TOKU DYJE

ŠŤASTNÝ J., SUKOP I. 128

ANALYSIS OF GROWTH HORMONE IN TENCH (*TINCA TINCA*)

ANALÝZA RŮSTOVÉHO HORMONU LÍNA OBECNÉHO (*TINCA TINCA*)

ZRŮSTOVÁ J., BÍLEK K., BARÁNEK V., KNOLL A. 129

Section – Plant Production

Sekce – Fytotechnika

EFFECT OF SULPHUR NUTRITION ON YIELD AND QUALITY OF MALTING BARLEY

VLIV SIRNÉ VÝŽIVY NA VÝNOS A KVALITU SLADOVNICKÉHO JEČMENE

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ABSTRACT

In years 2005 and 2006, effect of sulphur (S) application on yield and malting quality of barley were investigated in a pot experiment. There were 5 variants of applied sulphur: 1. control variant sulphur unfertilised, 2. lower dose of ammonium sulphate (0.2 g/pot), 3. higher dose of ammonium sulphate (0.4 g/pot), 4. lower dose of elemental sulphur (0.2 g/pot), 5. higher dose of elemental sulphur (0.4 g/pot). Three times during the growing season samples of vegetable matter were obtained (in DC 12, 31 and 57) and nutritions state was assessed on the basis of results of complete chemical analysis. In both years, following characteristics were studied: grain and straw yields, protein and starch contents in grain, thousand grains weight and proportion of full grain > 2.5 mm. The only significant difference was ascertained in 2005 in the proportion of full grain > 2.5 mm: the variant fertilised with the higher dose of sulphate sulphur showed a 1.45 % decrease in comparison to the control variant. Sulphur fertilization raised notably content of water-soluble sulphur in soil after the barley harvest. Sulphur applied in the forms of ammonium sulphate and elemental sulphur did not influence the exchangeable pH value significantly.

Key words: malting barley, fertilization, sulphur, yield.

DYNAMICS OF CHANGE OF NUTRITION CONTENT IN DRY MATTER OF WINTER BARLEY BARCELONA AND BABYLONE VARIETES

DYNAMIKA ZMIEN KONCENTRÁCIE ŽIVÍN A POMEROV JEDNOTLIVÝCH ŽIVÍN V SUŠINE NADZEMNEJ BIOMASY JAČMEŇA OZIMNÉHO ODRÔD BARCELONA A BABYLONE

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ABSTRACT

In small- plot nutritional experiments the effect of nitrogen fertilizing on dynamics of nutrition content change was investigating during two experimental years. In autumn constant rate of NPK pure nutrients of 30 kg.N.ha was applied before seeding of winter barley Barcelona and Babylone. There was investigated 4 variants of nitrogen fertilization which were 4 times repeated in the trial. Early in spring regeneration fertilizing of barley was performed using LAD (ammonium nitrate with dolomite) n various rates which were calculated on the basis of inorganic nitrogen content analyses of soil and in advance determined N- levels in soil. During growing season the content of total N and other nutrients in aboveground DM biomass was analyzed in growth stages of tillering, shooting, earning, and wax-milk maturity, respectively.

Concentration of basic makronutrients was decreased during vegetation season. Dry matter in plants was increased during vegetation. Greatest yield 7,31 $t.ha^{-1}$ was in 4. variant.

Key words: nitrogen fertilization, winter barley, dynamics of nutrition yield.

INFLUENCE OF GROWTH STRUCTURE, VARIETY AND YEAR ON NUMBER OF TILLERS AND YIELD OF ORGANICALLY GROWN WINTER WHEAT

VLIV STRUKTURY POROSTU, ODRŮDY A ROČNÍKU NA POČET ODNOŽÍ A VÝNOS U EKOLOGICKY PĚSTOVANÉ PŠENICE

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ABSTRACT

The effects of growth structure, variety and year on grain yield and number of tillers of two winter wheat cultivars (*Triticum aestivum L.*) - Ludwig and Sulamit grown in organic farming were studied in the growing seasons of 2004/05, 2005/06 and 2006/07. The experiment with different types of growth structure (inter-row distances - 125, 250 and 375 mm and sowing rates - 200, 300 and 400 seeds.m^{-2}) was carried out in Praha - Uhříněves. During vegetation period number of tillers and growth stage were observed in every variant in 14-days intervals. After harvest grain yield and TKW (thousand of kernel weight) of each variant from different types of growth structure were evaluated. Grain yield and number of tillers from classical inter-row distance 125 mm (the same sowing rates - 200, 300 and 400 seeds.m^{-2}) in conventional farming was used for comparison. The results of the experiments show that from observed factors the highest effect on grain yield had growth structure (51 %), in which effects of inter-row distance and yield were included. The effects of variety and year on yield were much lower (25 and 24 %). On the other hand effect of year on number of tillers was by far the highest (70-94 %- depending on growth stage). Grain grown under organic farming had statistically lower yield (by 1.87 t/ha) than the conventional one grown in 125 mm inter-row distance. Variances between variants from organic and conventional growing system were caused by different dynamic of tillers formation. Variety Ludwig reached statistically higher yield (by 0.73 t/ha) than Sulamit, because of intervarieties differences in TKW not in numbers of tillers. Reaching the highest yield, the optimal distance between rows in organic farming was 375 mm, where yields increased statistically about 0.25 – 0.3 t/ha in comparison with 125 and 250 mm inter-row distance. Also statistically higher yield was measured, when sowing rate was increased from 200 to 400 seeds.m^{-2}.

Key words: organic farming, winter wheat, growth structure, yield, number of tillers

ROOT SYSTEM SIZE OF WINTER WHEAT VARIETIES IN RELATION TO QUALITY

KVALITA ODRŮD PŠENICE OZIMÉ VZHLEDEM K VELIKOSTI KOŘENOVÉHO SYSTÉMU

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ABSTRACT

Root system size (RSS) is an important part of a plant, but is not clear how great it should be in relation to yield and environment. It can be supposed that RSS is a factor of yield stability because it enables availability of water from the deeper soil layers during dry periods. However, in not dry periods consumes greater RSS more photosynthesis without effect for the plant productivity. RSS was measured by means of its electric capacity in relation to the surrounding soil. Twenty winter wheat varieties on two locations in three terms (shooting, heading, grain filling) were evaluated in 2007. RSS was influenced first of all by the locations (83-86 %), but also significantly by the varieties (8-10%). The RSS of the varieties was also compared with their bakeries quality. The feed varieties had significantly greater RSS than the varieties bread for bread production (classes *E*, *A*, *B*). But superior variety *Akteur* (*E*) had greater RSS in all three terms than was the average RSS of all twenty evaluated varieties. It means, also high quality varieties with great RSS can be developed. However, the results are only preliminary, tracing to only one year´s results.

Key words: Winter wheat, root size system, quality

INFLUENCE OF UNTRADITIONAL ORGANIC FERTILIZERS AND NPK TO PHYTOMASS OF SUNFLOWER

VPLYV NETRADIČNÝCH ORGANICKÝCH HNOJÍV A NPK HNOJÍV NA FYTOMASU SLNEČNICE ROČNEJ

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ABSTRACT

During one year vessel experiment set up on the campus of the SPU in Nitra we have observed the influence of untraditional organic fetilizers (piggy manure fermented by housefly worm and biocompost Veget produced by anaerobic waste conditioning emergent by treatment producing) and NPK to phytomass of sunflower.

The sunflower (variety PR 63A90 - early hybrid) was sown on 16 of April 2007 in amount 7 pieces per vessel. Four plants were used for the experiment. There were investigated four variants witch were 5 times repeated in the trial. During the vegetation one repeating was used for collection of specimens. The dosage of NPK fertilizer was applied by following the volume of N_{un} and availabe P, K in the soil and the demand of NPK for yield planning in amount 3,5 $t.ha^{-1}$. The dosage of N in organic fertilizer was limited by Nitrat.

During the growth of sunflower the plant was visualy evaluaeted, in the variants we observed plants height, stalk thickness, plant weight, gross content of chlorophyll and nitrogen in the plants. On August 31 (130 days) were the sunflowers gathered and the yield of the achenies was measured out.

The aim of this experiment was to compare the efficiency of direct application of the untraditional organic fertilizers for sunflower with NPK fertilizers.

Compare to the non-fertilized variants the improvement of given indicators in variants with organic fertilizers are noticeable. The highest yield of achenies, which is a determining parameter of influence of fertilizers on sunflower´s phytomass, was determinated in NPK manured variant. The reason for this findings is the higher (probably 10 times) volume of unorganic nitrogen in NPK fertilizers in comparison of organic fertilizers. This supports and partly substantiates generaly known fact about the worthiness to nourish the sunflowers with industry fertilizers.

Key words: sunflower, untraditional organic fertilizers, NPK fertilisers

CHANGES OF SPECIES COMPOSITION IN GRASS VEGETATION ASSOCIATION SANGUISORBA-FESTUCETUM COMUTATAE

ZMĚNY DRUHOVÉ SKLADBY TRAVNÍHO POROSTU ASOCIACE SANGUISORBA-FESTUCETUM COMUTATAE

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ABSTRACT

Sample plot is situated to the east from Kameničky, is part of its land register and belongs to protected zone Žďárské vrchy.

The experiment on long-term study of botanical composition of the grassland was established in year 1992. The years 2005 – 2006 and the variants of fertilization (non fertilization, $N_0+P_{30}+K_{60}$, $N_{90}+P_{30}+K_{60}$) are evaluated in this thesis. On the plots with non fertilization, was in harvested fodder 53 % shared herbage, following grasses with 46 % and clovers were present with 1 %. Increasing doses of N fertilization caused strong changes of botanical composition. Herbage decrease presentation to 41 %, grasses contrariwise increase presentation to 59 % and clovers go out from this growth.

Key words: fertilization, grasses, legumes, herbages

DEVELOPMENT AND USING OF SOILCLIM SOFTWARE

VÝVOJ A VYUŽITÍ SOFTWARU SOILCLIM

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ABSTRACT

The main aim of this contribution was to describe and show possible utilization of the SoilClim software which was developed and tested within the Institute for Agrosystems and bioclimatology. This tool was designed in order to determine soil Hydric and Temperature regime and drought probability over a range of climatic and soil conditions. The SoilClim is based on a newly enhanced daily water balance model and incorporates realistically modeled interactions between soil and atmosphere through a dynamical module of vegetation cover. Snow cover simulator and algorithm for estimates of soil temperature in depth 50 cm are also included. Daily values of estimated soil moisture content in both model layers were compared in detail with the observed data on three most productive and in agricultural landscapes frequently appearing soil types: deep grounded chernosem, sandy chernosem and fluvisoil. Evaluation dataset from the period 1998-2005 was provided by lysimeters in Gross-Enzersdorf managed by Federal Office and Research Centre for Agriculture in Vienna. Calibration of SoilClim for Grass cover was carried out due to measurements at Kirchberg and Gumpenstein stations during 2002-2004. Soil temperature model was evaluated using soil temperature series from Doksany (1971-2000).

Consequently the SoilClim was run for sample of 8 sites in the Czech Republic and Nebraska to verify the overall model response within various climate and soil conditions.

The spatial assessment of the soil moisture regime within the Czech Republic was carried out using 125 weather stations where 99 year-long synthetic series resembling 1961-2000 climate of daily temperature, wind, relative humidity, global solar radiation and precipitation sums were available. In order to carry out spatial analysis, the model was run for all combinations of 125 weather stations using 400 different soil units (representing over 1600 individual soil polygons). The results were then interpolated into a 1x1 km grid matrix through locally weighted regression. As reference vegetation cover the spring barley was selected.

As the soil climate regimes are closely linked with key soil processes and also eventual drought impacts such as decrease of crop yields, damage to forest stands or low stream, the tool of this kind has a promising potential for a climate change impact studies as well as drought risk assessments.

Key words: Evapotranspiration, soil moisture and temperature, climate change

SPECIES DIVERSITY OF SCALE INSECTS (COCCOIDEA) IN GREENHOUSES IN THE CZECH REBUPLIC

DRUHOVÁ DIVERZITA SKLENÍKOVÝCH ČERVCŮ (COCCOIDEA) V ČESKÉ REPUBLICE

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ABSTRACT

The aim of this work was primary characteristic of scale insects, historical research and progress of scale insects numbers in greenhouses between 1959-1990 and beginning investigation the present state of scales in greenhouses. Scale insects (Coccoidea) are amongst one of the most unusual insects known. Around 45 species in 7 families occur on ornamental plants in greenhouses in the Czech Republic. The scales are most polyphagous pests, only females cause damage by sucking the sauce from the plants and excrete honeydew, adult males don't ingest feed. Most scales produce a waxy secretion that covers the body as a protective structure before chemical agents. The research on scale insects was started in the Czech lands in the end of the 19th century. Karel Šulc and Leonard Lindinger were the first, who investigated the scales morphology and taxonomy. Jiří Zahradník worked on scale faunistics and morphology from 50th years. He registered 34 species (1 species wasn't documented) up to 1959. Even 36 species were found by the same autor up to 1968 and 43 species (2 species weren't documented) were assigned in different greenhouses up to 1977. Ten families (45 species) of scales were observed in greenhouses on ornamental plants up to nineties of the 20th century: Asterolecaniidae (1 species), Coccidae (6), Diaspididae (25), Eriococcidae (1), Margarodidae (1), Ortheziidae (1) and Pseudococcidae (10). The investigation of scale insects was carried out at various localities of greenhouses in the Czech Republic currently. Eight species belonging to 4 different families have been found in greenhouses between 2006/2007.

Key words: Coccoidea, Czech Republic, pests, greenhouses, ornamental plants

CHANGE OF YIELD AND EVAPOTRANSPIRATION AT PERMANENT GRASSLAND IN CONSEQUENCE CLIMATE CHANGE

ZMĚNA VÝNOSŮ A EVAPOTRANSPIRACE U TRVALÝCH TRAVNÍCH POROSTŮ V DŮSLEDKU KLIMATICKÉ ZMĚNY

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ABSTRACT

Paper presents the evaluation of climate impact (precipitation, temperature, Lang factor and evapotranspiration balance) on permanent grassland yields and evapotranspiration. Černíkovice grassland experiment (CGE) was founded on mesophytic to mesohygrophytic about 35 km south of Prague in 1966. Soil type was fluvisol - gleysol with loamy texture, $pH_{(KCl)}$ 5.0. Depth of underground water table oscillates between 0.1-0.7 m during the vegetation season. The potential climate change impact on the permanent grassland was also researched for target year 2050 based on two different climate change scenarios of Hadley Center global circulation model and stochastic weather generator LARS-WG. Time series covering the period 1961 – 2005 were reconstructed taking into account the distance of rain gauge for computing precipitation time series, while for temperature and air pressure the elevation correction was made.

Results showed that researched mesophytic and mesohydrophytic localities hadn't the direct relation between the climate characteristics and yields, however climate conditions are limiting factor for summer yields especially, what is more significant for nutrition donated treatments. Climate change simulation proved the increasing occurrence of extreme summer climate condition similar or more severe as those of 2003. Also the probability of extreme condition repeating in consecutive years will increase significantly during 21st century. Based on the results the estimate of average yields reduction by 5 to 50 % depending on climate change scenario and N nutrition of the grassland was made. With mouthing average temperature (°C) will to growth potentional evapotranspiration in permanent grassland but it will decrease about LAI.

Key words: permanent grassland, climate, yield, climate change

BALANCE OF NUTRIENTS IN INTEGRATED AND ECOLOGICAL FARMING SYSTEM

BILANCIA ŽIVÍN V INTEGROVANOM A EKOLOGICKOM SYSTÉME HOSPODÁRENIA NA PÔDE

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ABSTRACT

A small-plot experiment was investigated in years 2002-2004 at the SPU Nitra- EXBA Dolná Malanta under the project VEGA no. 1/8089/02. Balance of nutrients (N, P, K) was investigated on loamy brownsoil under integrated (IS) and ecological (ES) farming system within six-field crop rotation. Crop rotation of IS and ES are shown in table no.1. Crops used in the experiment are follows: winter wheat, spring barley, pea, lucerne, corn silage, horsebean with lucerne. In both farming systems was 2 variants: non fertilized and fertilized. On fertilized variant in ES was applied only organic fertilizers (manure) and on fertilized variant in IS was applied not only organic fertilizers, but also artificial fertlizers. Fertilization was performed on the basis of soil and plant analyses using balance method. Inputs to the both systems were by seed, by organic and artificial fertlizers, by symbiotically and asymbiotically fixation of nitrogen, by rain deposit. Outputs from both systems were by yield of crops and by egestion of nitrogen. Except balance of nutrients was also calculated a percentage of nutrients substitution, that means percentage of inputs from outputs. Inputs and outputs by the elements and nutrient balance in IS and ES are shown in table no.2 and no.3.

Deficit of nitrogen in IS represented 7,4 kg. $N.ha^{-1}. yr^{-1}$ on fertilized variant, that is substitution of this element reached level of 95,9 %. At the same variant deficiency of P and K was 10,4 kg. $P.ha^{-1}. yr^{-1}$ and 122,6 kg. $K.ha^{-1}. yr^{-1}$ and its substitution amounted 69,9 and 31,9 % respectively.

As far as the fertilized variant of ES is concerned deficit of N, P and K represented 40,8; 18,3 and 144,5 kg. $ha^{-1}. yr^{-1}$ respectively and their respective substitution achieved level of 77,2; 28,5 and 21,9 %.

By the balance of nutrients was established a deficiency of all investigated elements in both framing systems. In ES deficiency was higher in most of the event that in IS. The highest deficiency in both farming systems was the deficit of potassium and the lowest was the deficit of nitrogen.

Key words: farming system; balance of nutrients; nitrogen; phosphorus; potassium

THE CLIMATE NICHES OF COLORADO POTATO BEETLE AND POTATO LATE BLIGHT IN CENTRAL EUROPE IN 2050

DOPADY ZMĚNY KLIMATU NA KLIMATICKOU NIKU MANDELINKY BRAMBOROVÉ A PLÍSNĚ BRAMBOROVÉ VE STŘEDNÍ EVROPĚ V ROCE 2050

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ABSTRACT

This study is focused on the most important potato pest i.e Colorado potato beetle (*Leptinotarsa decemlineata,* Say 1824) and also disease that have lead to severe potato yield collapses in the past i.e. Potato late blight (*Phytophtora infestans*, de Bary 1876). The aim was to develop models allowing the assessment of the CPB possible spread and risk of the early outbreaks or increases in the intensity of PLB both under the climate change. For the estimation of the CPB occurrence in expected climate conditions there was used a dynamic model CLIMEX that enables to determine the suitability of a given location climate for the pests survival and infestation capability based on known pests requirements to climate conditions. As a tool for the assessment of the PLB outbreak and the number of infectious days was invoked the CLIMEX supplementary tool DYMEX. Following the validation and calibration of the model input meteorological data were altered according to three Global Circulation Models (ECHAM4, HadCM3, NCARPCM) that were driven by two emission scenarios (A2, B1) with two assumed levels of climate system sensitivity for period 2050. Model output, for current and expected climate conditions, were visualized by GIS (Geographical Information Systems) using a digital landscape model. Under all climate change scenarios we noted marked shift of pests' potential niche to higher altitudes and change in infestation pressure of both evaluated species.

Key words: CLIMEX, DYMEX, Colorado potato beetle, Potato late blight, climate change

ARGYRESTHIA THUIELLA AND A. TRIFASCIATA (LEPIDOPTERA: YPONOMEUTIDAE) – BIONOMICS AND CONTROL POSSIBILITIES

MOLOVKA ZERAVOVÁ A M. JALOVCOVÁ (LEPIDOPTERA: YPONOMEUTIDAE) – BIONOMIE A MOŽNOSTI REGULACE

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ABSTRACT

Argyresthia thuiella (Packard, 1871) and *A. trifasciata* (Staudinger, 1871) have been studied in the park of Lednice and in the arboretum of Nový Dvůr. *Argyresthia thuiella* overwinters as caterpillar in branchlets, it pupates in spring there. Moths fly from the last decade of Mai up to the second half of June. Caterpillars of *Argyresthia trifasciata* pupated in autumn 2006 out of branchlets. Moths were on wings from the middle Mai to the middle June. *Argyresthia thuiella* was registered in *Thuja occidentalis* and *T. plicata, Argyresthia trifasciata* in *Juniperus communis*, *J. sabina*, *J.* × *media*, *J. squamata*. *Chamaecyparis* species were not attacked. Mospilan and Dimilin applied at the end of June was the most effectivest against *Argyresthia thuiella*. Mospilan applied at the end of June was the most effectivest against *Argyrestia trifasciata*.

Key words: pests of ornamental trees, *Argyresthia trifasciata*, *A. thuiella*

GREEN MASS OF BARLEY PLANTS AS A SOURCE ANTIOXIDANT ENZYMES

ZELENÁ HMOTA ROSTLIN JEČMENE JAKO ZDROJ ANTIOXIDAČNÍCH ENZYMŮ

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ABSTRACT

The topic of this study consisted in chemist research of green parts of young barley plants in the different growth phases, in light of enzyme catalase activity. The aim of our work was to choose the optimal material of barley for growing and subsequent processing. We dealt with problems of machine-made harvest of green matter.

In the organism, enzyme catalase protects cells against the toxic effect of a higher concentration of hydrogen peroxide by cleaving to water and oxygen. On our three-year research we evaluated activity of enzyme catalase in barley grass. We used spring two-row barley varieties *Sebastian*, *Malz* and the line *KM1910*, grown in 2005-2007 in plots of MUAF in Žabčice and Agrotest Kroměříž, under restricted chemical inputs. Analytical determination of enzyme catalase were carried out in two samplings. Barley green matter was taken in defined growth phases, as described by the decimal code (DC) scale: sampling I at growth phase DC29 and sampling II at phase DC31. In the year 2006 juice was made from the biomass of the variety *Sebastian* (DC31, Žabčice). Then the obtained product (juice) was analyzed.

To determine the activity of catalase enzyme we used the photometric method based on measurement of the decrease in absorbance at hydrogen peroxide cleaving, the difference measured for a time unit is a measure of catalase activity. Mentioned analyses we performed in the Brewing and Malting Research Institute in Brno. Catalase activity is expressed in $U.g^{-1}$ dry matter. Samplings, localities and years had very highly significantly effect on catalase activity. No significant effect was found in average catalase activity between the line *KM1910* (718 $U.g^{-1}$) and variety *Sebastian* (684 $U.g^{-1}$), but variety *Malz* showed significantly lower rate (631 $U.g^{-1}$). Average values (involving all factors) obtained from single localities embodied no statistically significantly difference. Green matter from sampling I– DC29 had significantly higher activity of catalase (854 $U.g^{-1}$) than sampling II– DC31 (503 $U.g^{-1}$).

Key words: green barley, green matter, barley grass, catalase, antioxidants

EFFECT OF MULCHING ON THE DOMINANCE OF IMPORTANT PLANT SPECIES IN THE STAND

VLIV MULČOVÁNÍ NA DOMINANCI VÝZNAMNÝCH ROSTLINNÝCH DRUHŮ V POROSTU

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ABSTRACT

In 1999, an experiment was established in the Vatín research station to study emergence of sown clover-grass stand (*Festuca rubra* 40%, *Festuca ovina* 30%, *Poa pratensis* 25% and *Trifolium repens* 5%) managed by four methods: (1) mulching once a year, (2) mulching three-times a year, (3) mowing three-times a year with the removal of phytomass, and (4) unmanaged. Research results from 2000-2006 demonstrated that the representation of individual species in the stand is greatly affected not only by the management method but also by the frequency of cuts. This is given by the closed cycling of substances in mulched stands; the frequency of cuts was then shown to considerably affect light conditions in the stand. As to individual plant species the research results were as follows:

Fescue sp. dominance is most conspicuous in the unmanaged stand in which its average representation amounted to 85.9%. In contrast, the species was severely suppressed by mulching with its proportion in the stand with mulching three-times a year ranging from 47-81%.

The share of meadow-grass was highest in the variants with mulching. In stands both harvested for hay and left unmanaged its representation fell to 4% and 7%, resp. as compared to 13% in the two mulched variants, which resulted from the insufficient supply of nutrients into the stand.

White clover exhibits a generally decreased representation, and the species did not occur at all in the unmanaged variant. It did best in the variant with the frequent mowing and phytomass removal in which its average share was maintained at 7%.

The share of common dandelion was increasing in all variants with an exception of the unmanaged stand with the greatest increase of its representation being observed in the variant with three mulchings per year, which increased from 0.3% in 2002 to 11.7% in 2006.

Key words: grassland, mulching, cut, species dominance

EFFECT OF SOWINF RATE ON YIELD OF HYBRID WHEAT

VLIV VÝŠE VÝSEVKU NA VÝNOS HYBRIDNÍ PŠENICE

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ABSTRACT

In contemporary agriculture there are ever more used hybrid cultivars of different field crops. Hybrid wheats usually reach higher yields in comparison with conventional cultivars, but have many differences in yield fomration, in quality, in environmental conditions requirements and growing technologies. These cultivars could be after verification under conditions of CR used in non-food area and also in food area.

The aim of this work was to investigate influence of seed rate (100, 200, 300, 400 of germinating grains per m^2) and growing intensity (total nitrogen dose of 100, 150 and 200 kg $N.ha^{-1}$, different level of plant protection) on winter wheat hybrid cultivars yield (Hybred, Hynomonta) and control yield (Biscay). Field experiments were established during 2006/2007 at experimental station of Czech University of Life Sciences. The highest yields were reached in both hybrid cultivars with seed rate of 200 germinating grains per m^2. Cultivar Hybred reached the highest yield (8,9 $t.ha^{-1}$) with total nitrogen dose of 150 kg $N.ha^{-1}$. Cultivar Hynomonta reached the highest yield (8,5 $t.ha^{-1}$) with total nitrogen dose of 200 kg $N.ha^{-1}$. With higher seed rates yields of hybrids decreased by 5-9%. Control wheat cultivar Biscay reached the highest yield 8,3 $t.ha^{-1}$ with seed rate of 400 germinating grains per m^2 and total nitrogen dose of 200 kg $N.ha^{-1}$.

Key words: wheat hybrid varieties, grain yields, seed rate

EFFECT OF COMBINED CHLORIDE FREE FERTILIZER „DUSLOFERT EXTRA 14-10-20-7S“AT GRAPE-VINE GROWING IN VINECULTURE REGION OF TOKAJ

ÚČINNOSŤ BEZCHLORIDOVÉHO KOMBINOVANÉHO HNOJIVA „DUSLOFERT EXTRA 14-10-20-7S“ PRI PESTOVANÍ VINIČA HROZNORODÉHO VO VINOHRADNÍCKEJ OBLASTI TOKAJ

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ABSTRACT

The nutritional experiment with application of N, P, K, S, Mg nutrients on the cultivars of Furmint was established in locality Malá Tŕňa of Tokaj vineculture region. Agrechemical soil analysis showed slight acid to acid reaction, content of N_{an} was medium, content of phosphorus very low, content of available potassium, calcium, sulphur and zinc was low to medium, content of manganese was medium to high, content of magnesium, iron and copper was good to high, and content of humus was low to medium.

On the experiment was established 6 diffrent variant of the trial and the best economical parameters with cultivar Furmint were achieved under the application of 100 kg nitrogen per hectar plus respective amount phosphorus, potassium and sulphur in the form of chloride-free of NPKS fertilizer. In this case, increment of yield in comparison to non-fertilized control represented 24,3 % and increase of profit in consequence of this combination of fertilizers aplication represented 22.439,- Sk.

Key words: grape- vine, macronutrients, micronutrients

THE CHEMICAL PROPERTIES OF THE TOPSOIL AND SUBSOIL AND THE INFLUENCE OF THIS CHANGES ON CROP AND QUALITY OF THE SUGAR BEET

VLIV CHEMICKÝCH VLASTNOSTÍ ORNICE A PODORNIČÍ NA VÝNOS A KVALITU CUKROVKY

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ABSTRACT

In this graduation, I assisted in measuring the influence of differences in agricultural engineering (tillage, stubble under-ploughing, soil loosening) on the chemical properties of the topsoil and subsoil,and the influence of this changes on crop and quality of the sugar beet. The monitored characteristics were: the quality and volume of humus, soil reaction, cation exchange capacity, total content of nitrogen, content of phosphorus and the contents of changed basics (K,Ca,Mg). The parameters haved been acquired during one year of monitoring (2006), under semi-functional circumstances, on the property of farming company Doubrava spol. s r.o., based in Zahnašovice, region Kroměříž. The parcel, used for the tests, was registered on 20.10.2005 in the land register of the village Ludslavice. The name of the parcel was Niva. The last product was corn *Tritium Aestivum*. Soil: black soil,type Luvic soil.

After one year monitoring was statistical demonstrated :

Tillage has been evidential, alternately, statistically proved ,as being the most positive influence on the chemical properties. Especially the quality of humus, and the content of P, K and Mg. Loosening the soil has been, evidential, the best variation, influencing the content of cation exchange capacity in the topsoil, and the content of P in the subsoil. On the contrary, the influence on the quality of humus was unfavourable. Stubble under-ploughing is statistical, evidential, the worst variation. It has had negative influence on almost all chemical properties.

The influence of each variant, in the tests, on the crop of the sugar beet was:

The soil loosening has surely been the best influence on the crop and quality of the sugar beet. It produced 7% more roots, 4% higher sugar content and 6% more crop, per acre, of these white goods, in relation to the worst variation in these tests. Tillage has been the average variation, but in sugar content this varation has been the lowest. Stubble under-ploughing is the worst variation for the preparation of the soil. It gave the lowest crop of roots and white goods. But the sugar content has been the highest one (as with soil loosening).

Key words: beet, soil, humus, soil reaction, cation exchange capacity, nitrogen

CONTENT OF NITROGEN AND CARBON IN HOT WATER EXTRACTION DEPENDING ON DIFFERENT SYSTEMS OF FERTILIZATION

OBSAH DUSÍKU A UHLÍKU V EXTRAKTU HORKOU VODOU V ZÁVISLOSTI NA RŮZNÝCH SYSTÉMECH HNOJENÍ

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ABSTRACT

Our objective was to follow the effects of different fertilization systems on nitrogen balance and content of hot water extractable carbon and nitrogen in long-time experiments (1997-2005) with rotation of potatoes, wheat and barley at location Humpolec in Czech Republic. The use of organic fertilization (sewage sludge, manure, barley straw) and mineral nitrogen fertilization were studied. It was used method of hot water extractable carbon and nitrogen. Average dry matter yield for the control without fertilization in the period 1997-2005 was 2.93 t of dry matter per ha of barley grain and 2.46 t of straw. Average nitrogen uptake by barley grain and straw for the control was 61.9 kg $N.ha^{-1}$ and 70.1 – 98.1 kg $N.ha^{-1}$ for fertilization treatments. Control treatment had a negative balance of N and it was -713 kg $N.ha^{-1}$. All treatments with organic fertilizers had positive balance of N. Treatments N and N+straw had negative balance of N and it was -258 and -136 kg $N.ha^{-1}$. The changes in the nitrogen regime of soil were characterized by the content of extractable nitrogen and carbon in hot water extraction.

Key words: hotwater extraction, longterm field experiment, N fertilizers, sewage sludge, N balance

THE INFLUENCE OF CONTROL MANAGEMENTS AGAINST EUROPEAN CORN BORER (*OSTRINIA NUBILALIS*) ON APHIDS AND THEIRS NATURAL ENEMIES IN MAIZE STANDS

VLIV TYPU OCHRANY PROTI ZAVÍJEČI KUKUŘIČNÉMU (OSTRINIA NUBILALIS) NA POPULACE MŠIC A JEJICH PŘIROZENÝCH ANTAGONISTŮ V POROSTECH KUKUŘICE

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ABSTRACT

Over periods of July to September 2005, 2006 effect of the biological pest control (effective organism – Trichogramma sp.) and chemical control (effective substance methoxyfenozide, in 2006 additional carbosulfan) against European corn borer on non-target species were evaluated in maize stands. Evaluation has been done approximately 8 km south from Brno (Moravia, Czech Republic). These aphids and theirs natural enemies were recorded in monitored fields (located in South Moravia, Czech Republic): *Rhopalosiphum padi*, *Sitobion avenae*, *Metopolophium dirhodum* (Hemiptera, Aphididae) parasitoids of genus *Aphidius* and *Praon* (Hymenopetra, Aphidiidea), predatory syrphid flies (Diptera, Syrphidae), ladybirds *Coccinella septempunctata*, *Propylea quatuordecimpunctata, Adalia bipunctata* (Coleoptera, Coccinellidae), Orius bugs (Heteroptera, Anthocoridae), Green Lacewing – *Chrysoperla carnea* (Neuroptera, Chrysopidae) and spiders (Araneida).Non-target species populations were evaluated seven times on two variants (biological and chemical) in 2005. Each variant included 100 maize plants. In 2006 were eight evaluations on three variants and each variant included 40 maize plants. Data were statistically processed by RDA and CCA gradient analysis in Canoco software. There was not found significant difference between variants in 2005 (T= 0.003, F = 4.894, P = 0.004). More remarkable differences in these populations were found only soon after spraying with Integro. These differences were probably caused by spraying Integro. Differences between numbers of aphid natural enemies in these two variants were continuously balanced during another time of evaluation. Environment in biological variant Trichoplus was found favorable for most species in 2006. On the other hand environment in chemical variant (methoxifenozide) was found favourable only for one species (T = 0.059, F = 7.608, P = 0.001).

Key words: maize, corn, aphids, natural enemies, insecticide, biological control, chemical control, non-targed species, European corn borer, natural enemies

IMPACT AFTER APPLICATION OF VARIOUS SULPHUR ON YIELD AND QUALITY OF MEADOW FORAGE

VLIV APLIKACE RŮZNÝCH FOREM SÍRY NA VÝNOS A KVALITU LUČNÍ PÍCE

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ABSTRACT

The effect of various forms of sulphur fertilizers on the yield and quantitative parameters of meadow forage was studied during a three-year vegetative experiment. The following variants were used: 1. sulphur-unfertilized control, 2. ammonium sulphate, 3. elementary sulphur, 4. gypsum and 5. elementary sulphur folia.

All forms of sulphur were applied yearly in the beginning of vegetative season in the amount of 40 kg of sulphur per hectare. Two cuttings were made during the vegetative season. The yield of dry mass content of grass forage, nutrient content, nitrogen compound content and the net lactation energy were monitored. The agrochemical qualities of soil were monitored after the second cutting.

In sulphur fertilizing there was not detected any significant effect on the yield increase. Sulphur content in dry mass of grass forage was gradually increasing during the studied years. In all other macro elements (N, P, K, Ca, Mg), no significant changes were observed. The highest nitrogen compound content and the net lactation energy were achieved in the variant fertilized with elementary sulphur.

The highest sulphur content in soil as well as in the plant mass was detected in the variant fertilized with gypsum.

Key words: meadow forage, sulphur, yield, quality

STRUCTURE OF TURF SOD ON GREEN AND RELATIONSHIP TO WATER CIRCULATION

STRUKTURA TRAVNÍHO DRNU JAMKOVIŠTĚ A VZTAH KE KOLOBĚHU VODY

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ABSTRACT

In this presentation there are reported research results regarding aerial and underground biomass structure in golf putting green. Experimental works have been implementing since 2006 on model putting green in botanical garden and arboretum MZLU Brno. Turfs are being regularly watered. Turf is nourished in 7 shots during a year, which contents 31g N/m^2, 6 g P_2O_5/m^2, 20 g K_2O/m^2 a 4 g MgO /m^2. There are presented differences in sod structure in two types of green: Golf green1, which has been founded by direct seeding of Agrostis stolonifera 100%; golf green2, which has been founded by direct seeding with grass seed mix, which consists of 40% of Festuca rubra commutata, 40% of Festuca rubra trichophylla and 20% of Agrostis tenuis. Taking of samples was made with soil pit of size 20 x 100 x 200 mm. A root biomass sample was took off each plot, which was further being stratificated to 0-20mm and 21-200mm layers. The height of cut before sampling was 10mm. Terms of assessment were on spring 18.4.2006 and on autumn 10.10.2006. The total weight of Golf green1 biomass sod increased from 670 g.m^{-2} in spring to 1213,7 g.m^{-2} in autumn, grow was +81,1 rel.%. The total weight of Golf green2 biomass sod increased from 493,75 in spring to 1045 g.m^{-2} in autumn, grow was +111,6 rel.%. The part of aerial biomass in spring was 62.7%, the same for both greens. In autumn it was for G1 42.5% and for G2 60.4%. In autumn was the growth of aerial biomass of Golf green formed by A.s. in comparison with spring higher by 23.6% and by 106.1% for Green 2.

Key words: green, biomass weight, sod structure

Section – Animal Production

Sekce – Zootechnika

COMPARISON OF TWO WEANING METHODS OF JUVENILE PIKEPERCH (*SANDER LUCIOPERCA*) FROM NATURAL DIET TO COMMERCIAL FEED

SROVNÁNÍ DVOU METOD PŘEVODU JUVENILNÍHO CANDÁTA OBECNÉHO (*SANDER LUCIOPERCA*) Z PŘIROZENÉ POTRAVY NA KOMERČNÍ KRMIVO

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ABSTRACT

The aim of our experiment was comparison of two weaning methods of juvenile pikeperch: direct (variant A, dry feed without natural food) and combined (variant B, co-feeding of dry feed and frozen chironomids). Six thousand individuals of juvenile pikeperch with mean initial total length (TL) 38.61 ± 2.40 mm, weight (W) 0.45 ± 0.08 g and condition factor (K) 1,34 ± 0,13 (n = 100, average ± SD) from pond were randomly distributed into six plastic tanks in the recirculation system. After 21-day rearing period, the weaning success was evaluated. In the variant B there was achieved significantly higher ($p<0,007$) survival (58.37%) in comparison with the variant A (27.87%). However, some fish in the variant B preferred only chironomids and did not intake any dry feed. TL of these fish was only 48.23 mm, W 0.76 g and K 1.08. By comparison of successfully converted fish there was not found any significant difference between variants (A - 27.87 % and B - 25.13 %). In values of specific growth rate (SGR), weight (W) and condition coefficient (K) there was not found any significant difference too (A - 7.70%.d^{-1}, 2.28 g and 1.40 respectively, B - 8.06%.d^{-1}, 2.47 g and 1.40 respectively). On the basis of achieved results it is possible to recommend method of direct conversion for use in fishery practice.

Key words: pikeperch, weaning, growth, survival, chironomid larvae, intensive conditions

THE EFFECT OF LOWERED LEVEL OF MANGANESE AND ZINC IN ORGANIC AND INORGANIC FORM ON CHICKEN GROWTH

VLIV SNÍŽENÉ DÁVKY ORGANICKY A ANORGANICY VÁZANÝCH MIKROPRVKŮ Zn A Mn NA RŮST KUŘAT

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ABSTRACT

The aim of the study was to evaluate the effect of lowered level of Mn and Zn in organic and inorganic form on chicken growth. The broiler males Ross 308 were divided into five groups in the age 10 days. They fed the same mixture only with different content of Mn and Zn in the premix. Group 1 had 80 mg Zn and 100 mg Mn per kg of premix in inorganic form (ZnO and MnO). Group 2 had 40 mg Zn and 50 mg Mn per kg of premix in inorganic form (ZnO and MnO). Group 3 had 40 mg Zn and 50 mg Mn per kg of premix in organic form (chelates). Group 4 had 20 mg Zn and 25 mg Mn per kg of premix in organic form (chelates). Group 5 had no added Mn and Zn in the premix. The lowest intensity of growth was found in the group 5 and the highest in the group 4. With lowering content of Mn and Zn in the mixture the content of these microelements decreased significantly ($P<0.05$) in the feaces.

Key words: manganese, zinc, chicken growth

PRODUCTION EFFECT OF DIFFERENT COMMERCIAL FEEDS ON JUVENILE TENCH (TINCA TINCA) UNDER THE INTENSIVE REARING CONDITIONS

PRODUKČNÍ EFEKT KOMERČNĚ VYRÁBĚNÝCH KRMNÝCH SMĚSÍ PŘI ODCHOVU JUVENILNÍHO LÍNA OBECNÉHO (TINCA TINCA L.) V KONTROLOVANÝCH PODMÍNKÁCH.

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ABSTRACT

The aim of feeding test, performed at tench fingerling (Tinca tinca) with initial individual weight of 69,41 mg, was to evaluate the production effect of three commercialy feeds (Dan Ex 1352, Karpico Crumble Excellent Ex and Brutfutter) with differentiated level energy and protein. Main monitored indices were – survival rate (%), individual body weight (mg) and growth rate (SGR, %.d-1). Dan Ex 1352 – 98,6 %, 400,74 mg, 4,17 %.d-1; Karpico Crumble Excellent Ex – 97,5 %, 378,06 mg, 4,04 %.d-1; Brutfutter – 99,1 %, 483,38 mg, 4,62 %.d-1.

Key words: tench, feeding test, intensive aquaculture, juvenilie rearing

EVALUATION INFLUENCE STRESS – SENSIBILITIES BOARS BREEDING PIETRAIN TO FRAGMENTARY INDICES CARCASS VALUES CROSSBREED PIGS

VYHODNOCENÍ VLIVU STRESCITLIVOSTI KANCŮ PLEMENE PIETRAIN NA DÍLČÍ UKAZATELE JATEČNÉ HODNOTY FINÁLNÍCH HYBRIDŮ PRASAT

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ABSTRACT

The aim was to quatifity influence of boars genotype in RYR1 gene on carcass values of final hybrids. The amout of 597 pigs (391 barrows and 296 gilts) from crosses breeding (Czech Large white x Czech Landrase) x Pietrain (homozygous halothane dominant – NN, heterozygous – Nn and homozygous recessive – nn), fatten up in common conditions of large capacity pig – farm was slaughtered, weighted and measured and evaluated by FOM applience. According to boars (fathers) genotype in RYR1 gene slaughter pigs were sorted out in groups of homozygous dominant genotype, heterozygous genotype and homozygous recessive genotype. The heaviest carcass reached pigs with homozygous recessive genotype (nn). The heighest carcass lenght reached pigs with heterozygous genotype and the lowest value of pH_1 at the same time. The differences between these qualities among particular groups were statistically significant. The results suggest possibilities of use prober boar genotype to produce quality slaughter pigs.

Key words: pig, pietrain, RYR1, carcass value, meat quality

EFFECT OF DIFFERENT WATER HARDNESS ON GROWTH, SURVIVAL AND SWIM BLADDER INFLATION OF PIKEPERCH (*SANDER LUCIOPERCA*) LARVAE

VLIV RŮZNÉ TVRDOSTI VODY NA RŮST, PŘEŽITÍ A NAPLŇOVÁNÍ PLYNOVÉHO MĚCHÝŘE U LAREV CANDÁTA OBECNÉHO (*SANDER LUCIOPERCA*)

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ABSTRACT

The aim of this study was to compare influence of different water hardness on growth, survival and swim bladder inflation of pikeperch (*Sander lucioperca*) larvae, during 3 – 16 day post hatch (DPH). The larvae were divided in 30 l green plastic tanks with three different initial water hardness (A – 174.85, B – 114.90 and C – 59.95 $mg.l^{-1}$ $CaCO_3$). Each of treatment had three replicates. The larvae were fed only with *Artemia* nauplii. In the end of the experiment, there was observed the highest survival in the variant A (60.95%), which was significantly ($p < 0.05$) than in the variant B (33.84%), and higher than in the variant C (40.77%). Average TL, SL and W of fish in the variant A were significantly different than in variants B and C ($p < 0.05$).

Key words: pikeperch larvae, water hardness, growth, survival, swim bladder inflation

COMPARISON OF INFLUENCE OF ORGANIC AND ANORGANIC ZINC SULEMENTATION FORM ON LABORATORY RATS GROWTH

POROVNÁNÍ VLIVU ANORGANICKÉ A ORGANICKÉ FORMY DOPLŇKU ZINKU NA RŮST LABORATORNÍCH POTKANŮ.

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ABSTRACT

Our objective was to follow the effects of anorganic and an organic zinc source on laboratory rats growth intensity. There were used 80 male rats in growth experiment. Animal were sorted to 4 groups. Groups were different in sources of Zn – experimental groups with organic zinc (commercial producers 3 different products) and in control group was used ZnO. Content of zinc in feed mixtures were on the same level (12 mg/kg of feed mixture).

Experimental animals were kept in vivarium with regulated air temperature (in range 23 ± 1°C), photoperiod (managed artificially according to scheme 12 hours day: 12 hours night with maximal intensity 200 lx), and continual air humidity at level of 60 %. From chemical conditions was limited CO2 content in stable air – max. 0.25 % and NH3 content – max. 0.0025 %).

Tempered feed mixtures and drinking water were accessible ad libitum, feed consumption was monitored in groups. Animals were entered in age of 28 days.

Key words: rat, growth, zinc

THE EFFECT OF FEEDING MIXTURE CONTAINING LINSEED OIL ON CONTENT OF FA IN POULTRY MEAT

VLIV ZKRMOVÁNÍ SMĚSI OBSAHUJÍCÍ LNĚNÝ OLEJ NA OBSAH MASTNÝCH KYSELIN V DRŮBEŽÍM MASE

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ABSTRACT

Linoleic acid (LA) and α-linolenic acid (LNA) are essential fatty acids. The first is starting metabolite of n-6 polyunsaturated fatty acids (PUFA) and the second of n-3 PUFA. Recommended ratio of n-6/n-3 PUFA for good health is 1 : 1, but this ratio in diet of population of developed countries is usually 10 – 25 : 1. Poultry products with high content of n-3 PUFA could be alternative source of these fatty acids (FA). In our experiment with 48 male broiler chickens Ross 308 of the age from 25 to 40 days was studied the effect of feeding linseed oils with considerably different ratio of n-6/n-3 PUFA on content of FA in chicken meat. Used were oils made either of seeds of the cultivar Lola (L) with a high content of linoleic acid (708 g/kg) or of the cultivar Atalante (A) with a high content of α-linolenic acid (612 g/kg). Breast meat contained significantly ($P<0,05$) higher level of proteins and significantly ($P<0,05$) lower level of fat than thigh meat. Chicken meat in A group contained significantly ($P<0.01$) higher level of LNA and lower LA than L group. Ratio of n-6/n-3 PUFA was significantly ($P<0.01$) wider in L group, it was 10.06 than in A group, it was only 0.94 in breast meat.

Key words: chickens, linseed oil, fatty acids

DYNAMIC OF FATTY ACID SPECTRUM CHANGES IN COMMON CARP MUSCLE DURING INTENSIVE REARING

DYNAMIKA ZMĚN SPEKTRA MASTNÝCH KYSELIN SVALOVINY KAPRA OBECNÉHO BĚHEM INTENZIVNÍHO ODCHOVU

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ABSTRACT

There was hold a feeding test with common carp fingerling (*Cyprinus Carpio L.*) in the autumn of 2006. The aim was find out knowledge about dynamic of fatty acid spectrum changes and fatty acids content in fishes muscles. The experiment was made at Department of fishery and hydrobiology MZLU in Brno. The carp fingerling was imported just from pond and located in the basin. There where acclimatized to conditions of experimental basin (temperature 21°C, pH 7,85). Fish where fed by commercial feed DAN-EX 1344. Feeding ratio was 1-1,5% of weight of fishes.

The fatty acids spectrum in the feed significantly induced fatty acid spectrum experimentally fish muscles. On the end of experiment the fish meal contented 1,9-2,5- fold of polyunsaturated fatty acid EPA and DHA. The content of n-6 fatty acids decreased and the n-3 fatty acid content grew gradually during test. This was very important and positive for bilateral proportion of those values n-3/n-6 fatty acids (this argument was 1,449 in the 7th week of experiment).

Key words: fatty acid, common carp, intensive rearing,

DYNAMIC VISCOSITY OF THE STALLION EJAKULATE

DYNAMICKÁ VISKOSITA EJAKULÁTU HŘEBCŮ

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ABSTRACT

The aim of our experiment was to find relation between the dynamic viscosity of the ejaculate with the qualitative parameters of the ejaculate.

The investigations involved 12 clinically healthy stallions. During the five consecutive weeks of ejaculate collections the quantitative parameters and dynamic viscosity were determined. The obtained values of qualitative sperm indicators their electric properties were interpreted by statistical methods (x, s_x, min. max.). The differences between two means were tested by the t-test. The closeness of the correlations between the respective indicators of ejaculate quality and their dynamic viscosity were interpreted by means of the calculated phenotype correlations.

Calculations of phenotype correlations didn't reveal any statistically significant correlations between the dynamic viscosity of the stallion ejaculate and qualitative parameters.

Key words: stallion, ejaculate, viscosity

INFLUENCE OF STAGE OF LACTATION ON THE TECHNOLOGICAL PROPERTIES OF SHEEP MILK AND ON RENNET CURD QUALITY

VLIV LAKTAČNÍ FÁZE NA TECHNOLOGICKÉ VLASTNOSTI OVČÍHO MLÉKA A NA JAKOST SÝŘENINY

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ABSTRACT

The study was conducted during lactation season 2007 on organic farm in Valašská Bystřice. The observation was carried out on 10 ewes, F_{112} crossbreeds of Lacaune (L), East Friesian (EF) and Improved Wallachian (IW) (L 50 EF 37.5 IW). Ewes were on the 3rd lactation. Ewe milk samples were taken five times during lactation season in periodic intervals: May, June, July, August, and September. Milk samples were taken for each ewe on test days during the morning milking. After milking, samples were refrigerated immediately at a temperature of 5–8 °C and then transported in thermo-box to laboratory at MUAF in Brno. The samples were analyzed by laboratory at MUAF in Brno for active acidity, titratable acidity, rennetability and rennet curd quality. The general linear models procedure of SAS and Pearson correlation analysis were used to analyze data. The aim of the study was to evaluate influence of stage of lactation on the chosen properties of sheep milk and on rennet curd quality

The results of this study indicate that high statistical significant effect ($P \leq 0.01$) of lactation stage was found on all chosen parameters. Means of chosen parameters for whole lactation were: titratable acidity 11.25 °SH and pH value 6.66, rennetability 152 s, quality of rennet curd 1.36. Positive significant correlations were registered among stage of lactation and titratable acidity, rennetability, rennet curd quality. No significant negative correlation was found only between pH and stage of lactation. It appears from this that: titratable acidity tended to increase, rennetability was prolonged and rennet curd quality was worsened as the lactation stage progressed.

Key words: ewe, sheep milk, stage of lactation, milk properties, rennetability

THE GENETIC DIVERSITY OF THE POPULATION OF AKHALTEKE HORSES IN CHOSEN COUNTRIES

GENETICKÁ DIVERZITA POPULACÍ ACHALTEKINSKÉHO KONĚ VE VYBRANÝCH STÁTECH

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ABSTRACT

Akhalteke horse is considered to be one of the oldest horse breed in the world. The population of the Akhalteke horses count about 3000 horses today and this breed is recorded as the national cultural heritage UNESCO.

Our research objective is to find out the genetic diversity in the breed and between their sirelines, heterozygous of their population in several breeding coutries. The research of the genetic diversity of the population should be contribute to improve the breeding methods used in the breeding proces in this breed. It´s necessary to analyse the manifestation of the heterozygous in the future breeding and the genetic balance of the population of Akhalteke breed. The results of our work have to act as the recommendation for the breeders of Akhalteke horses all around the world.

The database of the horses and their DNA type is offered by the Czech association of Akhal-Teke breeders (ČSCHAT) and the International Association of Akhal-Teke breeders (MAAK). We devided the whole database to the groups according to part of another breed in pedigree to purebred or partbred Akhalteke horses and next to groups according to sex, place of breeding and sirelines.

Key words: Akhalteke horse, genetic distance, heterozygous population, degree of inbreeding

HOLSTEIN CATTLE – EMBRYONIC MORTALITY

HOLŠTÝNSKÝ SKOT – EMBRYONÁLNÍ MORTALITA

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ABSTRACT

Fertility is one of the general problems in dairy cattle breeding economy. Reproduction is effected by many factors and one of them is embryonic mortality. We had determinated embryonic mortality in herd of 119 Holstein cows and 72 Holstein heifers and its relation on body condition, age, lactation and season. Animals were choosen by random sample and embryonic mortality has been observed in the days of 22nd, 26th, 30th, 34th, 38th and 42nd after an artificial insemination.

Embryonic mortality till the 42nd day was 31,1 % in cows and 30,6 % in heifers in our herd. In cows to the age of 4 years was embryonic mortality 30,9 %, in older cows 31,4 %. Embryonic mortality in cows during the first and the second lactation was 32,3 % and in cows from the third to the seventh lactation was 34,6 %. In heifers was the lowest embryonic mortality in the age of 16 – 18 months: 28,6 %. The best body condition for embryonic survive was BCS over 6 in cows and heifers, too. The worst season for embryonic survive was summer and winter in cows and spring and winter in heifers.

Results of our work show that risk of embryonic mortality grow with an age and with a number of lactation but not with rising body condition. Summer is the worst season for the cows embryonic survive on the score of heat stress and of poor-quality diet. Spring is the worst season for the heifers embryonic survive on the score of poor-quality diet, poor microclimate in a stud and musty bedding.

In fine: results show reproduction problems in herd. We must improve basic surroundings of the herd for innovation of reproduction functions.

Key words: embryo, fertility, embryonic mortality, body condition score

THE EVALUATION OF INFLUENCE OF MORNING AND EVENING MILKING ON THE SELECTED MILK PARAMETERS

ZHODNOCENÍ VLIVU RANNÍHO A VEČERNÍHO NÁDOJE NA VYBRANÉ PARAMETRY KRAVSKÉHO MLÉKA

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ABSTRACT

The aim of this experiment was evaluated the influence of morning and evening milking on the selected milk parameters. The samples of milk from the Holstein cows on the first lactation were analyzed. The milk yield (kg), the protein yield (kg), the fat yield (kg), the protein content (%), the fat content (%), somatic cell count (1000/ml), titratable acidity (SH), rennet coagulation time (s) and quality of curd (class) were determinated. There were found high significant differences ($P<0.01$) between morning milk yield (15.7 kg) and evening milk yield (13.8 kg), between morning protein yield (0.51 kg) and evening protein yield (0.45 kg) and between morning fat content (3.95 %) and evening fat content (4.41 %). There were no significant differences between morning and evening values of the rest parametrers.

Key words: cow, milking, milk

THE EVALUATION OF SPORT´S EFFICIENCY OF CZECH WARMBLOOD HORSE ON THE BASE OF RESULTS IN THE BREEDING COMPETITIONS

VYHODNOCENÍ SPORTOVNÍ VÝKONNOSTI ČESKÉHO TEPLOKREVNÍKA NA ZÁKLADĚ VÝSLEDKŮ V CHOVATELSKÝCH SOUTĚŽÍCH

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ABSTRACT

The aim of this study is to evaluate the results of breeding competition and work up a judgment of pedigree values. The breeding competitions are holded for four to six years old stallions and mares. The horses are evaluated by commisar. They have three marks for evaluation for jump, dexterity and readiness of horse. The horses are evaluated according to ten-point scale from 0 to 10. The general evaluation is sum total of these three marks. The commisar must take off negative point devide two from these three marks. There are compared some factors as sex, age, degree of difficultness, place and the date of compatition, commisar and rider. The results are obtained from the Czech eqeuestrian federation. The results are from the years 1998 - 2008. The database is made up at this moment.

Key words: breeding competition, Czech warmblood horse, judgment of pedigree values

FREQUENCE OF OCCURRENCE OF SPERM MORPHOLOGICAL CHANGES IN COCKS OF THREE INITIAL LAYING LINES

FREKVENCE VÝSKYTU MORFOLOGICKÝCH ZMĚN SPERMIÍ U KOHOUTŮ TŘÍ VÝCHOZÍCH SNÁŠKOVÝCH LINIÍ

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ABSTRACT

Aim of the study was to estimate and to compare ejaculates of cocks of different initial laying lines and of different time of semen collection. We tested cocks of these three lines: Barred Plymouth Rock (BPR-03), Rhode Island Red (RIR-05) and Rhode Island White (RIW-06). It was chosen 63 cocks, thus 21 cocks from each line. Semen was collected in the poultry breeding farm Bantice a.s. We collected semen four time, in the age of 201, 249, 304 and 375 days. After collection we measured the volume of ejaculates and then we made morphology examination of sperms in the laboratory. We always examined 100 sperms from each preparation. We evaluated these sperms morphological changes: changes on head, changes on midpiece, changes on tail, occurence of degenerated sperms, total number of sperms with morphological changes and normal sperms. Statistical evaluation was done by mean of statistical software SAS 9.1.3. where we used GLM method with fixed effects of cocks line and time of semen collections. Observed characteristics were formulated by LSM rate and standard deviation. We founded that influence of time of semen collection on the ejaculate volume was statistically non-significant. The second time of semen collection had statistically highly significant ($P\leq 0,01$) influence on the occurrence of sperms morphological abnormalities in ejaculate and it was 42,5 %. The most morphological changes were on tails, it was 30,4 %, and it was right at the second time of semen collection. The least sperms morphological changes were on the first time of semen collection and it was only 11,9 %. This rate was statistically highly significant ($P\leq 0,01$) and on other times of semen collection was higher occurrence of sperms abnormalities. Consequently it showed the influence of time of semen collection on the ejaculate characteristics. This was probably evoked by frequent semen collection and by high load of cocks in insemination. The highest ejaculate volume had cock line RIW-06, it was 0,66 ml and this rate was statistically significant ($P\leq 0,05$). Influence of cocks lines on the occurrence of sperm morphological changes was statistically non-significant. The most changes were on tails, line BPR-03 had 19,8 %, it was the most of all. This line had also the least statistically highly significant ($P\leq 0,01$) occurrence of degenerated sperms and it was only 0,7 %. On the basis of own results we can enunciate that cock line had not such influence on the ejaculate characteristics.

Key words: cock, ejaculate, sperm, morphological change, volume, head, midpiece, tail

INFLUENCE OF LEVEL OF FABA BEAN (*VICIA FABA*) IN EXPERIMENTAL FEED MIXTURES FOR CHICKENS

VLIV OBSAHU BOBU KOŇSKÉHO V POKUSNÝCH KRMNÝCH SMĚSÍCH PRO KUŘATA

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ABSTRACT

In 42-days experiment we tested effect of level of faba bean in experimental diets. Also describes its influence on health condition and growth performance. For testing were used selected male chickens at age of 2 days. These were divided in eight groups with hundred chickens each. During the experiment were observed consumption of testing feeding mixture. Experiment diets were made from 15 % wheat, 22-28 % extracted soya groats, 2,08 % brewer's yeast, 4% rape oil and 5,5 % mineral concentrate. The faba bean was submission to experimental groups of chickens in dose 6 and 12 %, 6 and 12 % plus increment coarse grit of faba bean. The best results was achieved in group with dose 12 % faba bean in feed. The harmful effect of antinutrition factor was insignificant.

Key words: faba bean, growth performance, chickens, antinutrition factor

THE EFFECT OF SILAGE ADDITIVE ON FERMENTATION QUALITY ON BREWERS GRAINS WITH ABSORBENT MATTER

VLIV SILÁŽNÍHO ADITIVA NA KVALITU FERMENTAČNÍHO PROCESU SILÁŽE PIVOVARSKÉHO MLÁTA S PŘÍDAVKEM SORBENTU

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ABSTRACT

In the experiment was evaluated the effect of additive on the fermentation quality of brewers´ grains silage with barley meal compared with the untreated control. There were altogether three treatments in experiment: Variant A – untreated control; Variant B – addition of a mixture of organic acids in the dose of 3L/t; Variant C – addition of a mixture of organic acids in the dose of 6 L/t. We monitored following parameters of fermentation quality in the experiment: Dry matter content, pH, acid water extract, content of lactic acid, propionic acid, acetic acid, butyric acid, ammonia, alcohol. Results were statistically analyzed using the method of single-factor analysis.

The results show that the absorbent using decreased the silage leaking. The silage additive usage leads to an improving of fermentation process. You can see more favorable content and ratio of acids and alcohol. In no silage sample was recognized any butyric acid content. In general the using of absorbent and silage additive improves the fermentation quality of brewers' grains.

Key words: fermentation quality, brewers´ grains, silage

TEMPERATURE EFFECT IN THE STABLE ON MILK YIELD OF HOLSTEIN COWS ON 2nd LACTATION

VLIV TEPLOTY VE STÁJI NA PRODUKCI MLÉKA HOLŠTÝNSKÝCH DOJNIC NA 2. LAKTACI

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ABSTRACT

The aim of this study was to evaluace the temperature effect in the stable on milk yield of Holstein cows. The group of 18 cows (on 2nd lactation) kept on the school farm Žabčice, were observed during July 2007. The dairy cows were fed with the same feeding ration and they were in the same stable. The temperature in the stable were measured by six senzors (HOBO) in 15 minutes intervals. The sensors were placed in height at withers. It has been found the negative influence of high temperatures on milk yield. The limited average temperature for breakpoint was 21°C in the stable. Increase of the temperature on 30°C in maximum led to reduction in average milk yield from 34 kg to 27 kg. Re-decline of temperature on 20°C caused increase the milk yield but only to 31 kg.

Key words: dairy cows, temperature, milk yield

THE ACCOUNT OF THE THOROUGHBRED OF THE BREEDING OF SPORT HORSES BREEDS

VÝZNAM ANGLICKÉHO PLNOKREVNÍKA VE ŠLECHTĚNÍ SPORTOVNÍCH PLEMEN KONÍ

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ABSTRACT

The Thoroughbred was bred to run so fast. It was made a system of racing to verify their performance. The Thoroughbred is old, blooded breed. The Thoroughbreds have excellent mechanics of movement, temperament, charakter and body conformation. Therefore they are used for breeding of so many riding horses. The Czech Warmblood is a most extended breed of sport horses in our republic. He has Thoroughbred blood in his background too.

The aim of this work is detect how the Thoroughbred have effect on sports scores of our sport horses. It may show us whether horses with more Thoroughbred blood in their background are better than horses with less Thoroughbred blood in their background. Another thing we want to detect is the correlation between the Thoroughbred´s turf career and the sports career of his get.

It will be maked a data base of sports scores from 1992 to 2005. Horses will be dividend into few groups by their age, sex, amount of Thoroughbred blood in their pedigree, rider, race, year of the race and difficulty of the race. It wil be used some statistic methods to get a finding.

The findings will be complete in two years.

Key words: Thoroughbred, breeding, sport horse

USING BLUP – ANIMAL MODEL TO ESTIMATE THE BREEDING VALUES OF SHOW JUMPING HORSES IN SLOVAK REPUBLIC

BLUP – ANIMAL MODEL V ODHADE PLEMENNÝCH HODNÔT PARKÚROVÝCH KONÍ NA SLOVENSKU

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ABSTRACT

Aim of our work was to estimate a performance and genetic parameters of show jumping horses in Slovak Republic, when breeding values were estimated using BLUP – Animal model. These values were estimated on the base of sport results of show jumping during the sesons 2002 – 2006. Genetic parameters and breeding values were estimated for 1389 horses and their ancesors (total 7618 horses). Genetic evaluation was realised on the base of fixed and random effects. In the genetic model we used fixed effects of competition, year of competition, rider, sex and age. As random effects we used effect of animal and effect of permanent horse environment. Breeding values were estimated from -1,676 to 3,087 for average rate of convert points.

BLUP – Animal model is used in all advanced countries and it can complete important but missing part of horse breeding in Slovak Republic if there is enough of considered information.

Key words: horses, breeding values, show jumping, Animal model

Section – Environmental Technologies

Sekce – Environmentální techniky

SEASON CORRECTION OF CATION EXCHANGE CAPACITY DYNAMIC IN TOPSOILS OF CHERNOZEMS

KOREKCE SEZÓNNÍ DYNAMIKY KATIONTOVÉ VÝMĚNNÉ KAPACITY ORNIC ČERNOZEMNÍCH PŮD

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ABSTRACT

There was surveyed the exchange cation capacity dynamic during the years 1993 – 1999. The survey took place on small – plots at Agricultural Research Institute, Kroměříž. Our objective was to follow the dynamic of the cation exchange capacity. The samples of the top soil were taken from the depth 0-30 cm. Taking of samples proceeded from the third decade of April to third decade of July each 2 weeks. Following this study there were taken samples of chernozems at 52 areas in central Moravia during the years 2000-2003. The samples for the analyses were taken pointwise from the depth 0-30cm. The results were statistically analysed. The point was to quantificate the influence of the content of clay elements and of the date of the taking of the sample on the value of the cation exchange capacity. There was assumed the cation exchange capacity is not stable, but that it changes its value during the time and it differs according to the kind of soil. That´s why the cation exchange capacity should be always respecting the content of clay elements. The influence of the date of taking of samples was not proofed.

Key words: chernozem, cation exchange capacity, dynamic, topsoil

MONITORING OF SELECTED BIOLOGICAL PROPRIETIES OF CHERNOZEMS IN SOUTH MORAVIA REGION

SLEDOVÁNÍ VYBRANÝCH BIOLOGICKÝCH VLASTNOSTÍ ČERNOZEMÍ V OBLASTI JIŽNÍ MORAVY

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ABSTRACT

The aim of this work was to evaluate microbiological respiration in selected Chernozems in the South Moravia region. The new method using apparatus Vaisala GMT220 and new accesories were applied. Soil samples were enriched with mineral and organic substances (ammonia sulphate – sample „N“, glucose – sample „G“ and sample with ammonia sulphate and glucose – „NG“) and the original sample was used as a control (a basal sample „B“). We came to the conclusion that the higher deficit of substances in the original sample was caused by higher intensity of respiration.

An efficiency of nitrogen, carbon and amount of organic substances were evaluated by ratio of basal and potential respirations.

The results showed that low „N:B” ratio caused low physiological efficiency of soil nitrogen by soil microorganisms. High „NG:B“ ratio showed high stability of organic substances in the soil.

Basically we can say that some decreasing of microbiological respiration is also measured in case without adding mineral and organic substances. The factors influenced the respiration were climate changes and type of soil management as well.

Key words: basal respiration, potential respiration, chernozem

ANTICORROSIVE RESISTANCE OF WATER DILUTES SINGLE-LAYER ANTICORROSIVE ENAMELS

KOROZNÍ ODOLNOST JEDNOVRSTVÝCH VODOUŘEDITENÝCH NÁTĚROVÝCH HMOT

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ABSTRACT

Recently the demand for coating systems which are environment-friendly is increasing. One of the most prospective direction is using of water diluted single-layer anticorrosive enamels. The goal of the article is ascertain of corrosive prevencion to select of water diluted single-layer anticorrosive enamels for particular backgrounds. The samples from steel number 11 321.21 will be tested in terms of SO_2, NaCl, distilled water, slurry and manure DAM 390 according to appropriate standards.

Excelent of anticorrosive resistance has Denapox ez in all atmospheres. Aquapol J and Antikor Special have good anticorrosive resistence in dung-water and DAM 390. They are utilizable in anticorrosive prevention of machines and engeneering construction in agriculture.

Key words: corrosion, coating composition

POWER OF THE SELF-IGNITION MOTOR FOR PURE PLANT OIL

VÝKON VZNĚTOVÉHO MOTORU NA ČISTÝ ROSTLINNÝ OLEJ

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ABSTRACT

Diesel oil may be substituted by vegetable oil. This paper presents the changes in fuel consumption and engine output of model compression ignition engine driven by cold-pressed sunflower oil.

Engine output was measured on two model vehicles with standard engines with modified fuel system for vegetable oil and for diesel oil.

Specific fuel oil consumption and pure cold-pressed sunflower oil consumption was measured on one of the vehicles.

It has been proofed, that the vegetable oil driven engine output reached 98-103% of the diesel driven engine output, and the sunflower oil drive engine consumes 96-98% of what the diesel oil driven engine consumes.

Key words: vegetable oil, bio fuel, power, torque, fuel consumption

THE EFFECT OF PHYSICAL FEATURES OF MINERAL FERTILISERS ON EVEN APPLICATION OF FERTILIZERS

VLIV FYZIKÁLNÍCH VLASTNOSTÍ MINERÁLNÍCH HNOJIV NA ROVNOMĚRNOST APLIKACE HNOJIV

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ABSTRACT

The intensive agriculture can not be applied without the mineral fertilizers anymore. The basic claim for the application of the fertilizers is even spreading of the fertilizer on the field, either in diagonal or in lengthwise direction. The goal of the trial was to pursue the influence of the physical feature of Calcium Ammonium Nitrate (CAN) from the different fertilizer producers LOVOCHEMIE, a.s. and NITROGÉNMÜVEK Rt, how they influence even application by using the disc spreader KUHN MDS and the pneumatic spread mechanism of the self-going spreader TERRA GATOR 8103 itself. Before the test of even spreading into the calibration bowls, there were compared the ascertained and declarated weight volumes and granulometry of the watched nitride. The basic adjustment of the spreaders was carried out according to the given tabular values from the producer. According to the results it follows that the granulometry is important for even spreading by using the disc spreading mechanism. The influence of physical features on even values was not proved by the pneumatic spreading mechanism.

Key words: mineral fertilizer, physical feature, even application

POSSIBILITIES OF THE LEAN LANDFILL GAS UTILIZATION ON THE CLOSED LANDFILL SITE

MOŽNOSTI VYUŽITÍ ZBYTKOVÉHO SKLÁDKOVÉHO BIOPLYNU UZAVŘENÉ SKLÁDKY

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ABSTRACT

Goal of this diploma thesis is focused on the possibilities of an energetic utilization of the lean landfill gas (< 30% CH_4). The running of the biogas motor was not by only lean landfill gas burning stable enough. On the investigated closed landfill site was established a pilot plant for an energetic utilization of the lean landfill gas in combination with a biogas produced in a pilot biogas plant. By burning of the mixed biogas in a biogas motor are produced an electricity and a heat energy. The investigated source data were analyzed. Topics of this diploma were analyses of feed substrate and process parameters of the pilot biogas plant and biogas yield. Further were assessed the chemical parameters of the fermentation process in the pilot biogas plant to optimize the biogas treatment and compare the results with recommended values, which were got by investigations in IFA Tulln in Austria. There were made suggestions to optimize the fermentation process. Due to analyses of the pilot plant for the mixed biogas energetic utilization was made a decision, that the mixed biogas burning works and makes the running of the biogas motor more stable. The next result is that the fermentation process optimization is necessary to reach a higher efficiency by the biogas plant.

Key words: biogas, energetic utilization, lean landfill gas, anaerobic digestion, process optimization

CONDITIONS OF ORGANIC FARMS DEVELOPMENT IN POLAND AND MALOPOLSKA AREA

PODMÍNKY VÝVOJE EKOLOGICKÉHO HOSPODAŘENÍ V POLSKU A OBLASTI MALOPOLSKA

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ABSTRACT

According to the definition of International Federation of Organic Agriculture Movements (IFOAM) organic agriculture is a set of several approaches to agricultural management systems, according to the requirements of soil, plants and animals and its overall objective is manufacturing of high quality food and simultaneous maintaining best biological balance in the natural environment. In organic agriculture production is managed in a closed soil- plant-animal cycle with retained considerable self-sufficiency. Owing to this fact certain benefits may be achieved such as protection of the natural environment for future generations and health of consumers of food produced in this system according to the motto

” To produce but not destroy the natural environment – to feed but not harm the consumer”.

Dynamically developing organic agriculture has been observed over the recent years in Poland, which is naturally predisposed for this system of farming. The number of organic farms in Poland almost doubled between 2004 and 2005 to 7183. In Poland organic farms occupy almost 204 thousand hectares. Despite dynamic development organic farms constitute only 0.2% of all farms and cover only 0.5% ha of arable lands. Mean organic farm area is 28 hectares and is third bigger than the average for traditional farms, i.e. 8 hectares. Almost 90% of organic farms cover less than 50 hectares. Smaller organic farms are localized mainly in central Poland and in its southern part, whereas large ones are situated in the eastern and northern parts and along the western border of Poland. Meadows and pastures (52%) dominate in the structure of organic farms, arable lands (43%), orchards, berry plantations (4%) and vegetables (1%) place next. The most frequently cultivated crops include mostly potatoes, then rye and wheat. Organic farm development is greatly supported by the Government, which plans to increase their number to 10000 by 2010. In 2005 the total number of organic farms in the Malopolska area was 1177, the number of organic farms increased by 91% in comparison with 2004, whereas in relation to 2003 over three-fold increase was registered in the number of farms using ecological methods of production. The asset of organic agriculture development in the discussed province is a greatly numerous farmer population, low cost of labour force, low degree of intensification and chemical use in agriculture and low pollution of the natural environment.

Key words: organic farms, development, Poland

ECONOMIC EVALUATION OF WOOD MATERIAL UTILIZATION POSSIBILITY FROM BIOLOGICAL LANDFILL RECLAMATION FOR ENERGY PURPOSES

EKONOMICKÉ ZHODNOCENÍ MOŽNOSTI VYUŽITÍ DŘEVNÍ HMOTY Z BIOLOGICKÉ REKULTIVACE SKLÁDKY PRO ENERGETICKÉ ÚČELY

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ABSTRACT

The study of wood material utilization possibility for energy purposes is worked up for the purposes of a newly established company that is in common property of the microregion of Strážovsko. In this microregion, there is quite a big natural potential for heating of the objects by means of biomass incineration. High forest coverage of the region providing a big amount of firewood and rather extensive agricultural idle areas conveys spaces for short rotation forestry plantations. Short rotation forestry outplanting meant for energy utilization is one of the possibilities of production utilization from biological landfill reclamation.

The product of the company is fuel wood chips made from wood waste that comes from fast-growing wood species, from mining material and from biological landfill reclamation. The principal product customers are communities of the microregion of Strážovsko.

The projects require considerable cost of investments (from the point of view of regional circumstances), this cost investm,ents do not have to be invested at the same time. A part of these investments can be covered by company operational revenues. The first revenues can be expected after three years after the establishment of the company. The yearly yield is presumed at 4.000 m^3 of wood chips.

The part of the revenues will be direct sale of wood chips, their transport to the customers and possible sale of other products. Total cost investments were calculated at 5.440.000,00 CZK. Investment return is estimated at 18th year of the company operation.

At the anticipated price for heating, the company will be competitive toward other heat suppliers, especially due to its price expediency and relative heating comfort.

The work brings evaluation of economic contributions of cleaner production for wood material utilization for energy purposes.

Key words: economic evaluation, biomass incineration, biological landfill reclamation

ABRASIVE WEAR OF Ag, Cu, Sn, Hg ALLOYS

OPOTŘEBENÍ SLITIN Ag, Cu, Sn, Hg

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ABSTRACT

The dissertation deals with the comparison of the resistance of Ag-Cu-Sn-Hg alloys towards abrasive wear. Three different alloys were compared - Safargam Special, ANA 2000 and Permite C. Out of interest, the tests were done also with with glass-ionomer cement FUJI GX IX, which is used as an alternative to mentioned alloys. For the materials, resistance towards abrasive wear and point pressure stress tests were designed. The tests were designed to reflect the real abrasive wear in usual practice as much as possible. The outcome of the dissertation is an analysis of the most resistant alloy Ag-Cu-Sn-Hg towards abrasive environment and point presure stress. The result of the dissertation is a selection of a material with the best resistance towards the abrasive wear.

Key words: abrasive wear, Ag-Cu-Sn-Hg alloys, stress, strenght

THE APPLICATION OF 2 – MERCAPTOPHENOL FOR PRECONCENTRATION AND DETERMINATION OF MERCURY SPECIES IN SEDIMENTS AND WATERS

VYUŽITÍ 2 – SULFANYLFENOLU PRO PREKONCENTRACI I STANOVENÍ CHEMICKÝCH FOREM (SPECIÍ) RTUTI V SEDIMENTECH A VE VODÁCH

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ABSTRACT

The aim of this work was development of analytical method, which enables the determination of mercury species in sediment and water samples after their preconcentration. The high-performance liquid chromatography-cold vapour atomic fluorescence spectrometry (HPLC/CV-AFS) was optimised and used for separation and determination of mercury species – 2-mercaptophenol complexes. The separation of four mercury species was achieved by an isocratic elution profile of aqueous methanol (65/35 %) on a Zorbax SB-C18 column (4,6 x 150 mm, 5 μm). The limits of detection were 4,3 μg l^{-1} for methylmercury ($MeHg^{+}$), 1,4 μg l^{-1} for ethylmercury ($EtHg^{+}$), 0,8 μg l^{-1} for inorganic mercury (Hg^{2+}), 0,8 μg l^{-1} for phenylmercury ($PhHg^{+}$). A preconcentration method utilizing a ″home-made″ C18 solid phase extraction (SPE) microcolumns was developed to enhance sensitivity of the mercury species determination. The preconcentration method uses the same complexation reagent (2-mercaptophenol), which is used also as modifier at chromatographic separation. The preconcentration factor as much as 1000 was achieved by on-column complex formation of mercury-2-mercaptophenol. 100% methanol was chosen for elution of preconcentrated mercury species. The method was applied for the determination of mercury species in river water samples. High-pressure microwave digestion unit Ethos SEL was applied for microwave assisted extraction (MAE) of mercury species in sediment samples. A mixture containing 3M HCl and 0,2M citric acid and 50% methanol was selected as the most suitable extraction agent. Citric acid in extraction reagent masks co-extracted Fe^{3+}. The efficiency of proposed extraction method was better than 95 % with RSD below 6 %.

Key words: mercury species, preconcentration, sediment, water, 2-mercaptophenol

THE EVALUATION OF SHAPEABLE ATTRIBUTES OF ZINC COATINGS

HODNOCENÍ TVÁRNÝCH VLASTNOSTÍ ZINKOVÝCH POVLAKŮ

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ABSTRACT

The article describes the problems of the evaluation of shapeable attributes of zinc coatings. Nowadays, when covering the car bodies with zinc is a common standard, arises the need of dealing with mechanical attributes of the zinc coating by the flame sprayed zinc parts. The shapeable attributes stand out among the most important ones because during folding the material can't be damaged in a way which would mean that the anticorrosive protection of the basic material would be damaged as well. That is why there were two samples of galvanized sheet metals selected for testing of the nominated methodics of damage revelation. On both A and B samples were tested by the following tests: tear-off test of adhesiveness, test of adhesiveness by folding at 180°, metallographic analysis and the thickness of the coating was measured as well.

The sample B showed a slightly bigger thickness of the zinc coating and during folding showed cracks in the form of a net at a width of about 25 μm. The metallographic analysis ascertained that the zinc layer is continuous with the well-apparent inhibitive layer between the transitional materials at a thickness of 0,5μm.

On the other hand the sample A had a lesser thickness of the zinc coating and during folding showed cracks in the axis of the folding at a thickness of 125 μm. By using the metallographic analysis we learned about the outbursts in the zinc layer in several places extending into the surface. The outbursts evolve most likely when excessing the ideal time after which the growth of the intermetallic compound comes up. Or their creation is initiated by a high reactivity of the basic material.

Key words: zinc coatings, shapeable attributes, coat defect.

RELATIONSHIP BETWEEN FRACTIONAL COMPOSITION OF HUMUS AND COLOR INDEX

VZTAH MEZI FRAKČNÍM SLOŽENÍM HUMUSU A BAREVNÝM INDEXEM

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ABSTRACT

Management of crops sooils is an important factor controling soil organic matter quality. It is supposed that soils under constant management for long enough time are able to as sume steady stable - state condotions and can secure an optimum humus status. The aim of our stady was to evaluate quality of humus in Eutric Cambisoil as influenced by different soil management. Our results represent a part of long-term filt experiments followed in the Czech-Moravian Upland (locality Vatín). Quality of humus under crop rotation system (used to produce cash crops) and grassland werw studied. Total carbon content was estimated oxidimetrically by a titrimetric method and fractional composition of humus was detwrmined according to Kononova-Beltchikova method. Optocal properties werw measured by UV-VIS spectrometer Varian Cary Probe 50 using fiber optic coupler in range 700 - 300 nm. Results showed high humus and sum of humic substances under grassy soil. Quality of humus given by HA/FA ratio was low (bellow 1). Linear corelation between HA/FA ratio and optical indexes was found.

Key words: fractional composition of humus, colour index

THE UTILIZATION OF DIGITAL VISUALIZATIONS IN DECISION MAKING PROCESS ON OPTIMIZING PROPOSAL OF BILLABONG REVITALIZATION

VYUŽITÍ DIGITÁLNÍCH VIZUALIZACÍ V PROCESU ROZHODOVÁNÍ A OPTIMALIZACI NÁVRHU REVITALIZAČNÍHO ZÁMĚRU ODSTAVENÝCH RAMEN

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ABSTRACT

Digital visualizations are very interesting advanced technologies useful in the decision making process finding the best billabong revitalization design. (comparing morphology characteristics, runoff coefficient etc.) In connection with proposal of levering out mud and connecting billabong with river (to allow fish and aquatic organisms to get into the billabong) increasing its biodiversity. Digital Visualizations should be used more frequently in practice.

The Digital Visualization technologies consist in terrain surface scale representation (two or three dimensions digital model), eventually in cross and longitudinal profiles of terrain. Their benefits lie basically in generalization, simplification and next using possibility as a basis of project documentation proposal or feature proposed movement's impacts analysis.

Presented results verified digital visualization technologies efficiency in billabongs revitalization practice. It has become a part of graduation theses named The Proposal of Revitalization and Conservation River Labe Billabongs in Pardubice Surrounding and it has become base of PhD. Thesis in Department of Landscape Management.

Fifteen chosen billabongs in Pardubice surrounding were evaluated by using special methodology and one of them was chosen for concrete proposal of revitalization using digital visualization technologies. The first step of solution was realized in the spring 2007, when the billabong was geodetically angled due to morphologic characteristics assessment. Terrain data was transferred to Kokeš geodetic software and digital model using contour lines visualization was created. Cross profiles and longitudinal profiles were proposed using software Atlas and there were transferred to Auto CAD software where were modified and dimensions of river surface (water level) were added. Than digital terrain model was transferred from Kokeš to ArcGIS 9.1 (GIS software) for create three dimensions digital terrain model for future analyse. The main result we can find in the three-dimension model of billabong that can be used as a base for 3D analysis in ARC Gis software as well as cross profiles and longitudinal profiles as a base for future project documentation.

Key words: digital visualizations, river billabong revitalization, GIS, Labe river

THE INFLUENCE OF AUTOMATIC SHIFTING ON TRACTOR ENGINE LOAD IN THE TRANSPORT

VLIV AUTOMATICKÉHO ŘAZENÍ NA ZATÍŽENÍ TRAKTOROVÉHO MOTORU V DOPRAVĚ

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ABSTRACT

The paper shows the influence of shifting method on engine load as well as transportation performance of a tractor used in transport. The measuring was realized with CASE IH Puma 195 tractor in a set with the Anaburger HTS 22.79 trailer. Data acquisition was based on the CAN-bus records. The main parameters consist of: fuel consumption per hour, tractor speed, engine speed, engine load, time and so on. The loop rate was preset to 200 miliseconds (5 S/s) and the outputs were stored into harddrive. There were taken some tests before road measurements, e.g. full speed characteristic. On the basis of the test we could built analyses of major transportation indicators together with specific consumption plots. As can be seen from the results the best output can be achieved with following settings: automatic shifting allows 30 % decreasing of engine speed before gear change. Manual shifting can bring similar results but it depends on operator skills. Differences among the results are notable especially when upwards drive or in the case the engine is under load.

Key words: engine load, full speed curve, set performance, transport

THE NEW POSSIBILITIES OF USAGE THROUGHOUT OF ANIMAL BY-PRODUCTIONS IN FERTILIZATION MAIZE

NOVÉ MOŽNOSTI VYUŽITÍ ZPRACOVANÝCH VEDLEJŠÍCH ŽIVOČIŠNÝCH PRODUKTŮ PŘI HNOJENÍ KUKUŘICE

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ABSTRACT

On the 1st November 2003 came into operation the clause of public notice n. 248/2003 Digest, which administer the low n. 91/1996 Digest, about feedstuffs, as amended by further Act is in Czech Republic prohibited using of bone-meal and meat bone-meal in feeding livestock. That caused margin more than 300 thousand tons of meal various sort and categories in Czech republic. The aim of my project was supervising and evaluating of income and amount of nitrogen substance in semiindustrial and parcelar experiment during fertilization of meat bone-meal (MBM), blood and industrial fertiliser (urea + amofos). I have placed 5 parcels of land of 0,85 hectare into semiindustrial experiment, which differed in dosages of meat bone-meal: 1. dosage 390kg industrial fertiliser DAM 390; 2. lower dosage 2 t/ha MBM; 3. middle-level dosage 4 t/ha MBM; 4. high-level 8 t/ha MBM and 5. controlled non fertilised parcele. I have placed 10 parcels of 5,5 m^2, which had been fertilised: 1. non fertilised – kontrol; 2. dosage 1,1kg MBM; 3. dosage 2,2 MBM; 4. dosage 4,1kg MBM; 5. dosage 5,2kg MBM; 6. dosage 5kg sterilised blood; 7. dosage 9kg sterilised blood; 8. dosage 0,4kg industrial fertiliser; 9. dosage 0,8kg industrial fertiliser and 10. dosage 0,4kg industrial fertiliser + dosage 2,2kg MBM. The highest income of semiindustrial experiment have been found in parcel n.3 of dosage 4t/ha MBM, that was 44% more than in kontrol parcel. In higher dosage has been shown redundance of nutrients, which left without usage. The contain of nitrogenous substances in seed of maize hasn´t been very different and altenated from 6,82 to 7,18%. In parcele experiment had found out the highest income in parcele n. 10 with combinated dosage MBM and industrial fertiliser of 109% more than control parcele. Completaly has also other parcels n. 3, 4, 6, 7 and 9 riched more than double increase of income and it was because of that dosages of fertiliser were very overlarged for the reason of riching filiation. The contain of nitrogenous substance had been in parcelar experiment measured hiogher so that in major part took over than 9% and the most in parcele n. 10 where have been measured 10,15% nitrogenous substance in maize seed. Experiments has clearly achieved that meat bone-meal is high quality fertilization, that also validated Direction of commision (ES) n. 181/2006 from 1. February 2006, when is legislatively allowed application of meat bone-meal in the form of ground supplements.

Key words: meat bone-meal, maize, fertilization, nitrogen, yield, nitrogenous substance

COMPARISON OF PHYTOPLANKTON COMMUNITIES DYNAMICS AND WATER CHEMISTRY OF THE PLUMLOV RESERVOIR AND THE BRNO RESERVOIR

SROVNÁNÍ DYNAMIKY FYTOPLANKTONNÍCH SPOLEČENSTECH A CHEMIZMU VODY PŘEHRADNÍCH NÁDRŽÍ BRNĚNSKÉ A PLUMLOVSKÉ

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ABSTRACT

During the whole vegetation season of the year 2007, the phytoplankton community compositions of two reservoirs were determined and in parallel basic physicochemical parameters were monitored. Both reservoirs are situated in the same climatic region and deal recently with the problem of heavy cyanobacterial water blooms serving probably as a good model of anthropogenic disturbance of aquatic ecosystem.

Regular determination and quantification of phytoplankton showed the classical cyanobacterial occurrence during July staying dominant over other present algal species until the end of vegetation period in both reservoirs. This typical cyanobacterial occurrence was changed by algological treatment in the Plumlov Reservoir. According to previous experiments the coagulating solution PAX18, commonly used during drinking water treatment, was applied.

After the PAX18 application no negative impact on other aquatic organisms was observed. Few days after the treatment species diversity of phytoplankton increased and this stage was maintained until the end of the season. Several hours after the application higher fluctuations in pH values were observed.

However, in the Brno Reservoir exhibiting no algological treatment the quantity of cyanobacteria did not change much during the whole vegetation period.

The research proofs that it is possible to eliminate cyanobacterial water blooms in Czech reservoirs but these acute treatment should be only a part of the complex solution for the revitalisation of whole water basins

Key words: phytoplankton diversity, PAX18, Brno Reservoir, Plumlov Reservoir.

THE REGIME OF GROUNDWATER IN THE AREA OF MASARYK TRAINING FOREST ENTERPRISE AT KRTINY

REŽIM PODZEMNÍ VODY NA ÚZEMÍ ŠKOLNÍHO LESNÍHO PODNIKU MASARYKŮV LES KŘTINY

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ABSTRACT

The study of groundwater regime and the choice of suitable working and evaluation methods were based on the selection of wells and springs where the Czech Hydrometeorological Institute in Brno carried out systematic observations, measurements and recording of groundwater level heights and yields. For the analysis of short-time variations in fluctuations of groundwater level heights probability curves of exceeding were constructed on the basis of weekly time series of groundwater levels in wells and groundwater yields in springs. The probability of exceeding monthly precipitation was determined to evaluate the humidity of the years. Precipitation in the spring season usually contributes to the circumannual recharge of groundwater resources in the area of TFE MF at Křtiny. The time occurrence of monthly limit stages allowed to determine in what year seasons the absolute limit stages occurred and in what months the limit stages occur most frequently.

Key words: groundwater level height, well, spring, water yield, probability curve of exceeding, time series

READING OF CALIBRE AE

SNÍMÁNÍ HODNOT AE

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ABSTRACT

The work is focused on the possibilities of accoustic emission (AE) signal reading from spatial and formatively inaccessible surfaces. The aim of the work is to verify the possibility of assembly of several measuring devices for following purpose. To maximise the possibilities of AE signal reading in practice.For such purpose, the samples of waveguids and sets of devices for their clamping all together with AE receiver have been constructed. Prepared samples have been tested in laboratory conditions and functionality of devices in practice havee been validated. A several sets of normalized AE signal measurements have been performed at all waveguides samples. The results havee been evaluated from several points of view, concerning waveguide design. The results brought an evident knowledge of signal conduction through waveguide body, its loss and deformation. The results evaluation has also confirmed that waveguide shape differences have not caused any critical failings. The possibilities of furtehr device set development have been confirmed.

Key words: acoustic emission, waweguide, nondestructive materiology

PASSIVE AIR SAMPLERS FOR A DETERMINATION OF POPs IN THE AIR

PASIVNÍ VZORKOVAČE PRO STANOVOVÁNÍ POPs V OVZDUŠÍ

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ABSTRACT

Passive air sampling of persistent organic pollutants is becoming more and more frequent due to the fact that passive samplers are noiseless and cheap in comparison with the conventional sampling methods. They can be deployed anywhere because no electricity is needed. The flow of organic pollutants from the air to the sampler is driven by the difference of chemical potentials of the compound in these two matrices. In this research passive air samplers consisting of polyurethane foam (PUF) disks were used. PUF disk have a large surface area and are suitable for long-term monitoring of polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and organochlorine pesticides (OCPs). In this research the air was sampled in ten selected sampling sites in vicinity of the chemical plant DEZA a.s. in Valašské Meziříčí. Polyurethane foam (PUF) disks were exposed for a period of 28 days during each of six seasons. Passive air samplers consisting of polyurethane foam (PUF) disks demonstrate spatial and seasonal variations.

Key words: passive sampling, PUF based passive air samplers, POPs

ENERGY BALANCE IN ORGANIC AND CONVENTIONAL CROPPING SYSTEM AS AN INDICATOR OF SUSTAINABLE FARMING

BILANCE ENERGIE V EKOLOGICKÉM A KONVENČNÍM SYSTÉMU ROSTLINNÉ PRODUKCE JAKO JEDEN Z INDIKÁTORŮ TRVALE UDRŽITELNÉHO HOSPODAŘENÍ

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ABSTRACT

Our objective was to assess organic and conventional cropping system from the point of view of energy balance and also to consider suitability of this approach for the sustainability assessment. Values of indicators were counted out from data from agronomic records of organic and conventional farm from the period of three years (2004 – 2006). Used methodology was the software model Repro (Hülsbergen, Diepenbrock, 1997), which counts with direct and indirect fossil energy on the side of input and works on the level of plot. In this survey, it was confirmed that total energy input into organic system (5,2 GJ.ha-1) is significantly lower than into the conventional one (9,1 GJ.ha-1). But input in the case of machinery and diesel (representing mechanized treatments) is higher in the organic plant production (3,4 $GJ.ha^{-1}$ versus 2,8 $GJ.ha^{-1}$ on conventional farm). Productivity of organic system (20,7 $OJ.ha^{-1}$ and 50,2 $GJ.ha^{-1}$) is much lover then conventional one (76,3 $OJ.ha^{-1}$ and 114,6 $GJ.ha^{-1}$), but the efficiency of energy use is almost comparable.

Energy balance is useful for sustainability assessment. It is an important indicator enables to consider stability and autonomy (self-sufficiency) of system. All inputs can be transferred to units of energy and than it is possible to work with them together.

Key words: energy balance, organic, sustainable cropping

POSSIBILITIES OF APPLICATION OF CLEANER PRODUCTION INDICATORS AT KLATOVY - ŠTĚPÁNOVICE LANDFILL

VÝZKUM VYUŽITÍ INDIKÁTORŮ ČISTŠÍ PRODUKCE V OKOLÍ SKLÁDKY V KLATOVECH - ŠTĚPÁNOVICÍCH

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ABSTRACT

The goal of my thesis is suggestion, application and verification of environmental indicators of cleaner production.Cleaner production (CP) is an ongoing application of integral prevention strategy to processes, products and services aiming at increasing their effectiveness and reducing their risks towards men as well as towards environment.CP is a strategy that protects the environment, the consumer and the workerwhile improving the industrial efficiency, profitability and competitivenessof enterprises. By eliminating or reducing waste at the source, economic development can continue to occur, but in a more environmentally sustainable manner. CP can bring significant financial and economic advantages as well as environmental benefits at the local and global level. Cleaner Production is called a "win-win" strategy, because it protects the environment, the consumer and the worker while at the same time improving industrial efficiency, profitability and competitiveness.CP is an integral, necessary component for achieving sustainable development. Some of the intrinsic concepts in CP that directly supportsustainable development include:Reduction of waste at source and reducing the use of raw materials as a more sustainable practice for the Earth's limited resources;Pollution prevention, which covers the environmental portion of the triple bottom line;Greater degree of partnerships and communication with local governments, universities, and communities to ensure local participation and encourage equity;Return on investment calculations that help the economy and the environment.A series of environmental indicators of cleaner production is specified in prevention of pollution development.An environmental indicators can generally be understood as a quantitative tool that points to a condition or analyses changes, while measuring and communicating progress towards the environmental resources. Its purpose is to show how well a system is working to meet the defined goals. The aim of environmental indicators is thus to develop a framework that attempts to bring the economic, social and environmental aspects of society together, emphasizing the links between them.Indicators should be specific, measurable, pedagogical, sensitive to change, reliable, based on accessible data, cost-effective and relevant.They monitor society in an integrated manner while accommodating responsibility across geographical and time scales.The aim of my thesis is a possibility of specifying environmental indicators - bioindicators of cleaner production focused mainly on process of landfilling. Here we can find a lot of opportunities for prevention, because landfilling is the least environmentally acceptable way of waste disposal.

Key words: cleaner production, environmental indicators, landfill, waste, bioindicators

PHYTOPLANKTON DEVELOPMENT OF SELECTED PONDS INHERED IN SOUTHERN MORAVIA IN DEPENDENCE ON POND MANAGEMENT INTENSITY

ROZVOJ FYTOPLANKTONU VYBRANÝCH RYBNÍKŮ JIŽNÍ MORAVY V ZÁVISLOSTI NA INTENZITĚ HOSPODAŘENÍ

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ABSTRACT

During the vegetative period of the year 2006 we carried out hydrochemical and hydrobiological monitoring of selected ponds inhered in southern Moravia in dependence on pond management intensity. Water temperature, dissolved oxygen content, pH, conductivity and water transparency were monitored directly at taking place, $N\text{-}NH_4^+$, $N\text{-}NO_2^-$, $N\text{-}NO_3^-$, $P\text{-}PO_4^{3-}$ content and chlorophyll-a concentration were measured in our hydrochemical laboratory. At the same time, water samples for taxonomical analyses of phytoplankton and toxins content assessment of cyanobacteria were taken.

All ponds were characterized by low water transparency and heavy water blooms during the whole monitored period, regardless of pond management intensity. Values of basic physicochemical parameters were markedly unstable due to high biomass of primary producers but still ranged in the interval suitable for fish farming.

Dominant group of primary producers was cyanobacteria. Diatoms and green algae were never occurred as a dominant group. Species composition of each taxonomical group was relatively plentiful. 191 species of cyanobacteria and algae were found during the monitored period.

Key words: phytoplankton diversity, hydrochemical parameters, ponds, southern Moravia

Section – Food Technology

Sekce – Technologie potravin

THE OCCURENCE OF PHTHALIC ACID ESTERS IN FEEDSTUFFS

VÝSKYT ESTERŮ KYSELINY FTALOVÉ V KRMIVECH

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ABSTRACT

Phthalic acid esters (PAEs) rang among the ubiquitous organic environmental contaminants. PAEs leak in the environment during manufacturing process, use and disposal of products. Phthalates are contained in consumer products like plastics, rubber gloves, cosmetics, pharmaceuticals, children´s toys, food packaging. The most common and toxic phthalates are di-2-ethylhexyl phthalate (DEHP) and di-n-butyl phthalate (DBP). Acute toxicity is low.

PAEs are markedly lipophilic, therefore their water-solubility is low. This is due to their chemical structure.

The aim of this study was to investigate the occurance and contents of PAEs in feedstuffs stored in different packages, which can get in contact with meat and food.

Samples of feedstuffs, premixes and feed additives for livestock were collected by ÚKZUZ from the store of received feeds, dispatch stores, reception stores and from multicomponent scales. Before starting the analyses, glass and laboratory materials are washed and rinsed with acetone. Feeds were homogenized properly, extracted by shaking with mixture of organic solvents (hexane:acetone 1:1). Co-extracts were removed by gel permeation chromatography (GPC) in a Bio-beads S-X3 filling. After GPC, the eluate was cleaned with hydrated sulphuric acid. PAEs were determinated by HPLC and UV detection at 224 nm in a column filled with Separon SX C 18, using acetonitrile:water (9:1) as the mobile phase. The detection limit for PAEs in feeds is 0,03 $mg.kg^{-1}$.

There were 59 samples analysed. DBP and DEHP were demonstrated in amount lower than detection limit (< 0,03 $mg.kg^{-1}$) to 26,63 $mg.kg^{-1}$ and 18,89 $mg.kg^{-1}$. Feed additives were low in phthalates as well as raw materials except colza-oil. DBP in feed additives ranged from levels below the detection limit to 0,62 $mg.kg^{-1}$, DEHP ranged from levels below the detection limit to 2,98 $mg.kg^{-1}$, expect Alimet, where the levels measured were 1,29 $mg.kg^{-1}$ DBP and 3,23 $mg.kg^{-1}$ DEHP. High levels in colza-oils (raw material) were due to high levels of lipids and the lipophilic character of phthalates. DBP levels were between 0,1 $mg.kg^{-1}$ and 26,63 $mg.kg^{-1}$, DEHP levels were between 1,24 $mg.kg^{-1}$ and 18,89 $mg.kg^{-1}$.

In feedstuffs, different levels of phthalates were found. They are transfered to animals and then to people. The highest levels were found in feeds with high fat contents.

Key words: phthalic acid esters, contaminant, feed

MICROBIAL CHARAKTERISTICS OF VEGETABLE JUICES TREATED BY HIGH - PRESSURE PASTEURIZATION

ZMĚNY V MIKROBIÁLNÍM OSÍDLENÍ U ZELENINOVÝCH ŠŤÁV OŠETŘENÝCH VYSOKOTLAKOU PASTERACÍ

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ABSTRACT

High pressure processing (HPP) at refrigeration, ambient or moderate heating temperature can inactivate pathogenic and spoilage microorganisms with fewer changes to product „freshness“ as compared to conventional food preservation processes.

The objective of this study was comparison of effects of high hydrostatic pressure and combine HPP (500 MPa, 10 min) with heat (65 ºC, 15 min). Microbial quality of vegetable juices produced in Beskyd Fryčovice Company was assessed as an important factor of their self life. Three sorts of juices (carrot, broccoli with apple, red beet) have been processed by pasteurization and then HPP treatment and analysed on the 1^{st}, 7^{th} and 30^{th} day of storing at chill temperature. Juices were analysed on Total Counts of Microorganisms, counts of Moulds and Yeast and coliforming bacteria. Then counts of sporoforms bacteria have been checked. According to microbial counts the effectivity of preservative methods was appointed. Microbial analysis have been carried out by pour plate cultivation, colony counts were determined by plate count method. The effectivity of HPP treatment on inactivation of vegetative microorganisms was confirmed.

The high pressure treatment (500 MPa, 10 min) is effective to inactivate more than 5 log decades of the viable microorganisms present originally in the raw juice. Products is free of coli-form bacteria, yeast and moulds during 30 days of storage at the chilled room temperature conditions (temperature up to 5 ºC), although the viability of surviving spores may cause spoilage if stored in wrong conditions.

Key words: High - pressure Pasteurization; Vegetable juices; Microbial inactivation; Spores

THE INFLUENCE OF DLS ON THE OESTRUS OF RABBIT DOES

VPLYV DLS NA ESTRUS SAMÍC KRÁLIKA

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ABSTRACT

The objective of this study was to explore the effects of a doe–litter separation for 36 h before artificial insemination (AI) without using PMSG on reproductive performance determined in doe rabbits. To prevent the weight loss of litters, and the distress of rabbit does and their litters due to doe-litter separation (DLS), without losing its beneficial effects on fertility, we did not use 48 h DLS before AI, but 36 h DLS. Initially, 20 nulliparous does of different parity were divided into two groups. During the post partum, the free-nursing does were treated as follows: 36 DLS (n=10), the nest-box was closed for 36 h, from days 9 to 11, before AI and control group with 24 DLS (n=10), the nest-box was closed for 24 h and, after suckling, for other 24 h before AI and we used PMSG 48 h before AI. Degree of oestrous synchronization (also referred in text as sexual receptivity) was estimated by the colour of the vulva at AI. Reproductive performance of does was evaluated based on fertility (kindling rates), prolificity, conceptrion rate, mortality at birth, mortality at 21 days post birth, weight of the litter at 21 days post birth and number of weaned rabbits. The results suggest that a 36 h doe–litter separation causes an increase in the conception rate and sexual receptivity. Whereas the 36 h DLS did not affect the growth-rate and the weight of nursed rabbits until the weaning. Mortality at birth was higher in control group (24 h DLS). We did not find statistically significant differences between groups. Temporary doe-litter separation may be recommended to improve reproductive performance of lactating nulliparous does. Dam-litter separation has been shown to be a good alternative to PMSG treatment.

Key words: rabbits, doe-litter separation, PMSG, AI, reproductive performance.

THE INFLUENCE OF AGEING PERIOD TO EDAMS SENZORY QUALITY

VLIV ZRÁNÍ NA SENZORICKOU KVALITU EIDAMŮ

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ABSTRACT

The aim of our case was sensory analyse of Edam cheese during ageing. Edam′s cheeses from 2 different producers (A, B) were chosen for evaluating with 45% and 30% fat and also with different started culture (LL, YY) in course of 5 months. The samples were analysed in sensory laboratory at Department of Food Technology, MZLU in Brno every month from November to March. Simultaneously with sensory analysis coincided measuring on Tira-test. Cheese had better value up to the third month of ripening. Hardness in mouth and hardness between fingers decreased, cohesiveness and smearness increased. 45% FDM cheese was evaluated as softer, more smearness and more palatable.

Key words: Edam cheese; sensory evaluation; rheological properties; ripening; Tira-test

THE EFFECTS OF ADDING AMARANTH TO FODDER MIXTURE ON SELECTED QUALITIES OF CHICKEN MEATENGLISH TITLE

VLIV PŘÍDAVKU AMARANTU DO KS NA VYBRANÉ VLASTNOSTI KUŘECÍHO MASA

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ABSTRACT

The objective of this experiment is an assessment of the effects of adding amaranth to fodder mixture on selected qualities of chicken meat. The experiment is identifies the effects of fodder and sex on protein, fat, dry mass and myoglobin content, loss of meat juice, changing pH in chicken's thigh and breast muscles. Experimental chickens ROSS 308 were fed till the age of 36 days. Each sex was fattened separately. The chicken were fed with a fodder mixture containing 10% of thermally non-treated amaranth, 10% of thermally treated (popped) amaranth or 10% of green plant dried amaranth plants. The control group was fed with fodder containing 2% of fish flour. Breast and thigh muscles were tested. The results show that the chicken fed with thermally treated amaranth had lower fat content in their breast muscle ($P<0,05$). The highest myoglobin content (myoglobin affects the color of meat) had the chicken fed with thermally treated amaranth grain ($P<0,01$). The lowest pH in breast muscle had the chicken fed with thermally non-treated amaranth ($P<0,10$). Lower pH of chicken meat is supposed to have some bacteriostatic effect. The highest protein content was found in thigh muscles of the chicken fed with dried amaranth plants ($P<0,05$). High protein content is suitable mainly for dietetic purposes. Amaranth's grain has a very good composition of fat acids. The fodder affects the fat acid's composition. Therefore, it would be interesting to do more research on detailed composition of chicken's fat. Amaranth is easy to grow, therefore, is suitable as livestock fodder.

Key words: amaranth, dry mass, fat, chicken meat, loss of meat juice, myoglobin, protein, pH

SCREENING OF STARTER AND PROBIOTIC CULTURES INTENDED FOR PROCESSING OF FERMENTED MEAT PRODUCTS FOR THEIR ABILITY TO PRODUCE BIOGENIC AMINES

SKRÍNING STARTOVACÍCH A PROBIOTICKÝCH KULTUR URČENÝCH PRO VÝROBU FERMENTOVANÝCH MASNÝCH VÝROBKŮ NA SCHOPNOST TVORBY BIOGENNÍCH AMINŮ

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ABSTRACT

Biogenic amines are toxic low-molecular organic basic compounds formed in food by amino acid decarboxylation induced by microbial enzymes (decarboxylases). Other factors like pH, temperature, oxygen availability and storage life affect the production of biogenic amines, too. Tyramine, histamine, cadaverine and putrescine are considered to be the toxicologically most important biogenic amines, with tyramine and histamine being the most intensively studiedThe group of organisms capable of production of biogenic amines includes Pediococcus spp, Lactobacillus spp., Pseudomonas spp., Streptococcus spp., Micrococcus spp. and many members of Enterobacteriaceae family, as well as Bacillus macerans and Propionibacterium. Some starter cultures used for fermented food processing can be included, too. The contemporary trend is using probiotic cultures in fermented food production. They can be used as starter cultures and for their positive effect on human health. Unfortunately, even some probiotic cultures can be counted among potential producers of biogenic amines, so their testing for the presence of biogenic amines is necessary. The aim of this study was to screening of 73 types of bacterial cultures (SACCO, Italy) as starter or probiotic cultures for their ability to produce biogenic amines. Cultivation in decarboxylating medium, HPLC descibed by, and PCR detection of genes coding enzymes tyrosindecarboxylase and histidindecarboxylase, participating in formation of biogenic amines, were used as the screening methods. Thirty-nine strains of Lactobacillus spp., 15 strains of Staphylococcus spp., 15 strains of Streptococcus spp., 2 strains of Pediococcus spp. and 2 strains of the Bifidobacterium spp. were examined by the methods mentioned above. The tyramine production was detected at 13 strains of Lactobacillus spp., 14 strains of Staphylococcus spp., 3 strains of Streptococcus spp. and 2 strains of the Bifidobacterium spp., whereas no tested cultures were found to be able to produce histamine. The strains at which production of biogenic amines wasn't detected are suitable for fermented food processing. When the strains at which production of biogenic amines was demonstrated were used in food processing, a control of concentration of biogenic amines in final product is highly recommended.

Key words: histamine, tyramine, biogenic amines, probiotic cultures

OPTIMIZATION OF FROZING PERIOD RAW MATERIALS TO PROCESS HEAT UNTREATED MEAT PRODUCTS

OPTIMALIZACE DOBY MRAŽENÍ VSTUPNÍ SUROVINY PŘI VÝROBĚ TEPELNĚ NEOPRACOVANÝCH MASNÝCH VÝROBKŮ

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ABSTRACT

Hygienic quality of meat depends on number, microbial species and ability of growth of microorganisms present in meat and on its surface, on manipulation with meat since slaughtery till its processing, as well as on storing conditions.

In this work, the level of microbial contamination of pork and beef meat for processing in heat-untreated meat products was monitored.

In company providing samples for this work, meat was kept frozen for period of 6 days (144 hours), which was not effective due to the financialy expensive frozing storages. The relation ship between meat freezing period and number of selected technological as well as hygienical significant microorganisms was monitored, with the aim to optimize frozing period to keep microbial quality of meat.

Microbiological analysis of meat samples was performed in accrodance with CSN ISO 7218, before freezing of meat and after 48, 72, 96, 120 and 144 hours of freezing. Total number of microorganisms, total number of psychrotrophic microorganisms, yeast and fungi, coliforms, bacteria of the genus *Enterococcus* and bacteria of family *Enterobacteriaceae* was detected. As from results, sufficient period for meat freezing was 72 hours. After this period total count as well as bacteria of *Enterobacteriaceae* family, coliforms bacteria and bacteria of the genus *Enterococcus* reached the level, which at next freezing was not influenced. By next prolonging of freezing period – above 72 hours – number of psychrotrophic microorganisms was growing, which was not wanted from the technological point of view. Numbers of yeast and moulds became almost unchanged during the whole freezing period.

When shortening the freezing, period at the same suitable microbial quality of raw material, expensive operation of freezing storages is capable for more effective usage of other raw materials.

Key words: microorganisms of meat, freezing period of meat

Section – Plant Biology

Sekce – Biologie rostlin

REGULATIONS OF PHOSPHOENOLPYRUVATE CARBOXYLASE FROM SEEDS OF MAIZE AND THEIR POSSIBLE ROLES IN GERMINATION

REGULACE FOSFOENOLPYRUVÁTKARBOXYLASY ZE SEMEN KUKUŘICE A JEJICH MOŽNÝ VÝZNAM PŘI KLÍČENÍ

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ABSTRACT

The purpose of this research was to determine missing information about non-photosynthetic phosphoenolpyruvate carboxylase (PEPC) from seeds and provide new data regarding the regulatory phosphorylation of this enzyme. The C_4 plant's maize seeds were chosen because there has been no study of PEPC phosphorylation in seeds of plants of this type, and also because its photosynthetic counterpart is one of the best characterized forms so far. The project was carried out in several steps. The enzyme was purified and identified using MS-MALDI as root-form PEPC. The phosphorylation status was determined using alkaline phosphatase and protein kinase A. Enzyme was found to be stored fully phosphorylated in developed seeds and its phosphorylation status was not affected by imbibition. The native (phosphorylated) and fully dephosphorylated form of the enzyme were kinetically characterized with ordinary plant inhibitors (L-aspartate and L-malate) and activators (glycine, glucose-6-phosphate). Dephosphorylation in vitro resulted in increase in enzyme sensitivity to inhibitors and also change in its reaction rate dependency on substrate PEP from hyperbolic to sigmoid. This change in kinetics was even more pronounced at high temperature and suboptimal pH. Effects of dephosphorylation were countered by free phosphate.

Key words: Phosphoenolpyruvate carboxylase, phosphorylation, seed PEPC, enzyme regulations

THE CHANGES OF ABSCISIC ACID LEVEL AND ETHYLENE PRODUCTION DURING TUBER FORMATION OF POTATO (SOLANUM TUBEROSUM L.) IN VITRO

ZMĚNY OBSAHU KYSELINY ABSCISOVÉ A PRODUKCE ETYLENU V PRŮBĚHU TVORBY HLÍZ BRAMBOR (SOLANUM TUBEROSUM L.) IN VITRO

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ABSTRACT

The objective of this study was to determine the relationships between the level of abscisic acid, ethylen and CO2 production and potato microtuber formation in vitro. Stem nodal segments of potato plants were cultivated in vitro 8 weeks on Murashige-Skoog medium containing modified level of inorganic nitrogen (10-12 μM or 65 -70 μM), 80 g/l sucrose and 10 mg/l benzylaminopurine. Cultures with low nitrogen level in induction medium showed higher frequency of tuber formation. During induction of tuber formation (first two weeks of cultivation) nodal segments produced ethylene. Later ethylene production inhibited the growth of stolons and tuber formation. Higher level of abscisic acid was determined in leaves, later in stolons and tubers on nodal segments cultivated on induction medium with low level of nitrogen.

Key words: tuber formation, abscisic acid, ethylene, potato

MAIZE β-GLUCOSIDASE ZM-P60.1 AND ITS MUTANT FORMS: OPTIMISATION OF PURIFICATION PROCEDURE

OPTIMALISACE PURIFIKACE KUKUŘIČNÉ β-GLUKOSIDASY A JEJÍCH MUTANTNÍCH FOREM

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ABSTRACT

β-Glucosidases serve different roles in planta and indeed we find that plants have several different groups of this enzyme. Some of them can release active zeatin from zeatin-O-glucoside, a cytokinin conjugate thought to be the transport or storage form. One such enzyme is Zm-p60.1 from Zea mays. We have over-expressed the cDNA encoding Zm-p60.1 in E. coli and subsequently purified the recombinant protein using a purification procedure (Zouhar et al., 1999, Verdoucq et al., 2003) which uses a phosphate buffer system, imidazole as eluent. This procedure has been successfully applied to purify the native protein, but attempts to purify His-tagged mutants were not successful. The presence of glycerol (a protection agent) in the elution solutions causes precipitation of some mutants, and protein denaturation occurred during hydrophobic column chromatography. We therefore had to completely revise the purification protocol. For purification of recombinant enzyme and its histidine mutant forms, we now use an improved, two-step purification procedure. This makes use of affinity chromatography containing Ni2+ as affinity ligand (HisTrap) with a Tris/NaCl/imidazole/EDTA buffer system, without any glycerol. The imidazole used here is not part of elution buffer but is a component of the equilibration and column washing buffers (the column is washed to remove unbound chemical agents). The bound enzyme is then eluted with a high ionic strength EDTA buffer. Subsequently, enzyme fractions are pooled and the volume reduced to 1.5 ml. The second purification step is gel filtration chromatography (HiLoad 16/60 Superdex 200) with a Tris/NaCl buffer system. Using this improved two-step purification yields the enzyme with high homogeniety. This procedure is therefore well-suited for the purification of the histidine mutant H137D, other mutants like W373K, E186Q, F200K and H137Q as well as for the wild-type recombinant enzyme. This procedure has been used to purify the mutant form P2, which has proved very difficult to purify previously.

Key words: optimalization, purification, Zm-p60.1, mutant form, 2007

UTILIZATION OF *OGU*-INRA HYBRID SYSTEM IN WINTER RAPESEED BREEDING

VYUŽITÍ HYBRIDNÍHO SYSTÉMU *OGU*-INRA PŘI ŠLECHTĚNÍ ŘEPKY OZIMÉ

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ABSTRACT

Restorer lines of Ogu-INRA hybrid system with RfRf gene and low glucosinolates content in seed were selected. On the begining selection of the restorer lines were carried out according to GSL content. Following selection was aimed at restoring ability in F1 generation after pollination of sterile CMS component. Total 194 restorer lines were tested according their restoring ability. The 45 restorer lines (i.e. 23.20 %) with restoring ability above 90 % were founded. The 31 restorer lines (i.e. 15.98 %) had also GSL content below 18 μmol/g seed. Molecular method using of SCAR marker SG34 was optimalized and successfuly used for markering of Rf restorer gene. Check test evaluation on 50 randomize selected restorer plants confirmed accuracy of detection dominant Rf gene using these molecular marker. Beacause of impossibility for recognize dominant homozygous and heterozygous form of Rf gene using of fertility restoring test according to fertile flowers in F1 generation in addition to molecular methods is considered in future. Correlation coefficient r=0.23** between GSL content in restorer lines and their restoring ability in F1 generation were evaluated using of 191 lines and their progeny. Close connection between gene for high GSL content in restorer lines and Rf gene was confirmed. Finally the 7 restorer lines selected according to healthiness and other convenient agronomical traits were used for creating the 196 experimental 3-lines Ogu-INRA hybrids.

Key words: winter rapeseed, hybrid, Ogu-INRA, restorer, Rf gene, seed quality, glucosinolates, molecular markers

THE INFLUENCE OF LONG-TERM ORGANIC FERTILIZERS APPLICATION ON SULFUR CONTENT AND ARYLSULFATASE ACTIVITY IN RAPE RHIZOSPHERE

VLIV DLOUHODOBÉ APLIKACE ORGANICKÝCH HNOJIV NA OBSAH SÍRY A AKTIVITU ARYLSULFATASY V RHIZOSFÉŘE ŘEPKY

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ABSTRACT

The effect of different fertilization systems on S forms and arylsulfatase activity in rhizosphere of winter rape (*Brassica napus* L.) was investigated in rhizobox experiment provided in a special design rhizoboxes (Wenzel et al., 2001) allowing sampling of soil rhizosphere profile according to thickness of 1 mm per one layer. The soil from the long-term stationary experiment (Cambisol and Chernozem) with different fertilization systems (unfertilized treatment, manure treatment, sewage sludge treatment) was used. Increase of sulfur content in rhizosphere of rape compared to bulk soil on both monitored soils was found. The sulfur content and arylsulfatase activity were higher in organically fertilized treatments compared to control. The water extractable sulfur content in Cambisol was determined three times higher in contrast to Chernozem.

Key words: rape, rhizosphere, sulfur, sewage sludge, manure, arylsulfatase activity

EFFECT OF PLANT DEFENSE ELICITORS ON THE LEVEL OF PHYTOHORMONES

VLIV ELICITORŮ OBRANNÉ REAKCE NA HLADINU FYTOHORMONŮ

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ABSTRACT

The purpose of my research was to observe the effect of elicitors on the synthesis of plant hormones cytokinins in tobacco suspension cells. Elicitors are substances that can induce defense responses when applied to plant tissues or cultured-plant cells. It was used elicitors ergosterol and cryptogein in my research. Ergosterol is elicitor from plasmatic membrane of fungi. It was add as complex with 2-hydroxypropyl-ß-cyclodextrin. The effect of the ergosterol was compared with that of cholesterol, which did not activate induce defense responses. Cryptogein is small protein - elicitin, which is secreted by Phytophthora cryptogea. Cytokinins are plant regulators, which play a crucial role in various phases of plant growth and development. All native cytokinins are derivatives of adenine with substituent at N6 position. Cytokinins affect growth and regeneration of plants. Concentration of cytokinins was determined by high performance liquid chromatography (HPLC) with mass spectrometry (MS) detection. It was also observed the viability of tobacco suspension cells. The viability was measured through determination of intracellular esterase activity and through using of fluorescent colour propidium iodide (PI) and fluorescein diacetate (FDA). Experimental system was cultures of tobacco suspension cells cv. Xanthi. Added elicitor decreased the viability of tobacco suspension cells compared with control tobacco culture. The viability of the cells suspension was extremely decreased by the cryptogein. It was observed that the concentration of cytokinins increased with increasing concentration of elicitors. This effect was observed in presence of both elicitors.

Key words: Elicitors, tobacco, ergosterol, cryptogein, cytokinins

FUSARIUM MYCOTOXINS IN THE GRAIN OF BARLEY

FUSARIOVÉ MYKOTOXINY V ZRNU JEČMENE JARNÍHO

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ABSTRACT

The aim of this work was to determinate content of the most frequent Fusarium toxins and others species of fungi in the grain of barley. In term of content of mycotoxins was also evaluated the influence of growing localities and fungicide treatment. The multidetection method of high performance liquid chromatography coupled with tandem mass spectrometer (LC/MS-MS) was used to determine selected mycotoxins in grain samples. The highest levels of the studied toxins were found in the locality Kroměříž. In the fungicide treatment barley samples were levels of contaminations higher than in samples which were not chemically treated. The hygienic standard for tolerance limit for deoxynivalenol in non-processed cereals was not exceeded in any analyzed samples.

Key words: barley, deoxynivalenol, r. *Fusarium*.

IMPROVED METHOD FOR DIRECTED ENZYME EVOLUTION

VYLEPŠENÁ METODA PRO ŘÍZENOU EVOLUCI ENZYMŮ

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ABSTRACT

In plants, β-glucosidases have been implicated in regulating several aspects of development, including phytohormone activation, degradation of endosperm cell wall during germination, and pathogen defense. β-glucosidases are a widespread group of enzymes that hydrolyze a broad variety of glucosides including aryl- and alkyl- β-D-glucosides.

The maize β-glucosidase Zm-p60.1 is important for the regulation of plant development through its role in the targeted release of free cytokinins from cytokinin-O-glucosides, their inactive storage forms.

For research focused on β-glucosidase Zm-p60.1 substrate specificity we needed a procedure proving structure stability of the enzyme during mutagenesis. We developed a directed mutagenesis assay using a system comprising specially designed multi degenerated primers and direct screening of colonies containing positive mutations. This method performed in cycles is a suitable tool for directed evolution of enzymes concretely β-glucosidases in this particular setup.

Key words: Directed Enzyme Evolution, Directed mutagenesis, β-glucosidase, QuikChange® Multi Site-Directed Mutagenesis, 5-Bromo-4-chloro-3-indolyl b -D-glucopyranoside, X-Glu

DIFFERENT REACTIONS OF DHN GENES IN PLANTS OF BARLEY EXPOSED TO SHORT/LONGTERM DROUGHT

ROZDÍLNÉ REAKCE DHN GENŮ V ROSTLINÁCH JEČMENE VYSTAVENÝCH NÁHLÉMU A DLOUHODOBÉMU SUCHU

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ABSTRACT

Water deficit is one of the major factors limiting plant growth and development and crop productivity. Tolerance to abiotic stress is associated with stress-induced proteins including LEA (Late Embryogenesis Abundant) proteins. These proteins are coded by dehydrins (*Dhn* genes). Dehydrins are typically accumulated in plants during the late stages of embryogenesis and they protect the embryos to dehydration. Also they are produced by plants during abiotic stress (drought, low temperature, osmotic stress, seed drying, salinity). They protect the cells against water deficit. The main function of *Dhn* genes encoding dehydrins is determination of stress reactions in many species. Previously, they have been identified in barley, wheat, maize, sunflower, peas and many others.

The aim of this work was to evaluated some physiological traits and transcription activity of some *Dhn* genes by Real-Time PCR in contrast barley cultivars with different level of drought tolerance in two experimental conditions. We exposed plants of barley to short-term (cut leaves of contrast cultivars) and long-term drought stress (intact plants of barley growing in solution of polyethylenglycol).

The results of morpho-physiological evaluation and evaluation on the level of gene expression show that adaptation of plants to drought is based on many factors involved physiological and genetics mechanisms.

Key words: barley, dehydrins, drought, stress, expression

THE CONTENT OF GLUCOSINOLATES IN RAPESEED COTYLEDONS AND PATHOGEN *LEPTOSPHAERIA MACULANS*

OBSAH GLUKOSINOLÁTŮ V DĚLOŽNÍCH LISTECH ŘEPKY OLEJKY OZIMÉ A PATOGEN *LEPTOSPHAERIA MACULANS*

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ABSTRACT

Glucosinolates (GSL) are significant group of sulphur secondary metabolites having the role as natural pesticides in plants. The aim of this experiment was to detect the reaction of glucosinolates synthesis in rapeseed cotyledons connected with infection of *Leptosphaeria maculans*. Experiment are realised using laboratory inoculation tests. Three rapeseed genotypes and one pathogen isolate having aggresive character (Tox^+) were used. This test was based on the method from the document CRUCIFER GENETICS COOPERATIVE (information document from Dept. of Plant Pathology, University of Wisconsin) was used as source for establishment and evaluation of experiments. Infection was evaluated using scale 1-9 (1 = no darkening around wound, 9 = accompanied by profuse sporulation in large, more than 5 mm, lesions with diffuse margins). Content of glucosinolates was stained in intact, damaged and infected (inoculated) cotyledons at three terms: 1.) immediately before damaging and inoculation at the day of inoculation, 2.) 6 days after inoculation and 3.) 10 days after inoculation. It was detected, that GSL content is different in intact, damaged and infected rapeseed cotyledons. The whole content of GSL increased at damaged and infected cotyledons. The content of desulfogluconasturtiine (6th and 10th day after inoculation, aromatic glucosinolate) and desulfo-4-hydroxyglucobrassicine (10th day after inoculation, indolyl glucosinolate) increased at infected cotyledons. It was verified, that infection of *Leptosphaeria maculans* affects the production of glucosinolates in rapeseed cotyledons.

Key words: winter rapseed, infection of *Leptosphaeria maculans*, content of glucosinolates, cotyledons

THE EFFECT OF INTERACTION BETWEEN LIGHT QUANTITY AND INCREASED LEVEL OF CYTOKININS ON *ARABIDOPSIS THALIANA* SEEDLINGS PHOTOMORPHOGENESIS

VLIV SPOLUPŮSOBENÍ SVĚTELNÉ INTENZITY A ZVÝŠENÉ HLADINY CYTOKININŮ NA FOTOMORFOGENEZI SEMENÁČKŮ *ARABIDOPSIS THALIANA*

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ABSTRACT

The extension of the hypocotyl is regulated by a network of interacting factors as light and plant hormones. Light is one of the most important environmental factors for plants, as it provides the source of energy and photomorphogenetic signal. Cytokinins are the plant growth regulators that among others inhibit hypocotyl elongation in darkness but have no obvious effect on hypocotyl length in the light. We have been investigated the influence of light quantity (fluence) on hypocotyl elongation of transgenic *A. thaliana* seedlings (pOp-ipt-GUS::LhG4) with increased level of endogenous cytokinins. Upon low fluence 16 μmol photons m^{-2} s^{-1} hypocotyls of *ipt* overexpressing plantlets were significantly longer compared to control - non-overexpressing plantlets. It is known, that ethylene overlaps the elongation effect of cytokinins on hypocotyl in the light. Despite it we have been observed this phenomenon even if inhibitors of ethylene synthesis respectively perception were not supplemented to growth medium. Further, it was observed, the level of endogenous cytokinins play the role in the phenotype variability in *ipt* overexpressing plants. The increased cytokinin level evoke several various abnormal phenotype, on the one hand larger leaf rosette compared to control plants, on the other hand dwarfish plants.

Key words: *Arabidopsis thaliana*, cytokinins, hypocotyl, plant growth regulators

DETECTION OF VIRUS PATHOGENS OF GLADIOLUS IN THE CZECH REPUBLIC BY ELISA

DETEKCE VIROVÝCH PATOGENŮ MEČÍKŮ V ČESKÉ REPUBLICE METODOU ELISA

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ABSTRACT

The gladiolus plants of different origin were tested for presence of *Bean yellow mosaic virus* (BYMV), *Cucumber mosaic virus* (CMV), *Tobacco rattle virus* (TRV) by enzyme-linked immunosorbent assay (ELISA). *Bean yellow mosaic virus* was the most prevalent one, this pathogen was found in leaves of 138 plants from 226 tested. *Cucumber mosaic virus* was also widespread, it was determined in leaves of 70 plants from 226 tested. *Tobacco rattle virus* was determined only in leaf samples of 7 plants from 199 tested. Enzyme-linked immunosorbent assay was sufficient for detection of BYMV in leaves but sometimes failed to detect it in flowers. This virus was detected only in 11 flowers from 19 tested, which were taken from infected plants. ELISA was totally insufficient for detection BYMV and CMV in corms and cormlets. BYMV was detected only in one corm from 69 tested and CMV in none corm. These corms were taken from plants in which viruses were determined in leaves.

Key words: gladiolus, *Bean yellow mosaic virus*, *Cucumber mosaic virus*, *Tobacco rattle virus*

UTILIZATION OF WHEAT AND RYE SSR MARKERS IN TRITICALE

VYUŽITÍ SSR MARKERŮ PŠENICE A ŽITA U TRITIKALE

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ABSTRACT

Genetic variability of 16 genotypes of triticale (X*Triticosecale* Wittmack., 2n = 6x = 42, BBAARR) was studied using the SSR method. Triticale is a man made cereal combining the genomes of wheat and rye, it is autogamous with a low share of cross-pollination. For detection of the genetic variability on the level of DNA polymorphism RAPD and AFLP markers were used. Microsatellites occur in a large number of alleles. Simple sequence repeats are codominant and highly variable. Eight varieties of triticale registered in the Czech Republic, one variety from Russia and seven translocation forms derived from cv. Presto were analyzed. An appropriate step is a control electrophoresis on agarose gel with a fraction of the sample after amplification, which makes it possible to select usable samples for separation on polyacrylamide gels. SSR markers localized on chromosomes of A, B, D and R genome were chosen from the literature for the analysis. Based on 30 SSR markers a dendrogram was calculated, which highly significantly differentiates the Valentine-90 genotype from all other 15 genotypes splitted into two sub-clusters. The first one includes cv. Lupus, Ticino, Presto and translocation forms of cv. Presto. The second sub-cluster consists of the cv. Lamberto, Kitaro, Triamant, Gutek and Tornado. Supported by the Grant Agency of MUAF in Brno, project No. 23/2007.

Key words: triticale, genetic variability, polymorphism of DNA, SSR, marker

EXPRESSION OF STORAGE PROTEINS IN RELATION TO CONTENT OF ABSCISIC ACID IN DESICCATED PEA ZYGOTIC EMBRYOS IN VITRO

EXPRESE ZÁSOBNÍCH PROTEINŮ VE VZTAHU K OBSAHU KYSELINY ABSCISOVÉ U DESIKOVANÝCH ZYGOTICKÝCH EMBRYÍ HRACHU IN VITRO

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ABSTRACT

The expression of storage proteins in relation to content of abscisic acid (ABA) in desiccated pea zygotic embryos (*Pisum sativum* L.) has been studied. Analyses has been provided on embryos and embryogenic axis cultivated *in vitro*. Mature and immature embryos were cultivated *in vitro* on the medium supplemented by 30 g or 80 g sucrose with 10 μM ABA or in the presence 20 μM flurochloridone. In these defined conditions only mature embryos were able to germinate. In early stages of development of cotyledonary embryos ABA level after treatment by flurochloridone was decreased, on the other side, exogenously applied ABA caused increased level of endogenous ABA. Expression of storage proteins corresponded to the high level of ABA in stage of ripening of cotyledonary embryos.

Key words: storage proteins, abscisic acid, zygotic embryo, *Pisum sativum*, flurochloridone, dessication

CHANGES OF LEVEL OF ENDOGENOUS PHYTOHORMONES AS NEW MARKER OF ENVIRONMENTAL LOADING

ZMĚNY OBSAHU ENDOGENNÍCH FYTOHORMONŮ JAKO NOVÝ UKAZATEL ENVIRONMENTÁLNÍHO ZNEČIŠTĚNÍ

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ABSTRACT

The aim of our study was to find, establish and verify new methods for early indication of stress evoked by organic compounds in plants. The level of endogenous phytohormones in pea plants (*Pisum sativum* L. cv. Garde) cultivated *in vitro* in the presence of polycyclic aromatic hydrocarbon (PAH) fluoranthene (FLT) was detected. The selected concentrations of FLT simulate low (0.1 mg/L) and high (1 and 5 mg/L) environmental loading. With the increasing loading of the environment by toxic compounds (e.g. PAHs) it is necessary to developed and use new methods for the early indication of stress. The effect of PAHs treatment on the vegetation cover has not yet been studied at the level of *in vitro* cultures. The use of *in vitro* cultures can be suitable for the study of influence of xenobiotics, with the regard to their spatial and financial demands.

The apical segments of pea plants were cultivated on Murashige-Skoog (MS) cultivation medium. MS medium was enriched with 0.1 mg/L indole-3-acetic acid (IAA) or combination of IAA and 0.1 mg/L N_6-benzylaminopurin (BA). The production of gaseous hormone ethylene was analysed after 1, 2, 3, 7, 14 and 21 days of cultivation by GC-FID. In 21-day-old plants the level of cytokinins was analysed after purification of methanolic extracts using P- and DEAE-cellulose columns and C18 Sep-pak cartridge by reversed-phase HPLC separation to individual fraction of cytokinins. Their levels were determined using the ELISA method. In 21-day-old plants the level of ABA was analysed by RIA method with monoclonal antibody MAC 252. Radioligand ^{3}H-ABA was used. Radioactivity was calculated using software Securia Packard. The results were processed with software STATISTICA 6.

The content of endogenous phytohormones (ethylene, cytokinins (DHZR, iP, BA, BAR, mT, mTR) and ABA) significantly increased with increasing FLT concentration (1 and 5 mg/L) in the environment. This fact indicates that it could be a precious tool for the study of toxic effects of other environmental contaminants.

Key words: fluoranthene, phytohormone, pea plants, *in vitro*

MECHANISM OF REGULATION OF *NICOTIANA BENTHAMIANA* DOMIN GERMINATION

REGULAČNÍ MECHANISMY KLÍČENÍ SEMEN *NICOTIANA BENTHAMIANA* DOMIN

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ABSTRACT

A target of our work was to find out how it is possible to enhance germination and break dormancy of seeds of *N. benthamiana*. Different compounds such as cyanide (KCN), pottassium ferricyanide (PFC), sodium nitroprusside (SNP), sodium nitrite and giberellins (GA) were used to fullfil our task. Abscisic acid (ABA) and paclobutrazol were also applied to know more about regulation of seed germination.

Seeds of *N. benthamiana* were colected from plants planted in a greenhouse. These seeds were imbibed in 11–cm glass Petri dishes containing double layer of sterile filter paper (Whatman International Ltd, England) moistened with ten ml of sterile distilled water containing desired compounds. The imbibition lasted three days.

Seeds of *N. benthamiana* were released from seed dormancy by after-ripening at room temperature and also at 4°C during cold treatment. After-ripening at room temperature was proved to be more efficient than cold treatment.

KCN, PFC and SNP break seed dormancy of *N. benthamiana* in dose-dependent manner. The higher concentrations of these compounds (100 μM and 250 μM) were more sufficient in releasing dormancy. Also nitrite promotes germination of *N. benthamiana* seeds but in much higher concentrations (500 μM and 1000 μM). Exogenous application of GA_3 on dormant and non-dormant seeds had no effect on their germination. However, GA_{4+7} promoted germination of dormant seeds in dose-response manner and had no effect on germination of non-dormant seeds. GA_{4+7} also overcome the inhibition of germination by darkness.

Paclobutrazol inhibited germination of non-dormant seeds of *N. benthamiana*. The response of non-dormant seeds was dose-dependent. The effect of ABA on half-dormant seeds was the same as on non-dormant seeds. ABA inhibited a protrusion of radicle but did not inhibite testa rupture. Whenever ABA was removed seeds started to germinate.

Key words: after-ripening, sodium nitroprusside, cyanide, giberellins, abscisic acid

Section – Animal Biology

Sekce – Biologie živočichů

MICROSATELLITE DIVERSITY OF HORSE BREEDS IN CZECH REPUBLIC

DIVERZITA MIKROSATELITNÝCH MARKEROV U PLEMIEN KONÍ V ČESKEJ REPUBLIKE

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ABSTRACT

In the present study was estimate the genetic diversity and relationships among nine horses breeds in Czech and Slovak Republic.

In conclusion, the main objective of study was to show the level of genetic distance among the horse breeds with different history of breeding of each country. Furthermore, it should be clarified whether these populations and subpopulations are distinct enough from each other to justify defining separate breeds. This research concerns the variability of microsatellite markers in genotypes of horse.

We compared the genetic diversity and distance among nine horse breeds Czech and Slovak Warmblood both of Czech origin, Slovak Warmblood of Slovak origin, Hucul, Hafling, Furioso, Noriker, Silesian Noriker and Bohemian-Moravian Belgian Horse.

In total, 932 animals were genotyped for 17 microsatellites markers (AHT4, AHT5, ASB2, HMS3, HMS6, HMS7, HTG4, HTG10, VHL20, HTG6, HMS2, HTG7, ASB17, ASB23, CA425, HMS1, LEX3) recommended by the International Society of Animal Genetics.

In the different population size, the allele frequencies, observed and expected heterozygosity, test for deviations from Hardy-Weinberg equilibrium and Polymorphism information content have been calculated for each breed. We analyzed genetic distance and diversity among them on the base of the dataset of highly polymorphic set of microsatellites representing all autozomes using set of PowerMarker v3.25 analysis tools and Structure 2.2. programme for results comparison.

Key words: microsatellite, horse, diversity

DYNAMIC DEVELOPMENT OF ZOOBENTHOS IN PONDS OF LEDNICE

DYNAMIKA ROZVOJE ZOOBENTOSU LEDNICKÝCH RYBNÍKŮ

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ABSTRACT

The ponds of Lednice are situated in the area „Lednicko-valtický areál“, which falls into the biospheric preserve UNESCO.

The aim of this essay was monitoring of seasonal dynamic development of zoobenthos in Lednice ponds over the years 2006-2007 and performance of qualitative and quantitative analysis of taken samples. The research was realized on ponds Nesyt, Hlohovecký, Prostřední, Mlýnský and Zámecký. Samples of macrozoobenthos were taken in monthly intervals. Qualitative studies of samples have showed 84 taxa of bentic macroinvertebrates in the localities mentioned above. Following groups of macrozoobenthos were the most often present: Oligochaeta *(Limnodrilus* sp.*, Tubifex Tubifex)*, Hirudinea *(Erpobdella octoculata, Glossiphonia complanata)*, Ephemeroptera *(Caenis robusta)*, Odonata *(Ischnura pumilio)* a Diptera *(Chironomus* gr. *plumosus, Ch.* gr. *semireductus, Endochironomus* gr. *nymphoides)*. In terms of quantitative monitoring following data were found out: The abundance ranged between 22 - 2833 individuals $.m^{-2}$, the biomass fluctuated between intervals 0,1 to 24,7 $g.m^{-2}$. With respect to the fact that only few researches with a focus on quality of macrozoobenthos in ponds of Lednice were realized, this research could bring supplementary information about the situation of bentic macroinvertebrates in the studied localities.

Key words: Zoobenthos, ponds of Lednice, quality, quantity.

ALLELE FREQUENCY OF KIT GENE ASSOCIATED WITH TOBIANO SPOTTING PATTERN IN PAINT HORSE BREED

FREKVENCE ALEL GENU KIT ASOCIOVANÉHO SE STRAKATOSTÍ TOBIANO U KONÍ PLEMENE PAINT HORSE

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ABSTRACT

The aim of this work was to determine allel frequency of gen, associated with tobiano spotting pattern in Paint Horse breed. Four main kinds of spotting are distinguished: tobiano, frame overo, sabino and splashed white. Tobiano spotting pattern is characterized by white patches that cross the dorsal midline and include legs. Depigmented areas descend vertically. Face markings are the same as on normal horses. Allele KM1 of protooncogene c-kit (KIT) with MspI restriction site is associated with tobiano spotting pattern. Fifty Paint Horses were tested for genotype of KIT gene, by PCR-RFLP. From 37 tobiano (or tovero) horses were 5 homozygous KM1 KM1, 32 heterozygous KM1 KM0. Thirteen non-tobiano horses (solid or other spotting pattern) were homozygous KM0 KM0. Allele frequency of KM1 in Paint Horse breed is 0,42.

Key words: horse, coat colour, tobiano, PCR-RFLP, allele frequency

HEAVY METAL CONTAMINATION OF FISH FROM MIDDLE COURSE OF THE JIHLAVA RIVER

MONITORING OBSAHU TĚŽKÝCH KOVŮ VE STŘEDNÍM TOKU ŘEKY JIHLAVY

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ABSTRACT

In May and August 2007, Cu, Cr, Ni, Cd, Zn, Pb and Hg content was monitored in two localities of the Jihlava River in order to determine the river loading. Fish, sediment, zoobenthos and water samples were taken for later analyses. Zoobenthos was taken as a mixed sample of single locality on the other hand sediment was taken as a mixed sample from whole locality. Barbillon (*Barbus barbus*) and Chub (*Leuciscus cephalus*) were chosen as an ichtyoindicators and their dorsal muscle without the skin was used for heavy metals analyses.

Values of Cu 7,988 mg/kg, Zn 53,93mg/kg, Cd 121mg/kg, Pb 3462,2mg/kg, Ni 90,658mg/kg, 64,5 mg/kg Cr, 0,01848mg/kg Hg were measured in sediment from Hrubšice locality and 6,37mg/kg Cu,38,678 mg/kg Zn, 0,197mg/kg Cd, 25,824mg/kg Pb, 1,9mg/kg Ni, 3,049mg/kg Cr and 0,028 mg/kg Hg from Vladislav locality.

In the Hrubsice locality weasured in zoobenthos 8,08mg/kg Cu, 76,89 mg/kg Zn,

177,3 mg/kg Cd, 819,9 mg/kg Pb, 243,88 mg/kg Ni, 140,5 mg/kg and 0,00637 mg/kg Hg ,from Vladislav locality 6,37mg/kg Cu, 38,678 mg/kg Zn, 0,197mg/kg Cd, 25,824mg/kg Pb, 1,9mg/kg Ni, 3,049mg/kg Cr and 0,028 mg/kg Hg.

Higher values of Hg in fish muscle were found in Vladislav locality (0,2105mg/kg) and similarly in Hrubšice locality (0,27365mg/kg).

Heavy metals contamination of the Jihlava Riwer whose very high.

Key words: heavy metals, Jihlava River, contamination

GENETICKÁ ANALÝZA VÝVOJOVÝCH VAD ČÍNSKÉHO CHOCHOLATÉHO PSA

GENETIC ANALYSE OF EVOLUTIONARY DEFECT IN CHINESE CRESTED DOG

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ABSTRACT

Content of this work is genetic anylysis evolutionary defects in Chinese crested dog. Analysis includes information from year 1999 to year 2006. There were considered 1776 borned puppies and 345 judgement dogs. Basic methods for analyse was genealogical studies of pedigree and segregace analysis.

In litter of Chinese crested dogs was located overbite, whose heredity isn´t possible establishs and underbite whose heredity correspond to autosomal recessive inheritance. Below it was detected that the presence of underbite and overbite is in linkage with occlusion forcipate. There is asumed linkage in oligodontia and dominant gene for nakedness in hairless breeds. There are not missed incisors and canines in 21,24% hairless and 42,48% coated individuals in Chinese crested dog, which proves positive impact in using coated dogs in breeds. In puppies is often detected umbilical hernia which is however not congenital defect. Its presence can be noticed in specific lines but enviroment has bigger influence on its appearance. There was not proved heritability of this defect in bubonocele hernia. In this breed was detected dry eye but even this defect can not be considered as inherited. In litters of Chinese crested dog there are detected blue coloured iris, opened fontanela, congenital deafness and missing auditory meatus too. From results is clear that blue coloured iris is defect which is controled by more recessive genes and in opened fontanela we can conclude that it is autosomal recessive heritability. For determination of congenital deafness heritability, which is linked with white coat, and undeveloped auditory meatus and external ear there has to be more test breeding**.** In hairless breeds there are not just sporadic dead born puppies and its death loss after delivery. Because the reason of death loss was not detected to this breeder this question is opened as question of inherited predispositions.

Key words: dogs, heredity, evolutionary defects, Chinese crested dog.

TOXICITY AND GENOTOXICITY OF HALOGENATED ALIPHATIC HYDROCARBONS IN *DROSOPHILA MELANOGASTER*

TOXICITA A GENOTOXICITA HALOGENOVANÝCH ALIFATICKÝCH UHLOVODÍKŮ U *DROSOPHILA MELANOGASTER*

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ABSTRACT

Halogenated aliphatic hydrocarbons represent important industial chemicals playing a great role as environmental pollutants. Hazard identification of this compound is fundamental to human health protection and environment protection.

Two halogenated aliphatic hydrocarbons, 1,2-dichloroethane and 1-iodopropane, were evaluated for toxic and genotoxic effects using the wing spot test, the variant of somatic mutation and recombination test (SMART) in Drosophila melanogaster. N-methyl-N-nitrosourea served as the positive control and distilled water as the negative control.

Tested compounds expressed toxic effect at larval stages of D. melanogaster. Comparing values LC50 (50% lethal concentrations), 1-iodopropane was more toxic than 1,2-dichloroethane.

For genotoxicity evaluation of tested compounds was used the wing spot test, which allow to assess induced genetic change via formation of mosaic spots on the wings of trans-hezygote flies carrying genetic markers mwh and flr3. 1-iodopropane did not show any genotoxicity at 50% lethal concentration and gave positive results only at a higher concentration. 1,2-dichloroethane was relatively high genotoxic at 50% lethal concentration and induced some twin spots, which were produced by mitotic recombination exclusively. MNU induced high number various spots, which documented its strong mutagenic and recombinogenic activity.

Additional, the stability of transgene lacZ in strain P-1152 was analysed after induction gametic mutations in treatment with 1,2-dichloroethane. It was employed SSCP (Single Strand Conformatin Polymophism) in assessment of transgen stability in offspring of exposed individuals at the molecular level. Any mutations weren´t detected in the transgen.

Key words: genotoxicity testing, SMART, wing spot test, Drosophila melanogaster, halogenated aliphatic hydrocarbons

DETECTION OF SNP IN MSTN GENE OF GASCONNE CATTLE BREED

DETEKCE SNP V GENU MSTN U PLEMENE GASCONNE

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ABSTRACT

In the present study we deal with detecting SNP in myostatin (MSTN) gene using molecular genomic methods. MSTN is a negativ regulator of muscle growth. Nine different mutations were found in that gene. Theese are responsible for double muscling in cattle and the others spesies. Mutation called G938A was detected in gasconne cattle breed and it is causing embarrassment during birth. The aim of breeders is to supress appearence of phenotype trait of double muscling in gasconne sires, mainly.

By mentioned reasons, two different methods were designed. First was based on allele specific PCR. The results were negative because of unussual sequence near SNP, low occurence of GC. The second one was sequencing of DNA fragment in which G938A mutation was found. The primers were designed using on line software Primer 3 (v 0.4.0). The samples were analysed in ABI PRISM 310 machine with using DNA Sequencing Analysis Software (ver. 5.1).

Key words: double muscling, myostatin, gasconne, AS – PCR, sequencing DNA

THE CHOICE OF THE MOST SUITABLE TECHNIQUE FOR ISOLATION OF NUCLEIC ACIDS AT DEPARTMENT OF ANIMAL MORPHOLOGY, PHYSIOLOGY AND GENETICS

VÝBĚR NEJVHODNĚJŠÍHO ZPŮSOBU IZOLACE NUKLEOVÝCH KYSELIN NA ÚSTAVU MORFOLOGIE, FYZIOLOGIE A GENETIKY ZVÍŘAT

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ABSTRACT

In 2007 we acquired a project „Education expansion by a course of molecular isolation techniques for students of Mendel University of Agriculture and Forestry in Brno“ from grant agency of Ministry of Education, Youth and Sports of the Czech Republic. The aim of this project is to familiarize the students of bachelor, master and Ph.D. degree at Mendel University of Agriculture and Forestry in Brno (MUAF) with the recent knowledge from the field of molecular isolation techniques. This report summarizes workflow of arrangement of our project. We chose the representative samples of the kits that were currently on the market. We compared different techniques of isolation RNA, DNA from different samples. Our results suggest that testing of kits before work with samples is important. The results vary in dependence on using of kits and systems. There were not found any differences between kits for nucleic acid witch were used for isolation from blood and milk. DNA from muscles and fat tissue was isolated more efficiently by kits determined only for DNA isolation, than kits for isolation DNA and RNA at the same time. For RNA isolation the kits based on phenol-chlorophorm methods were the best. The results of this project will be exploited for choice of suitable isolating kits used for education and also research.

Key words: DNA, RNA, isolation

ANALYSIS OF GENOMIC MARKER CSN2 IN COW'S MILK

ANALÝZA GENOMICKÉHO MARKERU CSN2 V MLÉCE SKOTU

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ABSTRACT

The aim of this paper was to analyze, evaluate and interpret genetic variability of beta-casein gene between populations of Normande breed in Czech Republic and Holstein breed in Czech Republic. At first the information about genetic marker and possible associations of marker with human health from literature was processed. Two populations were investigated, Normande breed and Holstein breed. Genotypes were detected using PCR-RFLP. The genetic diversity was studied. The frequencies of alleles and genotypes were calculated. The frequencies between populations were found out. It was established that frequencies of alleles and genotypes were in agreement with literature in most cases. Frequencies of alleles and genotypes of CSN2 are comparable between breeds. These results can be more developed and used for comparison with other cattle breeds in Czech Republic.

Key words: genetic polymorphism, beta-casein, Normand breed, Holstein breed, PCR-RFLP.

FOLLOWING DYNAMIC OF DEVELOPMENT OF WATER INVERTEBRATES ON LOWER REACH DYJE

SLEDOVÁNÍ DYNAMIKY ROZVOJE VODNÍCH BEZOBRATLÝCH DOLNÍHO TOKU DYJE

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ABSTRACT

This chapter contains the results of hydrobiological research carried in 2007. Observation was doing on two location. One of the study area was on the old part of river Dyje location 1 „Nejdek pod mostem“ and a another study area was on „New“ part of river Dyje location 2 „Pod Bulharským jezem“. The aim of study was to ascertain the changes in the hydrobiological parameters on two study area of river Dyje. In this project was referred only species structure and determinated constancy of a systém. On the first study area location Dyje 1. „Nejdek pod mostem“ was ascertain 59 species. Constancy of a species on this study area was 27,11% euconstancy, 20,33% constancy, 52,54% accessory. Accidental species was not find in this location. On the second study area location Dyje 2 „Pod Bulharským jezem“ was ascertain 38 species with 21,62 % euconstancy, 27,02 % constancy, 51,35 % accessory. Accidental species was not find too. On the finished of this project was determinate similarity with previous researche on basis Jaccard index. For compare of this two location was use works of this authors MAKOVSKÝ J., 2006, BRYCHTA M., 1999, BIELIK I., 1992, SUKOP I., 1990. The most similarity in this reseach and on above location was with MAKOVSKÝ J., 2006 Ja= 34,21%

Key words: Macrozoobentos, constancy, Jaccard index, Dyje

ANALYSIS OF GROWTH HORMONE IN TENCH (*TINCA TINCA*)

ANALÝZA RŮSTOVÉHO HORMONU LÍNA OBECNÉHO (*TINCA TINCA*)

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ABSTRACT

The aim of this work is to prepare proceeding protocols for students of practical course of "Fish Genetics" at MUAF. We have designed sets of primers and sequenced a part of tench (Tinca tinca) growth hormone gene. We also designed other sets of primers to sequence the rest of the gene. The RNA isolation was performed from the muscle of the tench and cDNA was synthesized from the total RNA with reverse transcriptase. Sets of primers for housekeeping genes were designed and will be used for quantitative analysis of growth hormone in tench by using real-time RT-PCR.

Key words: growth hormone, tench

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