No.	Records	Request
1	6390	SOYBEAN
2	4771	GLYCINE
3	8132	SOYBEAN or GLYCINE
4	16957	PY=2004
* 5	401	#3 and (PY=2004)

Record 1 of 401 - AGRICOLA 1998-2004/09
AU: Scandiani,-M.; Ruberti,-D.
TI: Report outbreak of soybean sudden death syndrome caused by Fusarium virguliforme and F. tucumaniae in Argentina.
SO: Plant disease. 2004 Sept., v. 88, no. 9 p. 1044.

Record 2 of 401 - AGRICOLA 1998-2004/09
AU: Ortiz-Ribbing,-L.M.; Eastburn,-D.M.
TI: Soybean root systems and sudden death syndrome severity: taproot and lateral root infection.
SO: Plant disease. 2004 Sept., v. 88, no. 9 p. 1011-1016.

Record 3 of 401 - AGRICOLA 1998-2004/09
AU: Koenning,-S.R.
TI: Resistance of soybean cultivars to field populations of Heterodera glycines in North Carolina.
SO: Plant disease. 2004 Sept., v. 88, no. 9 p. 942-950.

Record 4 of 401 - AGRICOLA 1998-2004/09
AU: Naz,-S.; Sheikh,-H.; Siddiqi,-R.; Sayeed,-S.A.
TI: Oxidative stability of olive, corn and soybean oil under different conditions.
SO: Food chemistry. 2004 Nov., v. 88, issue 2 p. 253-259.

Record 5 of 401 - AGRICOLA 1998-2004/09
AU: Mooney,-B.P.; Thelen,-J.J.
TI: High-throughput peptide mass fingerprinting of soybean seed proteins: automated workflow and utility of Uni-Gene expressed sequence tag databases for protein identification.
SO: Phytochemistry. 2004 June, v. 65, no. 12 p. 1733-1744.
AB: Identification of anonymous proteins from two-dimensional (2-D) gels by peptide mass fingerprinting is one area of proteomics that can greatly benefit from a simple, automated workflow to minimize sample contamination and facilitate high-throughput sample processing. In this investigation we outline a workflow employing robotic automation at each step subsequent to 2-D gel electrophoresis. As proof-of-concept, 96 protein spots from a 2-D gel were analyzed using this approach. Whole protein (1 mg) from mature, dry soybean (Glycine max [L.] Merr.) cv. Jefferson seed was resolved by high resolution 2-D gel electrophoresis. Approximately 150 proteins were observed after staining with Coomassie Blue. The rather low number of detected proteins was due to the fact that the dynamic range of protein expression was greater than 100-fold. The most abundant proteins were seed storage proteins which in total represented over 60% of soybean seed protein. Using peptide mass fingerprinting 44 protein spots were identified. Identification of soybean proteins was greatly aided by the use of annotated, contiguous Expressed Sequence Tag (EST) databases which are available for public access (UniGene, ftp.ncbi.nih.gov/repository/UniGene/). Searches were orders of

magnitude faster when compared to searches of unannotated EST databases and resulted in a higher frequency of valid, high-scoring matches. Some abundant, non seed storage proteins identified in this investigation include an isoelectric series of sucrose binding proteins, alcohol dehydrogenase and seed maturation proteins. This survey of anonymous seed proteins will serve as the basis for future comparative analysis of seed-filling in soybean as well as comparisons with other soybean varieties.

Record 6 of 401 - AGRICOLA 1998-2004/09

AU: Igamberdiev,-A.U.; Mikkelsen,-T.N.; Ambus,-P.; Bauwe,-H.; Lea,-P. J.; Gardestrom,-P.

TI: Photorespiration contributes to stomatal regulation and carbon isotope fractionation: a study with barley, potato and Arabidopsis plants deficient in glycine decarboxylase.

SO: Photosynthesis research. 2004, v. 81, no. 2 p. 139-152.

Record 7 of 401 - AGRICOLA 1998-2004/09

AU: Gryson,-N.; Messens,-K.; Dewettinck,-K.

TI: Evaluation and optimisation of five different extraction methods for soy DNA in chocolate and biscuits. Extraction of DNA as a first step in GMO analysis.

SO: Journal of the science of food and agriculture. 2004 Aug. 30, v. 84, issue 11 p.1357-1363.

AB: A method is described to discriminate between genetically modified (GM) and non-modified foodstuffs by detecting the presence of newly introduced genes at the protein or DNA level. Currently available methods operate almost exclusively at the DNA level and are based on the polymerase chain reaction (PCR). The first and most crucial step in this process is the isolation of DNA. In this study, five different methods for the isolation of DNA from chocolate and biscuits were evaluated, using four commercially available extraction kits and a non-commercial method for amplification of the soybean-specific lectin gene. The latter method involves the use of hot-start Taq polymerase, to prevent the formation of non-specific amplification products, and an increase in the number of cycles from 35 to 41. The performance of the non-commercial cetyl trimethylammonium bromide (CTAB)-based method was the best, taking into consideration the adaptations of the extraction procedure, although this method was more time-consuming than the others. Chocolate (white, milk and dark) and several biscuits generated positive amplification results using this PCR approach.

Record 8 of 401 - AGRICOLA 1998-2004/09

AU: Seguin,-P.; Zheng,-W.; Smith,-D.L.; Deng,-W.

TI: Isoflavone content of soybean cultivars grown in eastern Canada.

SO: Journal of the science of food and agriculture. 2004 Aug. 30, v. 84, issue 11 p. 1327-1332.

AB: Soybean (Glycine max (L) Merr) seeds contain isoflavones that have positive impacts on human health. The objective of this study was to determine isoflavone concentrations of early maturing soybean cultivars grown in different environments and to determine their relation to other important seed characteristics. Twenty soybean cultivars were grown in replicated trials at two sites in Montreal, Canada in 2002/2003 and their total and

individual isoflavone concentrations were determined by high-performance liquid chromatography. Seed yield, 100-seed weight and oil, crude protein and crude fiber concentrations were concurrently determined. Total and individual isoflavone concentrations were significantly affected by cultivar, site and year. Total isoflavone concentration ranged from 360 to 2241 microgram g-1 and averaged 851 microgram g-1 across environments and cultivars. Variation across environments ranged from 20 to 100% for specific cultivars. Total isoflavone concentration was, on average, 40% greater in 2003 than 2002, which was characterized by above average temperatures and severe drought. Despite significant cultivar x year x site interactions, cultivars with consistently high and low isoflavone concentrations across environments were identified. Weak but significant positive correlations were observed between total isoflavone concentration and seed yield, 100-seed weight and crude fiber, indicating that isoflavone concentration is positively associated with other desirable seed characteristics.

Record 9 of 401 - AGRICOLA 1998-2004/09

AU: Mueller,-D.S.; Bradley,-C.A.; Grau,-C.R.; Gaska,-J.M.; Kurle,-J.E.; Pedersen,-W.L.

TI: Application of thiophanate-methyl at different host growth stages for management of sclerotinia stem rot in soybean.

SO: Crop protection. 2004 Oct., v. 23, issue 10 p. 983-988.

AB: Sclerotinia stem rot (SSR), caused by Sclerotinia sclerotiorum, is an important disease of soybean (Glycine max L.) in the North Central United States. The incidence of SSR can be reduced by planting partially resistant cultivars and by implementation of cultural practices that limit pathogen activity. Fungicides such as thiophanate-methyl are another option for control of SSR, but usually recommended in situations where susceptible cultivars must be grown or modification of cultural practices are not disease control options. Previous studies have shown that control of SSR with fungicides is possible, but that the degree of control is inconsistent especially when incidence of SSR surpasses 50%. This study was designed to evaluate the efficacy of single or multiple applications of thiophanate-methyl in relation to timing of inoculation and early reproductive growth stages of the host. Inoculum was introduced at growth stage R2 at the Illinois location, and naturally occurring inoculum was relied upon to initiate SSR at the Wisconsin location. Thiophanate-methyl was effective when applied at R1 prior to inoculation at R2, but not if applied at R3, after inoculation. Two applications of thiophanate-methyl starting at R1 or the R2 growth stage and a second 2 weeks later lowered the incidence of SSR at the naturally infested Wisconsin site compared to one application with one exception. The incidence of SSR was identical for one and two applications starting at R1.5. Soybean yield was improved by fungicides at both experimental locations, and coincided with timing, and number of applications. Data from both locations suggested that fungicides need to be applied prior to inoculum arrival to the infection court. One application was effective in the controlled inoculation study, but two applications were needed at the naturally infested location. Two applications of thiophanate-methyl improved yield of a partially resistant soybean cultivar even though the incidence of SSR was <

10% at the Wisconsin location. Thiophanate-methyl is an effective option for control of SSR, especially to reduce seedborne inoculum in commercial seed production systems.

Record 10 of 401 - AGRICOLA 1998-2004/09

AU: Chen,-P.; Buss,-G.R.; Tolin,-S.A.

TI: Reaction of soybean to single and double inoculation with different Soybean mosaic virus strains.

SO: Crop protection. 2004 Oct., v. 23, issue 10 p. 965-971.

AB: Two soybean genotypes [Glycine max (L.) Merr.] were inoculated either singly with eight Soybean mosaic virus (SMV) strains, or doubly with combinations of two strains, to examine the interactions between strains and determine if complementation, interference, or synergism is evident. Inoculated plants were monitored for symptom development and assayed for strain identity. Virus replication and movement were also monitored by enzyme-linked immunosorbent assay and by a leaf imprint immunoassay. Plants with resistance genes inoculated with two avirulent SMV strains remained healthy and virus was not detected by immunoassays, indicating no apparent complementation between avirulent strains to break resistance. Virulent necrosis-inducing or mosaic-inducing strains, in the presence of an avirulent strain, induced necrosis or mosaic symptoms, respectively, and only the virulent strains were recoverable from the mix-inoculated plants. A necrotic strain inoculated together with a mosaic strain resulted in mosaic symptoms and only the mosaic strain was recovered. Inoculation with two mosaic strains gave rise to mosaic symptoms and only the more virulent mosaic strain was recovered. Thus, following mixed inoculation, the interaction appears to be that of interference. Mosaic strains predominate over necrotic strains, and both predominate over avirulent strains. There is no evident complementation among avirulent strains or phenotypic synergism between two mosaic strains.

Record 11 of 401 - AGRICOLA 1998-2004/09

AU: Porcel,-R.; Ruiz-Lozano,-J.M.

TI: Arbuscular mycorrhizal influence on leaf water potential, solute accumulation, and oxidative stress in soybean plants subjected to drought stress.

SO: Journal of experimental botany. 2004 Aug., v. 55, no. 403 p. 1743-1750.

Record 12 of 401 - AGRICOLA 1998-2004/09

AU: Arregui,-M.C.; Lenardon,-A.; Sanchez,-D.; Maitre,-M.; Scotta,-R.; Enrique,-S.

TI: Monitoring glyphosate residues in transgenic glyphosate-resistant soybean.

SO: Pest management science. 2004 Feb., v. 60, issue 2 p. 163-166.

AB: The availability of Roundup Ready (RR) varieties of soybean has increased the use of glyphosate for weed control in Argentina. Glyphosate [(N-phosphonomethyl)glycine] is employed for the eradication of previous crop vegetation and for weed control during the soybean growing cycle. Its action is effective, and low environmental impact has been reported so far. No residues have been observed in soil or water, either of glyphosate or its metabolite, AMPA (aminomethylphosphonic acid). The objective of this work was to monitor glyphosate and AMPA residues in soybean

plants and grains in field crops in Santa Fe Province, Argentina. Five sites were monitored in 1997, 1998 and 1999. Individual soybean plants were sampled from emergence to harvest, dried and ground. Analysis consisted in residue extraction with organic solvents and buffers, agitation, centrifugation, clean-up and HPLC with UV detection. In soybean leaves and stems, glyphosate residues ranged from 1.9 to 4.4 mg kg-1 and from 0.1 to 1.8 mg kg-1 in grains. Higher concentrations were detected when glyphosate was sprayed several times during the crop cycle, and when treatments approached the flowering stage. AMPA residues were also detected in leaves and in grains, indicating metabolism of the herbicide.

Record 13 of 401 - AGRICOLA 1998-2004/09

AU: Nascimento,-I.R.; Murata,-A.T.; Bortoli,-S.A.; Lopes,-L.M.X.

TI: Insecticidal activity of chemical constituents from Aristolochia pubescens against Anticarsia gemmatalis larvae.

SO: Pest management science. 2004 Apr., v. 60, issue 4 p. 413-416.

AB: Acetone and ethanol extracts of the tubercula and several compounds isolated from Aristolochia pubescens (Willd) were bioassayed on velvetbean caterpillars, Anticarsia gemmatalis (Hubner), for evaluation of the insecticidal activities. Of the extracts subjected to bioassay, the acetone extract showed the highest activity. (-)-Cubebin did not show activity against soybean caterpillars, whereas aristolochic acid and ent-kaur-15-en-17-ol increased the larval period. These compounds, and (+)-eudesmin and (+)-sesamin, reduced the viability of this period, giving rise to malformed adults. These extracts and compounds are therefore potential botanical insecticide agents for the control of velvetbean caterpillars in soybean crops.

Record 14 of 401 - AGRICOLA 1998-2004/09

AU: Barr,-L.A.; Fahnestock,-S.R.; Yang,-J.

TI: Production and purification of recombinant DP1B silk-like protein in plants.

SO: Molecular breeding new strategies in plant improvement. 2004 May, v. 13, no. 4 p. 345-356.

AB: Spider dragline silk of Nephila clavipes consists of two highly repetitive proteins, spidroin 1 and spidroin 2. To develop a plant platform for production of recombinant silk-like protein, two plant-optimized DP1B genes were synthesized to mimic spidroin 1. DP1B-8P encodes for a 64 kD DP1B silk-like protein and DP1B-16P for a 127 kD DP1B silk-like protein. Both genes have been introduced into Arabidopsis for leaf-based production driven by the 35S promoter and for seed-specific production driven by the beta-conglycinin alpha' subunit promoter, respectively. They have also been expressed in somatic soybean embryos under the control of thebeta-conglycinin alpha' subunit promoter. The results demonstrate the synthesis and accumulation of DP1B silk-like protein in leaves and seeds of Arabidopsis, as well as in somatic soybean embryos. They suggest that seeds are the more preferred tissue for DP1B production since they offer higher production yield and quality. In addition, a simplified protocol for purifying DP1B from plant tissue is discussed.

Record 15 of 401 - AGRICOLA 1998-2004/09

AU: Wang,-P.; Li,-G.; Kain,-W.
TI: Characterization and cDNA cloning of midgut carboxypeptidases from Trichoplusia ni.
SO: Insect biochemistry and molecular biology. 2004 Aug., v. 34, no. 8 p. 831-843.
AB: Carboxypeptidase A and carboxypeptidase B activities from the midgut of Trichoplusia ni larvae were characterized. In the T. ni larval midgut, the primary digestive carboxypeptidase activity was attributed to carboxypeptidase A, which was eight times more active than carboxypeptidase B. Both the midgut carboxypeptidase A and carboxypeptidase B exhibited maximal activities at pH 8.0-8.5 and were similarly susceptible to inhibition by potato carboxypeptidase inhibitor and phenanthroline. The midgut carboxypeptidase activities were analyzed in T. ni larvae fed on various diet sources and the results indicated that midgut carboxypeptidase activities per milligram of gut were similar regardless of the amount of dietary proteins or amino acids. However, midgut carboxypeptidase A activity was significantly higher in larvae exposed to soybean trypsin inhibitor and was significantly lower in larvae fed on broccoli foliage. From the T. ni larval midgut, five putative carboxypeptidase cDNAs were cloned, demonstrating that midgut carboxypeptidase activities are composed of multiple carboxypeptidase types. Sequence analysis indicated that the midgut carboxypeptidases were produced as secreted proenzymes which could be activated after removal of an N-terminal activation fragment by a trypsin. Two cloned cDNAs are predicted to code for carboxypeptidase A and one cDNA is predicted to code for a putative carboxypeptidase B. The other two cDNAs are highly similar to carboxypeptidase A and carboxypeptidase B in sequences, but their activity was not predictable.

Record 16 of 401 - AGRICOLA 1998-2004/09
AU: Rott,-M.E.; Lawrence,-T.S.; Wall,-E.M.; Green,-M.J.
TI: Detection and quantification of Roundup Ready soy in foods by conventional and real-time polymerase chain reaction.
SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5223-5232.
AB: Transgenic soybean line GTS-40-3-2, marketed under the trade name Roundup Ready (RR) soy, was developed by Monsanto (USA) to allow for the use of glyphosate, the active ingredient of the herbicide Roundup, as a weed control agent. RR soy was first approved in Canada for environmental release and for feed products in 1995 and later for food products in 1996 and is widely grown in Canada. Consumer concern issues have resulted in proposed labeling regulations in Canada for foods derived from genetically engineered crops. One requirement for labeling is the ability to detect and accurately quantify the amount of transgenic material present in foods. Two assays were evaluated. A conventional qualitative Polymerase Chain Reaction (PCR) assay to detect the presence of soy and RR soy and a real-time PCR to quantify the amount of RR soy present in samples that tested positive in the first assay. PCR controls consisted of certified RR soy reference material, single transgenic soybeans, and a processed food sample containing a known amount of RR soy. To test real-world applicability, a number of common grocery store food items that contain soy-based products were tested. For some samples,

significant differences in amplification efficiencies during the quantitative PCR assays were observed compared to the controls, resulting in potentially large errors in quantification. A correction factor was used to try to compensate for these differences.

Record 17 of 401 - AGRICOLA 1998-2004/09

AU: Reddy,-K.N.; Rimando,-A.M.; Duke,-S.O.

TI: Aminomethylphosphonic acid, a metabolite of glyphosate, causes injury in glyphosate-treated, glyphosate-resistant soybean.

SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5139-5143.

AB: Glyphosate-resistant (GR) soybean [Glycine max (L.) Merr.] was developed by stable integration of a foreign gene that codes insensitive enzyme 5-enolpyruvylshikimate-3-phosphate synthase, an enzyme in the shikimate pathway, the target pathway of glyphosate. Application of glyphosate to GR soybean results in injury under certain conditions. It was hypothesized that if GR soybean is completely resistant to the glyphosate, injury could be caused by a metabolite of glyphosate, aminomethylphosphonic acid (AMPA), a known phytotoxin. Glyphosate and AMPA effects on one- to two-trifoliolate leaf stage (16-18-days old) GR and non-GR soybean were examined in the greenhouse. In GR soybean, a single application of glyphosate-isopropylammonium (1.12-13.44 kg/ha) with 0.5% Tween 20 did not significantly reduce the chlorophyll content of the second trifoliolate leaf at 7 days after treatment (DAT) or the shoot dry weight at 14 DAT compared with Tween 20 alone. A single application of AMPA (0.12-8.0 kg/ha) with 0.5% Tween 20 reduced the chlorophyll content of the second trifoliolate leaf by 0-52% at 4 DAT and reduced shoot fresh weight by 0-42% at 14 DAT in both GR and non-GR soybeans compared with Tween 20 alone. AMPA at 0.12 and 0.50 kg/ha produced injury in GR and non-GR soybean, respectively, similar to that caused by glyphosate-isopropylammonium at 13.44 kg/ha in GR soybean. AMPA levels found in AMPA-treated soybean of both types and in glyphosate-treated GR soybean correlated similarly with phytotoxicity. These results suggest that soybean injury to GR soybean from glyphosate is due to AMPA formed from glyphosate degradation.

Record 18 of 401 - AGRICOLA 1998-2004/09

AU: Kubec,-R.; Hrbacova,-M.; Musah,-R.A.; Velisek,-J.

TI: Allium discoloration: precursors involved in onion pinking and garlic greening.

SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5089-5094.

AB: Precursors involved in the formation of pink and green-blue pigments generated during onion and garlic processing, respectively, have been studied. It has been confirmed that the formations of both pigments are of very similar natures, with (E)-S-(1-propenyl)cysteine sulfoxide (isoalliin) serving as the primary precursor. Upon disruption of the tissue, isoalliin and other S-alk(en)ylcysteine sulfoxides are enzymatically cleaved, yielding 1-propenyl-containing thiosulfinates [CH3CH=CHS(O)SR; R = methyl, allyl, propyl, 1-propenyl] among others. The latter compounds have been shown to subsequently react with amino acids to produce the pigments. Whereas the propyl, 1-propenyl, and

methyl derivatives form pink, pink-red, and magenta compounds, those containing the allyl group give rise to blue products after reacting with glycine at pH 5.0. The role of other thiosulfinates [RS(O)SR'] (R, R' = methyl, allyl, propyl) and (Z)-thiopropanal S-oxide (the onion lachrymatory principle) in the formation of the pigments is also discussed.

Record 19 of 401 - AGRICOLA 1998-2004/09

AU: Yang,-T.S.; Liu,-T.T.

TI: Optimization of production of conjugated linoleic acid from soybean oil.

SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5079-5084.

AB: Linoleic acid from soybean oil was used to synthesize conjugated linoleic acid (CLA), and the response surface methodology (RSM) was applied to optimize the process. A temperature of -35ÀC and a solvent to oil sample ratio of 8 were suggested for removal of saturated fatty acids by low-temperature crystallization. The ratio of oil sample/urea/methanol suggested was 1:2:5.5 (w/w/v) for removal of oleic acid by urea crystallization. A temperature of 150ÀC and a time of 140 min were found to be the optimal conditions in the isomerization for the production of c-9,t-11 and t-10,c-12 CLA isomers.

Record 20 of 401 - AGRICOLA 1998-2004/09

AU: O'Kane,-F.E.; Happe,-R.P.; Vereijken,-J.M.; Gruppen,-H.; Boekel,-M.A.J.S.-van

TI: Heat-induced gelation of pea legumin: comparison with soybean glycinin.

SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5071-5078.

AB: Gel network formation of pea legumin (8.4% on a protein basis, pH 7.6) was monitored via dynamic rheological measurements. Gelation was performed in the absence and presence of the thiol-blocking reagent N-ethylmaleimide, at different rates of heating and cooling. Overall, it was shown that pea legumin gel formation was not effected by changes in the heating rate, and the two differently heated samples were unaffected by the addition of 20 mM NEM, which indicated that disulfide bonds were not essential within the network strands of these legumin gels. However, slowly cooling the legumin samples caused disulfide bonds to become involved within the network; this was observed by a large increase in gel strength that was then substantially reduced when repeating the sample in the presence of NEM. These experiments were repeated with soybean glycinin in order to determine whether a common model for gel formation of legumin-like proteins could be built, based upon molecular reasoning. The two proteins were affected in the same way by changes in the conditions used, but when applying a procedure of reheating and recooling the gel networks responded differently. Pea legumin gel networks were susceptible to rearrangements that caused the gels to become stronger after reheating/recooling, yet glycinin gel networks were not. It was concluded that the same physical and chemical forces drove the processes of denaturation, aggregation, and network formation. Each process can therefore be readily targeted for modification based upon molecular reasoning. Pea legumin and soybean glycinin gel networks had structurally different building

blocks, however. A model of gelation aimed at texture control therefore requires additional information.

Record 21 of 401 - AGRICOLA 1998-2004/09

AU: Ebert,-T.A.; Derksen,-R.C.; Downer,-R.A.; Krause,-C.R.

TI: Comparing greenhouse sprayers: the dose-transfer process.

SO: Pest management science. 2004 May, v. 60, issue 5 p. 507-513.

AB: Three sprayers were evaluated for their affect on retention and efficacy: a carbon dioxide powered high-volume sprayer, a DRAMM coldfogger, and an Electrostatic Spraying Systems (ESS) sprayer with air-assistance. The active ingredients used were spinosad and azadirachtin. The plant canopy was constructed in the greenhouse using potted soybeans (Glycine max (L) Merrill cr Pioneer 9392). Application efficacy with spinosad was assessed using thrips [Western flower thrips, Frankliniella occidentalis (Pergande)] and mite (two-spotted spider mite, Tetranychus urticae Koch) abundance on shoots and leaves. Application efficacy with azadirachtin was assessed using thrips and aphid (soybean aphid, Aphis glycines Matsumura) abundance on shoots and leaves. The atomization characteristics of each sprayer were measured using an Aerometrics phase/Doppler particle analyzer (PDPA) 100-1D. The results of four tests are presented. Two tests used each sprayer according to manufacturer recommendations. These are 'recommended volume' tests that confound differences in toxicant distribution caused by the sprayer with differences caused by changes in application volume. The other two tests were 'constant volume' tests in which all three sprayers were used to deliver the same application volume. Both types of test gave differences between sprayers in retention of toxicant, but only the recommended volume tests showed significant effects of the sprayers on pest abundance. We attribute this difference to the role played by changing application volumes in the dose-transfer process. The constant-volume tests showed that application equipment influences efficacy.

Record 22 of 401 - AGRICOLA 1998-2004/09

AU: Kang,-I.S.; Wang,-J.J.; Shih,-J.C.H.; Lanier,-T.C.

TI: Extracellular production of a functional soy cystatin by Bacillus subtilis.

SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5052-5056.

AB: A recombinant Bacillus subtilis producing soy cystatin was developed by subcloning with a soy cystatin gene cloned in Escherichia coli. An active form of cystatin against the cysteine protease from Pacific whiting fillets contaminated with Myxosporidia parasite was constitutively expressed and secreted extracelluarly into the medium. Two gene fragments of signal peptides from kerA and sacB were introduced and compared for secretion efficiency of cystatin. The secretion level of active cystatin improved with the signal peptide of kerA when compared to that of sacB. Inhibitor activity was reduced rapidly after peak expression of the target protein at 36 h of fermentation. The addition of 1% glucose, a suppressor of protease, into the medium sustained the increase of the cystatin activity during fermentation. This study introduced a potential new method for fermentation production of cystatin.

Record 23 of 401 - AGRICOLA 1998-2004/09
AU: Bown,-D.P.; Wilkinson,-H.S.; Gatehouse,-J.A.
TI: Regulation of expression of genes encoding digestive proteases in the gut of a polyphagous lepidopteran larva in response to dietary protease inhibitors.
SO: Physiological entomology. 2004 Aug., v. 29, no. 3 p. 278-290.
AB: Larvae of Helicoverpa armigera (Hubner), a polyphagous lepidopteran crop pest, adapt to the presence of protease inhibitors in their diet by differential regulation of multiple genes encoding digestive proteases. The time-course of their response to dietary soybean Kunitz trypsin inhibitor (SKTI) involves several stages; an initial up-regulation of all protease genes assayed (up to 12 h after exposure to inhibitor) is succeeded by a longer-term down-regulation of expression of specific genes that encode proteases most sensitive to the inhibitor, whereas genes encoding putative inhibitor-insensitive proteases continue to be up-regulated (after 24 h of exposure). Consequently, insect protease activity changes from being sensitive to the inhibitor, to being largely insensitive. The insect response is comparable in its timescale with that of the synthesis of protease inhibitors in the plant wounding response. SKTl causes similar effects on protease gene expression and gut protease activity when fed in diets containing casein or hydrolysed casein as sources of amino acid, suggesting that the insect response is not mediated through inhibition of digestive proteolysis. Soybean Bowman-Birk inhibitor, which has a broader range of inhibitory activity against gut proteases in H. armigera, but is a less effective inhibitor on an I50 basis, proves to be a more effective antimetabolite than SKTI, but does not induce inhibitor-insensitive protease activity because it causes a general up-regulation of protease-encoding genes. A possible mechanism to account for these different responses is discussed.

Record 24 of 401 - AGRICOLA 1998-2004/09
AU: Nishimukai,-M.; Hara,-H.
TI: Enteral administration of soybean phosphatidylcholine enhances the lymphatic absorption of lycopene, but reduces that of alpha-tocopherol in rats.
SO: Journal of nutrition. 2004 Aug., v. 134, no. 8 p. 1862-1866.

Record 25 of 401 - AGRICOLA 1998-2004/09
AU: Strange-Hansen,-R.; Holm,-P.E.; Jacobsen,-O.S.; Jacobsen,-C.S.
TI: Sorption, mineralization and mobility of N-(phosphonomethyl) glycine (glyphosate) in five different types of gravel.
SO: Pest management science. 2004 June, v. 60, issue 6 p. 570-578.
AB: Sorption, mineralization and mobility of glyphosate were studied in six substrates: the five types of gravel most frequently used as surfacing in Denmark and a sandy agricultural soil from Simmelkær that served as a reference soil. Cumulative mineralization of [methyl-14C]glyphosate in batch studies was highest in coarse gravel, amounting to 14% after 4 days at 30 ÀC and 32% after 31 days. Mineralization was slowest in the sandy reference soil, amounting to only 2% after 31 days. The adsorption coefficient (Kd) of glyphosate in gravel ranged from 62 to 164 litre kg-1, while that in the sandy reference soil was 410 litre kg-1. The results indicate that the relatively low Kd

in gravel allows a relatively high rate of glyphosate mineralization by the biomass. When Kd is high, in contrast, mineralization is slow. Lowering the temperature to 10 ÀC decreased mineralization by 50% in one of two gravels. The leaching of glyphosate was screened in simple columns of gravel or soil in which precipitation events (20 mm over a 2-h period) were simulated on three occasions, starting either immediately after or 2 days after application of glyphosate. [14C]Glyphosate was applied as a tracer mixed with the commercial product Roundup Garden at the recommended rate of 2.4 kg glyphosate ha-1, equivalent to 1 micrograms g-1 soil. The highest concentration of [14C] compounds (expressed in terms of glyphosate concentration) in leachate from the columns exceeded 1300 micrograms litre-1, and was detected in rounded gravel after the first rain event. No glyphosate was detected in leachate from the sandy reference soil.

Record 26 of 401 - AGRICOLA 1998-2004/09

AU: Corzo,-A.; Kidd,-M.T.; Burnham,-D.J.; Kerr,-B.J.

TI: Dietary glycine needs of broiler chicks.

SO: Poultry science. 2004 Aug., v. 83, no. 8 p. 1382-1384.

AB: Dietary Gly might become a limiting factor in all-vegetable diets fed to broiler chicks when low CP is formulated in combination with marginal levels of dietary Thr and Ser. A study was conducted to evaluate dietary Gly needs of broiler chicks. Day-old Ross 508 male chicks were placed in 32 floor pens (15 chicks/pen). Chicks were fed a common prestarter diet from 0 to 7 d of age and then fed a diet that contained progressive amounts of dietary Gly ranging from 0.62 to 1.22% from 7 to 20 d of age. Treatment effects were observed for weight gain and feed conversion. Chicks responded in a quadratic manner to supplementation with dietary Gly. The dietary Gly level necessary to support maximum growth and feed conversion for the chick from 7 to 20 d of age was estimated to be at 0.98 (1.76% Gly + Ser) and 1.02% (1.80% Gly + Ser), respectively. Plasma Thr and Ser were unaffected by Gly supplementation, but plasma free Gly increased linearly. Dietary Gly may need to be considered as a limiting nutrient in early nutrition, especially if CP is low, and only vegetable ingredients are being used.

Record 27 of 401 - AGRICOLA 1998-2004/09

AU: Cruz,-V.C.; Pezzato,-A.C.; Ducatti,-C.; Pinheiro,-D.F.; Sartori,-J.R.; Goncalves,-J.C.

TI: Tracing metabolic routes of feed ingredients in tissues of broiler chickens using stable isotopes.

SO: Poultry science. 2004 Aug., v. 83, no. 8 p. 1376-1381.

AB: The present study aimed to quantify the proportion of 13C from energy and protein feed ingredients that follow the metabolic routing of the liver and muscle in broiler chickens. A stable isotope of carbon technique was used that is based on the isotopic discrimination that occurs in the plants during the photosynthesis process. One-day-old male chicks were subjected to treatments based on free choice of energy and protein sources. Rice bran (R) and soybean meal (S), C3 plants, have higher isotopic ratios than corn (C), a C4 plant, and corn gluten meal (G). Choices were R+S, C+G, R+G, C+S, or R+C+G+S. A complete feed (CF) was a sixth treatment. Feed intake and BW were measured at 30

d of age, when liver and breast muscle were collected for isotopic analysis. Treatments affected the amount of feed intake and the choices of energy or protein sources. Complete feed had the largest intake, differing from the other treatments that had free-choice feeding. Final BW was a direct reflection of consumption by these birds in all treatments. The isotopic results indicated that the 13C/12C ratio was generally higher in breast muscle than in liver, probably because of higher protein content. Moreover, in the liver, the proportion of 13C retained from the energy ingredient was greater than the proportion from the protein ingredient. That is in contrast to muscle, where the proportion of 13C retained from the protein ingredient was greater than from the energy ingredient that was self-selected.

Record 28 of 401 - AGRICOLA 1998-2004/09

AU: Kidd,-M.T.; Corzo,-A.; Hoehler,-D.; Kerr,-B.J.; Barber,-S.J.; Branton,-S.L.

TI: Threonine needs of broiler chickens with different growth rates.

SO: Poultry science. 2004 Aug., v. 83, no. 8 p. 1368-1375.

AB: The Thr needs in 3 commercial broiler strains (A, multipurpose; B, high yield; C, high yield) known to differ in terms of feed intake, growth rate, and breast yield were evaluated. Birds were randomized across 96 floor pens (12 birds/pen), received a common diet from d 1 to 20, and were fed graduations of Thr (0.52 to 0.87% total Thr in 0.07% increments) from d 21 to 42. Treatments (3 x 6 factorial) were replicated 5 or 6 times. The corn, soybean meal, and peanut meal test diet contained 0.43 and 0.96% digestible Thr and Lys, respectively. An additional group of strain C birds (6 pens) was maintained on a corn-soybean meal diet containing surfeit Thr (0.73% of diet). Birds fed the corn and soybean meal diet performed similarly (P less than or equal to 0.05) to birds fed peanut meal diets. A feed conversion interaction (P less than or equal to 0.05) occurred indicating that strain C was more sensitive to Thr deficiency than strains A and B. The abdominal fat interaction (P less than or equal to 0.05) indicated that strain A had more relative abdominal fat than strains B and C. All strains differed (P less than or equal to 0.05) in terms of BW gain (A, 78.2; B, 75.1; C, 72.9 g/d). Strain C had the lowest (P less than or equal to 0.05) feed intake, which resulted in the lowest (P < 0.05) Thr intake, but it had the highest (P less than or equal to 0.05) breast meat yield. Most parameters tested yielded quadratic (P less than or equal to 0.05) models whereby Thr estimates could be predicted. Namely, BW gain and breast meat yield resulted in total Thr estimates (95% of maximum response) of 0.74 and 0.71%, respectively, which are in close agreement with the 1994 NRC (0. 74%). The plasma Thr sigmoid response verified the former estimates. Analysis of strain intercepts and slopes as affected by Thr differed (P less than or equal to 0.05) in terms of feed intake but not BW gain or breast meat yield. The 21 to 42 d Thr need across strains was estimated as 0.74% total or 0.65% digestible. Because dietary Lys was not in excess of the bird's needs, the former digestibility estimate equated to a Thr/Lys of 0.68.

Record 29 of 401 - AGRICOLA 1998-2004/09

AU: Vieira,-S.L.; Lemme,-A.; Goldenberg,-D.B.; Brugalli,-I.

TI: Responses of growing broilers to diets with increased sulfur amino acids to lysine ratios at two dietary protein levels.
SO: Poultry science. 2004 Aug., v. 83, no. 8 p. 1307-1313.
AB: An experiment with 1,440 male Cobb 500 and 1,440 male Ross 308 broilers (14 to 35 d of age) was conducted to investigate the effects of diets having 4 levels of digestible methionine plus cysteine (SAA) on various performance criteria at 2 dietary protein levels (20.5 and 26.0%). Two corn-soybean meal/poultry by-product basal diets were formulated to contain 3,060 kcal/kg MEn and either 20.5 or 26.0% balanced protein, and 1.12 and 1.46% digestible (according to table values) lysine, respectively. Except for SAA, the ratios between essential amino acids were kept identical in both diets according to the ideal protein concept. The ratio between digestible SAA and digestible Lys was 50%. All remaining nutrients met or exceeded NRC (1994) recommendations. Graded levels of SAA were supplemented to obtain digestible SAA to Lys ratios of 62, 69, and 77%, with 77% representing an optimized amino acid balance. Increasing the protein level clearly improved weight gain, feed conversion, breast meat yield, and abdominal fat content. Increasing SAA levels resulted in strong nonlinear or linear dose responses at both protein levels and for both strains. Regression analysis suggested that reducing digestible SAA in a balanced protein (diets with SAA:Lys of 77%) impairs performance, and that optimum SAA:Lys ratio for growing broilers might be higher than 77%, although ANOVA revealed no significant improvement with an SAA:Lys ratio higher than 69%. Responses provide evidence that optimum dietary SAA level depends on dietary protein level and should therefore be related to the protein content.

Record 30 of 401 - AGRICOLA 1998-2004/09
AU: Silversides,-F.G.; Scott,-T.A.; Bedford,-M.R.
TI: The effect of phytase enzyme and level on nutrient extraction by broilers.
SO: Poultry science. 2004 June, v. 83, no. 6 p. 985-989.
AB: Three experimental phytase enzyme preparations derived from the same Escherichia coli gene but produced in Saccharomyces cerevisiae (A), Pichia pastoris (B), and Pseudomonas fluorescens (C) were compared with a commercial enzyme preparation by addition to wheat-soybean meal diets fed to broiler chicks. A positive control diet contained sufficient available phosphorus for normal broiler growth and a negative control diet was phosphorus deficient. The 4 enzymes were added to the negative control diet at 3 levels each (150, 450, and 1,250 U/kg), and all diets were pelleted above 80°C. Broiler chicks were fed experimental diets from 4 to 21 d. Chick performance and nutrient digestibility showed that the pelleting process inactivated enzymes A and C and the commercial enzyme. When added to the negative control diet, enzyme B had positive effects on broiler performance and calcium and phosphorus digestibility, and increasing levels of enzyme had greater positive effects. Enzyme B also increased the AME and protein digestibility over those of either control diet. These results suggest that enzyme B was not inactivated by pelleting above 80°C, whereas the other enzymes were.

Record 31 of 401 - AGRICOLA 1998-2004/09
AU: Martinez-Amezcua,-C.; Parsons,-C.M.; Noll,-S.L.

TI: Content and relative bioavailability of phosphorus in distillers dried grains with solubles in chicks.
SO: Poultry science. 2004 June, v. 83, no. 6 p. 971-976.
AB: Total phosphorus analysis was performed on 20 samples of corn distillers dried grains with solubles (DDGS), and three experiments were conducted to determine the bioavailability of P in different samples of DDGS varying in Lys digestibility and heat processing (autoclaving). Relative bioavailability of P was estimated from tibia ash using the slope ratio method after chicks were fed a P-deficient corn-soybean meal diet supplemented with 0.05 or 0.10% P from KH2PO4 or supplemented with 2 levels of the test DDGS (7 to 25%). The mean total P value for the 20 DDGS samples was 0.73 « 0.04% (SD), with an average dry matter value of 88 « 0.8% (SD). In experiment 1, the bioavailability coefficient for P in a random sample of DDGS relative to KH2PO4 was 69%. In experiment 2, the relative bioavailabilities of P in low digestible Lys DDGS 1, low digestible Lys DDGS 2, and high digestible Lys DDGS 3 were 102, 82 and 75%, respectively ($P < 0.05$). For experiment 3, the P bioavailability coefficients for a light-colored nonautoclaved DDGS and the same DDGS autoclaved at 121ÀC and 124 pKa were 75 and 87%, respectively ($P < 0.05$). Our results showed that the total P content of DDGS was similar to the 0.72% value reported by the NRC (1994), but the relative P bioavailability is higher than the value estimated from NRC (1994) based on table values for total and nonphytate P content. Our results also indicated that there is substantial variability in P bioavailability among different DDGS samples and suggest that increased heat processing may increase the bioavailability of P in DDGS.

Record 32 of 401 - AGRICOLA 1998-2004/09
AU: Corzo,-A.; Moran,-E.T.-Jr.; Hoehler,-D.
TI: Valine needs of male broilers from 42 to 56 days of age.
SO: Poultry science. 2004 June, v. 83, no. 6 p. 946-951.
AB: An experiment was conducted using Ross x Ross 308 males to estimate the proportion of dietary valine needed to optimize performance in broilers from 42 to 56 d of age. All birds received common feeds from 0 to 42 d, and then experimental diets were given to 56 d of age. A diet consisting of corn, soybean meal, and corn gluten meal (17% CP, 3.25 kcal of ME/g) having 0.60% valine served as basal feed. All other essential amino acids were above recommended levels. Successive additions of 0.07% of L-valine were isonitrogenously substituted for L-glutamic acid up to a total of 0.81%. Regression analysis (95% of response) indicated that valine at 0.72% of the diet maximized body weight gain, whereas 0.73% optimized feed conversion. Depot fat removed from the abdominal cavity after processing was unaltered, and weights of resultant chilled carcasses maximized at 0.73% valine in parallel with final live weight. The amount of fillets recovered from chilled carcasses optimized at 0.73% valine; however, the incidence of distinctive blood streaks in the meat (splash) progressively increased with valine as did the level of redness apart from streaking, based on light reflectance. Given lysine at 0.85%, a ratio of 0.86 with valine appears to be adequate. The presently determined requirement of 0.73% total valine (0.67% digestible) for broiler males from 42 to 56 d of age is slightly higher than the 0.70% recommended by

the NRC.

Record 33 of 401 - AGRICOLA 1998-2004/09

AU: Norberg,-S.E.; Dilger,-R.N.; Dong,-H.; Harmon,-B.G.; Adeola,-O.; Latour,-M.A.

TI: Utilization of energy and amino acids of spray-dried egg, plasma protein, and soybean meal by ducks.

SO: Poultry science. 2004 June, v. 83, no. 6 p. 939-945.

AB: A study was conducted to determine AMEn, TMEn, apparent amino acid digestibility (AAAD), and true amino acid digestibility (TAAD) of spray-dried egg (SDE), plasma protein (PP), and soybean meal (SBM). AMEn and TMEn values for ducks fed SDE were higher (P is less than or equal to 0.001) than for ducks fed PP, which were higher than SBM. The AMEn values were 5.048, 3.230, and 2.605 kcal/g for SDE, PP, and SBM, respectively, with TMEn values of 5.373, 3.555, and 2.930 kcal/g, respectively. Spray-dried egg, PP, and SBM were similar in apparent digestibility of the indispensable amino acids except for methionine, histidine, and valine. Apparent methionine digestibility in SDE (95.5%) was higher (P less than or equal to 0.01) than PP (88.3%) or SBM (91. 3%). Apparent digestibilities of dispensable amino acids were similar for SDE, PP, and SBM except proline and alanine. Apparent alanine digestibility in SDE (89.9%) was higher (P less than or equal to 0.05) than in SBM (85.7%). True digestibilities of indispensable amino acids were similar in SDE, PP, and SBM except for methionine, histidine, and valine. True methionine digestibility was higher (P less than or equal to 0.05) for SDE (97.0%) than for PP (89.8%) or SBM (92.7%), with PP and SBM being similar. True histidine and valine digestibilities were significantly lower for SDE (P less than or equal to 0.05) than for PP or SBM. True digestibilities of the dispensable amino acids were also similar in SDE, PP, and SBM except for proline and alanine. This study demonstrates that the energy value of SDE is greater than that of PP or SBM.

Record 34 of 401 - AGRICOLA 1998-2004/09

AU: Biggs,-P.E.; Persia,-M.E.; Koelkebeck,-K.W.; Parsons,-C.M.

TI: Further evaluation of nonfeed removal methods for molting programs.

SO: Poultry science. 2004 May, v. 83, no. 5 p. 745-752.

AB: The objective of this study was to evaluate several nonfeed removal methods compared with feed removal for induced molting of laying hens. An experiment was conducted using 576 Dekalb White hens (69 wk of age) randomly assigned to 1 of 8 dietary treatments. Two of these treatments consisted of feed removal for 10 d followed by ad libitum access to a 16% CP, corn-soybean meal diet or a 94% corn diet for 18 d. The other 6 treatments provided ad libitum access for 28 d to diets containing 94% corn, 94% wheat middlings (WM), 71% WM: 23% corn, 47% WM: 47% corn, 95% corn gluten feed, and 94% distillers dried grains with solubles (DDGS). At 28 d, all hens were fed a laying hen diet (16% CP), and production performance was measured for 40 wk.

Record 35 of 401 - AGRICOLA 1998-2004/09

AU: Ma,-F.; Cholewa,-E.; Mohamed,-T.; Peterson,-C.A.; Gijzen,-M.

TI: Cracks in the palisade cuticle of soybean seed coats correlate with their permeability to water.

SO: Annals of botany. 2004 Aug., v. 94, no. 2 p. 213-228.
AB: Background and Aims Soybean (Glycine max) is among the many legumes that are well known for 'hardseededness'. This feature can be beneficial for long-term seed survival, but is undesirable for the food processing industry. There is substantial disagreement concerning the mechanisms and related structures that control the permeability properties of soybean seed coats. In this work, the structural component that controls water entry into the seed is identified. Methods Six soybean cultivars were tested for their seed coat permeabilities to water. To identify the structural feature(s) that may contribute to the determination of these permeabilities, fluorescent tracer dyes, and light and electron microscopic techniques were used. Key Results The cultivar 'Tachanagaha' has the most permeable seed coat, 'OX 951' the least permeable seed coat, and the permeabilities of the rest ('Harovinton', 'Williams', 'Clark L 67-3469', and 'Harosoy 63') are intermediate. All seeds have surface deposits, depressions, a light line, and a cuticle about 0.2 m thick overlaying the palisade layer. In permeable cultivars the cuticle tends to break, whereas in impermeable seeds of 'OX 951' it remains intact. In the case of permeable seed coats, the majority of the cracks are from 1 to 5 m wide and from 20 to 200 m long, and occur more frequently on the dorsal side than in other regions of the seed coat, a position that correlates with the site of initial water uptake. Conclusions The cuticle of the palisade layer is the key factor that determines the permeability property of a soybean seed coat. The cuticle of a permeable seed coat is mechanically weak and develops small cracks through which water can pass. The cuticle of an impermeable seed coat is mechanically strong and does not crack under normal circumstances.

Record 36 of 401 - AGRICOLA 1998-2004/09
AU: Barnard,-D.R.; Xue,-R.D.
TI: Laboratory evaluation of mosquito repellents against Aedes albopictus, Culex nigripalpus, and Ochlerotatus triseriatus (Diptera: Culicidae).
SO: Journal of medical entomology. 2004 July, v. 41, no. 4 p. 726-730.
AB: Four synthetic mosquito repellents (Autan [10% KBR3023], IR3535 [7.5%], Off! [15% deet], Skinsations [7% deet]) and eight natural (primarily plant extracts and/or essential oils) product-based repellents (Bite Blocker [2% soybean oil], ByGone, GonE!, Natrapel [10% citronella], Neem Aura, Sunswat, MosquitoSafe [25% geraniol], and Repel [26% p-menthane-3,8-diol]) were tested in the laboratory against Aedes albopictus Skuse, Culex nigripalpus Theobald, and Ochlerotatus triseriatus (Say). When estimated mean protection time (eMPT) responses for each repellent were averaged for all three mosquito species, Autan, Bite Blocker, Off!, and Repel prevented biting for greater than or equal to 7.2 h; IR3535, MosquitoSafe, and Skinsations for 3.2-4.8 h; and ByGone, Natrapel, GonE, NeemAura, and SunSwat for 0.9-2.3 h. Against Ae. albopictus, the eMPT for Off! and Repel exceeded 7.0 h and ranged from 5.0 to 5.7 h for Autan, Bite Blocker, and Skinsations. Bygone, GonE, NeemAura, and SunSwat provided 0.2 h protection against Ae. albopictus and Oc. triseriatus, whereas Autan, Bite Blocker, Off!, and Repel prevented bites by Oc. triseriatus for

7.3 h. All 12 repellents provided an eMPT 2.8 h against Cx. nigripalpus (maximum: 8.5 h for Bite Blocker). When the average eMPT for each repellent (for all species) was divided by the eMPT for 7% deet (Skinsations), the order of repellent effectiveness and the corresponding repellency index (R(i)) was Repel (1.7) > Bite Blocker (1.5) = Autan (1.5) = Off! (1.5) > Skinsations (1.0) > IR3535 (0.8) > MosquitoSafe (0.6) > Natrapel (0.5) > Neem Aura (0.3) = SunSwat (0.3) = Bygone (0.3) > GonE (0.2).

Record 37 of 401 - AGRICOLA 1998-2004/09
AU: Davis,-D.A.; Arnold,-C.R.
TI: Red drum, Sciaenops ocellatus, production diets: replacement of fish meal with soybean meal.
SO: Journal of applied aquaculture. 2004, v. 15, no. 3-4 p. 173-181.

Record 38 of 401 - AGRICOLA 1998-2004/09
AU: Tarley,-C.R.T.; Visentainer,-J.V.; Matsushita,-M.; Souza,-N.E.-de
TI: Proximate composition, cholesterol and fatty acids profile of canned sardines (Sardinella brasiliensis) in soybean oil and tomato sauce.
SO: Food chemistry. 2004 Nov., v. 88, issue 1 p. 1-6.

Record 39 of 401 - AGRICOLA 1998-2004/09
AU: Egli,-D.B.; Bruening,-W.P.
TI: Water stress, photosynthesis, seed sucrose levels and seed growth in soybean.
SO: Journal of agricultural science. 2004 Feb., v. 142, pt. 1 p. 1-8.
AB: The rate of growth of individual seeds of soybean (Glycine max L. Merrill) is determined, in part, by the concentration of sucrose in the seed. Water stress during seed filling reduces photosynthesis, but the effect on seed sucrose concentration is not well understood. Soybean plants (cultivars Elgin 87 and Asgrow 232HS) were exposed to water stress from early in the seed-filling period until maturity in field and greenhouse experiments. Stress reduced yield (5-38%) and seed size (11-35%) but it did not affect the number of seeds. Stress accelerated leaf senescence as shown by a more rapid decline in leaf photosynthesis in both experiments. Seed-growth rate and cotyledon sucrose concentrations (expressed on a mM basis using the bulk water content of the cotyledons) during the linear phase of seed growth were not affected by stress in either experiment. Thus, water stress during seed filling had no direct effect on seed growth; its only effect was to accelerate leaf senescence, which shortened the seed-filling period and resulted in smaller seeds. Strategies to reduce yield loss from water stress during seed filling should focus on leaf senescence instead of seed growth.

Record 40 of 401 - AGRICOLA 1998-2004/09
AU: Dougher,-T.A.O.; Bugbee,-B.
TI: Long-term blue light effects on the histology of lettuce and soybean leaves and stems.
SO: Journal of the American Society for Horticultural Science. 2004 July, v. 129, no. 4 p. 467-472.

Record 41 of 401 - AGRICOLA 1998-2004/09
AU: Suszkiw,-J.

TI: New soy germplasm delivers high yield, genetic diversity.
SO: Agricultural research. 2004 July, v. 52, no. 7 p. 20.

Record 42 of 401 - AGRICOLA 1998-2004/09
AU: Nishino,-N.; Wada,-N.; Yoshida,-M.; Shiota,-H.
TI: Microbial counts, fermentation products, and aerobic stability of whole crop corn and a total mixed ration ensiled with and without inoculation of Lactobacillus casei or Lactobacillus buchneri.
SO: Journal of dairy science. 2004 Aug., v. 87, no. 8 p. 2563-2570.
AB: Whole crop corn (DM 29.2%) and a total mixed ration (TMR, DM 56.8%) containing wet brewers grains, alfalfa hay, dried beet pulp, cracked corn, soybean meal, and molasses at a ratio of 5:1:1:1:1:1 on fresh weight basis, were ensiled with and without Lactobacillus casei or Lactobacillus buchneri in laboratory silos. The effects of inoculation on microbial counts, fermentation products, and aerobic stability were determined after 10 and 60 d. Untreated corn silage was well preserved with high lactic acid content, whereas large numbers of remaining yeasts resulted in low stability on exposure to air. Inoculation with L. casei suppressed heterolactic fermentation, but no improvements were found in aerobic stability. The addition of L. buchneri markedly enhanced the aerobic stability, while not affecting the DM loss and NH3-N production. Large amounts of ethanol were found when the TMR was ensiled, and the content of ethanol overwhelmed that of lactic acid in untreated silage. This fermentation was related to high yeast populations and accounted for a large loss of DM found in the initial 10 d. The ethanol production decreased when inoculated with L. casei and L. buchneri, but the effects diminished at 60 d of ensiling. Inoculation with L. buchneri lowered the yeasts in TMR silage from the beginning of storage; however, the populations decreased to undetectable levels when stored for 60 d, regardless of inoculation. No heating was observed in TMR silage during aerobic deterioration test for 7 d. This stability was achieved even when a high population of yeasts remained and was not affected by either inoculation or ensiling period. The results indicate that inoculation with L. buchneri can inhibit yeast growth and improve aerobic stability of corn and TMR silage; however, high stability of TMR silage can be obtained even when no treatments were made and high population (>105 cfu/g) of yeasts were detected.

Record 43 of 401 - AGRICOLA 1998-2004/09
AU: DeFrain,-J.M.; Hippen,-A.R.; Kalscheur,-K.F.; Schingoethe,-D.J.
TI: Feeding lactose increases ruminal butyrate and plasma Wgb-hydroxybutyrate in lactating dairy cows.
SO: Journal of dairy science. 2004 Aug., v. 87, no. 8 p. 2486-2494.
AB: Ruminal fermentation of lactose increases molar proportions of butyrate, which is metabolized by the ruminal epithelium to Wgb-hydroxybutyrate (BHBA). To determine the effects of dietary whey, and specifically lactose, on concentrations of ruminal and blood volatile fatty acids (VFA) and blood BHBA, 8 Holstein and 4 Brown Swiss multiparous cows (210 +/- 33 d in milk) were blocked by breed and randomly assigned to one of three 4 x 4 Latin squares. Treatments were control (CON; 7.1% of dietary dry matter [DM] as cornstarch), liquid whey (WHEY; 9.4% of diet DM) containing 70% lactose on a DM basis, low lactose (LOLAC; 7.1% lactose), or high lactose (HILAC; 14.3% lactose). Diets contained

53% forage as corn silage, alfalfa hay, and grass hay (DM basis) and a corn and soybean meal-based concentrate. Average dietary percentage of crude protein and energy density (Mcal/kg net energy for lactation) were 16.8 and 1.47, respectively. Feeding lactose increased DM intake. Milk production and composition were not affected by diet with the exception of decreased urea nitrogen in milk from cows fed lactose. Greater proportions of ruminal propionate were observed in cows fed CON relative to those fed WHEY and LOLAC. Increasing dietary lactose increased proportions of ruminal butyrate and decreased acetate and branched-chain VFA. Concurrent with the increase in ruminal butyrate concentrations, there was an increase in plasma BHBA as lactose in the diet increased. Concentrations of VFA in plasma were not affected by diet with the exception of the branched-chain VFA, which were increased in cows fed LOLAC compared with WHEY. These data indicate lactose fermentation increases proportions of ruminal butyrate and plasma BHBA in lactating dairy cows; however, the observed increase in plasma BHBA is not sufficient to subject cows to ketosis.

Record 44 of 401 - AGRICOLA 1998-2004/09
AU: Nakamura,-A.; Maeda,-H.; Corredig,-M.
TI: Competitive adsorption of soy soluble polysaccharides in oil-in-water emulsions.
SO: Food research international. 2004, v. 37, issue 8 p. 823-831.
AB: The interactions of soybean soluble polysaccharide (SSPS) at an oilÆwater interface were studied in mixed systems containing small molecular weight surfactants (Tween 20 and 80) or milk proteins. The thick layer of SSPS was not displaced by small molecular weight surfactants. Only after hydrolysis of the carbohydrate moieties of SSPS, did Tween adsorb on to the oil-water interface. While the addition of SSPS to emulsions stabilized by caseinate did not affect the droplet size distribution, SSPS caused bridging of emulsion droplets stabilized by WPI. The interactions between WPI and SSPS seemed to be electrostatic in nature and were affected by the type of SSPS used. Although destabilization was also shown at pH 7.0, extensive bridging flocculation was shown at pH 4.0. These results are the first evidence of interactions occurring between SSPS and milk proteins at the oil-water interfaces.

Record 45 of 401 - AGRICOLA 1998-2004/09
AU: Gomes,-M.J.; Dias-da-Silva,-A.A.; Azevedo,-J.M.T.-de; Guedes,-C.M.
TI: Response of lambs fed wheat straw-based diets to supplementation with soybean hulls.
SO: Australian journal of agricultural research. 2004, v. 55, no. 3 p. 261-272.

Record 46 of 401 - AGRICOLA 1998-2004/09
AU: Liu,-Z.S.; Chang,-S.K.C.; Li,-L.T.; Tatsumi,-E.
TI: Effect of selective thermal denaturation of soybean proteins on soymilk viscosity and tofu's physical properties.
SO: Food research international. 2004, v. 37, issue 8 p. 815-822.
AB: Thermal denaturation of soy proteins is a pre-requisite for tofu-gel formation. Differential scanning calorimetry of soymilk showed that the denaturation temperature of glycinin (92 ÀC) is about 20 ÀC higher than that of -conglycinin (71 ÀC). This makes

it possible to denature soybean proteins selectively using two-step heating, that is, soymilk was heated at 75 ÀC for 5 min and then heated at 95 ÀC for another 5 min. The effects of selective thermal denaturation (STD) on soymilk viscosity and tofu's physical properties were investigated with three soybean samples and varied soymilk solid contents (10-12%). Comparing to one-step heating (95 ÀC, 5 min), STD increased soymilk viscosity by approximately 150% and tofu's apparent Young's modulus by approximately 20%, and reduced tofu's syneresis rate by approximately 10%. Change in tofu microstructure was also observed by scanning electronic microscopy. STD mechanism based on the interaction between glycinin and beta-conglycinin was discussed.

Record 47 of 401 - AGRICOLA 1998-2004/09

AU: Graham,-M.A.; Silverstein,-K.A.T.; Cannon,-S.B.; VandenBosch,-K.A.

TI: Computational identification and characterization of novel genes from legumes.

SO: Plant physiology. 2004 July, v. 135, no. 3 p. 1179-1197.

AB: The Fabaceae, the third largest family of plants and the source of many crops, has been the target of many genomic studies. Currently, only the grasses surpass the legumes for the number of publicly available expressed sequence tags (ESTs). The quantity of sequences from diverse plants enables the use of computational approaches to identify novel genes in specific taxa. We used BLAST algorithms to compare unigene sets from Medicago truncatula, Lotus japonicus, and soybean (Glycine max and Glycine soja) to nonlegume unigene sets, to GenBank's nonredundant and EST databases, and to the genomic sequences of rice (Oryza sativa) and Arabidopsis. As a working definition, putatively legume-specific genes had no sequence homology, below a specified threshold, to publicly available sequences of nonlegumes. Using this approach, 2,525 legume-specific EST contigs were identified, of which less than three percent had clear homology to previously characterized legume genes. As a first step toward predicting function, related sequences were clustered to build motifs that could be searched against protein databases. Three families of interest were more deeply characterized: F-box related proteins, Pro-rich proteins, and Cys cluster proteins (CCPs). Of particular interest were the >300 CCPs, primarily from nodules or seeds, with predicted similarity to defensins. Motif searching also identified several previously unknown CCP-like open reading frames in Arabidopsis. Evolutionary analyses of the genomic sequences of several CCPs in M. truncatula suggest that this family has evolved by local duplications and divergent selection.

Record 48 of 401 - AGRICOLA 1998-2004/09

AU: Liener,-I.E.

TI: Comment on a semi-pilot-scale procedure for isolating and purifying soybean (Glycine max) lectin.

SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 3208-3209.

Record 49 of 401 - AGRICOLA 1998-2004/09

AU: Allan,-G.L.; Booth,-M.A.

TI: Effects of extrusion processing on digestibility of peas, lupins, canola meal and soybean meal in silver perch Bidyanus bidyanus (

Mitchell) diets.
SO: Aquaculture research. 2004 Aug. 20, v. 35, no. 10 p. 981-991.
AB: Two experiments were conducted to investigate effects of processing on apparent digestibility coefficients (ADCs) of legumes and oilseeds for juvenile silver perch, Bidyanus bidyanus (approximately 49 g). The first experiment evaluated interactive effects of ingredients (lupins or field peas), processing (whole seed; hulls on or hulls off) and extrusion cooking (raw or extruded) on ADCs for juvenile silver perch (approximately 4 g fish-1). The second experiment was a three-fixed-factor anova designed to evaluate interactive effects of ingredients (soybean meal or canola meal), extrusion cooking (raw or extruded) and inclusion content (30% or 50% of the diet) on ADCs for juvenile silver perch (approximately 4 g fish-1). Lupin protein was more digestible than that of peas (ADC for crude protein 91% vs. 85% for peas) but the organic matter was less digestible (ADC for organic matter 50% vs. 67% for peas). Dehulling lupins significantly improved ADCs for all indices (dry matter, organic matter, energy and crude protein), but extrusion had no effect because lupins do not contain starch or heat-labile anti-nutrients. Conversely, for starch-rich peas that contain heat-labile trypsin inhibitors, both dehulling and extrusion significantly improved ADCs. Digestibility of soybean meal was much higher than that of canola meal. For soybean meal, neither processing, content nor their interaction affected digestibility but extrusion improved ADCs for dry matter, organic matter and energy but there was an interaction with content. Although higher overall, digestibility for these indices declined with increasing content for extruded product while there were only minor effects of inclusion for raw product. Benefits of extrusion were attributed to reductions in anti-nutrients, including phytic acid. For canola, there were no interactions between extrusion and content for any ADC. Increasing content reduced ADCs for crude protein, dry matter and organic matter but did not effect energy. Surprisingly, extrusion of canola also reduced digestibility for all ADCs. Dehulling improved both lupins and peas. Crude protein for all ingredients was well digested with ingredients ranked: lupins>soybean meal>peas>canola meal. Energy digestibility was best for soybean meal and worst for lupins. Extrusion greatly improved digestibility of peas and to a lesser extent soybean meal, gave no benefits to lupins and was detrimental for canola.

Record 50 of 401 - AGRICOLA 1998-2004/09
AU: Vielma,-J.; Ruohonen,-K.; Gabaudan,-J.; Vogel,-K.
TI: Top-spraying soybean meal-based diets with phytase improves protein and mineral digestibilities but not lysine utilization in rainbow trout, Oncorhynchus mykiss (Walbaum).
SO: Aquaculture research. 2004 Aug. 20, v. 35, no. 10 p. 955-964.
AB: Two digestibility trials and two growth trials were carried out to evaluate the influence of top-sprayed phytase on apparent digestibility coefficients (ADCs) of protein and mineral and utilization in rainbow trout fed with soybean meal-based diets. In Trial 1, a semi-purified diet containing 50% soybean meal was supplemented with graded levels of phytase (0, 500, 1000, 2000 and 4000 U kg-1 diet), and fed to triplicate groups of fish. In Trial 2, commercial-type extruded feeds containing 36% soybean

meal with either 0 or 2000 U phytase kg-1 were fed to five replicate groups of fish. Phytase clearly decreased phytic acid content of feces from 35 to 5 mg and from 34 to 14 mg phytic acid per g faecal dry matter in Trials 1 and 2 respectively. Apparent digestibility coefficient of P improved from 23% to 83% in Trial 1 and from 35% to 54% in Trial 2 by phytase. Apparent protein increased by 1.2% and 3.2%-units by phytase in Trials 1 and 2. Zinc digestibility was significantly increased in Trial 1, but not in Trial 2. Trials 3 and 4 were conducted to evaluate the influence of phytase on dietary P (Trial 3) and lysine (Trial 4) utilization. Three diets were prepared for each trial: P (Trial 3)- or lysine (Trial 4)-deficient basal diets, basal diets with phytase supplementation (2000 U kg-1) and P (Trial 3)- or lysine (Trial 4)-fortified diets. Rainbow trout (initial weight 20 g) were fed for 10 weeks using four and six replicates for Trials 3 and 4 respectively. Phytase increased P utilization in Trial 3 as demonstrated by an increase in vertebra ash from 24.1% to 45.4%, and by an increase in weight gain from 243% to 459% of the initial weight. Phytase did not increase lysine utilization, since neither protein retention nor weight gain were enhanced by phytase. Supplemental lysine increased protein retention and weight gain to 43.1% and 514%, respectively, and also decreased whole-body lipid contents significantly from 120 to 123 g kg-1 in fish fed the basal diet and phytase-supplemented diet to 106 g kg-1 in fish fed with lysine-fortified diet.

Record 51 of 401 - AGRICOLA 1998-2004/09

AU: Fagbenro,-O.A.

TI: Soybean meal replacement by roquette (Eruca sativa Miller) seed meal as protein feedstuff in diets for African catfish, Clarias gariepinus (Burchell 1822), fingerlings.

SO: Aquaculture research. 2004 Aug. 20, v. 35, no. 10 p. 917-923.

AB: Apparent digestibility coefficient (ADC) values for mechanically extracted meal derived from roquette (Eruca sativa) seeds were obtained. The digestibility of dry matter (DM), protein and energy was measured using an inert marker in the diets and by faeces collection using the dissection method. Soybean meal and roquette meal had similar ADC values for protein and energy. Roquette seed meal was thereafter evaluated as a protein source in diets (400-g crude protein, 120-g crude lipid and 18.00 MJ gross energy kg-1 DM) fed to African catfish, Clarias gariepinus, fingerlings (10.4«0.4 g) to apparent satiation twice daily for 70 days. The test diets contained roquette seed meal as replacement for soybean meal protein in a control diet, providing 20%, 40% or 60% of the total protein. Catfish mortality was low (<10%) and not diet related. Substituting soybean meal protein with roquette seed meal protein providing 20% of total protein did not affect weight gain, growth response, feed conversion ratio, protein utilization or carcass composition of catfish. Catfish growth was, however, retarded and feed was poorly utilized only when roquette seed meal provided above 20% of total protein, caused by reduced energy digestibility, deficiencies in some essential amino acids and presence of antinutritional factors. Livers of catfish fed high dietary levels of roquette seed meal showed severe histological abnormalities.

Record 52 of 401 - AGRICOLA 1998-2004/09

AU: Sangiorgio,-L.; Strumbo,-B.; Tenchini,-M.L.; Malcovati,-M.; Ronchi,-S.; Simonic,-T.
TI: A novel Chlamydomonas reinhardtii gene potentially encoding a proline-, glycine-, and tyrosine-rich protein (PGYRP).
SO: Plant science. 2004 Sept., v. 167, issue 3 p. 519-526.

Record 53 of 401 - AGRICOLA 1998-2004/09
AU: Wu,-M.L.; Chang,-J.C.; Lai,-Y.H.; Cheng,-S.L.; Chiou,-R.Y.Y.
TI: Enhancement of tofu isoflavone recovery by pretreatment of soy milk and koji enzyme extract.
SO: Journal of agricultural and food chemistry. 2004 July 28, v. 52, no. 15 p. 4785-4790.
AB: Isoflavones are novel nutraceutical constituents of soybeans, but considerable amounts are lost in the whey during conventional tofu manufacturing. In this study, in a small-scale process, 2 mL of koji enzyme extract (soybean koji/deionized water, 1/3, w/v) was combined with 600 mL of soy milk, and 30 mL aliquots were incubated at 35 ÀC for 0, 30, 60, 120, and 300 min, for enzyme pretreatment. After each treatment time, soy milk was heated to 85 ÀC, CaSO4 was added to aggregate protein, and the mixture was centrifuged to separate the solids (tofu) from the whey. The tofu yield and moisture contents from soy milk treated for 30 or 60 min were higher than those from soy milk treated for 0 (control), 120, or 300 min. The protein content of freeze-dried tofu varied in a limited range, and native PAGE and SDS-PAGE patterns revealed slight quantitative and qualitative variations among products. Soy milk daidzein and genistein contents increased while daidzin and genistin contents decreased as the time of enzyme pretreatment of the soy milk increased. After 30 min of pretreatment, daidzin, genistin, daidzein, and genistein contents recovered in tofu products were higher than those of the control. In a pilot-scale process, aliquots (3 L) of soy milk were enzyme-treated for 30 min, aggregated with CaSO4, and hydraulically pressed to remove the whey. As in pretreatments, soy milk daidzein and genistein contents increased while daidzin and genistin contents decreased. In a comparison of the control and enzyme-treated tofu products, the total recoveries of daidzin, genistin, daidzein, and genistein in the tofu products increased from 54.9% to 64.2%. When the tofu products were subjected to a sensory panel test, both products were judged acceptable.

Record 54 of 401 - AGRICOLA 1998-2004/09
AU: Bawadi,-H.A.; Antunes,-T.M.; Shih,-F.; Losso,-J.N.
TI: In vitro inhibition of the activation of pro-matrix metalloproteinase 1 (Pro-MMP-1) and pro-matrix metalloproteinase 9 (pro-MMP-9) by rice and soybean Bowman-Birk inhibitors.
SO: Journal of agricultural and food chemistry. 2004 July 28, v. 52, no. 15 p. 4730-4736.
AB: The in vitro inhibitory activity of the rice Bowman-Birk inhibitor (rBBI) or soybean Bowman-Birk inhibitor (sBBI) against trypsin-catalyzed activation of pro-matrix metalloproteinase 1 or 9 (pro-MMP-1 or pro-MMP-9), respectively, was investigated using electrophoresis with silver staining, heparin-enhanced zymography, biotinylated gelatin, Biotrak assay, and fluorescence quenched substrate hydrolysis. rBBI at concentrations of 0.08-0.352 mg/mL dose-dependently inhibited the in vitro

activation of 45 microgram/mL pro-MMP-1 by trypsin. Heparin-enhanced zymography analysis of pro-MMP-1, trypsin-activated MMP-1, and a mixture of pro-MMP-1-trypsin-rBBI showed clear zones associated with trypsin-activated MMP-1 and the absence of clear zones in lanes containing pro-MMP-1 or a mixture of pro-MMP-1, trypsin, and rBBI. The results of the Biotrak assay also indicated that rBBI dose-dependently suppressed the activation of pro-MMP-1 by trypsin. sBBI dose-dependently inhibited the activation of 100 microgram/mL of pro-MMP-9 by trypsin. Biotinylated gelatin assays demonstrated that pro-MMP-9 or pro-MMP-9 in the presence of trypsin and BBI did not hydrolyze gelatin, whereas p-aminophenylmercury acetate (APMA)-activated MMP-9 and trypsin-activated MMP-9 caused significant hydrolysis of gelatin. Quenched fluorescence substrate hydrolysis for total MMP activity showed that pro-MMP-1 or pro-MMP-9 did not hydrolyze the substrate Mca-Pro-Leu-Gly-Leu-Dpa-Ala-Arg-NH2; active MMP-1 or MMP-9 hydrolyzed the substrate, but lower substrate hydrolysis was obtained when pro-MMP-1 or pro-MMP-9 was incubated with trypsin in the presence of increasing concentrations of rBBI. The results are discussed in light of the role of MMP-1 and MMP-9 in the process of angiogenesis and the potential of rBBI or sBBI as a functional food ingredient.

Record 55 of 401 - AGRICOLA 1998-2004/09

AU: Alfonso,-M.; Collados,-R.; Yruela,-I.; Picorel,-R.

TI: Photoinhibition and recovery in a herbicide-resistant mutant from Glycine max (L.) Merr. cell cultures deficient in fatty acid unsaturation.

SO: Planta. 2004 July, v. 219, no. 3 p. 428-439.

AB: Photoinhibition and recovery were studied in two photosynthetic cell suspensions from soybean (Glycine max L. Merr): the wild type (WT) and the herbicide-resistant D1 mutant STR7. This mutant also showed an increase in saturated fatty acids from thylakoid lipids. STR7 was more sensitive to photoinhibition under culture conditions. In vivo photoinhibition experiments in the presence of chloramphenicol, in vitro studies in isolated thylakoid membranes, and immunoblot analysis indicated that the process of light-induced degradation of the D1 protein was not involved in the response of STR7 to light. At growth temperature (24ÀC), the recovery rate of photoinhibited photosystem II (PSII) was slower in STR7 relative to WT. Photoinhibition and recovery were differentially affected by temperature in both cell lines. The rates of photoinhibition were faster in STR7 at any temperature below 27ÀC. The rates of PSII recovery from STR7 were more severely affected than those of WT at temperatures lower than 24ÀC. The photoinhibition and recovery rates of WT at 17ÀC mimicked those of STR7 at 24ÀC. In organelle translation studies indicated that synthesis and elongation of D1 were substantially similar in both cell lines. However, sucrose gradient fractionation of chloroplast membranes demonstrated that D1 and also other PSII proteins such as D2, OEE33, and LCHII had a reduced capability to incorporate into PSII to yield a mature assembled complex in STR7. This effect may become the rate-limiting step during the recovery of photoinhibited PSII and may explain the increased sensitivity to high light found in STR7. Our data may hint at a possible role of fatty acids from membrane lipids in the assembly and dynamics of PSII.

Record 56 of 401 - AGRICOLA 1998-2004/09

AU: Ahn,-K.C.; Watanabe,-T.; Gee,-S.J.; Hammock,-B.D.

TI: Hapten and antibody production for a sensitive immunoassay determining a human urinary metabolite of the pyrethroid insecticide permethrin.

SO: Journal of agricultural and food chemistry. 2004 July 28, v. 52, no. 15 p. 4583-4594.

AB: Permethrin is the most popular synthetic pyrethroid insecticide in agriculture and public health. For the development of the enzyme-linked immunosorbent assay (ELISA) to evaluate human exposure to permethrin, the glycine conjugate (DCCA-glycine) of a major metabolite, cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carboxylic acid (DCCA), of permethrin was established as the target analyte. Four different types of the cis- and trans-isomers of immunizing haptens were synthesized as follows: N-(cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carbonyl)glycine (hapten 3), N-(cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carbonyl)-4-amino-L-phenylalanine (hapten 5), N-(N-(cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carbonyl)glycine)amino-6-(2,4- dinitrophenyl)aminohexanoic acid (hapten 9), and N-(cis/trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane-1-carbonyl) glycine-4-oxobutanoic acid (hapten 24). Sixteen polyclonal antibodies produced against each cis- or trans-hapten-thyroglobulin conjugate as immunogens were screened against numerous hapten-bovine serum albumin conjugates as coating antigens. Six ELISAs with both a heterologous hapten structure and a heterologous hapten configuration (cis/trans or trans/cis) between antibody and coating antigen showed a high sensitivity for the target analyte. The IC50 was 1.3, 2.1, and 2.2 g/L for the trans-target analyte and 0.4, 2.3, and 2.8 g/L for the cis-target analyte. The immunizing haptens, except for hapten 5, provided the target specific antibodies. Molecular modeling of the haptens supported the selection of reasonable immunizing haptens that best mimicked the target analyte. Hapten 5 was suitable as a coating antigen rather than as an immunogen since it had a different geometry. Very low cross-reactivities were measured to permethrin, its free metabolite (DCCA), PBA-glycine conjugate, and glycine. The ELISA will be optimized for the detection of total cis/trans-DCCA-glycine in human urine samples.

Record 57 of 401 - AGRICOLA 1998-2004/09

AU: Okazaki,-S.; Sugawara,-M.; Minamisawa,-K.

TI: Bradyrhizobium elkanii rtxC gene is required for expression of symbiotic phenotypes in the final step of rhizobitoxine biosynthesis.

SO: Applied and environmental microbiology. 2004 Jan., v. 70, no. 1 p. 535-541.

AB: We disrupted the rtxC gene on the chromosome of Bradyrhizobium elkanii USDA94 by insertion of a nonpolar aph cartridge. The rtxC mutant, designated delta rtxC, produced serinol and dihydrorhizobitoxine but no rhizobitoxine, both in culture and in planta. The introduction of cosmids harboring the rtxC gene into the delta rtxC mutant complemented rhizobitoxine production, suggesting that rtxC is involved in the final step of

rhizobitoxine biosynthesis in B. elkanii USDA94. Glycine max cv. Lee inoculated with delta rtxC or with a null mutant, delta rtx::omega 1, showed no foliar chlorosis, whereas the wild-type strain USDA94 caused severe foliar chlorosis. The two mutants showed significantly less nodulation competitiveness than the wild-type strain on Macroptilium atropurpureum. These results indicate that dihydrorhizobitoxine, the immediate precursor of the oxidative form of rhizobitoxine, has no distinct effect on nodulation phenotype in these legumes. Thus, desaturation of dihydrorhizobitoxine by rtxC-encoded protein is essential for the bacterium to show rhizobitoxine phenotypes in planta. In addition, complementation analysis of rtxC by cosmids differing in rtxC transcription levels suggested that rhizobitoxine production correlates with the amount of rtxC transcript.

Record 58 of 401 - AGRICOLA 1998-2004/09

AU: El-Khatib,-R.T.; Hamerlynck,-E.P.; Gallardo,-F.; Kirby,-E.G.

TI: Transgenic poplar characterized by ectopic expression of a pine cytosolic glutamine synthetase gene exhibits enhanced tolerance to water stress.

SO: Tree physiology. 2004 July, v. 24, no. 7 p. 729-736.

AB: Physiological responses to water stress in hybrid poplar (INRA 7171-B4, Populus tremula L. x P. alba L.) lines transformed to overexpress a pine cytosolic glutamine synthetase (GS1) gene were compared with those of non-transgenic plants. Before, during and after a drought treatment, net photosynthetic rates (Anet) were higher in transgenic than in non-transgenic plants. Stomatal conductance (gs) was higher in transgenic than in non-transgenic plants before, but not after exposure to drought. Before drought treatment, a sudden reduction in photosynthetic photon flux caused a greater burst of CO2 efflux in transgenic than non-transgenic plants, indicating greater photorespiratory activity. Drought caused greater reductions in photochemical quenching, photosystem II (PSII) antennae transfer efficiency (Fv' /Fm') and light-adapted PSII yield (FPSII) in non-transgenic than in transgenic plants, especially at low irradiances. Antennae-based thermal dissipation was higher in transgenic plants than in non-transgenic plants both during the imposition of drought and 1 or 3 days after the relief of drought. Under severe water stress and subsequently, transgenic plants maintained a higher expression of glutamine synthetase, glutamate synthase and Rubisco and higher concentrations of chlorophyll and glycine than non-transgenic plants. These findings indicate that overexpression of pine cytosolic GS1 enhanced sustained photosynthetic electron transport capacity during severe stomatal limitation. The data also suggest that ectopic expression of cytosolic GS increases photorespiratory activity, and that this serves as a protective sink for electrons from photosynthetic reaction centers.

Record 59 of 401 - AGRICOLA 1998-2004/09

AU: Nestel,-D.; Nemny-Lavy,-E.; Chang,-C.L.

TI: Lipid and protein loads in pupating larvae and emerging adults as affected by the composition of Mediterranean fruit fly (Ceratitis capitata) meridic larval diets.

SO: Archives of insect biochemistry and physiology. 2004 July, v. 56, no. 3 p. 97-109.

AB: The effects of sucrose and amino acid (aa) composition and concentration in meridic larval diets (e.g., partially defined at the chemical level) was examined on several parameters of Mediterranean fruit fly (Medfly) development. Lipid and protein levels of pupating larvae and emerging adults were examined. Different sucrose concentrations in the diet had small effects upon most of the development parameters. However, sucrose concentration significantly affected the ability of larvae to accumulate lipid reserves and proteins. Adults emerging from the different sucrose diets did not significantly differ in their lipid contents and protein loads. Specific deletions of aa from the diet, and general aa concentration, had a strong effect upon the parameters of development and pupating larvae lipids and proteins. Glycine-deletion was the most deleterious, followed by the deletion of all non-essential aa, and serine. High aa concentration in the diet has a detrimental effect upon development. Lipid contents in pupating larvae, and to some extent protein levels, were affected by aa manipulations in the diet. Lipid and protein loads in emerging adults were not significantly affected by aa manipulations. Based on the analysis of lipid frequency distribution it is suggested that the Medfly seems to regulate the level of lipid content in emerging adults within a certain range, regardless of the larval diet history or lipid contents. Proteins do not seem to be regulated as are lipids. These results point to an interesting and unexpected metabolic regulation of energetic resources during metamorphosis of the Medfly.

Record 60 of 401 - AGRICOLA 1998-2004/09
AU: Kratochvil,-R.J.; Pearce,-J.T.; Harrison,-M.R.-Jr.
TI: Row-spacing and speeding rate effects on Glyphosate-resistant soybean for mid-atlantic production system.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1029-1038.

Record 61 of 401 - AGRICOLA 1998-2004/09
AU: Pedersen,-P.; Lauer,-J.G.
TI: Soybean growth and development response to rotation sequence and tillage system.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1005-1012.

Record 62 of 401 - AGRICOLA 1998-2004/09
AU: Seiter,-S.; Altemose,-C.E.; Davis,-M.H.
TI: Forage soybean yield and quality responses to plant density and row distance.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 966-970.

Record 63 of 401 - AGRICOLA 1998-2004/09
AU: Estela,-A.; Escriche,-B.; Ferre,-J.
TI: Interaction of Bacillus thuringiensis toxins with larval midgut binding sites of Helicoverpa armigera (Lepidoptera: Noctuidae).
SO: Applied and environmental microbiology. 2004 Mar., v. 70, no. 3 p. 1378-1384.
AB: In 1996, Bt-cotton (cotton expressing a Bacillus thuringiensis toxin gene) expressing the Cry1Ac protein was commercially introduced to control cotton pests. A threat to this first generation of transgenic cotton is the evolution of resistance by the insects. Second-generation Bt-cotton has been developed with

either new B. thuringiensis genes or with a combination of cry genes. However, one requirement for the "stacked" gene strategy to work is that the stacked toxins bind to different binding sites. In the present study, the binding of 125I-labeled Cry1Ab protein (125I-Cry1Ab) and 125I-Cry1Ac to brush border membrane vesicles (BBMV) of Helicoverpa armigera was analyzed in competition experiments with 11 nonlabeled Cry proteins. The results indicate that Cry1Aa, Cry1Ab, and Cry1Ac competed for common binding sites. No other Cry proteins tested competed for either 125I-Cry1Ab or 125I-Cry1Ac binding, except Cry1Ja, which competed only at the highest concentrations used. Furthermore, BBMV from four H. armigera populations were also tested with 125I-Cry1Ac and Cry1Ab to check the influence of the insect population on the binding results. Finally, the inhibitory effect of selected sugars and lectins was also determined. 125I-Cry1Ac binding was strongly inhibited by N-acetylgalactosamine, sialic acid, and concanavalin A and moderately inhibited by soybean agglutinin. In contrast, 125I-Cry1Ab binding was only significantly inhibited by concanavalin A. These results show that Cry1Ac and Cry1Ab use different epitopes for binding to BBMV.

Record 64 of 401 - AGRICOLA 1998-2004/09

AU: Ellis-Jones,-J.; Schulz,-S.; Douthwaite,-B.; Hussaini,-M.A.; Oyewole,-B.D.; Olanrewaju,-A.S.; White,-R.

TI: An assessment of integrated Striga hermonthica control and early adoption by farmers in northern Nigeria.

SO: Experimental agriculture. 2004 July, v. 40, no. 3 p. 353-368.

AB: Two sets of on-farm trials, each covering two years, were conducted in the northern Guinea savannah of Nigeria over the period 1999-2001, the objective being to compare integrated Striga hermonthica control measures (soybean or cowpea trap crops followed by maize resistant to Striga) with farmers' traditional cereal-based cropping systems. In both sets of trials, this proved to be highly effective in increasing productivity over the two year period, especially where soybean was used as a trap crop. Resistant maize after a trap crop increased the net benefit over the two cropping seasons in both trials by over 100% over farmer practice. However, in the second set of trials there was no significant increase in productivity between a trap crop followed by Striga resistant maize, and a trap crop followed by local maize especially where legume intercropping and fertilizer had been applied in the farmer practice. There was also no increase in productivity between two years' traditional cereal cropping and one year's local maize followed by Striga resistant maize. This indicates the importance of a legume trap crop in the first year in order to ensure high productivity in the second year, regardless of variety. Up to 20% of farmers obtained higher productivity from their own practices, notably intercropping of cereals with legumes and use of inorganic fertilizers. Leguminous trap crops and Striga resistant maize, together with two key management practices (increased soybean planting density and hand-roguing) were seen to be spreading both within and beyond the research villages, indicating that farmers see the economic benefits of controlling Striga. Survey findings show that explaining the reasons why control practices work can greatly increase the adoption of these practices. Wider adoption of

Striga control will therefore require an extension approach that provides this training as well as encouraging farmers to experiment and adapt Striga control options for their local farming systems.

Record 65 of 401 - AGRICOLA 1998-2004/09

AU: Garten,-C.T.-Jr.

TI: Potential net soil N mineralization and decomposition of glycine-13C in forest soils along an elevation gradient.

SO: Soil biology and biochemistry. 2004 Sept., v. 36, no. 9 p. 1491-1496.

AB: The objective of this research was to better understand patterns of soil nitrogen (N) availability and soil organic matter (SOM) decomposition in forest soils across an elevation gradient (235-1670 m) in the southern Appalachian Mountains. Laboratory studies were used to determine the potential rate of net soil N mineralization and in situ studies of 13C-labelled glycine were used to infer differences in decomposition rates. Nitrogen stocks, surface soil (0-5 cm) N concentrations, and the pool of potentially mineralizable surface soil N tended to increase from low to high elevations. Rates of potential net soil N mineralization were not significantly correlated with elevation. Increasing soil N availability with elevation is primarily due to greater soil N stocks and lower substrate C-to-N ratios, rather than differences in potential net soil N mineralization rates. The loss rate of 13C from labelled soils (0-20 cm) was inversely related to study site elevation ($r=-0.85$; $P<0.05$) and directly related to mean annual temperature (+0.86; $P<0.05$). The results indicated different patterns of potential net soil N mineralization and 13C loss along the elevation gradient. The different patterns can be explained within a framework of climate, substrate chemistry, and coupled soil C and N stocks. Although less SOM decomposition is indicated at cool, high-elevation sites, low substrate C-to-N ratios in these N-rich systems result in more N release (N mineralization) for each unit of C converted to CO_2 by soil microorganisms.

Record 66 of 401 - AGRICOLA 1998-2004/09

AU: Halachmi,-I.; Maltz,-E.; Livshin,-N.; Antler,-A.; Ben-Ghedalia,-D.; Miron,-J.

TI: Effects of replacing roughage with soy hulls on feeding behavior and milk production of dairy cows under hot weather conditions.

SO: Journal of dairy science. 2004 July, v. 87, no. 7 p. 2230-2238.

AB: Two total mixed rations (TMR) containing different proportions of roughage neutral detergent fiber (NDF) were fed to lactating cows under Israeli summer conditions, and the effects on feeding behavior and milk production were measured. Forty-two lactating cows were divided into 2 groups fed ad libitum a TMR containing either 18% NDF of roughage origin (control group) or only 12% roughage NDF, in which the corn silage component (16.5% of dry matter [DM]) was replaced with soy hulls (experiment group). This and additional adjustments in TMR were reflected in higher net energy for lactation and in vitro digestibility of the experimental TMR. Cow behavior was investigated at the feeding lane during June 2001; about 11,000 cow visits were analyzed. Feed intake per meal and average meal duration were significantly higher in the experiment group (1.51 kg of DM per meal and 12.1

min per meal, respectively) as compared with the control group (1. 22 kg of DM per meal and 9.47 min per meal, respectively). However, number of meals per day recorded in the feeding lane was significantly higher in the control group (21.0 vs. 16.6 meals/d per cow). Distribution of meals and feed intake along the day depended more on management practices, such as milking and feed dispensing times, than on feed composition or weather conditions. These differences between groups were expressed in similar daily eating duration (~200 min), and because the rate of feed consumption was similar for both treatments (~127 g DM/min), the daily average DM intake was also similar (25.0 to 25.7 kg). However, NDF intake was higher in the experiment group. Consequently, the average milk yield was higher in the experimental group, and production of milk fat, 4% fat-corrected milk, and economically corrected milk were significantly higher in the experiment group than in the control group. Data imply that the experimental TMR containing only 12% NDF of roughage origin is more suitable for cows under hot climate conditions compared with the control TMR.

Record 67 of 401 - AGRICOLA 1998-2004/09

AU: Daverede,-I.C.; Kravchenko,-A.N.; Hoeft,-R.G.; Nafziger,-E.D.; Bullock,-D.G.; Warren,-J.J.; Gonzini,-L.C.

TI: Phosphorus runoff from incorporated and surface-applied liquid swine manure and phosphorus fertilizer.

SO: Journal of environmental quality. 2004 July-Aug, v. 33, no. 4 p. 1535-1544.

AB: Excessive fertilization with organic and/or inorganic P amendments to cropland increases the potential risk of P loss to surface waters. The objective of this study was to evaluate the effects of soil test P level, source, and application method of P amendments on P in runoff following soybean [Glycine max (L.) Merr.]. The treatments consisted of two rates of swine (Sus scrofa domestica) liquid manure surface-applied and injected, 54 kg P ha-1 triple superphosphate (TSP) surface-applied and incorporated, and a control with and without chisel-plowing. Rainfall simulations were conducted one month (1MO) and six months (6MO) after P amendment application for 2 yr. Soil injection of swine manure compared with surface application resulted in runoff P concentration decreases of 93, 82, and 94%, and P load decreases of 99, 94, and 99% for dissolved reactive phosphorus (DRP), total phosphorus (TP), and algal-available phosphorus (AAP), respectively. Incorporation of TSP also reduced P concentration in runoff significantly. Runoff P concentration and load from incorporated amendments did not differ from the control. Factors most strongly related to P in runoff from the incorporated treatments included Bray P1 soil extraction value for DRP concentration, and Bray P1 and sediment content in runoff for AAP and TP concentration and load. Injecting manure and chisel-plowing inorganic fertilizer reduced runoff P losses, decreased runoff volumes, and increased the time to runoff, thus minimizing the potential risk of surface water contamination. After incorporating the P amendments, controlling erosion is the main target to minimize TP losses from agricultural soils.

Record 68 of 401 - AGRICOLA 1998-2004/09

AU: Sanden,-M.; Bruce,-I.J.; Rahman,-M.A.; Hemre,-G.I.

TI: The fate of transgenic sequences present in genetically modified plant products in fish feed, investigating the survival of GM soybean DNA fragments during feeding trials in Atlantic salmon, Salmo salar L.
SO: Aquaculture. 2004 Aug. 2, v. 237, no. 1-4 p. 391-405.
AB: Vegetable protein sources like soybeans, canola and maize gluten are good alternatives to fish meal. However, a large proportion of such products available on the international market may possess genetically modified (GM) components. This report concerns a study to investigate the fate and survival of ingested GM soy DNA fragments (120 and 195 bp) and a 180-bp fragment of the lectin gene of soybean (Glycine max) during feeding trials with Atlantic salmon post-smolt. Specifically, the study focused on the fate of selected GM soy DNA fragments from feed to fish to investigate their survival through the fish gastrointestinal (GI) tract and whether the DNA could be traced in a variety of fish tissues. Fish were fed three experimental diets for 6 weeks, which were formulated from defined components and represented either GM or non-GM materials (17.2% of the fish meal was replaced with either GM or non-GM soy). A control diet composed of fish meal as the only protein source was used for comparison purposes. The transgenic sequences (120 and 195 bp) and the lectin gene (180 bp) could be detected in the GM soy feed. In the fish GI tract, however, only the smaller DNA fragment (120 bp) could be amplified from the content of the stomach, pyloric region, mid intestine and distal intestine. No transgenic or conventional soy DNA fragments could be detected in liver, muscle or brain tissues resected from sacrificed fish. The sensitivity limit of the method was evaluated to be 20 copies. These data indicate that GM soy transgenic sequences may survive passage through the GI tract but that they cannot be traced in fish tissues.

Record 69 of 401 - AGRICOLA 1998-2004/09
AU: Huang,-C.H.; Huang,-S.L.
TI: Effect of dietary vitamin E on growth, tissue lipid peroxidation, and liver glutathione level of juvenile hybrid tilapia, Oreochromis niloticus x O. aureus, fed oxidized oil.
SO: Aquaculture. 2004 Aug. 2, v. 237, no. 1-4 p. 381-389.
AB: A feeding experiment was conducted to evaluate the effects of dietary vitamin E levels on growth, tissue lipid peroxidation, and liver glutathione level of juvenile hybrid tilapia fed diets containing oxidized oil. Juvenile hybrid tilapia were fed diets containing 0 to 300 IU vitamin E/kg at 12% dietary lipids for 14 weeks. Dietary lipid source (menhaden fish oil/soybean oil) was oxidized to peroxide value (POV) of 98 meq/kg oil. Growth performance of fish fed diets containing 0 IU vitamin E/kg was significantly lower than those fed higher vitamin E (>80 IU/kg) diets. Feed conversion ratio and protein efficiency ratio followed similar trends as growth performance. Further, ascorbate-induced lipid peroxidation in muscle and liver of fish fed diets containing 0 and 40 IU vitamin E/kg was significantly greater than those fed diets containing higher vitamin E (>80 IU/kg). Tissue vitamin E and liver glutathione level increased when dietary vitamin E increased. When weight gain was used as the indicator, using broken-line regression model, dietary vitamin E requirement of juvenile hybrid tilapia fed oxidized oil was 62.5

IU/kg. This value is similar to the dietary vitamin E requirement determined previously for the same species fed un-oxidized oil.

Record 70 of 401 - AGRICOLA 1998-2004/09

AU: Glencross,-B.D.; Carter,-C.G.; Duijster,-N.; Evans,-D.R.; Dods,-K.; McCafferty,-P.; Hawkins,-W.E.; Maas,-R.; Sipsas,-S.

TI: A comparison of the digestibility of a range of lupin and soybean protein products when fed to either Atlantic salmon (Salmo salar) or rainbow trout (Oncorhynchus mykiss).

SO: Aquaculture. 2004 Aug. 2, v. 237, no. 1-4 p. 333-346.

AB: This study compares the digestibility of a series of lupin and soybean protein products when fed to either rainbow trout or Atlantic salmon. The test ingredients in the study, from one of two key grain resources (lupins: Lupinus angustifolius and soybeans), represented various levels of processing of each grain in order to increase the protein content of the meals. A reference ingredient of enzymatically hydrolyzed casein (EHC) was also included in the study. The rainbow trout (266+/-18 g) were housed in freshwater tanks (250 l, salinity <1per thousand, 22.1+/-1.8ÀC) and acclimated to the diets for 6 days before faecal collection commenced. The Atlantic salmon (66+/-10 g) were housed in similar freshwater tanks (250 l, salinity <1per thousand, 15ÀC) and acclimated to the diets for at least 6 days before faecal collection commenced. Faeces were collected from each fish species using settlement collection methods. The digestibility of organic matter, phosphorus, energy and nitrogen was assessed using the diet-substitution method, with each test ingredient included in the diet at 30%. Several differences were observed between the two fish species in their capacity to digest nutrients and energy from each of the products. Organic matter and energy digestibility of each of the ingredients was largely reflective of the protein content of each ingredient. Protein digestibilities were generally consistent between the two fish species with only lupin kernel meal having a significantly higher digestibility when fed to Atlantic salmon than rainbow trout and the soybean protein concentrate a significantly lower digestibility. Although limited differences in protein digestibility were noted among the ingredients when fed to rainbow trout, more substantial differences were noted when the same ingredients were fed to Atlantic salmon. The digestible energy value of the range of products examined was generally higher in Atlantic salmon than rainbow trout. A clear difference between the two fish species was their capacity to digest phosphorus from the ingredients, with several of the plant protein ingredients showing differences in phosphorus digestibility between the two fish species. Generally, both series of grain products have excellent potential as feed ingredients for either of these species. However, the digestive capacity of Atlantic salmon appears to more positively respond to the absence of dietary non-starch polysaccharide content than that of rainbow trout.

Record 71 of 401 - AGRICOLA 1998-2004/09

AU: Mundheim,-H.; Aksnes,-A.; Hope,-B.

TI: Growth, feed efficiency and digestibility in salmon (Salmo salar L.) fed different dietary proportions of vegetable protein sources in combination with two fish meal qualities.

SO: Aquaculture. 2004 Aug. 2, v. 237, no. 1-4 p. 315-331.
AB: This study was performed to evaluate the effect on fish growth performance by replacing fish meal with a blend of vegetable protein sources. Atlantic salmon were fed eight diets where the percentage of protein from fish meal to vegetable protein varied from 85.1%, 68.6%, 51.9% to 34.7%, respectively. The experimental groups were fed in triplicate for 11 weeks, increasing fish weight from about 128 g at start to 450 g in the end. The vegetable protein blend was composed of full-fat soybean meal and corn gluten meal at a 1:2 ratio. Four percentages of fish meal to vegetable protein blend were used in four diets using LT fish meal or medium quality fish meal. All diets were extruded and balanced to be equal in gross energy, crude protein, lipid, carbohydrate, lysine and phosphorus. A significant positive linear correlation between fish meal inclusion and fish growth, feed efficiency and digestibility of protein, lipid and energy was observed in diets containing high quality fish meal. The difference in growth corresponded to a difference in final weight of 13.3% comparing diets with 85.1% and 34.7% fish meal protein. A significant positive correlation between fish meal inclusion and growth and feed efficiency was also observed in diets containing medium quality fish meal. No difference in growth was found between treatments containing the two fish meal qualities (P=0.06). However, feed intake was significantly higher and feed efficiency lower for fish fed medium quality compared to high quality fish meal. Protein, amino acid and energy digestibilities were reduced with increased dietary vegetable protein blend inclusion. Protein efficiency ratio (PER) and net protein value (NPV) were also positively linearly correlated to dietary fish meal percentage, and significant reductions in PER and NPV of 10% were observed as dietary fish meal protein decreased from 51.9% to 34.7%. NPV were in average 6.5% higher in fish fed diets containing high quality fish meal compared to medium quality fish meal. No difference in chemical composition of the fish was observed for any of the diets. A difference in performance was observed for fish meal quality and vegetable blend. The effect of reduced fish meal quality could be explained by reduced digestibility of protein and amino acids. This was compensated by a similar increase in feed intake, reducing NPV for medium quality fish meal. Increased inclusion of vegetable blend affected growth performance and reduced digestibility, but was not compensated by increased feed intake.

Record 72 of 401 - AGRICOLA 1998-2004/09
AU: Wang,-Z.Y.; Kelly,-J.M.; Kovar,-J.L.
TI: In situ dynamics of phosphorus in the rhizosphere solution fo five species.
SO: Journal of environmental quality. 2004 July-Aug, v. 33, no. 4 p. 1387-1392.
AB: Root activity can modify the chemistry of the rhizosphere and alter phosphorus (P) availability and uptake. However, until recently, relatively little was known about the dynamics of soil solution P at the root surface because of our inability to measure in situ changes in solution P at the plant root. A mini-rhizotron experiment with corn (Zea mays L. cv. Stine 2250), soybean [Glycine max (L.) Merr. cv. Pioneer 3563), cottonwood (Populus deltoids L.), smooth brome (Bromus inermis Leyss.), and

switchgrass (Panicum virgatum L.) was conducted to measure the spatial and temporal dynamics of P in the rhizosphere solution of a fine silty, P-rich calcareous soil (solid-phase total P concentration = 62 mg kg-1, pH = 7.68) from western Iowa. Micro-suction cups were used to collect samples of soil solution from defined segments of the rhizosphere, and capillary electrophoresis (CE) was used to determine the P concentration of the soil solution. At the end of 10 d, a decreasing P concentration gradient in soil solution toward the root was observed in corn, cottonwood, and smooth brome. No clear rhizosphere effect was observed for soybean and switchgrass. Statistical analysis indicated significantly lower solution P concentrations in the rhizospheres of corn (p = 0.05), cottonwood (p = 0.01), and smooth brome (p = 0.01) compared with bulk soil solution. Results indicate that P depletion from rhizosphere soil solution depends on plant species. Under the conditions of this study, corn, cottonwood, and smooth brome were more effective in depleting solution P than soybean and switchgrass.

Record 73 of 401 - AGRICOLA 1998-2004/09

AU: Carter,-S.B.; Nokes,-S.E.; Crofcheck,-C.L.

TI: The influence of environmental temperature and substrate initial moisture content on Aspergillus niger growth and phytase production in solid-state cultivation.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 945-949.

AB: Aspergillus niger is being used commercially for phytase production utilizing solid-state cultivation; however, no studies have been published that investigated the optimal environmental temperature and initial substrate water content to maximize fungal growth and/or phytase production. Solid-state cultivations of Aspergillus niger on wheat bran and soybean meal were conducted at three temperatures (25ÀC, 30ÀC, and 35ÀC) and three initial moisture contents (50%, 55%, and 60% wet basis) in a split-plot full-factorial experimental design. Fermentations were conducted for 0, 24, 48, 72, and 120 h. The containers were sampled destructively and assayed for phytase activity and glucosamine concentration as an estimate of fungal biomass. Temperature affected phytase activity production, but substrate initial moisture content did not. The highest phytase activity was found at 30ÀC, 50% to 60% initial moisture content, and 72 h of fermentation. Initial substrate moisture content affected glucosamine production after 72 and 120 h of fermentation. The maximum glucosamine was produced at 35ÀC, either 50% or 60% initial moisture content, and 120 h of fermentation. The results show that the optimal biomass growth conditions are not the same as the optimal phytase production conditions, suggesting that phytase production is not entirely correlated with fungal growth.

Record 74 of 401 - AGRICOLA 1998-2004/09

AU: Bajwa,-S.G.; Bajcsy,-P.; Groves,-P.; Tian,-L.F.

TI: Hyperspectral image data mining for band selection in agricultural applications.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 895-907.

AB: Hyperspectral remote sensing produces large volumes of data, quite often requiring hundreds of megabytes to gigabytes of memory storage for a small geographical area for one-time data collection. Although the high spectral resolution of

hyperspectral data is quite useful for capturing and discriminating subtle differences in geospatial characteristics of the target, it contains redundant information at the band level. The objective of this study was to identify those bands that contain the most information needed for characterizing a specific geospatial feature with minimal redundancy. Band selection is performed with both unsupervised and supervised approaches. Five methods (three unsupervised and two supervised) are proposed and compared to identify hyperspectral image bands to characterize soil electrical conductivity and canopy coverage in agricultural fields. The unsupervised approach includes information entropy measure and first and second derivatives along the spectral axis. The supervised approach selects hyperspectral bands based on supplemental ground truth data using principal component analysis (PCA) and artificial neural network (ANN) based models. Each hyperspectral image band was ranked using all five methods. Twenty best bands were selected by each method with the focus on soil and plant canopy characterization in precision agriculture. The results showed that each of these methods may be appropriate for different applications. The entropy measure and PCA were quite useful for selecting bands with the most information content, while derivative methods could be used for identifying absorption features. ANN measure was the most useful in selecting bands specific to a target characteristic with minimum information redundancy. The results also indicated that a combination of wavebands with different bandwidths will allow use of fewer than 20 bands used in this study to represent the information contained in the top 20 bands, thus reducing image data dimensionality and volume considerably.

Record 75 of 401 - AGRICOLA 1998-2004/09

AU: Yang,-C.C.; Prasher,-S.O.; Goel,-P.K.

TI: Differentiation of crop and weeds by decision-tree analysis of multi-spectral data.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 873-879.

AB: The purpose of this study was to use a data mining technique (i.e. , decision trees) to classify multi-spectral images of experimental plots having different crop and weed populations. Eleven types of plots were prepared for this study. Eight types were seeded with corn or soybeans and were either: (1) weed-free, (2) co-populated by velvetleaf only, (3) co-populated with a mixture of grass species, or (4) co-populated with the predominant weed species of the regions. The other three types were as (2), (3), and (4) with neither corn nor soybeans. An aircraft-mounted pushbroom imaging spectrometer was used to obtain scans of the plots in one blue, five green, five red, and thirteen infrared bands. Eight classification problems involving different degrees of recognition complexity were set up. Each was tested using three different input types from the multi-spectral data. The three types of input were: (a) absolute values of radiance from the 24 wavebands; (b) vegetation index (VI), which consists of 12 inputs; and (c) normalized difference vegetation index (NDVI), which consists of 65 inputs. Results showed that the most complex classification problem (distinguishing between 11 crop/weed combinations) was best resolved using the NDVI inputs (success classification of 0.85 as compared with 0.79 and 0.55 for the absolute radiance and VI, respectively). Moreover,

NDVI performed best as inputs in seven out of the eight problems.

Record 76 of 401 - AGRICOLA 1998-2004/09
AU: Rukunudin,-I.H.; Bern,-C.J.; Misra,-M.K.; Bailey,-T.B.
TI: Carbon dioxide evolution from fresh and preserved soybeans.
SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 827-833.
AB: Carbon dioxide evolution has proven to be a good indicator of deterioration in studies of stored cereal grains and oilseeds. Since little work has been done with stored soybeans, a study was conducted measuring carbon dioxide from stored soybeans using freshly harvested and preserved soybean samples. The objective of the study was to determine the effects of harvesting method, storage temperature, storage moisture content, and storage time on soybean deterioration. Following storage treatment, samples were held under aeration in a respirometer at 26ÀC and 21% moisture, and evolved carbon dioxide mass was measured until samples had lost 1.0% of original dry matter. At high harvest moistures, combine-harvested soybeans deteriorated faster, but at low harvest moistures, the deterioration rate of hand-harvested soybeans was greater. After 48 weeks of storage, the soybeans harvested at 22% moisture and preserved at -18°C deteriorated in a respirometer like freshly harvested soybeans, but soybeans harvested at 9% deteriorated in a respirometer significantly faster than those freshly harvested at 13% moisture.

Record 77 of 401 - AGRICOLA 1998-2004/09
AU: Basic,-F.; Kisic,-I.; Mesic,-M.; Nestroy,-O.; Butorac,-A.
TI: Tillage and crop management effects on soil erosion in central Croatia.
SO: Soil and tillage research. 2004 Aug., v. 78, issue 2 p. 197-206.

Record 78 of 401 - AGRICOLA 1998-2004/09
AU: Fernando,-S.; Hanna,-M.; Mesquita,-C.
TI: Soybean threshing mechanism development and testing.
SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 599-605.
AB: Soybean harvesting is done predominantly with combine harvesters. The size, sophistication, and operational costs of this modern machine make the combine harvester unaffordable for the small-scale farmer, especially in developing countries. Research has shown that the energy required to process the whole plant in the conventional combine is much greater than that required to open the soybean pods. An alternative soybean harvester was developed to thresh soybeans while the soybean plants were still rooted in the ground. The unit, which employed rotating plastic cords to impact and open the seed pods, was field tested with shaft rotational speeds of 1000, 1800, and 2600 rpm at different times of the day. The threshing efficiencies of the threshing mechanism, operating at 1000, 1800, and 2600 rpm, were <50%, 87.3%, and 93.7%, respectively. Seed breakages of 0.35% to 1.11% and seed coat damages of 11.8% to 16.6% were observed. The energy required to thresh one hectare of soybeans was estimated to be 6 to 9 MJ, excluding the power required to propel the equipment.

Record 79 of 401 - AGRICOLA 1998-2004/09
AU: Logsdon,-S.D.; Karlen,-D.L.
TI: Bulk density as a soil quality indicator during conversion to no-tillage.

SO: Soil and tillage research. 2004 Aug., v. 78, issue 2 p. 143-149.

Record 80 of 401 - AGRICOLA 1998-2004/09

AU: Germini,-A.; Mezzelani,-A.; Lesignoli,-F.; Corradini,-R.; Marchelli,-R.; Bordoni,-R.; Consolandi,-C.; De-Bellis,-G.

TI: Detection of genetically modified soybean using peptide nucleic acids (PNAs) and microarray technology.

SO: Journal of agricultural and food chemistry. 2004 July 14, v. 52, no. 14 p. 4535-4540.

AB: Peptide nucleic acid (PNA) microarrays for the detection of Roundup Ready soybeans in food have been prepared. PNA probes are known to be more efficient and selective in binding DNA sequences than the analogous oligonucleotides and are very suitable to be used for diagnostics in food. PNAs of different lengths were carefully designed and synthesized by solid-phase synthesis on an automatic synthesizer adopting the BOC strategy. PNAs were purified by HPLC and characterized by HPLC/MS. The probes were spotted on a functionalized surface to produce a microarray to be hybridized with PCR products. DNA extracted from reference material was amplified using Cy3- and Cy5-labeled primers, and the fluorescent PCR products obtained were hybridized on the microarray. Two protocols were adopted: the hybridization with dsDNA or with ssDNA obtained by digestion with the enzyme exonuclease. The best results were obtained using a 15-mer PNA probe in combination with the ssPCR product derived from enzymatic digestion. The method was applied to the analysis of a sample of certified transgenic soybean flour.

Record 81 of 401 - AGRICOLA 1998-2004/09

AU: Egamberdiyeva,-D.; Qarshieva,-D.; Davranov,-K.

TI: The use of Bradyrhizobium to enhance growth and yield of soybean in calcareous soil in Uzbekistan.

SO: Journal of plant growth regulation. 2004 Mar., v. 23, no. 1 p. 54-57.

AB: In this work the effect of inoculation with Bradyrhizobium japonicum S2492 on soybean (Glycine max (L) Merr) growth, nodulation and yield in nitrogen-deficient soil of Uzbekistan was studied. The field experiments were carried out in Tashkent Province of Uzbekistan in a randomized complete block design with four replicates of each treatment. The results revealed positive effects on growth, nodule number and yields of soybean after inoculation with B. japonicum S2492. The yield of soybean varieties was 48% higher for inoculated than for uninoculated plants. The effect of the inoculation was specific for variety but not for growth type. The protein and oil contents of seeds also increased after inoculation. It was concluded that B. japonicum S2492 can be considered as a biofertilizer for increasing the productivity of soybean in nitrogen-deficient soils in Uzbekistan.

Record 82 of 401 - AGRICOLA 1998-2004/09

AU: Kern,-A.J.; Dyer,-W.E.

TI: Glycine betaine biosynthesis is induced by salt stress but repressed by auxinic herbicides in Kochia scoparia.

SO: Journal of plant growth regulation. 2004 Mar., v. 23, no. 1 p. 9-19.

AB: Kochia scoparia biotypes that are susceptible or resistant to the

auxinic herbicide dicamba were used to characterize expression levels of choline monooxygenase (CMO) and glycine betaine accumulation in response to salt stress and herbicide treatment. A 1180-bp cDNA was isolated using differential display and 3' RACE with a deduced amino acid sequence that was more than 90% similar to the carboxy terminal 290 residues of CMOs from four related plant species. Salt stress led to a substantial increase in CMO mRNA and enzyme levels in K. scoparia biotypes, and the accumulation of up to 80 mol g-1 fresh weight glycine betaine. In contrast, dicamba treatment was followed by the rapid attenuation of CMO message and protein levels, with a recovery of expression in the resistant but not the susceptible biotype. CMO mRNA and enzyme levels similarly declined, and recovered in the resistant biotype, after dicamba treatment of plants that were previously salt stressed for 4 days. The opposing effects of these two stresses may represent a regulatory scheme in which competition for the substrate choline leads to a repression of glycine betaine biosynthesis to make sufficient choline available for auxin-mediated growth processes.

Record 83 of 401 - AGRICOLA 1998-2004/09

AU: Snow,-J.L.; Baker,-D.H.; Parsons,-C.M.

TI: Phytase, citric acid, and 1a-hydroxycholecalciferol improve phytate phosphorus utilization in chicks fed a corn-soybean meal diet.

SO: Poultry science. 2004 July, v. 83, no. 7 p. 1187-1192.

AB: Previous research from our laboratory has shown that phytase, citric acid, and 1a-hydroxycholecalciferol [1a-(OH) D3] individually improve phytate P use in young chicks fed a P-deficient corn-soybean meal (C-SBM) diet. The current study was conducted to evaluate combinations of these additives on phytate P utilization. In 3 chick experiments, male crossbred chicks (New Hampshire x Columbian) were fed experimental diets from 8 to 21 d of age. The C-SBM basal diet used in all assays contained no supplemental P and was calculated to provide 23% CP, 0.13% nonphytate P (0.39% total P), 0.62% Ca, 25 mg of cholecalciferol/kg, and 3,260 kcal of TME/kg. In all 3 experiments, factorial arrangements (2 x 2 or 2 x 2 x 2) were used to evaluate 2 levels of phytase (0 and 300 units/kg), citric acid (0 and 3 or 4%), and 1a-(OH) D3 (0 and 5, 10, or 15 micrograms/kg). Phytase, citric acid, and 1a-(OH) D3 each increased weight gain and tibia ash in all 3 experiments. There were some significant interactions among the compounds, but these were not consistent across experiments. Using standard curve methodology for tibia ash data, it was estimated that 0.03, 0.02, and 0.04% P were released by 3% citric acid, 300 units of phytase/kg, and 5 micrograms 1a-(OH) D3/kg, respectively, and that the combination of all 3 compounds resulted in the release of 0.13% P. Our results indicate that all 3 compounds increased phytate P use, and that their effects were generally additive, with some possible synergism between citric acid and 1 Wga-(OH) D3.

Record 84 of 401 - AGRICOLA 1998-2004/09

AU: Zyla,-K.; Mika,-M.; Stodolak,-B.; Wikiera,-A.; Koreleski,-J.; Swiatkiewicz,-S.

TI: Towards complete dephosphorylation and total conversion of phytates in poultry feeds.

SO: Poultry science. 2004 July, v. 83, no. 7 p. 1175-1186.

AB: The rate of phytate P removal from feed (level of dephosphorylation, DL) and the extent to which the molecule of phytic acid is deprived of phosphate moieties (conversion degree, CD) were studied in vitro and in a feeding trial with broilers fed corn-soybean diets. In the in vitro model, phytase A asymptotically increased DL and CD. Phytase B influenced DL only at low dosages of phytase A [0 or 250 phytase activity units (FTU) /kg], but it enhanced CD irrespective of phytase A activity. In the feeding trial, 3-phytase A and 6-phytase A (at 750 FTU/kg) exerted similar effects on broiler performance and similarly influenced bone mineralization, P retention, and Ca retention. Phytase B [6,400 acid phosphatase activity units (ACPU)/kg] enhanced feed intake, BW gain (BWG), toe ash, and P retention but not the retention of Ca. Myo-inositol fed at 0.1% significantly increased BWG, but it reduced P retention. Under conditions of a higher CD (excess of phytase B), 3-phytase A was more effective in enhancing performance than 6-phytase A, but it reduced Ca retention. Lower phytase B activities (0 to 3,200 ACPU/kg) with added 6-phytase A were more necessary for optimal growth of chickens than for enhanced P and Ca retention (4,800 to 6,400 ACPU/kg). The efficacy of both forms of phytase A and phytase B depended on the Ca level in feed. There is enough evidence to conclude that myo-inositol phosphates resulting from simultaneous action of 3-phytase A and phytase B affect bird physiology differently than intermediates accumulated by the action of 6-phytase A and phytase B.

Record 85 of 401 - AGRICOLA 1998-2004/09

AU: Batal,-A.B.; Parsons,-C.M.

TI: Utilization of various carbohydrate sources as affected by age in the chick.

SO: Poultry science. 2004 July, v. 83, no. 7 p. 1140-1147.

AB: In 3 experiments, New Hampshire x Columbian male chicks were fed carbohydrate-soybean meal (SBM) or casein diets from 0 to 21 d of age, and MEn was determined at 0 to 2, 3 to 4, 7, 14, and 21 d of age. Carbohydrate sources evaluated in experiment 1 were dextrose (D-glucose), conventional cornstarch, dextrinized cornstarch, corn-syrup solids, pregelatinized unmodified cornstarch, pregelatinized tapioca starch, tapioca dextrin, high-amylose starch, and polycose (mixed glucose polymers). Carbohydrate sources evaluated in experiments 2 and 3 were conventional corn, waxy corn, high-oil corn, corn flour, rice flour, dextrose, and sucrose. In experiment 1, chicks fed the dextrose diet had the highest weight gains, and the chicks fed high-amylose starch and pregelatinized unmodified cornstarch diets had the lowest weight gains. The MEn values varied among carbohydrate sources with MEn being highest for the dextrose diet and lowest for the high amylose starch diet. In experiment 2, chicks fed waxy corn, high-oil corn, or dextrose-SBM diets had ($P < 0.05$) higher growth rates than chicks fed conventional corn, corn flour, or rice flour. The MEn values increased with age for all diets except the dextrose-SBM, which was consistently high at all ages. In experiment 3, the dextrose diets (SBM or casein) yielded higher growth performance and MEn values than the sucrose-diets, and the differences were greater at younger ages. The MEn values were also much higher for the casein than the SBM diets, and MEn of

the SBM diets increased with increasing age. The results of this study indicate that MEn varies among carbohydrate sources and increases with age for most carbohydrate-SBM diets.

Record 86 of 401 - AGRICOLA 1998-2004/09
AU: McDowell,-J.M.
TI: Convergent evolution of disease resistance genes.
SO: Trends in plant science. 2004 July, v. 9, no. 7 p. 315-317.

Record 87 of 401 - AGRICOLA 1998-2004/09
AU: Fox,-T.B.; Landis,-D.A.; Cardoso,-F.F.; Difonzo,-C.D.
TI: Predators suppress Aphis glycines Matsumura population growth in soybean.
SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 608-618.
AB: The soybean aphid, Aphis glycines Matsumura, is an invasive pest of soybean, first discovered in North America in 2000. We studied the ability of the existing predator community in soybean to suppress A. glycines population growth during June-August 2002, in field studies using predator exclusion and sham cages or no-cage controls. Cages were infested with uniform initial densities of A. glycines adults, and subsequent populations of aphids and predators were monitored. After 2 wk, exclusion and sham cages were switched, with aphid and predator density followed for additional 2 wk. The experiment was repeated a second time, allowing observation of predator community response to both low and high density aphid populations over several time periods and stages of soybean development. Cages had minimal effects on temperature, relative humidity, or soybean growth. In contrast, predator communities and aphid populations were strongly affected by cage treatments. In the first trial, the activity of foliar-foraging predators effectively prevented A. glycines population growth maintaining populations below 10 aphids per plant (adult + nymphs) in sham cages, while populations exceeded 200 aphids per plant in exclusion cages. After cage switch, these high A. glycines populations in the former exclusion cages were rapidly colonized and reduced by nearly an order of magnitude within 2 wk by a combination of generalist and specialist predators. The second trial produced qualitatively similar results, but at much lower aphid densities. The most abundant predators in both trials included: Harmonia axyridis Pallas, Orius insidiosus (Say), and Leucopis spp. These studies demonstrate that existing predator communities comprised of a mixture of indigenous and naturalized species can suppress A. glycines population density in soybean. The impact of existing predator communities should be further investigated as a component of A. glycines management in United States soybean production systems.

Record 88 of 401 - AGRICOLA 1998-2004/09
AU: Ji,-F.; Kim,-S.W.
TI: Effects of carbohydrase supplement on lactation performance of primiparous sows fed corn-soybean meal based lactation diet.
SO: Asian-Australasian journal of animal sciences. 2004 Apr., v. 17, no. 4 p. 533-537.

Record 89 of 401 - AGRICOLA 1998-2004/09
AU: French,-B.W.; Chandler,-L.D.; Ellsbury,-M.M.; Fuller,-B.W.; West,-

M.
TI: Ground beetle (Coleoptera: Carabidae) assemblages in a transgenic corn-soybean cropping system.
SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 554-563.
AB: Ground beetles often prey on crop pests, and their relative abundance and assemblages vary among cropping systems and pest management practices. We used pitfall traps arranged in transects to study ground beetle assemblages in a large field-scale Bt cornÆsoybean cropping system for 3 yr. The transgenic corn expressed the Cry1Ab protein targeting lepidopteran pests. Three of the 57 ground beetle species collected accounted for 81% of all individuals captured. Six other species accounted for an additional 14% of all beetles captured. Ground beetles were captured equally in cornfields and soybean fields. They also were captured most frequently at field edges, but many were captured within field centers. Canonical correspondence analysis was used to arrange ground beetles along environmental gradients. Years 2001 and 2002 were the primary variables separating assemblages of ground beetles along the first canonical axis. The second canonical axis further separated the 2000 assemblage of ground beetles. With the effects of year and field removed, ground beetles were classified with respect to crop association and distance into the fields along axes 1 and 2 of a partial canonical correspondence analysis. Based on this analysis, ground beetles occupying the Bt cornfields were separated from those occupying soybean fields along the first canonical axis. The second canonical axis separated beetles occupying the field borders from field interiors. Ground beetles ordinating near the center of the axes may represent habitat generalists, and because of their high relative abundances, continuous seasonal activity, predatory nature, and ability to occupy field centers, they could assist in the biological control of agricultural pests.

Record 90 of 401 - AGRICOLA 1998-2004/09
AU: Peterson,-R.K.D.; Shannon,-C.L.; Lenssen,-A.W.
TI: Photosynthetic responses of legume species to leaf-mass consumption injury.
SO: Environmental entomology. 2004 Apr., v. 33, no. 2 p. 450-456.
AB: Several studies have addressed plant primary physiological responses (gas exchange responses) to insect herbivory. However, relatively few plant species have been examined. It is unknown whether responses to leaf-mass removal by insects vary among plant families and species. Within the legumes, only alfalfa, Medicago sativa L., and soybean, Glycine max (L.) Merrill, have been examined. The goal of this study was to test the hypothesis that gas exchange responses to leaf-mass consumption in a broad range of cultivated legumes do not differ from those of soybean and alfalfa. The species and cultivars used were M. sativa Cimarron, Medicago scutellata (L.) Sava, Medicago truncatula Gaertner Paraggio, Melilotus officinalis (L.) Pallas, Trifolium hybridum L., and Trifolium pratense L. Twelve greenhouse experiments were conducted and each legume species was used in a separate experiment. Depending on the experiment, there were either two or three treatments (control, simulated insect injury, and actual insect injury). For simulated and actual insect defoliation, injury was limited to a single leaf per plant. Simulated insect injury treatments were imposed by removing leaf

tissue on each leaflet with scissors. For the actual insect defoliation treatment, fall armyworm larvae, Spodoptera frugiperda (J.E. Smith), were used. Defoliation of single leaves on the six species resulted in similar responses. Plant gas exchange variables (photosynthesis, stomatal conductance, intercellular CO2, and transpiration) were not significantly affected by either simulated or actual insect defoliation. Our results support the hypothesis that there is a generalized primary physiological response to leaf-mass consumption injury among the cultivated legumes. More generally, the results from this experiment support that there is a generalized plant gas exchange response to leaf-mass consumption injury.

Record 91 of 401 - AGRICOLA 1998-2004/09

AU: Brodbeck,-B.V.; Andersen,-P.C.; Mizell,-R.F.-III; Oden,-S.

TI: Comparative nutrition and developmental biology of xylem-feeding leafhoppers reared on four genotypes of Glycine max.

SO: Environmental entomology. 2004 Apr., v. 33, no. 2 p. 165-173.

AB: A simplified protocol for rearing the glassy-winged sharpshooter, Homalodisca coagulata (Say) (Homoptera: Cicadellidae), was tested on four genotypes of soybean, Glycine max (L.) Merrill. Growth and development of leafhoppers were examined on three glabrous isolines (D88-5320, D88-5328, and D90-9216) and one pubescent genotype (Hagood). All three glabrous isolines were adequate hosts producing an average of >100 adults from eight original mating pairs of leafhoppers. Pubescent Hagood produced significantly fewer adults with longer developmental times. Isoline D88-5328 produced 30% more adults than the other glabrous isolines. Genotype also had significant effects on total developmental times, developmental rates within instars, growth rates, and adult masses at eclosion with insect performance being enhanced on isoline D88-5328. All genotypes of G. max had similar xylem chemistry at the initiation of the rearing experiment (6-week-old plants), but as G. max matured (14-18 wk), isoline D88-5328 provided significantly more organic nitrogen. Chemical analyses of xylem fluid and developmental data support the hypothesis that young H. coagulata required balanced profiles of organic nitrogen for development but benefited from increased organic nitrogen as they approached maturation. Poor performance on pubescent Hagood was not related to xylem chemistry and was assumed to result from the inhibitory effect of trichomes. Xylem fluid analysis suggests that some plants may have eventually experienced nitrogen deprivation from high leafhopper loads; this, in turn, resulted in slow development and small body size at maturation for some insects. Although this protocol provides a simplified technique for rearing H. coagulata, it is likely that manipulation of xylem chemistry via fertilization would further maximize growth and developmental rates.

Record 92 of 401 - AGRICOLA 1998-2004/09

AU: Blanc,-G.; Wolfe,-K.H.

TI: Widespread paleopolyploidy in model plant species inferred from age distributions of duplicate genes.

SO: Plant cell. 2004 July, v. 16, no. 7 p. 1667-1678.

AB: It is often anticipated that many of today's diploid plant species are in fact paleopolyploids. Given that an ancient large-scale duplication will result in an excess of relatively

old duplicated genes with similar ages, we analyzed the timing of duplication of pairs of paralogous genes in 14 model plant species. Using EST contigs (unigenes), we identified pairs of paralogous genes in each species and used the level of synonymous nucleotide substitution to estimate the relative ages of gene duplication. For nine of the investigated species (wheat [Triticum aestivum], maize [Zea mays], tetraploid cotton [Gossypium hirsutum], diploid cotton [G. arboretum], tomato [Lycopersicon esculentum], potato [Solanum tuberosum], soybean [Glycine max], barrel medic [Medicago truncatula], and Arabidopsis thaliana), the age distributions of duplicated genes contain peaks corresponding to short evolutionary periods during which large numbers of duplicated genes were accumulated. Large-scale duplications (polyploidy or aneuploidy) are strongly suspected to be the cause of these temporal peaks of gene duplication. However, the unusual age profile of tandem gene duplications in Arabidopsis indicates that other scenarios, such as variation in the rate at which duplicated genes are deleted, must also be considered.

Record 93 of 401 - AGRICOLA 1998-2004/09
AU: Ha,-T.J.; Nihei,-K.; Kubo,-I.
TI: Lipoxygenase inhibitory activity of octyl gallate.
SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 3177-3181.
AB: Octyl gallate inhibited soybean lipoxygenase-1 (EC 1.13.11.12, type I) with an IC50 of 1.3 micromolar. The inhibition of the enzyme by octyl gallate is a slow and reversible reaction without residual activity. The inhibition kinetics analyzed by Lineweaver-Burk plots indicates that octyl gallate is a competitive inhibitor, and the inhibition constant, KI, was obtained as 0.54 micromolar. One molecule of octyl gallate scavenged six molecules of 1,1-diphenyl-2-picrylhydrazyl and inhibited autoxidative lipid peroxidation. In addition, octyl gallate was effective in preventing lipid peroxidation.

Record 94 of 401 - AGRICOLA 1998-2004/09
AU: Franco,-O.L.; Dias,-S.C.; Magalhaes,-C.P.; Monteiro,-A.C.S.; Bloch,-C.-Jr.; Melo,-F.R.; Oliveira-Neto,-O.B.; Monnerat,-R.G.; Grossi-de-Sa,-M.F.
TI: Effects of soybean Kunitz trypsin inhibitor on the cotton boll weevil (Anthonomus grandis).
SO: Phytochemistry. 2004 Jan., v. 65, no. 1 p. 81-89.

Record 95 of 401 - AGRICOLA 1998-2004/09
AU: Dust,-J.M.; Gajda,-A.M.; Flickinger,-E.A.; Burkhalter,-T.M.; Merchen,-N.R.; Fahey,-G.C.-Jr.
TI: Extrusion conditions affect chemical composition and in vitro digestion of select food ingredients.
SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 2989-2996.
AB: An experiment was conducted to determine the effects of extrusion conditions on chemical composition and in vitro hydrolytic and fermentative digestion of barley grits, cornmeal, oat bran, soybean flour, soybean hulls, and wheat bran. Extrusion conditions altered crude protein, fiber, and starch concentrations of ingredients. Organic matter disappearance (OMD)

increased for extruded versus unprocessed samples of barley grits, cornmeal, and soybean flour that had been hydrolytically digested. After 8 h of fermentative digestion, OMD decreased as extrusion conditions intensified for barley grits and cornmeal but increased for oat bran, soybean hulls, and wheat bran. Total short-chain fatty acid production decreased as extrusion conditions intensified for barley grits, soybean hulls, and soybean flour. These data suggest that the effects of extrusion conditions on ingredient composition and digestion are influenced by the unique chemical characteristics of individual substrates.

Record 96 of 401 - AGRICOLA 1998-2004/09

AU: Li,-H.; Pordesimo,-L.; Weiss,-J.

TI: High intensity ultrasound-assisted extraction of oil from soybeans.

SO: Food research international. 2004, v. 37, issue 7 p. 731-738.

AB: The application of 20 kHz high-intensity ultrasound during extraction of oil from two varieties of soybeans (TN 96-58 and N 98-4573) using hexane, isopropanol and a 3:2 hexane-isopropanol mixture was evaluated. In a simplified extraction procedure, ground soybeans were added to solvents and ultrasonicated between 0 and 3 h at ultrasonic intensity levels ranging from 16.4 to 47.6 W/cm2. Oil was recovered after distillation and yield and composition determined. Using hexane as a solvent, yield generally increased as both application time and intensity of ultrasound increased. Solvent type influenced the efficiency of the extraction, i.e., the highest yield was obtained using ultrasound in combination with the mixed solvent. Gas chromatography analysis of ultrasonicated soybean oil did not show significant changes in fatty acid composition. Results were attributed to mechanical effects due to ultrasonically induced cavitation increasing permeability of plant tissues. A comparison of scanning electron microscopy images of raw and ultrasonicated soybeans indicated development of microfractures and disruption of cell walls in ground soybean flakes. Our study suggests that high-intensity ultrasound may reduce time required to extract edible oils from plant sources and hence improve throughput in commercial oil production processes.

Record 97 of 401 - AGRICOLA 1998-2004/09

AU: Azeredo,-H.M.C.; Faria,-J.-de-A.F.; Silva,-M.A.A.P.-da

TI: Minimization of peroxide formation rate in soybean oil by antioxidant combinations.

SO: Food research international. 2004, v. 37, issue 7 p. 689-694.

AB: The objective of this work was to minimize peroxide formation rates in refined soybean oil packaged in PVC bottles. The experiment was conducted according to a central composite design for four variables, namely, concentrations of TBHQ, Wgb-carotene and citric acid in the oil, and Tinuvin P (UV-absorber) in the bottles. The samples were stored at 1720 lx and 25 ÀC during 6 months. Peroxide values were measured monthly, and the mean peroxide formation rate (PFR) during storage time was calculated. PFR was highly correlated to odor changes, measured as differences-from-control at the end of storage time. TBHQ was the most effective antioxidant, followed by Tinuvin P. Wgb-Carotene impaired the color acceptance of the oil. The following antioxidant ranges were suggested to decrease PFR without

promoting oil rejection: 150-200 mg kg-1 of TBHQ, not more than 11 mg kg-1 of Wgb-carotene, 30 mg kg-1 of citric acid, and 3-4 g kg-1 of Tinuvin P.

Record 98 of 401 - AGRICOLA 1998-2004/09

AU: Wu,-Q.; Wang,-M.; Sciarappa,-W.J.; Simon,-J.E.

TI: LC/UV/ESI-MS analysis of isoflavones in Edamame and Tofu soybeans.

SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 2763-2769.

AB: High-performance liquid chromatography coupled with ultraviolet and electrospray ionization mass spectrometry (HPLC/UV/ESI-MSD) was applied to the study of isoflavones in both Edamame and Tofu soy varieties, from which the immature fresh soybeans or the mature soybean seeds are consumed, respectively. Positive atmospheric pressure interface (API) MS and MS/MS were used to provide molecular mass information and led to the identification of a total 16 isoflavones, including three aglycones, three glycosides, two glycoside acetates, and eight glycoside malonates. The major isoflavones in soybean seeds were daidzein and genistein glycoside and their malonate conjugates. Trace levels of daidzein and genistein acetyl glycosides were found only in the mature dry soybean seeds. To facilitate quantitative analysis, acid hydrolysis during extraction of soy samples was selected to convert the various phytoestrogen conjugates into their respective isoflavone aglycones, allowing accurate quantitation of total phytoestrogens as aglycones. On the basis of HPLC combined with UV and MS detection, all three targeted soy isoflavone aglycones, daidzein, genistein and glycitein in hydrolyzed extracts were successfully quantified within 25 min with formononetin used as the internal standard. The standard curves of UV detection were fitted in the range of 14.16-29000 ng/mL for daidzein, 15.38-31500 ng/mL for genistein, and 11.72-24000 ng/mL for glycitein. For MS detection, the standard curves were established in the range of 3.54-1812.5 ng/mL for daidzein, 3.85-1968.75 ng/mL for genistein, and 2.93-1500 ng/mL for glycitein. Good linearities (r2 > 0.999 for UV and r2 > 0.99 for MS) for standard curves were achieved for each isoflavone. The accuracy and precision (RSD) were within 10% for UV detection and 15% for MS detection (n = 10). Using this method, the phytoestrogen levels of total isoflavone aglycones from 30 soybean seed varieties were then evaluated for confirmation of the technique. Total isoflavones ranged across the varieties from 0.02 to 0.12% in the Edamame varieties, which are harvested while the seeds are still immature, and from 0.16 to 0.25% in Tofu varieties, harvested when the seeds are physiologically mature. While the literature has focused on the isoflavone content of soy products and processing soy, this report provides a reliable analytical technique for screening of authenticated fresh immature Edamame soybeans and Tofu soybeans.

Record 99 of 401 - AGRICOLA 1998-2004/09

AU: Lee,-J.H.; Renita,-M.; Fioritto,-R.J.; St.-Martin,-S.K.; Schwartz,-S.J.; Vodovotz,-Y.

TI: Isoflavone characterization and antioxidant activity of Ohio soybeans.

SO: Journal of agricultural and food chemistry. 2004 May 5, v. 52,

no. 9 p. 2647-2651.
AB: Seventeen Ohio soybeans were screened for isoflavone content and antioxidant activity. Isoflavone content was determined by C18 reversed phase high-performance liquid chromatography coupled with a photodiode array detector. Antioxidant activities of soybean extracts were measured using 2,2-diphenyl-1-picryl-hydrazyl (DPPH) free radical and photochemiluminescence (PCL) methods. The highest and lowest total isoflavone contents were 11.75 and 4.20 micromol/g soy, respectively, while the average was 7.12 micromol/g soy. Antioxidant activities of soybean extracts ranged from 7.51 to 12.18 micromol butylated hydroxytoluene (BHT) equivalent/g soy using the DPPH method. Lipid and water soluble antioxidant activities of soybean extracts ranged from 2.40 to 4.44 micromol Trolox equivalent/g soy and from 174.24 to 430.86 micromol ascorbic acid equivalent/g soy, respectively, using the PCL method.

Record 100 of 401 - AGRICOLA 1998-2004/09
AU: Li,-D.; Park,-J.H.; Park,-J.T.; Park,-C.S.; Park,-K.H.
TI: Biotechnological production of highly soluble daidzein glycosides using Thermotoga maritima maltosyltransferase.
SO: Journal of agricultural and food chemistry. 2004 May 5, v. 52, no. 9 p. 2561-2567.
AB: The use of soybean isoflavones in food products is limited due to their low hydrophilicity. To enhance its solubility, the isoflavone daidzin was transglycosylated as a model compound using Thermotoga maritima maltosyltransferase (MTase). Four novel transglycosylation products of daidzin were identified by TLC and MALDI-TOF MS: daidzein 7-O-triglucoside, daidzein 7-O-pentaglucoside, daidzein 7-O-heptaglucoside, and daidzein 7-O-nonaglucoside. The major product, daidzein 7-O-triglucoside, was purified by C18 and gel filtration chromatography, and its molecular structure was determined using UV, IR, MALDI-TOF MS, and NMR. The solubility of daidzein 7-O-triglucoside was 7.5 x 10(4) times that of daidzin, suggesting that the transglycosylation greatly enhanced its water solubility.

Record 101 of 401 - AGRICOLA 1998-2004/09
AU: Liu,-Z.Q.; Zhou,-J.H.; Zeng,-Y.L.; Ouyang,-X.L.
TI: The enhancement and encapsulation of Agaricus bisporus flavor.
SO: Journal of food engineering. 2004 Dec., v. 65, issue 3 p. 391-396.
AB: 1-octene-3-ol, the major flavoring substance in Agaricus bisporus, is formed by the reaction of linolenic acid in the presence of enzyme. By adding sunflower oil hydrolysate rich in linolenic acid into the system, we enhanced the flavor formation, then extracted flavors with ethanol while treating them with complex enzymes, later using spray drying to produce a microencapsulated powder flavor. The experiment on flavor enhancement showed that the enhancement effect reached its maximum when the pH is 6.5, temperature is 35ÀC and mixed fatty acid is 0.3%.The experiment on the encapsulation of flavor showed the best ratio of the carriers is (calculated according to the weight of fresh mushroom): soybean hydrolyzing protein 10%, Arabic gum 1%, dextrin 15%. The most suitable process was a feed temperature, air inlet and air outlet temperature during spray

drying of 50-60, 130-140 and 70-80ÀC respectively.

Record 102 of 401 - AGRICOLA 1998-2004/09

AU: Wiriyaumpaiwong,-S.; Soponronnarit,-S.; Prachayawarakorn,-S.

TI: Comparative study of heating processes for full-fat soybeans.

SO: Journal of food engineering. 2004 Dec., v. 65, issue 3 p. 371-382.

AB: Heating is very important to inactivate anti-nutritional factors and enhance quality of soybean products. Four heating techniques i.e. extrusion, fluidized bed, spouted bed and infrared radiation have been investigated along with their performances, regarding moisture reduction, urease inactivation, protein solubility and lysine. The rate of moisture diffusion for soybean kernel in the spouted bed and infrared dryer was described by a semi-empirical drying equation for which the drying constant was determined using non-linear regression. The experimental results have shown that the water mobility is more rapidly accelerated by infrared radiation. Every technique has a potential to reduce the urease activity to the standard range, with the quantity of remaining lysine being insignificantly different ($p<0.05$) under the testing conditions. The extent of urease inactivation in each technique depends on the moisture content, time and temperature, the latter being the most important factor. High moisture content induces rapid urease inactivation for the soybeans treated by the convection and radiation-type equipments. Conversely, inhibited inactivation is encountered with the extruded soybeans due to the strong cohesive forces amongst ground soybeans at a higher moisture content of 24% d.b., inducing poor mixing behaviour in the barrel. The results from the lab- and commercial-scale equipment are shown to have higher soluble protein content in 0.2% KOH for the infrared-treated soybeans, comparing to the other techniques. Extrusion consumed the largest quantity of energy followed by the fluidized bed with no recycled air and the micronizer becomes the most effective energy utilization.

Record 103 of 401 - AGRICOLA 1998-2004/09

AU: Choi,-N.J.; Kwon,-D.; Yun,-S.H.; Jung,-M.Y.; Shin,-H.K.

TI: Selectively hydrogenated soybean oil with conjugated linoleic acid modifies body composition and plasma lipids in rats.

SO: Journal of nutritional biochemistry. 2004 July, v. 15, no. 7 p. 411-417.

AB: The present study examined effects of a selectively hydrogenated soybean oil (SHSO) containing about 21% CLA on body composition, adipose depots and organ weights, and plasma lipid profiles in rats. Male Sprague Dawley rats were fed for 6 weeks a purified diet containing 0%, 1%, 3%, and 5% of SHSO. Different levels of SHSO supplementation did not significantly affect growth performance, although there was a trend toward decreased body weight gain with increasing dietary SHSO levels. The weights of inguinal, epididymal, and retroperitoneal adipose depot, but not mesenteric, were significantly influenced by dietary SHSO supplementation ($P < 0.05$, $P < 0.01$ and $P < 0.001$, respectively). Although the absolute weight of body protein in the control rats was higher in SHSO-fed rats, the effect on absolute weight of body protein is diluted and eliminated when the data are adjusted for eviscerated carcass weight as a percentage base. Therefore, as dietary SHSO level increased, body protein as a percentage of

carcass weight increased (P < 0.05), although as dietary SHSO level increased, body fat proportion in carcass decreased (P < 0.01). Plasma triglycerides (TG) and total cholesterol (TC) concentrations were beneficially decreased, and HDL-cholesterol (HDL-C) to TC ratio was also beneficially increased by SHSO supplementation (P < 0.05, P < 0.001, and P < 0.01, respectively). However, plasma HDL-C concentration undesirably decreased with dietary SHSO supplementation (P < 0.05). The present study observed that body composition and plasma lipids were beneficially modulated by SHSO supplementation at least 3% levels (0.6% of CLA), and suggested that SHSO is a useful fat source because of the high level of CLA.

Record 104 of 401 - AGRICOLA 1998-2004/09

AU: Faye,-T.; Brede,-D.A.; Langsrud,-T.; Nes,-I.F.; Holo,-H.

TI: Prevalence of the genes encoding propionicin T1 and protease-activated antimicrobial peptide and their expression in classical propionibacteria.

SO: Applied and environmental microbiology. 2004 Apr., v. 70, no. 4 p. 2240-2244.

AB: The purpose of this study was to investigate the frequency of production of the bacteriocin propionicin T1 and the protease-activated antimicrobial peptide (PAMP) and their corresponding genes in 64 isolates of classical propionibacteria. This study revealed that these genes are widespread in Propionibacterium jensenii and Propionibacterium thoenii but absent from the remaining species of classical propionibacteria that were studied. The pro-PAMP-encoding gene (pamA) was found in 63% of the P. jensenii strains and 61% of the P. thoenii strains, and all of these strains displayed PAMP activity. The propionicin T1-encoding gene (pctA) was present in 89% of the P. thoenii strains and 54% of the P. jensenii strains. All P. thoenii strains containing the pctA gene exhibited antimicrobial activity corresponding to propionicin T1 activity, whereas only 38% of the pctA-containing P. jensenii strains displayed this activity. Sequencing of the pctA genes revealed the existence of two allelic variants that differed in a single nucleotide in six strains of P. jensenii; in these strains the glycine at position 55 of propionicin T1 was replaced by an aspartate residue (A variant). No strains harboring the A variant showed any antimicrobial activity against propionicin T1-sensitive bacteria. An open reading frame (orf2) located immediately downstream from the pctA gene was absent in three strains containing the G variant of propionicin T1. Two of these strains showed low antimicrobial activity, while the third strain showed no antimicrobial activity at all. The protein encoded by orf2 showed strong homology to ABC transporters, and it has been proposed previously that this protein is involved in the producer immunity against propionicin T1. The limited antimicrobial activity exhibited by the strains lacking orf2 further suggests that this putative ABC transporter plays an important role in propionicin T1 activity.

Record 105 of 401 - AGRICOLA 1998-2004/09

AU: Lee,-M.N.; Whelan,-J.

TI: Identification of signals required for import of the soybean F(A) d subunit of ATP synthase into mitochondria.

SO: Plant molecular biology. 2004 Jan., v. 54, no. 2 p. 193-203.
AB: The requirements for protein import into mitochondria was investigated by using the targeting signal of the F(A)d subunit of soybean mitochondrial ATP synthase attached to two different passenger proteins, its native passenger and soybean alternative oxidase. Both passenger proteins are soybean mitochondrial proteins. Changing hydrophobic residues at positions -24:25 (Phe:Leu), -18:19 (Ile:Leu) and -12:13 (Leu:Ile) of the 31 amino acid cleavable presequence gave more than 50% inhibition of import with both passenger proteins. Some other residues in the targeting signal played a more significant role in targeting of one passenger protein compared to another. Notably changing positive residues (Arg, Lys) had a greater inhibitory affect on import with the native passenger protein, i.e. greater inhibition of import with FAd mature protein was observed compared to when alternative oxidase was the mature protein. When using chimeric passenger proteins it was shown that the nature of the mature protein can greatly affect the targeting properties of the presequence. In vivo investigations of the targeting presequence indicated that the presequence of 31 amino acids could not support import of GFP as a passenger protein. However, fusion of the full-length F(A)d coding sequence to GFP did result in mitochondrial localisation of GFP. Using the latter fusion we confirmed the critical role of hydrophobic residues at positions -24:25 and -18:19. These results support the proposal that core mitochondrial targeting features exist in all presequences, but that additional features exist. These features may not be evident with all passenger proteins.

Record 106 of 401 - AGRICOLA 1998-2004/09
AU: Wu,-K.; Feng,-H.; Guo,-Y.
TI: Evaluation of maize as a refuge for management of resistance to Bt cotton by Helicoverpa armigera (Hubner) in the Yellow River cotton-farming region of China.
SO: Crop protection. 2004 June, v. 23, no. 6 p. 523-530.
AB: Bt cotton has been planted to the exclusion of non-Bt cotton in the Yellow River cotton-farming region of China since 2000. Alternative non-Bt hosts, such as maize, soybean, peanut, wheat, and other host plants of Helicoverpa armigera (Hubner) may be acting as refuges for Bt-susceptible larvae of this pest, thereby delaying evolution of resistance to Bt cotton. Egg, larval, and adult densities of H. armigera were measured on Bt cotton, and on maize that was planted on dates that reflected local farming practices, in order to assess the role of maize as a refuge during 2001-2002 in Xinxiang County, Henan Province and Anci County, Hebei Province. The results indicated that the average egg densities for the second-fourth generation of the pest on Bt cotton in Xinxiang and the second generation in Anci County were significantly higher than those in maize fields. However, maize typically had much higher larval densities in the third and fourth generation of H. armigera than on Bt cotton. These data indicate that maize is probably serving as an effective refuge for third and fourth generation H. armigera, but is of less value for the second generation. The densities of moths produced by Bt cotton and by maize in a cage experiment confirmed the importance of maize as a refuge in the third and fourth generation.

Record 107 of 401 - AGRICOLA 1998-2004/09
AU: Aert,-R.; Sagi,-L.; Volckaert,-G.
TI: Gene content and density in banana (Musa acuminata) as revealed by genomic sequencing of BAC clones.
SO: Theoretical and applied genetics. 2004 June, v. 109, no. 1 p. 129-139.
AB: The complete sequence of Musa acuminata bacterial artificial chromosome (BAC) clones is presented and, consequently, the first analysis of the banana genome organization. One clone (MuH9) is 82,723 bp long with an overall G+C content of 38.2%. Twelve putative protein-coding sequences were identified, representing a gene density of one per 6.9 kb, which is slightly less than that previously reported for Arabidopsis but similar to rice. One coding sequence was identified as a partial M. acuminata malate synthase, while the remaining sequences showed a similarity to predicted or hypothetical proteins identified in genome sequence data. A second BAC clone (MuG9) is 73,268 bp long with an overall G+C content of 38.5%. Only seven putative coding regions were discovered, representing a gene density of only one gene per 10.5 kb, which is strikingly lower than that of the first BAC. One coding sequence showed significant homology to the soybean ribonucleotide reductase (large subunit). A transition point between coding regions and repeated sequences was found at approximately 45 kb, separating the coding upstream BAC end from its downstream end that mainly contained transposon-like sequences and regions similar to known repetitive sequences of M. acuminata. This gene organization resembles Gramineae genome sequences, where genes are clustered in gene-rich regions separated by gene-poor DNA containing abundant transposons.

Record 108 of 401 - AGRICOLA 1998-2004/09
AU: Song,-Q.J.; Marek,-L.F.; Shoemaker,-R.C.; Lark,-K.G.; Concibido,-V.C.; Delannay,-X.; Specht,-J.E.; Cregan,-P.B.
TI: A new integrated genetic linkage map of the soybean.
SO: Theoretical and applied genetics. 2004 June, v. 109, no. 1 p. 122-128.
AB: A total of 391 simple sequence repeat (SSR) markers designed from genomic DNA libraries, 24 derived from existing GenBank genes or ESTs, and five derived from bacterial artificial chromosome (BAC) end sequences were developed. In contrast to SSRs derived from EST sequences, those derived from genomic libraries were a superior source of polymorphic markers, given that the mean number of tandem repeats in the former was significantly less than that of the latter ($P<0.01$). The 420 newly developed SSRs were mapped in one or more of five soybean mapping populations: 'Minsoy' x 'Noir 1', 'Minsoy' x 'Archer', 'Archer' x 'Noir 1', 'Clark' x 'Harosoy', and A81-356022 x PI468916. The JoinMap software package was used to combine the five maps into an integrated genetic map spanning 2,523.6 cM of Kosambi map distance across 20 linkage groups that contained 1,849 markers, including 1,015 SSRs, 709 RFLPs, 73 RAPDs, 24 classical traits, six AFLPs, ten isozymes, and 12 others. The number of new SSR markers added to each linkage group ranged from 12 to 29. In the integrated map, the ratio of SSR marker number to linkage group map distance did not differ among 18 of the 20 linkage groups; however, the SSRs were not uniformly spaced over a linkage group, clusters of SSRs with very limited recombination were frequently

present. These clusters of SSRs may be indicative of gene-rich regions of soybean, as has been suggested by a number of recent studies, indicating the significant association of genes and SSRs. Development of SSR markers from map-referenced BAC clones was a very effective means of targeting markers to marker-scarce positions in the genome.

Record 109 of 401 - AGRICOLA 1998-2004/09

AU: Costa,-J.H.; Hasenfratz-Sauder,-M.P.; Pham-Thi,-A.T.; Lima,-M.-da-G.S.; Dizengremel,-P.; Jolivet,-Y.; Fernandes-de-Melo,-D.

TI: Identification in Vigna unguiculata (L.) Walp. of two cDNAs encoding mitochondrial alternative oxidase orthologous to soybean alternative oxidase genes 2a and 2b.

SO: Plant science. 2004 Aug., v. 167, issue 2 p. 233-239.

Record 110 of 401 - AGRICOLA 1998-2004/09

AU: Liu,-Z.S.; Chang,-S.K.C.

TI: Effect of soy milk characteristics and cooking conditions on coagulant requirements for making filled tofu.

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3405-3411.

AB: The amount of coagulant added to soy milk is a critical factor for tofu-making; particularly it affects the textural properties of tofu. Earlier research indicated that the critical point of coagulant concentration (CPCC) is a characteristic parameter of soy milk and could be used as an effective indicator of optimal coagulant concentration (OCC) for making filled tofu. The objective of this study was to investigate the possible correlations between CPCC and the characteristics of soy milk made from various soybean samples and the effect of soy milk cooking and dilution conditions on CPCC. CPCC was determined by a titration method. Calcium chloride and magnesium chloride were used as coagulants. Soy milk characteristics including solid, protein, phytate, pH, titratable acidity, mineral content, and 11S/7S protein and these characteristics as affected by heating rate, heating time, and sequence of dilution and heating were studied. The results showed that the CPCC was significantly ($p < 0.05$) positively correlated with phytate content (grams per gram of protein), pH, and 7S protein content but negatively correlated with protein content, 11S protein content, 11S/7S ratio, titratable acidity, and original calcium content. Within the same soybean material, more proteins required more coagulant, but higher protein concentration during cooking resulted in less coagulant required by each gram of protein during coagulation. The CPCC decreased with increasing soy milk heating time or decreasing heating rate. The sequence of heating and diluting for preparing soy milk also had an effect on CPCC.

Record 111 of 401 - AGRICOLA 1998-2004/09

AU: Dahuja,-A.; Madaan,-T.R.

TI: Off-flavour development in soybeans: comparative role of some antioxidants and related enzymes.

SO: Journal of the science of food and agriculture. 2004 Apr. 30, v. 84, issue 6 p. 547-550.

AB: Off-flavour development is the major impediment in the effective use of soybeans as food ingredients. In the present study, the levels of vitamin E and vitamin C along with those of antioxidant

enzymes, like superoxide dismutase, peroxidase and catalase, were estimated in sixteen soybean varieties to explore their effectiveness against off-flavour generation. Thiobarbituric acid (TBA) number, an indicator of lipid peroxidation, was used to measure the quality with respect to off-flavour. Data on activities of various antioxidant enzymes indicated that the off-flavour is mainly generated enzymatically by the action of lipoxygenase on polyunsaturated fatty acids. Furthermore, varieties PK 416 and JS 7105 had the highest level of vitamin E while their TBA number was the lowest indicating the inverse relationship between the two parameters. It was further observed that the peroxidative effect of higher vitamin C concentrations is controlled by vitamin E. Among the varieties analyzed, PK 416 and JS 7105 appeared to have greater potential as most acceptable food ingredients.

Record 112 of 401 - AGRICOLA 1998-2004/09

AU: Ishurd,-O.; Zahid,-M.; Xiao,-P.; Pan,-Y.

TI: Protein and amino acids contents of Libyan dates at three stages of development.

SO: Journal of the science of food and agriculture. 2004 Apr. 15, v. 84, issue 5 p. 481-484.

AB: The protein and amino acid contents of three Libyan date varieties (Taasfirt, Bikrari and Khadhrai) at different stages of fruit development were determined. The protein concentration in all three varieties was highest at the green stage. Seventeen amino acids were detected and quantified; their concentrations (dry weight basis) were higher in Khadhrai and Bikrari than in Taasfirt. At the green stage the concentrations of glutamic acid, aspartic acid, lysine, leucine, alanine and serine were highest. At the yellow and ripe stages, glutamic acid, aspartic acid, lysine, leucine, proline and glycine were present in high concentrations. For most amino acids the concentrations were higher at the yellow stage than at the ripe stage.

Record 113 of 401 - AGRICOLA 1998-2004/09

AU: Variyar,-P.S.; Limaye,-A.; Sharma,-A.

TI: Radiation-induced enhancement of antioxidant contents of soybean (Glycine max Merrill).

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3385-3388.

AB: Soybean samples were treated with gamma-radiation doses between 0.5 and 5 kGy for achieving insect disinfestation and microbial decontamination. Nutritional quality of soybeans with respect to antioxidant isoflavone content was tested in radiation-treated and untreated samples. Changes in major isoflavones such as genistein, diadzein, glycetein, and their glycosides were monitored by high-performance liquid chromatography. Interestingly, a decrease in content of glycosidic conjugates and an increase in aglycons were noted with increasing radiation dose. Antioxidant potential measured as percent 1,1-diphenyl-2-picrylhydrazyl scavenging activity showed an increasing trend with dose, indicating that radiation processing as a method of food preservation has a positive nutritional implication.

Record 114 of 401 - AGRICOLA 1998-2004/09

AU: Nyachoti,-C.M.; Onyango,-E.M.; Omogbenigun,-O.F.; Adeola,-O.
TI: Nutritional evaluation of peas for ducks.
SO: Journal of the science of food and agriculture. 2004 Apr. 15, v. 84, issue 5 p. 474-480.
AB: The nutritive value of four pea cultivars (AC Advantage, Carneval, CDC Mozart and Keoma) and soybean meal (SBM) was evaluated in a 102 h study with 48 male White Pekin ducks. All birds were tube-fed 25 g of dextrose at 24 and 30 h after feed withdrawal, then 25 g of each feedstuff was tube-fed to eight ducks at 48 and 54 h after feed withdrawal. Excreta were quantitatively collected during the next 54 h. Endogenous nitrogen, amino acids and energy per bird in the 54 h collection period were 1.06 +/- 0.58 g, 0.047 +/- 0.025 g and 0.098 +/- 0.049 MJ respectively. There were differences ($P < 0.05$) in apparent amino acid digestibilities (AAAD) and true amino acid digestibilities (TAAD). On average, AAAD were 82.8, 82.0, 70.3, 82.4 and 77.7% and TAAD were 89.4, 89.2, 82.3, 89.5 and 85.3% for SBM, AC Advantage, Carneval, CDC Mozart and Keoma respectively. The nitrogen-corrected apparent and true metabolisable energy values did not differ among the pea diets and were 13.36 +/- 0.071 and 14.59 +/- 0.071 MJ kg-1 respectively. Respective values for SBM were 12.16 +/- 0.16 and 13.39 +/- 0.16 MJ kg-1 and both were lower ($P < 0.05$) than in peas.

Record 115 of 401 - AGRICOLA 1998-2004/09
AU: Ding,-J.; Jia,-J.; Yang,-L.; Wen,-H.; Zhang,-C.; Liu,-W.; Zhang,-D.
TI: Validation of a rice specific gene, sucrose phosphate synthase, used as the endogenous reference gene for qualitative and real-time quantitative PCR detection of transgenes.
SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3372-3377.
AB: With the development of transgenic crops, many countries have issued regulations to label the genetically modified organisms (GMOs) and their derived products. Polymerase Chain Reaction (PCR) methods are thought to be reliable and useful techniques for qualitative and quantitative detection of GMOs. These methods generally need to amplify the transgene and compare the amplified result with that of the corresponding reference gene to obtain reliable results. In this article, we reported the development of specific primers and probe for the rice (Oryza sativa) sucrose phosphate synthase (SPS) gene and PCR cycling conditions suitable for the use of this sequence as an endogenous reference gene in both qualitative and quantitative PCR assays. Both methods were assayed with 13 different rice varieties, and identical amplification products were obtained with all of them. No amplification products were observed when DNA samples from other species, such as wheat, maize, barley, tobacco, soybean, rapeseed, tomato, sunflower, carrot, pepper, eggplant, lupine, mung bean, plum, and Arabidopsis thaliana, were used as templates, which demonstrated that this system was specific for rice. In addition, the results of the Southern blot analysis confirmed that the SPS gene was a single copy in the tested rice varieties. In qualitative and quantitative PCR analyses, the detection sensitivities were 0.05 and 0.005 ng of rice genomic DNA, respectively. To test the practical use of this SPS gene as an endogenous reference gene, we have also quantified the

beta-glucuronidase (GUS) gene in transgenic rice using this reference gene. These results indicated that the SPS gene was species specific, had one copy number, and had a low heterogeneity among the tested cultivars. Therefore, this gene could be used as an endogenous reference gene of rice and the optimized PCR systems could be used for practical qualitative and quantitative detection of transgenic rice.

Record 116 of 401 - AGRICOLA 1998-2004/09

AU: Ko,-Y.T.; Lin,-Y.L.

TI: 1,3-beta-glucan quantification by a fluorescence microassay and analysis of its distribution in foods.

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3313-3318.

AB: The objective of this study was to establish analytical approaches to quantify 1,3-beta-glucan (1,3-beta-G) in foods. Six food categories including legumes, cereals, tubers, vegetables, fruits, and mushrooms and 17 total items were tested. An extraction procedure was designed to prepare food cold-water soluble, hot-water soluble, cold-alkaline soluble, and hot-alkaline soluble fractions. A fluorescence microassay based on aniline blue dye, which bound specifically to 1,3-beta-G, was developed to measure its content in the food fractions. Curdlan was used as standard to construct the 1,3-beta-G calibration curve, and a linear correlation within a 14 microgram/mL concentration range was obtained. This microassay displayed selectivities among various 1,3-beta-G species. Biologically active ones such as pachyman and yeast glucan possessed much stronger fluorescent signals than others such as laminarin and barley glucan. Possible fluorescent interference from food proteins was estimated. This assay tolerated up to 50% of bovine serum albumin in 10 microgram/mL curdlan. Analysis of the four food fractions showed that besides the well-known lentinan-containing shiitake, popular foods such as celery, chin-chian leaves, carrot, and radish contained nearly 20% 1,3-beta-G in their total sugar. Soybean dry weight contained 0.8% 1,3-beta-G, which was twice the amount compared to shiitake. Snow mushroom dry weight had the highest 1,3-beta-G content, at 2.5%, and was rich in both water (0.67%) and alkaline soluble (1. 87%) forms. In conclusion, this dye-binding fluorescence microassay in conjunction with the extraction procedure can be applied in the prescreening of potential foods rich in functional 1,3-beta-G.

Record 117 of 401 - AGRICOLA 1998-2004/09

AU: Svetaz,-L.; Tapia,-A.; Lopez,-S.N.; Furlan,-R.L.E.; Petenatti,-E.; Pioli,-R.; Schmeda-Hirschmann,-G.; Zacchino,-S.A.

TI: Antifungal chalcones and new caffeic acid esters from Zuccagnia punctata acting against soybean infecting fungi.

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3297-3300.

AB: The crude methanolic extract of Zuccagnia punctata was active toward the fungal pathogens of soybean Phomopsis longicolla and Colletotrichum truncatum. Assay guided fractionation led to the isolation of two chalcones, one flavanone and a new caffeoyl ester derivative as the compounds responsible for the antifungal activity. Another new caffeoyl ester derivative was isolated from

the antifungal chloroform extract but proved to be inactive against the soybean infecting fungi up to 50 microgram/mL.

Record 118 of 401 - AGRICOLA 1998-2004/09

AU: Pipolo,-A.E.; Sinclair,-T.R.; Camara,-G.M.S.

TI: Protein and oil concentration of soybean seed cultured in vitro using nutrient solutions of differiing glutamine concentration.

SO: Annals of applied biology. 2004, v. 144, no. 2 p. 223-227.

Record 119 of 401 - AGRICOLA 1998-2004/09

AU: Germini,-A.; Zanetti,-A.; Salati,-C.; Rossi,-S.; Forre,-C.; Schmid,-S.; Fogher,-C.; Marchelli,-R.

TI: Development of a seven-target multiplex PCR for the simultaneous detection of transgenic soybean and maize in feeds and foods. [Erratum: 2004 June 30, v. 52, no. 13, p. 4350.].

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3275-3280.

AB: The detection of genetically modified organisms (GMOs) in food and feed is an important issue for all the subjects involved in raw material control, food industry, and distribution. Because the number of GMOs authorized in the EU increased during the past few years, there is a need for methods that allow a rapid screening of products. In this paper, we propose a method for the simultaneous detection of four transgenic maize (MON810, Bt11, Bt 176, and GA21) and one transgenic soybean (Roundup Ready), which allows routine control analyses to be sped up. DNA was extracted either from maize and soybean seeds and leaves or reference materials, and the recombinant DNA target sequences were detected with 7 primer pairs, accurately designed to be highly specific for each investigated transgene. Cross and negative controls were performed to ensure the specificity of each primer pair. The method was validated on an interlaboratory ring test and good analytical parameters were obtained (LOD = 0.25%, Repeatability, (r) = 1; Reproducibility, (R) = 0.9). The method was then applied to a model biscuit made of transgenic materials baked for the purpose and to real samples such as feed and foodstuffs. On account of the high recognition specificity and the good detection limits, this multiplex PCR represents a fast and reliable screening method directly applicable in all the laboratories involved in raw material and food control.

Record 120 of 401 - AGRICOLA 1998-2004/09

AU: Glaser,-K.R.; Wenk,-C.; Scheeder,-M.R.L.

TI: Evaluation of pork backfat firmness and lard consistency using several different physicochemical methods.

SO: Journal of the science of food and agriculture. 2004 June, v. 84, issue 8 p. 853-862.

AB: A total of 96 pigs were fed on a control diet (barley, wheat, soybean meal) or the control diet supplemented with one of six fats, differing in saturated (SFA), cis- and trans-monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA) content, in order to produce backfat widely differing in fatty acid composition. In addition to fatty acid composition, firmness was measured, by means of a puncture test, in the intact outer backfat layer and in lard extracted from the outer layer. Melting behaviour and solid fat content (SFC) were determined by differential scanning calorimetry and crystallisation time with a

Rapid Interesterification Control-Box. Regression analyses revealed that all consistency traits were mainly dependant on SFA content, particularly stearic acid. Cis-MUFA were the next most decisive for crystallisation time and SFC. The prediction of firmness and SFC at 0ÀC was improved when the proportion of PUFA was also considered. The stearic to linoleic acid ratio provided the best prediction of lard firmness. It was concluded that MUFA and PUFA exert specific effects on the different consistency characteristics and not only PUFA but also MUFA should be considered in feeding recommendations for growing-finishing pigs when lard consistency is to be improved.

Record 121 of 401 - AGRICOLA 1998-2004/09
AU: Pipolo,-A.E.; Sinclair,-T.R.; Camara,-G.M.S.
TI: Effects of temperature on oil and protein concentration in soybean seeds cultured in vitro.
SO: Annals of applied biology. 2004, v. 144, no. 1 p. 71-76.

Record 122 of 401 - AGRICOLA 1998-2004/09
AU: Becker-Ritt,-A.B.; Mulinari,-F.; Vasconcelos,-I.M.; Carlini,-C.R.
TI: Antinutritional and/or toxic factors in soybean (Glycine max (L) Merril) seeds: comparison of different cultivars adapted to the southern region of Brazil.
SO: Journal of the science of food and agriculture. 2004 Feb., v. 84, issue 3 p. 263-270.
AB: Soybean (Glycine max (L) Merril) seeds are known to contain different proteins displaying antinutritional and/or toxic effects, such as soybean agglutinin (an N-acetylgalactosamine-specific lectin), proteinase inhibitors (Kunitz- and Bowman-Birk-type trypsin and chymotrypsin inhibitors) and urease (seed and tissue isoforms). Two other toxic proteins were previously isolated from soybeans, soyatoxin (21 kDa) and soybean toxin (18.4 kDa), which are immunologically related to canatoxin, a toxic protein from Canavalia ensiformis (jackbean) seeds. In this work we have screened crude extracts from seeds of six different soybean cultivars, which together represent most of the crop harvested in the southern region of Brazil, for the presence of urease, trypsin inhibitory and haemagglutination activities, intraperitoneal toxicity in mice and immunoreactivity against anti-canatoxin antibodies. Significant differences were found in the contents of proteinase inhibitors, lectin, urease activity and lethality in mice. The relevance of these findings to the agronomic qualities and to the choice of soybean cultivars to be used as food or feed is discussed.

Record 123 of 401 - AGRICOLA 1998-2004/09
AU: Hou,-D.H.J.; Chang,-S.K.C.
TI: Structural characteristics of purified glycinin from soybeans stored under various conditions.
SO: Journal of agricultural and food chemistry. 2004 June 16, v. 52, no. 12 p. 3792-3800.
AB: Soybeans were stored in 84% relative humidity at 30 ÀC (adverse conditions) for 9 months and in 57% relative humidity at 20 ÀC, cold (4 ÀC), and an uncontrolled ambient garage for 18 months. Glycinin was isolated and purified; its structural properties were characterized. The purified glycinin from soybean in the adverse conditions was associated with a significant amount of

sugar and showed reductions in hydrophobic interactions after 3 months; the total free sulfhydryl content in glycinin decreased, but the intramolecular disulfide bonds increased; the Wga-helix content of secondary structure slightly increased, but the Wgb-sheet content decreased. The structure of glycinin purified from the other three conditions showed no significant changes for 18 months of storage when compared to the control. The molecular mass of glycinin remained in the range of 313-340 kDa during the whole storage period for the four conditions.

Record 124 of 401 - AGRICOLA 1998-2004/09

AU: Zanini,-S.F.; Torres,-C.A.A.; Bragagnolo,-N.; Turatti,-J.M.; Silva,-M.G.; Zanini,-M.S.

TI: Effect of oil sources and vitamin E levels in the diet on the composition of fatty acids in rooster thigh and chest meat.

SO: Journal of the science of food and agriculture. 2004 May, v. 84, issue 7 p. 672-682.

AB: The aim of this study was to evaluate the inclusion of different oil sources and dietary supplementation with vitamin E on the composition of fatty acids in rooster meat. Two hundred and forty 30-week-old White Leghorn roosters were distributed in a completely randomized factorial arrangement of 5 x 2, using five oil sources (sunflower, soybean, canola, linseed and fish) and two levels of antioxidant (30 and 400 mg vitamin E kg-1 of diet). The intake of fish and canola oil in the diet reduced ($P < 0.05$) the content of saturated and unsaturated fatty acids in the thigh meat. Amongst the unsaturated fatty acids in the thigh, the fish and canola oil reduced ($P < 0.05$) the level of omega6 fatty acid, with a consequent decrease in the ratio omega6:omega3. The diet with fish oil increased ($P < 0.05$) the content of C22:6omega3 in the thigh meat. The use of linseed oil resulted in a significant reduction of the ratio of omeg6:omega3 fatty acid in the thigh. The use of soybean oil in the diet increased ($P < 0.05$) the content of saturated and unsaturated fatty acids in the thigh, specifically in the content of omega 6. The inclusion of vitamin E increased the polyunsaturated fatty acids in the chest meat, such as C18:3omega3, C20:5omega3 and C22:6omega3.

Record 125 of 401 - AGRICOLA 1998-2004/09

AU: Davalos,-A.; Bartolome,-B.; Gomez-Cordoves,-C.

TI: Inhibition of methyl linoleate autoxidation by phenolics and other related compounds under mild oxidative conditions.

SO: Journal of the science of food and agriculture. 2004 May, v. 84, issue 7 p. 631-638.

AB: Methyl linoleate (MeLo) is a commercially available substrate widely used for studying the inhibitory properties of pure compounds and plant extracts against lipid oxidation. In this paper, 13 phenolic (benzoic and cinnamic acids, aldehydes and derivatives, and flavonoids) and other related compounds (butylated hydroxyanisole, butylated hydroxytoluene and tocopherols) as well as nine complex mixtures rich in phenolics (wines) or tocopherols (soybean oil extracts) were assayed for their inhibitory activity against MeLo autoxidation under mild conditions (40ÀC, darkness and atmospheric pressure). Samples were also assayed for their free radical-scavenging capacity against 2,2-diphenyl-1-picrylhydrazyl (DPPHç). Protocatechuic aldehyde, a compound that has not been previously evaluated by

either of the two methods, showed the highest antioxidant activity. Some variations in the antioxidant ranking for some compounds were found between our results and those obtained by other authors using accelerated conditions for MeLo oxidation. Antioxidant activity of wines and soybean oil extracts was related to their richness in phenolics and tocopherols respectively. Correlation between antioxidant capacity measured by the MeLo and DPPHçmethods was found for wines but not for the other samples studied. Therefore the measure of the free radical-scavenging capacity of a compound is not always a reliable indicator of its lipid oxidation inhibitory ability.

Record 126 of 401 - AGRICOLA 1998-2004/09

AU: Mundt,-S.; Wedzicha,-B.L.

TI: Comparative study of the composition of melanoidins from glucose and maltose.

SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4256-4260.

AB: The composition of melanoidins formed in the reactions of either glucose or maltose with glycine (70 ÀC, pH 5.5, [glucose] = [maltose] = [glycine] = 0.25 M) (MW > 3500) was investigated by microanalysis and the use of 14C-labeled sugars and amino acid. The most reliable parameter obtained from microanalysis data is the C/N value, as it was calculated with no model assumption. The C/N value (7.6 « 0.2 for glucose and 10.5 « 0.2 for maltose) does not change with molecular weight (MW > 3500) as the polymers grow in size. A comparison between the radiochemically determined composition and that obtained from microanalysis suggests that the amino ketone, which is one of the products of Strecker degradation reaction, forms part of the of the melanoidin structure, together with the sugar-derived moiety and the Strecker aldehyde. Evidence is presented that glucose is formed at intermediate stages of the maltose-glycine reaction. The melanoidins are the result of the polymerization of glucose and intact, or substantially intact, maltose residues with glycine.

Record 127 of 401 - AGRICOLA 1998-2004/09

AU: Weder,-J.K.P.; Hinkers,-S.C.

TI: Complete amino acid sequence of the lentil trypsin-chymotrypsin inhibitor LCI-1.7 and a discussion of atypical binding sites of Bowman-Birk inhibitors.

SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4219-4226.

AB: The complete primary structure of the lentil (Lens culinaris) trypsin-chymotrypsin inhibitor LCI-1.7 was determined by conventional methods in order to find relationships between partial sequences and the difference in action against human and bovine chymotrypsin. As other Bowman-Birk type inhibitors, LCI-1.7 contained 68 amino acid residues, seven disulfide bridges, and two reactive sites, Arg16-Ser17 for trypsin and Tyr42-Ser43 for chymotrypsin. Evaluation of sequence homologies showed that it belonged to the group III Bowman-Birk inhibitors. The atypical additional binding site of LCI-1.7 for human chymotrypsin was discussed and compared with such binding sites of two other Bowman-Birk inhibitors, the Bowman-Birk soybean proteinase inhibitor BBI, and the lima bean proteinase inhibitor LBI I, for human and bovine trypsin and chymotrypsin. A concept

to reduce the action of these inhibitors against human enzymes by genetic engineering was proposed.

Record 128 of 401 - AGRICOLA 1998-2004/09

AU: Zamora,-R.; Olmo,-C.; Navarro,-J.L.; Hidalgo,-F.J.

TI: Contribution of phospholipid pyrrolization to the color reversion produced during deodorization of poorly degummed vegetable oils.

SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4166-4171.

AB: The Ehrlich reaction was optimized to determine the formation of pyrrolized phospholipids in edible oils in an attempt to understand the color reversion produced during the deodorization of poorly degummed edible oils. The procedure consisted of the treatment of the oil with p-(dimethylamino)benzaldehyde in tetrahydrofuran/2-propanol at a controlled acidity and temperature and the spectrophotometric determination of adducts produced. The extinction coefficient of Ehrlich adducts was calculated by using 1-[1-(2-hydroxyethyl)-1H-pyrrol-2-yl]propan-1-ol (1) as a standard and was 15 300 M-1 cm-1. The response was linear and reproducible within the range of 0.334-48.6 micromolar of compound 1. When the assay was applied to a soybean oil treated with 100-1000 ppm of phosphatidylethanolamine and submitted to deodorization, the formation of pyrrolized phospholipids was observed at the same time that the disappearance of the phospholipid and the oil darkening were produced. The main changes were observed during the first steps of the deodorization process, when the oil was heated between 80 and 160 ÀC. During the initial heating of the oil until achieving 200 ÀC, oil darkening, phosphatidylethanolamine disappearance, and pyrrolized phospholipid formation were correlated, therefore suggesting a contribution of phospholipid pyrrolization to the oil darkening produced.

Record 129 of 401 - AGRICOLA 1998-2004/09

AU: Penalvo,-J.L.; Heinonen,-S.M.; Nurmi,-T.; Deyama,-T.; Nishibe,-S.; Adlercreutz,-H.

TI: Plant lignans in soy-based health supplements.

SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4133-4138.

AB: The presence of plant lignans in 14 different soy-based health supplements is reported here for the first time together with the analysis of the isoflavone content, for which these products are commercialized. Six plant lignans, i.e., secoisolariciresinol, matairesinol, syringaresinol, lariciresinol, isolariciresinol, and pinoresinol, have been identified and quantified by gas chromatography-mass spectrometry, and a positive correlation has been found between the levels of plant lignans and the levels of isoflavones in the different products. Additional quantification of plant lignans and isoflavones in soybeans has been carried out, and results are provided to allow the comparison of the average levels in soybeans and soy-based supplements.

Record 130 of 401 - AGRICOLA 1998-2004/09

AU: Tseng,-S.H.; Lo,-Y.W.; Chang,-P.C.; Chou,-S.S.; Chang,-H.M.

TI: Simultaneous quantification of glyphosate, glufosinate, and their major metabolites in rice and soybean sprouts by gas chromatography with pulsed flame photometric detector.

SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4057-4063.

AB: Procedures were developed for the simultaneous determination of glyphosate [N-(phosphonomethyl)glycine] and glufosinate [DL-homoalanin-4-yl-(methyl)phosphinic acid] and their major metabolites, aminomethylphosphonic acid (AMPA) and 3-(methylphosphinico)propionic acid (3-MPPA), in rice and soybean sprouts by gas chromatography (GC) equipped with a pulsed flame photometric detector (PFPD). Herbicides and their major metabolites were previously derivatized with TMOA (trimethyl orthoacetate (TMOA) in the presence of acetic acid, and their GC responses versus heating temperature (70-90 ÀC) and heating time (30-120 min) were optimized. It was found that increases in heating temperature and heating time were unfavorable for the derivatization of glyphosate or glufosinate, whereas high temperature and extended reaction time remarkably facilitated that of AMPA and 3-MPPA except at 90 ÀC for an extended reaction time (120 min). Combination of AG1-X8 anion-exchange chromatography with a Florisil cartridge cleanup process was favorable for the GC-PFPD analysis. Four types of derivatives spiked in rice and soybean sprout matrices were eluted, reaching a baseline separation, in a sequence of 3-MPPA, AMPA, glyphosate, and glufosinate within 14 min using a DB-608 capillary column. Recoveries of glyphosate, AMPA, glufosinate, and 3-MPPA (0.5 ppm) spiked in both sample matrices were determined to be 72-81, 71-86, 101-119, and 83-90%, respectively, whereas the coefficient of variation was determined to be <10% in three repeated determinations. The instrumental limits of detection for glyphosate, AMPA, glufosinate, and 3-MPPA in sample matrices were 0.02, 0.03, 0.02, and 0.01 ppm, respectively. The limits of quantification for glyphosate, AMPA, glufosinate, and 3-MPPA in sample matrices were 0.06, 0.10, 0.06, and 0.04 ppm, respectively.

Record 131 of 401 - AGRICOLA 1998-2004/09

AU: Wang,-N.; Daun,-J.K.

TI: Effect of variety and crude protein content on nutrients and certain antinutrients in field peas (Pisum sativum).

SO: Journal of the science of food and agriculture. 2004 July, v. 84, issue 9 p. 1021-1029.

AB: Protein content was used as an indicator of environmental conditions for a study on varietal and environmental variation in proximate composition, minerals, amino acids and certain antinutrients of field peas. Four field pea varieties, each with three levels of protein content, were selected. Crude protein content overall ranged from 20.2 to 26.7%. Analysis of variance showed that both variety and environmental conditions had a significant effect on starch, acid detergent fibre (ADF), neutral detergent fibre (NDF) and fat content, but ash content was only affected by variety. Significant varietal and environmental differences in potassium (K), manganese (Mn) and phosphorus (P) were noted. Calcium (Ca) and copper (Cu) showed significant varietal differences, while iron (Fe), magnesium (Mg) and zinc (Zn) had significant environmental differences. Environmental conditions showed significant effects on alanine, glycine, isoleucine, lysine and threonine content. Variety had a significant effect on sucrose, raffinose and phytic acid content,

whereas environmental conditions had an influence on trypsin inhibitor activity (TIA). The major pea components protein and starch were inversely correlated. ADF, NDF, Fe, Mg, Zn and the amino acid arginine were positively correlated with protein content. The amino acids glycine, histidine, isoleucine, lysine and threonine were negatively correlated with protein content. It was found that tryptophan was the most deficient amino acid and the sulphur-containing amino acids were the second limiting amino acids in peas. Raffinose was positively correlated with sucrose but negatively correlated with verbascose. There were significant correlations between mineral contents and some of the proximate components.

Record 132 of 401 - AGRICOLA 1998-2004/09
AU: Rideout,-T.C.; Fan,-M.Z.
TI: Nutrient utilisation in response to dietary supplementation of chicory inulin in growing pigs.
SO: Journal of the science of food and agriculture. 2004 July, v. 84, issue 9 p. 1005-1012.
AB: The digestive and post-absorptive utilisation of dietary crude protein (CP), calcium (Ca) and phosphorus (P) in response to dietary supplementation of chicory inulin extract was investigated with six Yorkshire barrows with an average initial body weight of 30 kg. The barrows were fed a corn (maize) and soybean meal-based diet containing 0 or 50 g kg-1 chicory inulin extract according to a two-period crossover design. The digestive utilisation of CP, Ca and P did not differ (P > 0.05) between the control and the inulin-fed pigs. Furthermore, the post-absorptive urinary loss of CP and Ca was not affected (P > 0.05) by 50 g kg-1 chicory inulin supplementation. However, inulin supplementation improved post-absorptive P utilisation through a reduction (P = 0.01) in urinary P loss by 1.6 percentage units compared with the control group. In conclusion, dietary supplementation of 50 g kg-1 chicory inulin does not affect dietary CP and Ca utilisation but does reduce urinary P loss in growing pigs.

Record 133 of 401 - AGRICOLA 1998-2004/09
AU: Westphal,-A.; Robinson,-A.F.; Scott,-A.W.-Jr.; Santini,-J.B.
TI: Depth distribution of Rotylenchulus reniformis under crops of different host status and after fumigation.
SO: Nematology international journal of fundamental and applied nematological research. 2004, v. 6, pt. 1 p. 97-107.

Record 134 of 401 - AGRICOLA 1998-2004/09
AU: Meyer,-S.L.F.; Huettel,-R.N.; Liu,-X.Z.; Humber,-R.A.; Juba,-J.; Nitao,-J.K.
TI: Activity of fungal culture filtrates against soybean cyst nematode and root-knot nematode egg hatch and juvenile motility.
SO: Nematology international journal of fundamental and applied nematological research. 2004, v. 6, pt. 1 p. 23-32.

Record 135 of 401 - AGRICOLA 1998-2004/09
AU: Lax,-P.; Rondan-Duenas,-J.C.; Gardenal,-C.N.; Doucet,-M.E.
TI: Genetic variability estimated with RAPD-PCR markers in two populations of Heterodera glycines Ichinohe, 1952 (Nematoda: Heteroderidae) from Argentina.

SO: Nematology international journal of fundamental and applied nematological research. 2004, v. 6, pt. 1 p. 13-21.

Record 136 of 401 - AGRICOLA 1998-2004/09

AU: Lima,-A.C.S.; Lara,-F.M.

TI: Resistance of soybean genotypes to the silverleaf whitefly Bemisia tabaci (Genn.) biotype B (Hemiptera: Aleyrodidae).

SO: Neotropical entomology. 2004 Jan-Feb, v. 33, no. 1 p. 71-75.

AB: Trials were carried out with seven soybean genotypes, to evaluate the resistance to Bemisia tabaci Genn. biotype B, between October 2000 and January 2001, at the Faculdade de Ciencias Agrarias e Veterinarias - UNESP Jaboticabal, SP, Brazil. Oviposition non-preference (free choice and no-choice tests) and antibiosis were evaluated as well as the correlation between the density of the trichomes present in the genotypes' leaflets and oviposition preference. Among the genotypes tested, BR-82 12547 and PI 229358 showed non-preference type resistance to oviposition of the silverleaf whitefly, and oviposition was positively correlated with the total density of trichomes. Thus, PI 227687 with the biggest quantity of trichomes was the most oviposited genotype, whereas BR-82 12547 and PI 229358 with the smallest quantities of trichomes were the least oviposited genotypes. The antibiosis test was accomplished with five genotypes: BR-82 12547, IAC 100, IAC 78-2318, PI 229358 and PI 227687, selected from the oviposition non-preference test. IAC 100 affected negatively B. tabaci biotype B, by prolonging the ninfal period (12,8 days) and the reducing adults' emergence (80,0%).

Record 137 of 401 - AGRICOLA 1998-2004/09

AU: Li,-Y.; Hill,-C.B.; Hartman,-G.L.

TI: Effect of three resistant soybean genotypes on the fecundity, mortality, and maturation of soybean aphid (Homoptera: Aphididae).

SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 1106-1111.

AB: The fecundity, longevity, mortality, and maturation of the soybean aphid, Aphis glycines Matsumura (Homoptera: Aphididae), were characterized using three resistant soybean, Glycine max (L.) Merrill, genotypes ('Dowling', 'Jackson', and PI200538 'Sugao Zarai') and two susceptible genotypes ('Pana' and 'Loda'). Antibiosis in the resistant genotypes was demonstrated by a significant decrease in fecundity and longevity and increased mortality of A. glycines. Aphid fecundity, measured as number of offspring produced in the first 10 d by each viviparous aptera, was higher on Pana than on the resistant genotypes. Aphid longevity, the mean number of days a 1-d-old adult lived, was 7 d longer on Pana than on Dowling and Jackson. The mortality of both viviparous apterae and nymphs on resistant genotypes was significantly higher than on susceptible genotypes. A greater number of first instars survived to maturation stage (date of first reproduction) on susceptible plants than on resistant plants. None of the first instars placed on Dowling and PI200538 leaves survived to maturation. Observations of aphid behavior on leaves indicated that aphids departed from the leaves of resistant plants 8-24 h after being placed on them, whereas they remained indefinitely on leaves of susceptible cultivars and developed colonies. Reduced feeding due to ingestion of

potentially toxic compounds in soybean may explain the possible mechanism of resistance to the soybean aphid.

Record 138 of 401 - AGRICOLA 1998-2004/09

AU: Hill,-C.B.; Li,-Y.; Hartman,-G.L.

TI: Resistance of Glycine species and various cultivated legumes to the soybean aphid (Homoptera: Aphididae).

SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 1071-1077.

AB: The soybean aphid, Aphis glycines Matsumura, is a new pest of soybean, Glycine max (L.) Merr., in North America. It has become widespread on soybean in North America since it was first identified in the Midwest in 2000. Species of Rhamnus L. (buckthorn) are the primary hosts of A. glycines, and soybean is known as a secondary host. There is limited information about the secondary host range of A. glycines. Aphid colonization on various legume hosts was compared in choice experiments. Aphid colonization occurred on species in the genus Glycine Wild. No colonization occurred on Lablab purpureus (L.) Sweet, Lens culinaris Medik, Phaseolus vulgaris L., Pisum sativum L., or species of Vicia L. and Vigna Savi. Colonization was limited or aphids were transient on species of Medicago L., Phaseolus L., and Trifolium L. There were significant differences in aphid colonization among Medicago truncatula accessions with numbers ranging from 7 to 97 aphids per plant. Six Glycine soja Sieb. & Zucc. accessions were as resistant as G. max accessions to A. glycines; these may represent novel sources of A. glycines resistance not found in G. max. Antibiosis was found to play a large role in the expression of resistance in three of the G. soja accessions. Results of this study indicated that G. max and G. soja were the best secondary hosts of A. glycines; however, its secondary host range may include other leguminous species. Therefore, A. glycines did not seem to have a highly restricted monophagous secondary host range.

Record 139 of 401 - AGRICOLA 1998-2004/09

AU: Bernard,-M.B.; Horne,-P.A.; Hoffmann,-A.A.

TI: Developing an ecotoxicological testing standard for predatory mites in Australia: acute and sublethal effects of fungicides on Euseius victoriensis and Galendromus occidentalis (Acarina: Phytoseiidae).

SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 891-899.

AB: Laboratory bioassays for testing the effect of agrochemicals on Euseius victoriensis (Womersley) and Galendromus occidentalis (Nesbitt) on detached leaves of Glycine max (L.) (soybean) and Phaseolus vulgaris L. (French bean) were developed. The tests allowed standardized comparisons between mite species and leaf substrates, under "worst-case scenario" exposure, comparable with commercial pesticide application. Young juveniles, along with their initial food and the entire water supply, were sprayed to the point of runoff by using a Potter spray tower. The highest registered field rate concentration used on French bean was adjusted to deliver the same pesticide dose per higher runoff point spray volume on soybean. Cumulative mortality was assessed at 48 h, 4 d, and 7 d after spray application. Fecundity was assessed for 7 d from the onset of egg lay. Boscalid (Filan 500

WG), dithianon (Delan 700 WG), and kresoxim-methyl (Stroby 500 WG) caused no significant 7-d mortality or fecundity reduction to G. occidentalis or E. victoriensis compared with controls, and are classified as harmless to both species. Mancozeb (Mancozeb 750 WG) was highly toxic to both species, resulting in severe mortality and fecundity reduction and is considered incompatible with integrated pest management programs that use these species. Metiram (Polyram 700 WG) was highly toxic to E. victoriensis but only moderately toxic to G. occidentalis. Analyses of mortality proportions, including, and excluding unaccounted escapees, produced the same results. Test standardization on leaf substrates provides an alternative approach to standardization via residue on glass used by International Organisation for Biological and Integrated Control or Noxious Animals and Plants/ West Palaearctic Regional Section regulatory testing in the European Union.

Record 140 of 401 - AGRICOLA 1998-2004/09

AU: Hibbard,-B.E.; Higdon,-M.L.; Duran,-D.P.; Schweikert,-Y.M.; Ellersieck,-M.R.

TI: Role of egg density on establishment and plant-to-plant movement by western corn rootworm larvae (Coleoptera: Chrysomelidae).

SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 871-882.

AB: The effect of egg density on establishment and dispersal of larvae of the western corn rootworm, Diabrotica virgifera virgifera LeConte, was evaluated in a 3-yr field study. Implications of these data for resistance management plans for Bt crops are discussed. Viable egg levels of 100, 200, 400, 800, and 1,600 eggs per infested plant were evaluated in 2000, 2001, and 2002. A 3,200 viable egg level was also tested in 2001 and 2002. All eggs were infested on one plant per subplot in a field that was planted to soybean, Glycine max (L.), in the previous year. For each subplot, the infested plant, three plants down the row, the closest plant in the adjacent row of the plot, and a control plant at least 1.5 m from any infested plant (six plants total) were sampled. In 2000, there were five sample dates between egg hatch and pupation, and in 2001 and 2002, there were six sample dates. On each sample date, four replications of each egg density were sampled for both larval recovery and plant damage. Initial establishment on a corn plant seemed to not be density-dependent because a similar percentage of larvae was recovered from all infestation rates. Plant damage and, secondarily, subsequent postestablishment larval movement were density-dependent. Very little damage and postestablishment movement occurred at lower infestation levels, but significant damage and movement occurred at higher infestation rates. Movement generally occurred at a similar time as significant plant damage and not at initial establishment, so timing of movement seemed to be motivated by available food resources rather than crowding. At the highest infestation level in 2001, significant movement three plants down the row and across the 0.76 m row was detected, perhaps impacting refuge strategies for transgenic corn.

Record 141 of 401 - AGRICOLA 1998-2004/09

AU: McCornack,-B.P.; Ragsdale,-D.W.; Venette,-R.C.

TI: Demography of soybean aphid (Homoptera: Aphididae) at summer

temperatures.
SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 854-861.
AB: Soybean aphid, Aphis glycines Matsumura, is now widely established in soybean, Glycine max L., production areas of the northern United States and southern Canada and is becoming an important economic pest. Temperature effect on soybean aphid fecundity and survivorship is not well understood. We determined the optimal temperature for soybean aphid growth and reproduction on soybean under controlled conditions. We constructed life tables for soybean aphid at 20, 25, 30, and 35 ÀC with a photoperiod of 16:8 (L:D) h. Population growth rates were greatest at 25 ÀC. As temperature increased, net fecundity, gross fecundity, generation time, and life expectancy decreased. The prereproductive period did not differ between 20 and 30 ÀC; however, at 30 ÀC aphids required more degree-days (base 8.6 ÀC) to develop. Nymphs exposed to 35 ÀC did not complete development, and all individuals died within 11 d. Reproductive periods were significantly different at all temperatures, with aphids reproducing longer and producing more progeny at 20 and 25 ÀC than at 30 or 35 ÀC. Using a modification of the nonlinear Logan model, we estimated upper and optimal developmental thresholds to be 34.9 and 27.8 ÀC, respectively. At 25 ÀC, aphid populations doubled in 1.5 d; at 20 and 30 ÀC, populations doubled in 1.9 d.

Record 142 of 401 - AGRICOLA 1998-2004/09
AU: Paz,-M.M.; Shou,-H.; Guo,-Z.; Zhang,-Z.; Banerjee,-A.K.; Wang,-K.
TI: Assessment of conditions affecting Agrobacterium-mediated soybean transformation using the cotyledonary node explant.
SO: Euphytica international journal of plant breeding. 2004, v. 136, no. 2 p. 167-179.

Record 143 of 401 - AGRICOLA 1998-2004/09
AU: Yokoyama,-K.; Nio,-N.; Kikuchi,-Y.
TI: Properties and applications of microbial transglutaminase.
SO: Applied microbiology and biotechnology. 2004 May, v. 64, no. 4 p. 447-454.
AB: Some properties and applications of the transglutaminase (TGase) referred to as microbial TGase (MTGase), derived from a variant of Streptomyces mobaraensis (formerly classified as Streptoverticillium mobaraense), are described. MTGase cross-linked most food proteins, such as caseins, soybean globulins, gluten, actin, myosins, and egg proteins, as efficiently as mammalian TGases by forming an epsilon-(Wgc-glutamyl)lysine bond. However, unlike many other TGases, MTGase is calcium-independent and has a relatively low molecular weight. Both of these properties are of advantage in industrial applications; a number of studies have illustrated the potential of MTGase in food processing and other areas. The crystal structure of MTGase has been solved. It provides basic structural information on the MTGase and accounts well for its characteristics. Moreover, an efficient method for producing extracellular MTGase has been established using Corynebacterium glutamicum. MTGase may be expected to find many uses in both food and non-food applications.

Record 144 of 401 - AGRICOLA 1998-2004/09

AU: Ridley,-W.P.; Shillito,-R.D.; Coats,-I.; Steiner,-H.Y.; Shawgo,-M.; Phillips,-A.; Dussold,-P.; Kurtyka,-L.
TI: Development of the International Life Sciences Institute Crop Composition Database.
SO: Journal of food composition and analysis an official publication of the United Nations University, International Network of Food Data Systems. 2004 June-Aug, v. 17, no. 3-4 p. 423-438.
AB: In May 2003, the International Life Sciences Institute released an online comprehensive Crop Composition Database (www.cropcomposition.org) that provides up-to-date information on the natural variability in composition of conventional crops. The database is a compilation of data on the nutrients, anti-nutrients, and secondary metabolites for maize and soybean samples obtained from controlled field trials, in multiple world-wide locations over a 6-year period. The analyses of the samples were conducted using validated analytical methods with reference citations and, in most cases, under the guidelines of Environmental Protection Agency Good Laboratory Practices. Version 1.0 of the database contains more than 53,000 data points that may be searched and accessed based upon user-selected queries. The database complements existing food and nutrient databases and should be of interest to research and regulatory scientists in many areas such as plant biology, food science, and animal nutrition.

Record 145 of 401 - AGRICOLA 1998-2004/09
AU: McCue,-P.; Shetty,-K.
TI: A hypothetical model for action of soybean isoflavonoids against cancer involving a shift to proline-linked energy metabolism through activation of the pentose-phosphate pathway.
SO: Food biotechnology. 2004, v. 18, no. 1 p. 19-37.
AB: Soybean isoflavonoids and related phenolic antioxidants from other dietary plant species have long been associated with numerous biological activities linked to the chemoprevention of cancers and oxidation-linked diseases. But until now, no mechanisms or models have been put forth to explain how all of these activities of dietary phenolics could work together to promote health and protect from disease. Here, we present a hypothetical model based on the soybean isoflavonoid genistein for the beneficial action of dietary phenolic antioxidants that incorporates not only the known molecular activities, but also the known metabolic effects that dietary phenolics have on cellular systems such as energy metabolism and the antioxidant enzyme response to reactive oxygen species. Our model presents in a clear manner how a cancerous cell, although mutated and dysfunctional on both biochemical and genetic levels, cannot escape its beginnings as a normal cell and the underlying response mechanisms that are retained from that heritage. By our model, we present how dietary phenolics such as genistein may trigger a switch in energy metabolism from an NADH-supported system to one supported by proline (via the proline-linked pentose-phosphate pathway) through the activation of a stress-response mechanism known to occur in normal cells during stress conditions and which may still remain in cancerous cells. Further, we postulate how an inability of cancer cells to disengage this stress response-induced change in energy metabolism due to biochemical and/or genetic mutations could

result in the death of the diseased cell. This metabolic model has implications for the further understanding of how dietary phenolics may confer their beneficial effects and also for the design of chemopreventive agents and functional foods.

Record 146 of 401 - AGRICOLA 1998-2004/09

AU: Kamchan,-A.; Puwastien,-P.; Sirichakwal,-P.P.; Kongkachuichai,-R.

TI: In vitro calcium bioavailability of vegetables, legumes and seeds.

SO: Journal of food composition and analysis an official publication of the United Nations University, International Network of Food Data Systems. 2004 June-Aug, v. 17, no. 3-4 p. 311-320.

AB: Plant foods high in calcium were collected from representative markets in Bangkok. The purpose of this research was to study the bioavailability of calcium in plant sources and the presence of some in situ calcium inhibitory factors. Single composite samples from each market were prepared as commonly consumed and analyzed for in vitro calcium bioavailability (by equilibrium dialysis after simulated gastric digestion method) and for dietary fiber, phytate and oxalate. Compared to milk powder, which contains 25 mg calcium/100 g, five out of 11 vegetables had higher calcium dialysability (25%). High levels of dialysable calcium (20-39%) were found in kale, celery, collard, pak-chee-lao (Anethum graveolens L.), Chinese cabbage and soybean sprouts. These vegetables contained low levels of dietary fiber, phytate and oxalate. Medium levels of dialysable calcium (11-18%) were found in Indian mulberry and sesbania leaves, both of which had medium levels of oxalate (290-580 mg/100 g). Medium levels of dialyzable calcium were also found in young and mature cooked soybean seeds, both of which had low levels of oxalate and medium levels of phytate (290-400 mg/100 g). Pak-paw (Polygonum odoratum Lour.), amaranth, wild betal and white and black sesame seeds contained low dialysable calcium (2-7%) with high level of oxalate (680-2620 mg/100 g). Sesame seeds also contained high levels of dietary fiber and phytate. The presence of inhibitory factors, especially oxalate, at high or medium levels could limit the calcium bioavailability of plant foods.

Record 147 of 401 - AGRICOLA 1998-2004/09

AU: Yuan,-H.; Chen,-X.; Zhu,-L.; He,-G.

TI: Isolation and characterization of a novel rice gene encoding a putative insect-inducible protein homologous to wheat Wir1.

SO: Journal of plant physiology. 2004 Jan., v. 161, no. 1 p. 79-85.

AB: A full-length cDNA, designated BpHi008A, was cloned representing a rice (Oryza sativa) mRNA that accumulates after brown planthopper (BPH) Nilapar vata lugens Stål feeding. The cDNA encodes a putative 82 amino acid protein (BpHi008A) exhibiting about 37 % amino acid sequence identity to Wir1 family of proteins that are encoded by pathogen-induced transcripts in wheat. Like Wir1 proteins, it consists of a hydrophobic N-terminal half and a hydrophilic C-terminal half relatively rich in glycine and proline. These proteins are predicted to be integrated into the membrane, with the C-terminus being extracytoplastic. Genomic Southern analysis indicated that the BpHi008A gene was present as a single-copy sequence in the rice genome. Temporal and spatial studies showed that BpHi008A were systemically induced in rice when 2nd and 3rd-instars were

feeding. The BpHi008A transcripts level was also increased in seedlings damaged by mechanical wounding. These data indicated that BphHi008A was implicated in the response of rice plants to BPH feeding and wounding.

Record 148 of 401 - AGRICOLA 1998-2004/09

AU: Fargeix,-C.; Gindro,-K.; Widmer,-F.

TI: Soybean (Glycine max. L.) and bacteroid glyoxylate cycle activities during nodular senescence.

SO: Journal of plant physiology. 2004 Feb., v. 161, no. 2 p. 183-190.

AB: Soybean (Glycine max. L.) nodular senescence results in the dismantling of the peribacteroid membrane (PBM) and in an increase of soybean isocitrate lyase (ICL; EC 4.1.3.1) and malate synthase (MS; EC 4.1.3.2) mRNA and protein levels. This suggests that in senescing soybean nodular cells, the specific glyoxylate cycle enzyme activities might be induced to reallocate carbon obtained from the PBM degradation. In order to evaluate as well the carbon metabolism of the nitrogen-fixing Bradyrhizobium japonicum endosymbiotic bacteroids during nodular senescence, their glyoxylate cycle activities were also investigated. To this end, partial DNA sequences were isolated from their icl and ms genes, but the corresponding mRNAs were not detected in the microorganisms. It was also observed that the bacteroid ICL and MS activities were negligible during nodular senescence. This suggests that glyoxylate cycle activities are not reinitiated in the bacteroids under these physiological conditions. In case the microorganisms nevertheless feed on the PBM degradation products, this might occur via the citric acid cycle exclusively.

Record 149 of 401 - AGRICOLA 1998-2004/09

AU: Gitelson,-A.A.

TI: Wide Dynamic Range Vegetation Index for remote quantification of biophysical characteristics of vegetation.

SO: Journal of plant physiology. 2004 Feb., v. 161, no. 2 p. 165-173.

AB: The Normalized Difference Vegetation Index (NDVI) is widely used for monitoring, analyzing, and mapping temporal and spatial distributions of physiological and biophysical characteristics of vegetation. It is well documented that the NDVI approaches saturation asymptotically under conditions of moderate-to-high aboveground biomass. While reflectance in the red region (rho(red)) exhibits a nearly flat response once the leaf area index (LAI) exceeds 2, the near infrared (NIR) reflectance (rhoNIR) continue to respond significantly to changes in moderate-to-high vegetation density (LAI from 2 to 6) in crops. However, this higher sensitivity of the rhoNIR has little effect on NDVI values once the rhoNIR exceeds 30 %. In this paper a simple modification of the NDVI was proposed. The Wide Dynamic Range Vegetation Index, WDRVI = (a * rhoNIR-rho(red))/(a * rhoNIR+rho (red)), where the weighting coefficient a has a value of 0.1-0.2, increases correlation with vegetation fraction by linearizing the relationship for typical wheat, soybean, and maize canopies. The sensitivity of the WDRVI to moderate-to-high LAI (between 2 and 6) was at least three times greater than that of the NDVI. By enhancing the dynamic range while using the same bands as the NDVI, the WDRVI enables a more robust characterization of crop physiological and phenological characteristics. Although this index needs further evaluation, the linear relationship with

vegetation fraction and much higher sensitivity to change in LAI will be especially valuable for precision agriculture and monitoring vegetation status under conditions of moderate-to-high density. It is anticipated that the new index will complement the NDVI and other vegetation indices that are based on the red and NIR spectral bands.

Record 150 of 401 - AGRICOLA 1998-2004/09

AU: Yu,-G.R.; Wang,-Q.F.; Zhuang,-J.

TI: Modeling the water use efficiency of soybean and maize plants under environmental stresses: application of a synthetic model of photosynthesis-transpiration based on stomatal behavior.

SO: Journal of plant physiology. 2004 Mar., v. 161, no. 3 p. 303-318.

AB: Understanding the variability of plant WUE and its control mechanism can promote the comprehension to the coupling relationship of water and carbon cycle in terrestrial ecosystem, which is the foundation for developing water-carbon coupling cycle model. In this paper, we made clear the differences of net assimilation rate, transpiration rate, and WUE between the two species by comparing the experiment data of soybean (Glycine max Merr.) and maize (Zea mays L.) plants under water and soil nutrient stresses. WUE of maize was about two and a half times more than that of soybean in the same weather conditions. Enhancement of water stresses led to the marked decrease of Am and Em of two species, but water stresses of some degree could improve WUE, and this effect was more obvious for soybean. WUE of the two species changed with psiL in a second-order curve relation, and the WUE at high fertilization was higher than that at low fertilization, this effect was especially obvious for maize. Moreover, according to the synthetic model of photosynthesis-transpiration based on stomatal behavior (SMPTSB) presented by Yu et al. (2001), the WUE model and its applicability were discussed with the data measured in this experiment. The WUE estimated by means of the model accorded well with the measured values. However, this model underestimated the WUE for maize slightly, thus further improvement on the original model was made in this study. Finally, by discussing some physiological factors controlling Am and WUE, we made clear the physiological explanation for differences of the relative contributions of stomata- and mesophyll processes to control of Am and WUE, and the applicability of WUE model between the two species. Because the requirement to stomatal conductance by unit change of net assimilation rate is different, the responses of opening-closing activity of stomata to environmental stresses are different between the two species. To obtain the same level of net assimilation rate, soybean has to open its stomata more widely to keep small stomatal resistance, as compared with maize.

Record 151 of 401 - AGRICOLA 1998-2004/09

AU: Jackson,-A.A.; Gibson,-N.R.; Lu,-Y.; Jahoor,-F.

TI: Synthesis of erythrocyte glutathione in healthy adults consuming the safe amount of dietary protein.

SO: American journal of clinical nutrition. 2004 July, v. 80, no. 1 p. 101-107.

AB: Background: The finding that plasma glutathione turnover decreases as dietary protein intake decreases suggests that the safe amount of dietary protein, although sufficient for

maintenance of nitrogen balance, may be insufficient for maintenance of cellular glutathione. Objective: Our objective was to determine the effect of the safe protein intake on the erythrocyte glutathione synthesis rate and its relation with urinary 5-L-oxoproline excretion. Design: Erythrocyte glutathione synthesis and urinary 5-L-oxoproline excretion were measured in young adults (6 men and 6 women) by using an infusion of [13C2] glycine on 3 occasions: initially during the subjects' habitual protein intake (1.13 g ¨ kg-1 ¨ d-1) and on days 3 and 10 of consumption of a diet providing the safe protein intake (0.75 g ¨ kg-1 ¨ d-1). Results: Compared with baseline values, the fractional synthesis rate of erythrocyte glutathione was significantly lower (P < 0.05) on days 3 and 10 of the diet with the safe protein intake. Urinary 5-L-oxoproline excretion increased significantly (P < 0.05) above baseline by the third day of the diet with the safe protein intake and remained elevated. Erythrocyte glutathione concentrations and absolute synthesis rates decreased by day 3 but recovered to baseline values by day 10. Erythrocyte concentrations of cysteine, methionine, and serine remained unchanged, whereas erythrocyte concentrations of glycine, glutamic acid, and glutamine increased significantly by day 10. Conclusion: During adaptation to the safe amount of dietary protein, there are changes in the concentration and kinetics of erythrocyte glutathione that suggest a reduced antioxidant capacity and possible increased susceptibility to oxidant stress.

Record 152 of 401 - AGRICOLA 1998-2004/09

AU: Wallace,-I.S.; Roberts,-D.M.

TI: Homology modeling of representative subfamilies of Arabidopsis major intrinsic proteins. Classification based on the aromatic/arginine selectivity filter.

SO: Plant physiology. 2004 June, v. 135, no. 2 p. 1059-1068.

AB: Major intrinsic proteins (MIPs) are a family of membrane channels that facilitate the bidirectional transport of water and small uncharged solutes such as glycerol. The 35 full-length members of the MIP family in Arabidopsis are segregated into four structurally homologous subfamilies: plasma membrane intrinsic proteins (PIPs), tonoplast intrinsic proteins (TIPs), nodulin 26-like intrinsic membrane proteins (NIPs), and small basic intrinsic proteins (SIPs). Computational methods were used to construct structural models of the putative pore regions of various plant MIPs based on homology modeling with the atomic resolution crystal structures of mammalian aquaporin 1 and the bacterial glycerol permease GlpF. Based on comparisons of the narrow selectivity filter regions (the aromatic/Arg [ar/R] filter), the members of the four phylogenetic subfamilies of Arabidopsis MIPs can be classified into eight groups. PIPs possess a uniform ar/R signature characteristic of high water transport aquaporins, whereas TIPs are highly diverse with three separate conserved ar/R regions. NIPs possess two separate conserved ar/R regions, one that is similar to the archetype, soybean (Glycine max) nodulin 26, and another that is characteristic of Arabidopsis NIP6;1. The SIP subfamily possesses two ar/R subgroups, characteristic of either SIP1 or SIP2. Both SIP ar/R residues are divergent from all other MIPs in plants and other kingdoms. Overall, these findings suggest that higher plant

MIPs have a common fold but show distinct differences in proposed pore apertures, potential to form hydrogen bonds with transported molecules, and amphiphilicity that likely results in divergent transport selectivities.

Record 153 of 401 - AGRICOLA 1998-2004/09
AU: Gore,-J.; Adamczyk,-J.J.-Jr.
TI: Selective feeding of soybean looper (Lepidoptera: Noctuidae) on meridic diet with different concentrations of the Bacillus thuringiensis Cry1Ac protein.
SO: Journal of entomological science. 2004 Apr., v. 39, no. 2 p. 243-250.

Record 154 of 401 - AGRICOLA 1998-2004/09
AU: Gore,-J.; Adamczyk,-J.J.-Jr.
TI: Characterization of soybean looper (Lepidoptera: Noctuidae) tolerance to Bollgard cotton: implications for resistance management.
SO: Journal of entomological science. 2004 Apr., v. 39, no. 2 p. 235-242.

Record 155 of 401 - AGRICOLA 1998-2004/09
AU: Whitaker,-B.D.; Knight,-J.W.
TI: Exogenous gamma-glutamyl cycle compounds supplemented to in vitro maturation medium influence in vitro fertilization, culture, and viability parameters of porcine oocytes and embryos.
SO: Theriogenology. 2004 July, v. 62, no. 1-2 p. 311-322.
AB: High concentrations of intracellular glutathione (GSH) enhance in vitro production of porcine embryos. Objectives were: (1) to determine the effects of gamma-glutamyl cycle compound supplements to the IVM medium on IVF and IVC; and (2) to evaluate embryo viability. Porcine oocytes were matured in NCSU 23 medium supplemented with either L-cysteine (3.3 mM), L-cysteamine (150 micromolar), L-cysteine and L-cystemaine, L-glycine (1, 2.5, or 5 mM), L-glutamate (1, 2.5, or 5 mM), L-alpha-aminobutyrate (3.3 mM), beta-mercaptoethanol (BME) (25 micromolar), L-cysteine and BME, or L-alpha-aminobutyrate and BME. Increases ($P < 0.05$) in GSH concentrations were observed using L-cysteine, 1.0 mM L-glutamate, L-alpha-aminobutyrate, and L-alpha-aminobutyrate with BME. Oocytes matured with L-alpha-aminobutyrate and BME had a lower ($P < 0.05$) occurrence of polyspermy during IVF compared to controls and a greater percentage ($P < 0.05$) of embryos reaching the blastocyst stage compared to other treatment groups. For Objective 2, oocytes were matured in NCSU 23 or NCSU 23 supplemented with L-alpha-aminobutyrate with BME. Embryo cell death was determined using an Annexin V-FITC assay. Supplementation had no effect on the time of cell death. Embryo mortality was increased ($P < 0.05$) from 24 to 42 h post-IVF, with the greatest occurrence around 36 h. In conclusion, supplementing L-alpha-aminobutyrate and BME into the IVM medium increased intracellular GSH concentrations, decreased the occurrence of polyspermy during IVF, and increased embryo development parameters during IVC, but did not affect cell death during embryo development. The onset of cell death occurred from 24 to 42 h post-IVF, with the greatest occurrence around 36 h post-IVF.

Record 156 of 401 - AGRICOLA 1998-2004/09

AU: Van-Heerden,-P.D.R.; Kruger,-G.H.J.
TI: Dark chilling inhibition of photosynthesis and symbiotic nitrogen fixation in soybean during pod filling.
SO: Journal of plant physiology. 2004 May, v. 161, no. 5 p. 599-609.
AB: The growth stage of a soybean [Glycine max (L.) Merrill] plant may influence its physiological response to dark chilling. Opposed to vegetative development, the intense nutrient and energy requirements of the developing seeds during pod filling could cause additional chilling damage and decreased recovery capacity. Previously, we investigated dark chilling tolerance during vegetative development in two soybean genotypes, Maple Arrow and Fiskeby V and consistently found that photosynthesis and symbiotic nitrogen fixation (SNF) was less affected by dark chilling in Maple Arrow. In this study we describe the dark chilling response of the same genotypes during pod filling. Our aim was to establish whether the potential selection criteria for dark chilling tolerance, identified during vegetative development, was equally sensitive during pod filling. The results indicate that photosynthesis is less affected by dark chilling in Maple Arrow than in Fiskeby V, not only during vegetative development, but also during the critical reproductive stage of pod filling. Fiskeby V also lacks the ability to restore normal photosynthetic capacity during an extended recovery treatment. The decrease of nodule ureide content indicates that SNF was inhibited to a similar extent in both genotypes. Nodule ureide content was reduced more than stem ureide content, suggesting that the former is a more sensitive indicator of chilling stress effects on SNF. The results indicate that certain photosynthetic and fluorescence parameters are sensitive indicators of dark chilling tolerance throughout plant development and should prove valuable in future breeding programmes aimed at increasing the chilling tolerance of soybean.

Record 157 of 401 - AGRICOLA 1998-2004/09
AU: Gunduz,-I.; Buss,-G.R.; Chen,-P.; Tolin,-S.A.
TI: Genetic and phenotypic analysis of Soybean mosaic virus resistance in PI 88788 soybean.
SO: Phytopathology. 2004 July, v. 94, no. 7 p. 687-692.
AB: Resistance to Soybean mosaic virus (SMV) was identified in PI 88788 soybean, a germ plasm accession from China that is used widely as a source of resistance to soybean cyst nematode. Strains SMV-G1 through -G7 infected the inoculated leaves of PI 88788 but were not detected in upper, noninoculated trifoliolate leaves. Inheritance of resistance was determined by inoculating progenies of crosses of PI 88788 with susceptible cvs. Essex and Lee 68 with SMV strains G1 and G7. Allelomorphic relationships with known genes for resistance to SMV were tested in crosses with the resistant genotypes PI 96983, L29, and V94-5152, possessing Rsv1, Rsv3, and Rsv4 genes, respectively. Data analyses showed that resistance in PI 88788 to SMV-G1 is controlled by a single, partially dominant gene; however, to SMV-G7, the same gene was completely dominant. The PI 88788 gene was independent of the Rsv1 and Rsv3 loci, but allelic to Rsv4 in V94-5152. Expression of the Rsv4 gene in PI 88788 resulted in a reduced number of infection sites and restricted short- and long-distance movement of virus, rather than hypersensitivity. A unique late susceptible phenotype was strongly associated with

heterozygosity. This gene has potential value for use in gene pyramiding to achieve resistance to several SMV strains, as well as for rate-reducing resistance.

Record 158 of 401 - AGRICOLA 1998-2004/09
AU: James,-D.; Schmidt,-A.M.
TI: Use of an intron region of a chloroplast tRNA gene (trnL) as a target for PCR identification of specific food crops including sources of potential allergens.
SO: Food research international. 2004, v. 37, no. 4 p. 395-402.
AB: Simple but reliable PCR techniques were developed for the detection and identification of several food crops, including crops known to contain allergens. A single pair of oligonucleotide primers (PL-1C and PL-2D), that target the trnL region of the chloroplast tRNA gene in polymerase chain reaction (PCR) analysis, was used to amplify crop specific fragments. The specific DNA fragments were of the following sizes; 387 bp (canola), 532 bp (corn), 571 bp (potato), 584 bp (soybean), 615 bp (white and red rice), 642 bp (peanut), and 662 bp (wheat). Each amplified fragment was reliably identified using 3% agarose gel electrophoresis. The amplified fragments were cloned, sequenced, and a variable region was used to design specific sense primers for identity confirmation of some selected crops. When combined with the antisense primer PL-2D, specific fragments of 403, 397, 343, and 304 bp were amplified for peanut, wheat, soybean, and rice, respectively. These are common crops known to contain allergens. The PCR techniques described may be easily adapted for the detection of other crops and may be modified for use in multiplex PCR detection techniques, or micro-/macro-array analysis.

Record 159 of 401 - AGRICOLA 1998-2004/09
AU: Rousseau,-G.; Huynh-Thanh,-T.; Dostaler,-D.; Rioux,-S.
TI: Greenhouse and field assessments of resistance in soybean inoculated with sclerotia, mycelium, and ascospores of Sclerotinia sclerotiorum.
SO: Canadian journal of plant science = Revue Canadienne de phytotechnie. 2004 Apr., v. 84, no. 2 p. 615-623.

Record 160 of 401 - AGRICOLA 1998-2004/09
AU: Tambussi,-E.A.; Bartoli,-C.G.; Guiamet,-J.J.; Beltrano,-J.; Araus, -J.L.
TI: Oxidative stress and photodamage at low temperatures in soybean (Glycine max L. Merr.) leaves.
SO: Plant science. 2004 July, v. 167, issue 1 p. 19-26.

Record 161 of 401 - AGRICOLA 1998-2004/09
AU: Hulburt,-D.J.; Boerma,-H.R.; All,-J.N.
TI: Effect of pubescence tip on soybean resistance to lepidopteran insects.
SO: Journal of economic entomology. 2004 Apr., v. 97, no. 2 p. 621-627.
AB: DNA marker analysis has mapped a quantitative trait locus for soybean, Glycine max (L.) Merr., resistance to the corn earworm, Helicoverpa zea (Boddie) (Lepidoptera: Noctuidae), on the USDA soybean genetic linkage map near the classical gene Pb, which conditions pubescence tip. This study was initiated to determine

the effect of pubescence tip on resistance to H. zea larvae and to examine the effect on beet armyworm, Spodoptera exigua (Hubner) (Lepidoptera: Noctuidae), and soybean looper, Pseudoplusia includens (Walker) (Lepidoptera: Noctuidae), larvae. The effect of blunt (pb) and sharp (Pb) pubescence tip was tested in antixenosis and antibiosis bioassays on H. zea, S. exigua, and P. includens larvae with near-isolines and insect-resistant and -susceptible genotypes differing in pubescence tip morphology. Sharp pubescence tip significantly reduced defoliation (antixenosis) from H. zea, S. exigua, and P. includens and weight gain (antibiosis) of H. zea. The weight gain of P. includens was unaffected, and S. exigua weight gain was significant for one pair of near-isolines differing in pubescence tip but not the other. The results indicate that sharp pubescence tip would be beneficial to introgress into elite soybean germplasm due to its association with resistance to H. zea, S. exigua, and P. includens.

Record 162 of 401 - AGRICOLA 1998-2004/09
AU: Nonnenmann,-M.W.; Donham,-K.J.; Rautiainen,-R.H.; O'Shaughnessy,-P.T.; Burmeister,-L.F.; Reynolds,-S.J.
TI: Vegetable oil sprinkling as a dust reduction method in swine confinement.
SO: Journal of agricultural safety and health. 2004 Feb., v. 10, no. 1 p. 7-15.

Record 163 of 401 - AGRICOLA 1998-2004/09
AU: Rasanen,-L.A.; Saijets,-S.; Jokinen,-K.; Lindstrom,-K.
TI: Evaluation of the roles of two compatible solutes, glycine betaine and trehalose, for the Acacia senegal-Sinorhizobium symbiosis exposed to drought stress.
SO: Plant and soil. 2004 Mar., v. 260, no. 1-2 p. 237-251.

Record 164 of 401 - AGRICOLA 1998-2004/09
AU: Kassem,-M.A.; Meksem,-K.; Kang,-C.H.; Njiti,-V.N.; Kilo,-V.; Wood,-A.J.; Lightfoot,-D.A.
TI: Loci underlying resistance to manganese toxicity mapped in a soybean recombinant inbred line population of 'Essex' x 'Forrest'.
SO: Plant and soil. 2004 Mar., v. 260, no. 1-2 p. 197-204.

Record 165 of 401 - AGRICOLA 1998-2004/09
AU: Shah,-M.A.; Friedman,-E.J.; Bahaa,-A.O.; Murphy,-M.R.
TI: Effect of liquid flavor supplementation of the diet on dairy cows in the transition period.
SO: Journal of dairy science. 2004 June, v. 87, no. 6 p. 1872-1877.
AB: A 9-wk trial was conducted to study the performance of 24 Holstein cows during the transition period (3 wk prepartum to 6 wk postpartum). Cows were assigned to either a control or liquid-flavored (0.52 mL/kg of feed) total mixed ration in a randomized complete block design. The diets contained corn silage, alfalfa haylage, cottonseed, and a grain mix based on ground corn and soybean meal. Cows were fed to ensure 10% orts, and the diet provided (on a dry matter basis) 13% crude protein, 32% acid detergent fiber, 44% neutral detergent fiber, and 1.54 Mcal/kg of NEL prepartum and 17.5% crude protein, 30% acid detergent fiber, 40% neutral detergent fiber, and 1.57 Mcal/kg of NEL postpartum. An additional 2.3 kg of alfalfa hay was fed

during the first 5 d postpartum. Weekly means of dry matter intake (DMI), milk yield, milk protein, milk fat, SNF, somatic cell counts, and body weight (BW) were analyzed using a repeated measures procedure. There was no effect of treatment on these variables, and least squares means were 16.9 and 15.7 kg/d for DMI, 38 and 35.3 kg/d for milk yield, 3.10 and 3.11% for milk protein, 3.69 and 3.74% for milk fat, 8.37 and 8.16% for SNF, 1.99 x 10(5) and 4.33 x 10(5) for somatic cell count, and 631 and 651 kg for BW for cows fed control and flavored diets, respectively. Individual cow daily DMI data were fitted to an exponential model describing pre- and postpartum feed consumption [DMI = a - b x e(-c x t), where DMI was measured in kg, a = asymptotic DMI, b = potential fractional increase in DMI, c = fractional rate of increase in DMI, and t = days prior to calving or days in milk]. Fractional rates of increase in DMI were similar: 0.139 and 0.123/d for control and flavored diets, respectively. Data for both groups were separately analyzed using multiple regression with 3.5% fat-corrected milk as the dependent variable and BW and DMI as independent variables. More BW was mobilized per unit increase in 3.5% fat-corrected milk in cows fed the control than in cows fed the flavored diet. Cows fed the control diet tended to be in more negative energy balance during early lactation than cows fed the flavored diet. It was concluded that feeding flavor improved energy balance of cows in early lactation and may reduce the risk of health or reproductive problems.

Record 166 of 401 - AGRICOLA 1998-2004/09

AU: Birkelo,-C.P.; Brouk,-M.J.; Schingoethe,-D.J.

TI: The energy content of wet corn distillers grains for lactating dairy cows.

SO: Journal of dairy science. 2004 June, v. 87, no. 6 p. 1815-1819.

AB: Forty-five energy balances were completed with 12 multiparous, lactating Holstein cows in a study designed to determine the energy content of wet corn distillers grains. Treatments were applied in a repeated switchback design and consisted of total mixed diets containing 31.4% corn silage, 18.4% alfalfa hay, and either 30.7% rolled corn and 16.7% soybean meal or 17.0% rolled corn and 31.2% wet corn distillers grains (dry matter basis). Replacement of corn and soybean meal with wet corn distillers grains reduced dry matter intake 10.9% but did not affect milk production. Neither digestible nor metabolizable energy were affected by diet composition. Heat and milk energy output did not differ by diet, but body energy retained was 2.8 Mcal/d less in cows fed the wet corn distillers grains diet. Multiple regression estimates of maintenance metabolizable energy requirement and partial efficiencies of metabolizable energy used for lactation and body energy deposition did not differ by diet. Pooled estimates were 136.2, 0.66, and 0.85, kcal of metabolizable energy/body weight0.75 per day, respectively. Calculated by difference, wet corn distillers grains was estimated to contain 4.09, 3.36, and 2.27 Mcal/kg of dry matter as digestible, metabolizable, and lactational net energy, respectively. These energy estimates were 7 to 11% and 10 to 15%, respectively, greater than those reported for dried corn distillers grains by the 1989 and 2001 dairy NRC publications.

Record 167 of 401 - AGRICOLA 1998-2004/09

AU: Castillo,-A.R.; Gallardo,-M.R.; Maciel,-M.; Giordano,-J.M.; Conti, -G.A.; Gaggiotti,-M.C.; Quaino,-O.; Gianni,-C.; Hartnell,-G.F.

TI: Effects of feeding rations with genetically modified whole cottonseed to lactating Holstein cows.

SO: Journal of dairy science. 2004 June, v. 87, no. 6 p. 1778-1785.

AB: Two experiments were conducted to evaluate dry matter intake (DMI) , milk yield, and milk composition from feeding rations that contained different sources of genetically modified whole cottonseed to Argentinean Holstein dairy cows. Twenty-four lactating multiparous Argentinean Holstein dairy cows were used in 2 experiments with a replicated 4 x 4 Latin square design, with cows averaging 565 kg body weight and 53 d in milk at the beginning of the experiments. Treatments in Experiment 1 were: Bollgard cotton containing the cry1Ac gene, Bollgard II cotton containing cry1Ac and cry2Ab genes, Roundup Ready cotton containing the cp4 epsps gene, and a control nongenetically modified but genetically similar cottonseed. In Experiment 2, two commercial sources, a parental control line, and the transgenic cotton containing both cry1Ac and cp4 epsps genes were used as treatments. All cows received the same total mixed ration but with different whole cottonseed sources. Cottonseed was included to provide 2.50 kg per cow daily (dry matter [DM] basis) or about 10% of the total diet DM. The ingredient composition of the total mixed ration was 32% alfalfa hay, 28% corn silage, 22% corn grain, 17% soybean meal, and 2% minerals and vitamins. In addition, genomic DNA was extracted from a subset of milk samples and analyzed by polymerase chain reaction followed by Southern blot hybridization for small fragments of the cry1Ac transgene and an endogenous cotton gene, acp1. No sample was positive for transgenic or plant DNA fragments at the limits of detection for the assays following detailed data evaluation criteria. The DMI, milk yield, milk composition, body weight, and body condition score did not differ among treatments. Cottonseed from genetically modified varieties used in these studies yielded similar performance in lactating dairy cows when compared to non-transgenic control and reference cottonseed.

Record 168 of 401 - AGRICOLA 1998-2004/09

AU: AbuGhazaleh,-A.A.; Schingoethe,-D.J.; Hippen,-A.R.; Kalscheur,-K. F.

TI: Conjugated linoleic acid increases in milk when cows fed fish meal and extruded soybeans for an extended period time.

SO: Journal of dairy science. 2004 June, v. 87, no. 6 p. 1758-1766.

AB: The objective of this study was to determine the effect of feeding a conjugated linoleic acid (CLA) stimulating diet for an extended period of time on milk cis-9, trans-11 CLA and vaccenic acid (VA) concentrations. Twenty cows (16 Holstein and 4 Brown Swiss) were divided into 2 groups (n = 10 per treatment) for a 10-wk study. Cows in group 1 were fed a traditional corn-soybean-basal diet (control), while those in group 2 were fed a blend of 0.5% fish oil from fish meal and 2% soybean oil from extruded soybeans (FMESB) to achieve higher milk fat cis-9, trans-11 CLA and VA. Diets were formulated to contain 18% CP and were composed (dry matter basis) of 50% concentrate mix, 25% corn silage, and 25% alfalfa hay. Dry matter intake was not affected by diet. Milk production increased in cows fed the FMESB diet. Milk fat and

milk protein percentages decreased with the FMESB diet; however, milk fat and protein yields were not affected by treatments. Milk fat cis-9, trans-11 CLA and VA concentration (g/100 of fatty acids) and yield (g/d) were 2.5-fold greater for cows fed the FMESB diet over the 10 wk of fat supplementation. For cows fed the FMESB diet, contents of milk fat cis-9, trans-11 CLA and VA gradually increased from the first week of fat supplementation, reached the highest concentrations in wk 3, then gradually decreased during wk 4 and 5 and then remained relatively constant until wk 10. The concentration of cis-9, trans-11 CLA and VA from the control diet was relatively constant over the 10 wk of fat supplementation. Concentrations of cis-9, trans-11 CLA and VA in milk fat can be increased within a week by feeding a blend of fish meal and extruded soybeans, and that increase remains relatively constant after wk 5 of fat supplementation.

Record 169 of 401 - AGRICOLA 1998-2004/09

AU: Rondon,-S.I.; Gray,-M.E.

TI: Ovarian development and ovipositional preferences of the western corn rootworm (Coleoptera: Chrysomelidae) variant in east central Illinois.

SO: Journal of economic entomology. 2004 Apr., v. 97, no. 2 p. 390-396.

AB: The rotation of maize, Zea mays L., and soybean, Glycine max (L.) Merr., has been the traditional cultural tactic to manage the western corn rootworm, Diabrotica virgifera virgifera LeConte, in the Corn Belt. The reduced effectiveness of this rotation as a pest management tool in east central Illinois, northern Indiana, and southern Michigan can be explained by the shift in the ovipositional behavior of the new variant of western corn rootworm. The objective of this study was to evaluate the influence of maize, soybean, oat, Avena sativa L., stubble, and alfalfa, Medicago sativa L., on the ovarian development and ovipositional preferences of the variant western corn rootworm. Field research was conducted near Urbana, IL, during 1998-2000. Gravid females were present throughout the season in all crops, and due to the prolonged period in which western corn rootworm females can lay eggs, none of the crops were immune from oviposition. Results indicated that the western corn rootworm variant oviposits in maize, soybean, oat stubble, and alfalfa. In 1998 and 1999, maize was the preferred oviposition site among crops; however, in 2000, maize, soybean, and oat stubble treatments had similar densities of western corn rootworm eggs. Lack of oviposition preference of the western corn rootworm variant demonstrated in this experiment represents a reasonable explanation of why the effectiveness of the rotation strategy to control western corn rootworm has diminished.

Record 170 of 401 - AGRICOLA 1998-2004/09

AU: Krell,-R.K.; Pedigo,-L.P.; Hill,-J.H.; Rice,-M.E.

TI: Bean leaf beetle (Coleoptera: Chrysomelidae) management for reduction of bean pod mottle virus.

SO: Journal of economic entomology. 2004 Apr., v. 97, no. 2 p. 192-202.

AB: Bean pod mottle virus (BPMV) is a management concern for soybean, Glycine max (L.), producers in the North Central states because it can cause yield loss and reduce seed quality by induction of

seed coat mottling. The main vector of BPMV is the bean leaf beetle, Cerotoma trifurcata (Forster). An experiment was conducted in 2000 and 2001 at two locations in northwestern and central Iowa to test three insecticide treatments for suppression of bean leaf beetles, and subsequently, BPMV. Treatments of insecticide applications with lambda-cyhalothrin were 1) a single early-season application (23 g [AI]/ha) (2.5 oz/acre) at the VE-VC soybean developmental stage; 2) two early-season applications, the first the same as treatment 1 and a second at the same rate 9-13 d later; 3) a single early-season application the same as treatment 1, followed by a mid-season application (28 g [AI]/ha (3.2 oz/acre) at approximately R2 (flowering, near 15 July); and 4) an unsprayed control. Application of lambda-cyhalothrin after soybean emergence and again as first-generation bean leaf beetles emerged in northwestern Iowa in 2000 (treatment 3) significantly reduced beetle densities through mid-season, BPMV field incidence by 31.5%, and seed coat mottling by 31.2%, compared with the unsprayed control. Similar effects were measured at the same location when insecticide was applied twice at early season (treatment 2). Yield was 453.7 kg/ha (6.74 bu/acre) greater in treatment 2 and 525.20 kg/ha (7.80 bu/acre) greater in treatment 3 than in the unsprayed control at the northwestern site in 2000. At both locations in 2001 fewer treatment effects were observed, which was likely related to lower beetle populations in that year. Early-season insecticide sprays targeted at overwintered beetles on VC-VE reduced the initial population of vector insects and may have contributed to a lower first-generation population because of reduced overwintered beetle oviposition. In 1 year at one location there was a benefit to an additional mid-season insecticide spray, although effectiveness of spraying at this time could vary based on the magnitude of the vector population.

Record 171 of 401 - AGRICOLA 1998-2004/09

AU: Watanabe,-M.; Sumida,-N.; Yanai,-K.; Murakami,-T.

TI: A novel saponin hydrolase from Neocosmospora vasinfecta var. vasinfecta.

SO: Applied and environmental microbiology. 2004 Feb., v. 70, no. 2 p. 865-872.

AB: We isolated a soybean saponin hydrolase from Neocosmospora vasinfecta var. vasinfecta PF1225, a filamentous fungus that can degrade soybean saponin and generate soyasapogenol B. This enzyme was found to be a monomer with a molecular mass of about 77 kDa and a glycoprotein. Nucleotide sequence analysis of the corresponding gene (sdn1) indicated that this enzyme consisted of 612 amino acids and had a molecular mass of 65,724 Da, in close agreement with that of the apoenzyme after the removal of carbohydrates. The sdn1 gene was successfully expressed in Trichoderma viride under the control of the cellobiohydrolase I gene promoter. The molecular mass of the recombinant enzyme, about 69 kDa, was smaller than that of the native enzyme due to fewer carbohydrate modifications. Examination of the degradation products obtained by treatment of soyasaponin I with the recombinant enzyme showed that the enzyme hydrolyzed soyasaponin I to soyasapogenol B and triose [Wga-L-rhamnopyranosyl (1 to 2)-Wgb-D-galactopyranosyl (1 to 2)-Wgb-D-glucuronopyranoside]. Also, when soyasaponin II and soyasaponin V, which are different

from soyasaponin I only in constituent saccharides, were treated with the enzyme, the ratio of the reaction velocities for soyasaponin I, soyasaponin II, and soyasaponin V was 2,680:886:1. These results indicate that this enzyme recognizes the fine structure of the carbohydrate moiety of soyasaponin in its catalytic reaction. The amino acid sequence of this enzyme predicted from the DNA sequence shows no clear homology with those of any of the enzymes involved in the hydrolysis of carbohydrates.

Record 172 of 401 - AGRICOLA 1998-2004/09
AU: Bhattarai,-S.P.; Huber,-S.; Midmore,-D.J.
TI: Aerated subsurface irrigation water gives growth and yield benefits to zucchini, vegetable soybean and cotton in heavy clay soils.
SO: Annals of applied biology. 2004, v. 144, no. 3 p. 285-298.

Record 173 of 401 - AGRICOLA 1998-2004/09
AU: Stacey,-G.; Vodkin,-L.; Parrott,-W.A.; Shoemaker,-R.C.
TI: National Science Foundation-sponsored workshop report. Draft plan for soybean genomics.
SO: Plant physiology. 2004 May, v. 135, no. 1 p. 59-70.
AB: Recent efforts to coordinate and define a research strategy for soybean (Glycine max) genomics began with the establishment of a Soybean Genetics Executive Committee, which will serve as a communication focal point between the soybean research community and granting agencies. Secondly, a workshop was held to define a strategy to incorporate existing tools into a framework for advancing soybean genomics research. This workshop identified and ranked research priorities essential to making more informed decisions as to how to proceed with large scale sequencing and other genomics efforts. Most critical among these was the need to finalize a physical map and to obtain a better understanding of genome microstructure. Addressing these research needs will require pilot work on new technologies to demonstrate an ability to discriminate between recently duplicated regions in the soybean genome and pilot projects to analyze an adequate amount of random genome sequence to identify and catalog common repeats. The development of additional markers, reverse genetics tools, and bioinformatics is also necessary. Successful implementation of these goals will require close coordination among various working groups.

Record 174 of 401 - AGRICOLA 1998-2004/09
AU: Conrath,-U.; Amoroso,-G.; Kohle,-H.; Sultemeyer,-D.F.
TI: Non-invasive online detection of nitric oxide from plants and some other organisms by mass spectrometry.
SO: Plant journal. 2004 June, v. 38, no. 6 p. 1015-1022.
AB: As nitric oxide (NO) is a key messenger in many organisms, reliable techniques for the detection of NO are essential. Here, it is shown that a combination of membrane inlet mass spectrometry (MIMS) and restriction capillary inlet mass spectrometry (RIMS) allows for the fast, specific, and non-invasive online detection of NO that has been emitted from tissue cultures of diverse organisms, or from whole plants. As an advantage over other NO assays, MIMS/RIMS discriminates nitrogen isotopes and simultaneously measures NO and O2 (and other gases)

from the same sample. MIMS/RIMS technology may thus help to identify the source of gaseous NO in cells, and elucidate the relationship between primary gas metabolism and NO formation. Using RIMS, it is demonstrated that the novel fungicide F500 triggers NO production in plants.

Record 175 of 401 - AGRICOLA 1998-2004/09
AU: Gendra,-E.; Moreno,-A.; Alba,-M.M.; Pages,-M.
TI: Interaction of the plant glycine-rich RNA-binding protein MA16 with a novel nucleolar DEAD box RNA helicase protein from Zea mays.
SO: Plant journal. 2004 June, v. 38, no. 6 p. 875-886.
AB: The maize RNA-binding MA16 protein is a developmentally and environmentally regulated nucleolar protein that interacts with RNAs through complex association with several proteins. By using yeast two-hybrid screening, we identified a DEAD box RNA helicase protein from Zea mays that interacted with MA16, which we named Z. mays DEAD box RNA helicase 1 (ZmDRH1). The sequence of ZmDRH1 includes the eight RNA helicase motifs and two glycine-rich regions with arginine-glycine-rich (RGG) boxes at the amino (N)- and carboxy (C)-termini of the protein. Both MA16 and ZmDRH1 were located in the nucleus and nucleolus, and analysis of the sequence determinants for their cellular localization revealed that the region containing the RGG motifs in both proteins was necessary for nuclear/nucleolar localization The two domains of MA16, the RNA recognition motif (RRM) and the RGG, were tested for molecular interaction with ZmDRH1. MA16 specifically interacted with ZmDRH1 through the RRM domain. A number of plant proteins and vertebrate p68/p72 RNA helicases showed evolutionary proximity to ZmDRH1. In addition, like p68, ZmDRH1 was able to interact with fibrillarin. Our data suggest that MA16, fibrillarin, and ZmDRH1 may be part of a ribonucleoprotein complex involved in ribosomal RNA (rRNA) metabolism.

Record 176 of 401 - AGRICOLA 1998-2004/09
AU: Jobe,-J.
TI: Biodiesel project looks promising for Iowa co-op.
SO: Rural cooperatives. 2004 Mar-Apr, v. 71, no. 2 p. 9, 30.

Record 177 of 401 - AGRICOLA 1998-2004/09
AU: O'Doherty,-J.V.; Nolan,-C.S.; Callan,-J.J.; McCarthy,-P.
TI: The interaction between lactofeed level and soya-bean meal on growth performance of weanling pigs.
SO: Animal science an international journal of fundamental and applied research. 2004 June, v. 78, pt. 3 p. 419-427.
AB: A 3 x 2 factorial experiment was conducted to investigate the interaction between lactofeed 70 (LF70) (860 g/kg whey permeate, 140 g/kg soya-bean meal, Volac International, UK) levels and soya-bean meal inclusion (SBM) (90 and 225 g/kg) from day 0 to day 25 after weaning (starter period) on growth performance and diet digestibility. A common diet was offered from day 25 to day 38. Dietary treatments were established by substituting LF70 for extruded wheat and soya-bean meal for potato protein (PP) and soya protein concentrate (SPC). Digestible energy and amino acids were maintained by adjusting soya oil and synthetic amino acids. A total of 252 pigs (7.7 kg and 28 « 2 days of age) were allotted randomly to six treatments containing (1) 0 LF70 with 40 g/kg PP

and 40 g/kg SPC and 90 g/kg SBM (2) 0 LF70 with 225 g/kg SBM (3) 175 g/kg LF70 with 40 g/kg PP and 40 g/kg SPC and 90 g/kg SBM (4) 175 g/kg LF70 with 225 g/kg SBM (5) 350 g/kg LF70 with 40 g/kg PP, 40 g/kg SPC and 90 g/kg SBM and (6) 350 g/kg LF70 with 225 g/kg SBM. There was an increase in average daily gain (ADG) (0.182 v. 0.292 v. 0.318 kg, s.e. 0.0089; P < 0.001) and food intake (0.413 v. 0.472 v. 0.489 kg, s.e. 0.0139; P < 0.01) and an improvement in food conversion ratio (FCR) (2.31 v. 1.63 v. 1.55 kg, s.e. 0.037; P < 0.001) as the level of LF70 increased during the starter period. From day 25 to day 38, the pigs given the starter diets containing no LF70 had an improved ADG (P < 0.05) and FCR (P < 0.001) compared with the pigs given 175 and 350 g/kg LF70. The pigs offered diets containing 350 g/kg lactofeed had a significantly higher N digestibility (P < 0.05) than the pigs offered diets containing no lactofeed. There was a significant interaction (P < 0.001) between LF70 and SBM in the apparent digestibility of gross energy (GED). Pigs given higher SBM diets had a higher GED at the 350 g/kg LF70 inclusion than pigs given PP + SPC diets. However, there was no difference in GED at the 0 and 175 g/kg LF70 inclusion. In conclusion, the inclusion of LF70 increased ADG, food intake and apparent N digestibility and improved FCR.

Record 178 of 401 - AGRICOLA 1998-2004/09

AU: Heimpel,-G.E.; Ragsdale,-D.W.; Venette,-R.; Hopper,-K.R.; O'Neil,-R.J.; Rutledge,-C.E.; Wu,-Z.

TI: Prospects for importation biological control of the soybean aphid: anticipating potential costs and benefits.

SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 249-258.

AB: We discuss the potential pros and cons of using importation biological control against the soybean aphid, Aphis glycines Matsumura (Homoptera: Aphididae). Importation of exotic organisms for biological control is never completely risk-free, but the potential negative impacts of not achieving biological control of invasive pests may exceed the risks associated with a biological control introduction. The potential benefits of biological control include reduced insecticide use and a reduced ability of the invasive pest to impact native flora and fauna, and we outline what the scope of these benefits may be for the soybean aphid. The benefits are only accrued, however, if biological control is successful, so the likelihood of successful biological must also be assessed. Accordingly, we outline some issues relevant to predicting the success of importation biological control of the soybean aphid. We also outline the potential risks to nontarget organisms that would be associated with importation biological control of the soybean aphid. Currently, two parasitoid species, Aphelinus albipodus Hayat and Fatima (Hymenoptera: Aphelinidae) and Lipolexis gracilis Förster (Hymenoptera: Braconidae) have been imported from Asia and have passed through quarantine. We briefly review the biology and host range of these two species. A different strain of A. albipodus that was released against the Russian wheat aphid, Diuraphis noxia (Mordvilko) (Homoptera: Aphididae), in the early 1990s was also found to attack the soybean aphid in the laboratory and has been redistributed from Wyoming to Minnesota and Wisconsin in field releases against the soybean aphid. We discuss our

rationale for going forward with this redistribution.

Record 179 of 401 - AGRICOLA 1998-2004/09

AU: Rutledge,-C.E.; O'Neil,-R.J.; Fox,-T.B.; Landis,-D.A.

TI: Soybean aphid predators and their use in integrated pest management.

SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 240-248.

AB: The discovery of the soybean aphid, Aphis glycines Matsumura, in U.S. soybean production systems in 2000 has provided a unique opportunity to study the interaction of a new invader with existing natural enemy communities. One research thrust has been examining the role of predators in soybean aphid dynamics in the Midwest. We discuss the roles of predatory arthropods in field crops and set forth a conceptual model that we have followed to identify key predators in the soybean aphid system. We identify Orius insidiosus (Say) and Harmonia axyridis (Pallas) as potentially key predators and show our findings on their phenology in soybean fields and their impact on soybean aphid population dynamics. Finally, we discuss how this information can be used in integrated pest management programs for soybean aphid and point to gaps in our knowledge where future studies are needed.

Record 180 of 401 - AGRICOLA 1998-2004/09

AU: Liu,-J.; Wu,-K.; Hopper,-K.R.; Zhao,-K.

TI: Population dynamics of Aphis glycines (Homoptera: Aphididae) and its natural enemies in soybean in northern China.

SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 235-239.

AB: A field survey of soybean aphid, Aphis glycines Matsumura, and its natural enemies was conducted during summer 2002 in Langfang, northern China (116.4ÀE, 39.3ÀN). Aphids colonized soybean when plants were still small in early July. After a lag of 2 wk, aphid density increased rapidly in late July, reaching a peak of 114 « 46 aphids per five soybean plants on 1 August. The population declined to a plateau immediately after this peak and then declined again starting in mid-August, although a second small peak occurred in late August. The finite rate of increase varied from zero- to five-fold, and the aphid seemed to be limited by natural enemies. The main species of natural enemy were the aphid parasitoid Lysiphlebus sp., the aphid predators Propylaea japonica (Thunberg), Scymnus (Neopullus) babai Sasaji, and Paragus tibialis (Fallen). In a field exclosure experiment, A. glycines density in small-mesh cages peaked three-fold higher than in large-mesh cages and 12-fold higher than on uncaged plants, indicating that natural enemies did indeed limit aphid density.

Record 181 of 401 - AGRICOLA 1998-2004/09

AU: Voegtlin,-D.J.; O'Neil,-R.J.; Graves,-W.R.

TI: Tests of suitability of overwintering hosts of Aphis glycines: identification of a new host association with Rhamnus alnifolia L'Heritier.

SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 233-234.

AB: Eleven species from the family Rhamnaceae, including both species

exotic and native to North America, were tested for their acceptability to the fall migrants of the soybean aphid, Aphis glycines Matsumura. Two species, Rhamnus cathartica L. and Rhamnus alnifolia L'Heritier were accepted and had overwintering eggs deposited on them. Eggs survived the winter, and colonies developed on both hosts in the spring. R. alnifolia is a new overwintering host for the soybean aphid.

Record 182 of 401 - AGRICOLA 1998-2004/09
AU: Voegtlin,-D.J.; Halbert,-S.E.; Qiao,-G.
TI: A guide to separating Aphis glycines Matsumura and morphologically similar species that share its hosts.
SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 227-232.
AB: Aphis glycines Matsumura shares its hosts with two other aphid species, Aphis nasturtii Kaltenbach and Aphis gossypii Glover. Tables of characters and photographs are provided to assist in the separation of these three species. A photographic plate showing a gynopara, male, ovipara, and late summer apterous vivipara of A. glycines is included.

Record 183 of 401 - AGRICOLA 1998-2004/09
AU: Venette,-R.C.; Ragsdale,-D.W.
TI: Assessing the invasion by soybean aphid (Homoptera: Aphididae): where will it end.
SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 219-226.
AB: The invasion of soybean aphid, Aphis glycines Matsumura, into soybean (Glycine max L.) production areas of the northcentral United States has generated substantial concern over the ultimate impact of this pest on domestic agriculture. To evaluate the potential extent and severity of its invasion in the United States, we examined possible pathways for the arrival of the insect, considered the likelihood for establishment in different regions of the United States, and described patterns of spread. Historical records of aphid interceptions by the U.S. Department of Agriculture, Animal and Plant Health Inspection Service suggest that populations of soybean aphid most likely arrived in the United States from Japan or China, either carried by an international airline passenger or associated with horticultural cargo. Two methods of climate comparison suggest that the aphid may ultimately be present in all soybean producing areas of the United States. However, the severity of infestations within these areas is likely to vary considerably in space and time.

Record 184 of 401 - AGRICOLA 1998-2004/09
AU: Wu,-Z.; Schenk-Hamlin,-D.; Zhan,-W.; Ragsdale,-D.W.; Heimpel,-G.E.
TI: The soybean aphid in China: a historical review.
SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 209-218.
AB: Since the discovery of the soybean aphid, Aphis glycines Matsumura, in North America in the summer of 2000, a great deal of interest has developed in the biology, ecology, and control of this insect in its native range of eastern Asia. Although there is a wealth of literature on A. glycines that could help guide the efforts of North American entomologists, much of it is written in Chinese. Here, we review the Chinese-language

literature on the biology, ecology, natural enemies, and control of the soybean aphid in China.

Record 185 of 401 - AGRICOLA 1998-2004/09

AU: Ragsdale,-D.W.; Voegtlin,-D.J.; O'Neil,-R.J.

TI: Soybean aphid biology in North America.

SO: Annals of the Entomological Society of America. 2004 Mar., v. 97, no. 2 p. 204-208.

AB: Soybean aphid, Aphis glycines Matsumura, a native of eastern Asia, was first discovered in North America in July 2000 in Wisconsin and subsequently in a total of 10 North Central U.S. states by September 2000. Currently, soybean aphid has spread to 20 U.S. states and three Canadian provinces, putting >60 million acres of soybean at risk to crop injury caused by this exotic insect. The life history of this species has been studied by a number of entomologists and crop protection specialists, and here we provide a summary of the observations made by ourselves and our colleagues. The soybean aphid has been observed at all stages of a heterecious holocyclic life cycle and seems to be adapting to a large geographic area of the North Central United States. Soybean aphid uses native and exotic primary hosts found in North America, specifically Rhamnus cathartica L. and Rhamnus alnifolia L'Her. The aphid's principal secondary host is soybean, Glycine max (L.) Merr., but there seems to be a lengthy gap in early spring between the production of alatae on buckthorn (Rhamnus spp.) and the occurrence of soybean. In the fall when soybean is senescing, a biological bottleneck is created as the aphid must develop sexual morphs on soybean that emigrate back to the primary host to complete the sexual phase of its life cycle. During the summer, A. glycines is prone to develop winged morphs during any generation on soybean, which puts much of the soybean crop at risk of invasion by this exotic species, even if the insect does not overwinter locally. The integrated pest management challenges presented by the aphid require a deeper understanding of its biology as it adapts to North America.

Record 186 of 401 - AGRICOLA 1998-2004/09

AU: Moon,-J.; Salzman,-R.A.; Ahn,-J.E.; Koiwa,-H.; Zhu-Salzman,-K.

TI: Transcriptional regulation in cowpea bruchid guts during adaptation to a plant defence protease inhibitor.

SO: Insect molecular biology. 2004 June, v. 13, issue 3 p. 283-291.

AB: Cowpea bruchid, when fed on a diet containing the soybean cysteine protease inhibitor soyacystatin N (scN),activates an array of counter-defence genes to adapt to the negative effects of the inhibitor and regain its normal rate of feeding and development. A collection of 1920 cDNAs was obtained by differential subtraction withcDNAs prepared from guts of the 4th instar larvae of scN-adapted (reared on scN-containing diet) and scN-unadapted(reared on regular scN-free diet) cowpea bruchids. Subsequent expression profiling using DNA microarray and Northern blot analyses identified ninetyfour transcript species from this collection that are responsive to dietary scN. scN-adapted insects induced genes encoding protein and carbohydrate digestive enzymes, probably to help meet their carbon and nitrogen requirements. Up-regulation of antimicrobial and detoxification protein genes may represent a generalized defence response. Genes down-regulated by scNreflected physiological adjustments of the

cowpea bruchids to scN challenge. A large portion of the responsive genes, presumably involved in carrying out the counter-defence response, were of unknown function.The full-length cDNA of an scN-inducible cathepsin B- like cysteine protease was obtained. Its transcriptional response to scN during larval development contrasts with the pattern of the cathepsin L family, the major digestive enzymes. These results suggest cathepsinB-like cysteine proteases may play a crucial role incowpea bruchid adaptation to dietary scN.

Record 187 of 401 - AGRICOLA 1998-2004/09

AU: Morikawa,-H.; Takahashi,-M.; Sakamoto,-A.; Matsubara,-T.; Arimura,-G.; Kawamura,-Y.; Fukunaga,-K.; Fujita,-K.; Sakurai,-N.; Hirata,-T.

TI: Formation of unidentified nitrogen in plants: an implication for a novel nitrogen metabolism.

SO: Planta. 2004 May, v. 219, no. 1 p. 14-22.

AB: Plants take up inorganic nitrogen and store it unchanged or convert it to organic forms. The nitrogen in such organic compounds is stoichiometrically recoverable by the Kjeldahl method. The sum of inorganic nitrogen and Kjeldahl nitrogen has long been known to equal the total nitrogen in plants. However, in our attempt to study the mechanism of nitrogen dioxide (NO2) metabolism, we unexpectedly discovered that about one-third of the total nitrogen derived from 15N-labeled NO2 taken up by Arabidopsis thaliana (L.) Heynh. plants was converted to neither inorganic nor Kjeldahl nitrogen, but instead to an as yet unknown nitrogen compound(s). We here refer to this nitrogen as unidentified nitrogen (UN). The generality of the formation of UN across species, nitrogen sources and cultivation environments for plants has been shown as follows. Firstly, all of the other 11 plant species studied were found to form the UN in response to fumigation with 15NO2. Secondly, tobacco (Nicotiana tabacum L.) plants fed with 15N-nitrate appeared to form the UN. And lastly, the leaves of naturally fed vegetables, grass and roadside trees were found to possess the UN. In addition, the UN appeared to comprise a substantial proportion of total nitrogen in these plant species. Collectively, all of our present findings imply that there is a novel nitrogen mechanism for the formation of UN in plants. Based on the analyses of the exhaust gas and residue fractions of the Kjeldahl digestion of a plant sample containing the UN, probable candidates for compounds that bear the UN were deduced to be those containing the heat-labile nitrogenÆoxygen functions and those recalcitrant to Kjeldahl digestion, including organic nitro and nitroso compounds. We propose UN-bearing compounds may provide a chemical basis for the mechanism of the reactive nitrogen species (RNS), and thus that cross-talk may occur between UN and RNS metabolisms in plants. A mechanism for the formation of UN-bearing compounds, in which RNS are involved as intermediates, is proposed. The important broad impact of this novel nitrogen metabolism, not only on the general physiology of plants, but also on plant substances as human and animal food, and on plants as an integral part of the global environment, is discussed.

Record 188 of 401 - AGRICOLA 1998-2004/09

AU: Nomata,-T.; Kabeya,-Y.; Sato,-N.

TI: Cloning and characterization of glycine-rich RNA-binding protein cDNAs in the moss Physcomitrella patens.
SO: Plant and cell physiology. 2004 Jan., v. 45, no. 1 p. 48-56.
AB: We isolated three cDNAs for the genes PpGRP1, PpGRP2 and PpGRP3 that encode glycine-rich RNA-binding proteins (GRPs) from Physcomitrella patens. Three full-length cDNA clones were isolated from a cDNA library prepared from poly(A)+ RNA from 7-day-old protonemata of P. patens. They were named PpGRP1, PpGRP2 and PpGRP3, which encode putative polypeptides of 162, 178 and 155 residues, respectively. Preliminary genomic sequencing suggested that the positions of the three introns in the PpGRP3 gene are similar to those of introns in Arabidopsis GRP genes. PpGRP3 had a putative transit sequence. The PpGRP1-sGFP and PpGRP2-sGFP fusions were targeted to the cell nucleus, while PpGRP3-sGFP fusion was targeted to mitochondria. The level of these PpGRP transcripts as well as that of PpGRP proteins increased after cold treatment. Homoribopolymer RNA assay revealed that PpGRP3 protein show high affinity for poly(U) and poly(G). Results of phylogenetic analysis suggest that the nuclear and mitochondrial forms of GRP have been established early during the evolution of green plants.

Record 189 of 401 - AGRICOLA 1998-2004/09
AU: Noureddini,-H.; Harkey,-D.W.; Gutsman,-M.R.
TI: A continuous process for the glycerolysis of soybean oil.
SO: Journal of the American Oil Chemists' Society. 2004 Feb., v. 81, no. 2 p. 203-207.

Record 190 of 401 - AGRICOLA 1998-2004/09
AU: Yaklich,-R.W.; Vinyard,-B.T.
TI: Estimating soybean seed protein and oil concentration before harvest.
SO: Journal of the American Oil Chemists' Society. 2004 Feb., v. 81, no. 2 p. 189-194.

Record 191 of 401 - AGRICOLA 1998-2004/09
AU: Kawuki,-R.S.; Tukamuhabwa,-P.; Adipala,-E.
TI: Soybean rust severity, rate of rust development, and tolerance as influenced by maturity period and season.
SO: Crop protection. 2004 May, v. 23, no. 5 p. 447-455.
AB: Studies were conducted in Uganda for three consecutive seasons to evaluate soybean lines of different maturation periods against rust. All the lines were highly susceptible to rust with only two lines graded as moderately resistant: TGx 1835-10E (early maturing) and TGx 1838-5E (late maturing). These two lines were consistently associated with non-sporulating lesions. Within each maturation group, soybean lines differed significantly in rates of rust development (RRDs), rust severities at R6 growth stage, and yielding ability under rust stress. Most of the lines had RRDs higher than the local check. However, it was only the early maturing lines that yielded higher than the local check. Higher levels of rust tolerance were observed in the early maturing lines (yields >1000 kg/ha), and lowest in late maturing lines (yields<500 kg/ha). Most variation in yields was due to differences among soybean lines, except the late and medium maturing lines were it was due to seasonal variation. Most variation in RRDs was due to the seasons and not soybean lines,

and rust severity increased with crop age.

Record 192 of 401 - AGRICOLA 1998-2004/09

AU: Hoa,-L.T.P.; Nomura,-M.; Kajiwara,-H.; Day,-D.A.; Tajima,-S.

TI: Proteomic analysis on symbiotic differentiation of mitochondria in soybean nodules.

SO: Plant and cell physiology. 2004 Mar., v. 45, no. 3 p. 300-308.

AB: Symbiotic interactions between legume plants and rhizobia induce specific metabolisms and intracellular organelles in nodules. For surveying symbiotic differentiation of a key organelle, mitochondria, protein constituents of soybean nodule and root mitochondria were compared after two-dimensional (2-D) electrophoresis, and the proteins were characterized in combination with matrix-assisted desorption/ionization time-of-flight mass spectrometry, electrospray ionization mass spectrometry and N-terminal amino acid sequencing. Of the proteins that were detected only in nodule mitochondria, phosphoserine aminotransferase, flavanone 3-hydroxylase, coproporphyrinogen III oxidase, one ribonucleoprotein and three unknown proteins were identified. Seven up-regulated, eight down-regulated and two strongly suppressed protein spots in nodule mitochondria were also assigned protein identities. The physiological roles of these differential expressions were discussed in relation to nodule-specific metabolisms in soybean nodules.

Record 193 of 401 - AGRICOLA 1998-2004/09

AU: He,-S.; Woods,-L.C.-III

TI: Changes in motility, ultrastructure, and fertilization capacity of striped bass Morone saxatilis spermatozoa following cryopreservation.

SO: Aquaculture. 2004 June 14, v. 236, no. 1-4 p. 677-686.

AB: In the present study, motility, ultrastructure and fertilization capacity of fresh and cryopreserved striped bass spermatozoa were investigated in order to evaluate semen dilution ratio, freezing rate and cryomedia. Four dilution ratios (semen/cryomedia), and four freezing rates were evaluated on the basis of post-thaw sperm motility. The dilution ratio of 1:3 yielded the highest ($P<0.05$) post-thaw motility. Sperm cryopreserved with a freezing rate of -40ÀC min-1 resulted in a higher percentage of motile sperm ($P<0.05$) than other lower freezing rates we examined. Six cryomedia with various dimethyl sulfoxide (DMSO) and glycine concentrations were tested for their influences on ultrastructure, post-thaw motility and fertilizing capacity of cryopreserved sperm. The ultrastructural results revealed that the plasma membranes of spermatozoa were better protected with the higher DMSO concentrations we examined. Two cryomedia containing 5% or 7.5% DMSO, both with glycine added, resulted in the highest ($P<0.05$) post-thaw motility compared with other cryomedia without glycine. The percentage of eggs fertilized with sperm cryopreserved in six cryomedia ranged from 26+/-2.1% (2.5% DMSO without glycine) to 54+/-5.6% (7.5% DMSO with glycine), which were equivalent to 44% and 90% of fresh semen controls. No differences ($P>0.05$) were detected in the percentage of eggs fertilized among DMSO concentrations that did not contain glycine , although post-thaw motility did vary significantly ($P<0.05$) in these treatments. These results suggest that adding glycine to

our basic cryomedia containing DMSO increases the fertilization capacity of these cryopreserved spermatozoa.

Record 194 of 401 - AGRICOLA 1998-2004/09

AU: Twibell,-R.G.; Wilson,-R.P.

TI: Preliminary evidence that cholesterol improves growth and feed intake of soybean meal-based diets in aquaria studies with juvenile channel catfish, Ictalurus punctatus.

SO: Aquaculture. 2004 June 14, v. 236, no. 1-4 p. 539-546.

AB: Two feeding trials were conducted in aquaria to examine the effects of dietary soybean meal (SBM), purified soybean saponin and supplemental cholesterol concentrations on growth responses of channel catfish. In the first experiment, five dietary treatments were formulated to contain either 0%, 13.9%, 27.7%, 41.6% or 55.5% SBM which was added to the diets at the expense of soy protein concentrate (SPC) on an isonitrogenous basis. Each diet was fed to apparent satiation twice daily to triplicate groups of fish initially weighing 7.0 g/fish. At the end of the 8-week feeding trial, weight gain and feed intake (FI) in fish fed diets containing 0% or 13.9% SBM were significantly higher than in fish fed diets containing 27.7%, 41.6% or 55.5% SBM. Fish fed 27.7% dietary SBM exhibited significantly higher weight gain and feed intake compared with fish fed 41.6% or 55.5% dietary SBM. No significant differences were detected in feed efficiency (FE) or survival among fish fed any of the dietary treatments. In the second experiment, five dietary treatments were formulated to contain various concentrations of SBM (0% and 55.5%), supplemental cholesterol (0% and 1.0%) and purified soybean saponin (0% and 0.26%) to determine whether cholesterol could alleviate the deleterious effects of high dietary SBM concentrations. Each diet was fed to apparent satiation twice daily to triplicate groups of channel catfish initially weighing 9.7 g/fish. At the end of the 8-week feeding trial, weight gain, FI and FE were not significantly different between fish fed the purified control diet and fish fed the SBM-based diet (55.5% SBM) supplemented with 1.0% cholesterol. Fish fed the SBM-based diet containing 1.0% supplemental cholesterol exhibited significantly higher growth rate and FI compared with fish fed the SBM-based diet containing no supplemental cholesterol. Weight gain and FI in fish fed the diets containing purified soybean saponin were not significantly different than in fish fed the purified control diet, indicating that soy saponin was not responsible for reduced feed consumption in fish fed high dietary SBM concentrations. Results of this research indicated that 1.0% supplemental cholesterol may improve growth responses in juvenile channel catfish fed SBM-based diets and that soybean saponin was not responsible for reduced FI in fish fed high dietary SBM concentrations.

Record 195 of 401 - AGRICOLA 1998-2004/09

AU: Longstreth,-D.J.; Burow,-G.B.; Yu,-G.

TI: Solutes involved in osmotic adjustment to increasing salinity in suspension cells of Alternanthera philoxeroides Griseb.

SO: Plant cell, tissue and organ culture. 2004 Sept., v. 78, no. 3 p. 225-230.

AB: Cell recovery from osmotic stress was studied in suspension cell cultures from Alternanthera philoxeroides [Mart.] Griseb. Changes

in different classes of cellular solutes were measured after cells were transferred from 0 to 200 mM NaCl (high salt) to obtain an integrated picture of the solute pools involved in osmotic adjustment. By 2 h, cellular [Na+] and [Cl-] had increased several-fold, potentially accounting for the osmotic adjustment that produced a rapid recovery of cell turgor. There was a four-fold increase in the concentration of quaternary ammonium compounds (QAC) by 12 h and a slower increase for several days afterward. Betaine aldehyde dehydrogenase (BADH) is required for synthesis of glycine betaine, a QAC produced by a range of organisms in response to osmotic stress. Western-blot analysis for BADH suggested that glycine betaine was a significant component of the QAC solutes. The amount of BADH was generally similar at different sampling times for control and high salt cells, unlike previous reports of stimulation by osmotic stress in intact plants of some species. Between 3 and 7 days after cell transfer to high salt, other organic solutes increased in concentration and [Na+] and [Cl-] decreased. In A. philoxeroides, high [Na+] and [Cl-] produce rapid osmotic adjustment but organic solutes apparently replace these potentially harmful inorganic ions after the recovery of turgor.

Record 196 of 401 - AGRICOLA 1998-2004/09

AU: Ashok-Kumar,-H.G.; Murthy,-H.N.

TI: Effect of sugars and amino acids on androgenesis of Cucumis sativus.

SO: Plant cell, tissue and organ culture. 2004 Sept., v. 78, no. 3 p. 201-208.

AB: The effects of sugars (sucrose, maltose, glucose and fructose) and amino acids (glutamine, glycine, arginine, asparagine and cysteine) on embryogenesis and plantlet regeneration from cultured anthers of Cucumis sativus L. cv. Calypso and Green Long were studied. Type and concentration of sugar and amino acid influenced embryogenesis. Among the different sugars tested, sucrose was the best for embryo induction with an optimal concentration of 0.25 M. Maximum of 72 and 80 embryos per 60 anthers of Calypso and Green Long, respectively, were induced on embryo induction medium [B5 (Gamborg, Miller and Ojima (1968) Exp. Cell Res. 50: 151-158) supplemented with 2.0 micromolar 2,4-dichlorophenoxyacetic acid (2,4-D), 1.0 micromolar 6-benzyladenine (BA)] containing 0.25 micromolar sucrose. The addition of amino acids to the embryo induction medium improved embryo yield with a combination of amino acids (glutamine, glycine , arginine, asparagine and cysteine of 1.0 mM each) giving the best response. Embryo differentiation was achieved on B5 medium supplemented with 0.25 micromolar of Wga-naphthaleneacetic acid (NAA), 0.25 micromolar kinetin (KN) and 0.09 M sucrose. Embryos were converted on B5 medium supplemented with abscisic acid (ABA) (10 micromolar) and 0.09 M sucrose. Embryos that developed on B5 medium supplemented with a combination of amino acids (glutamine, glycine, arginine, asparagine and cysteine of 1.0 mM each) exhibited the highest plantlet regeneration frequency.

Record 197 of 401 - AGRICOLA 1998-2004/09

AU: Bunce,-J.A.

TI: A comparison of the effects of carbon dioxide concentration and temperature on respiration, translocation and nitrate reduction

in darkened soybean leaves.
SO: Annals of botany. 2004 June, v. 93, no. 6 p. 665-669.
AB: Background and aims: Respiration of autotrophs is an important component of their carbon balance as well as the global carbon dioxide budget. How autotrophic respiration may respond to increasing carbon dioxide concentrations, [CO2], in the atmosphere remains uncertain. The existence of short-term responses of respiration rates of plant leaves to [CO2] is controversial. Short-term responses of respiration to temperature are not disputed. This work compared responses of dark respiration and two processes dependent on the energy and reductant supplied by dark respiration, translocation and nitrate reduction, to changes in [CO2] and temperature. Methods: Mature soybean leaves were exposed for a single 8-h dark period to one of five combinations of air temperature and [CO2], and rates of respiration, translocation and nitrate reduction were determined for each reatment. Key results: Low temperature and elevated [CO2] reduced rates of respiration, translocation and nitrate reduction, while increased temperature and low [CO2] increased rates of all three processes. A given change in the rate of respiration was accompanied by the same change in the rate of translocation or nitrate reduction, regardless of whether the altered respiration was caused by a change in temperature or by a change in [CO2]. Conclusions: These results make it highly unlikely that the observed responses of respiration rate to [CO2] were artefacts due to errors in the measurement of carbon dioxide exchange rates in this case, and indicate that elevated [CO2] at night can affect translocation and nitrate reduction through its effect on respiration.

Record 198 of 401 - AGRICOLA 1998-2004/09
AU: Toyoshima,-K.; Noguchi,-R.; Hosokawa,-M.; Fukunaga,-K.; Nishiyama, -T.; Takahashi,-R.; Miyashita,-K.
TI: Separation of sardine oil without heating from surimi waste and its effect on lipid metabolism in rats.
SO: Journal of agricultural and food chemistry. 2004 Apr. 21, v. 52, no. 8 p. 2372-2375.
AB: Sardine oil was obtained by centrifugation of surimi wastewater without heating or chemical refining. This oil (CE) showed light yellow color and the peroxide value was less than 1.0 meq/kg. The main lipid class of CE was triacylglycerol (TG) (>99%). These features indicate that CE can be directly used as food materials without further purification. Commercial sardine oil (CO) is usually prepared via some kind of refining process with high temperature (250 ÀC) and chemical treatment. The comparative study on the physiological effects of these sardine oils (CE and CO) revealed that the dietary sardine oils were more effective in reducing abdominal fat pads, plasma total cholesterol, and TG levels of rats than was a soybean oil diet (control). Furthermore, these effects were greater in CE than CO, although there was little difference in the fatty acid composition of both oils. Although the main lipid class of CE was TG (>99%), CE was prepared by centrifugation from surimi waste and directly used as dietary fat without further purification. Therefore, CE may contain some kinds of minor components, which could be attributed to the higher physiological activity of CE. To reveal the involvement of the minor compounds in CE, we prepared TG from CE

by column chromatography and measured its effect on lipid metabolism of rats. TG from CE also showed the reducing effects on abdominal fad pads and plasma lipid levels. The effect of TG from CE was almost the same as that of original CE, suggesting that the higher nutritional activity of CE than CO may not be due to the minor compounds in CE.

Record 199 of 401 - AGRICOLA 1998-2004/09

AU: Valavanidis,-A.; Nisiotou,-C.; Papageorgiou,-Y.; Kremli,-I.; Satravelas,-N.; Zinieris,-N.; Zygalaki,-H.

TI: Comparison of the radical scavenging potential of polar and lipidic fractions of olive oil and other vegetable oils under normal conditions and after thermal treatment.

SO: Journal of agricultural and food chemistry. 2004 Apr. 21, v. 52, no. 8 p. 2358-2365.

AB: The antioxidant activity (IC50) of extra virgin olive oil (EVOO), commercial olive oil, and other vegetable oils (soybean, sunflower, and corn oil) was determined by UV-vis and by electron paramagnetic resonance (EPR) spectroscopy of the stable radical 2,2-diphenyl-1-picrylhydrazyl (DPPH). Also, we studied the antioxidant activity of the methanol soluble phase (methanolic, MF) and the nonsoluble phase (lipidic, LF) of oils by the same methods. Similarly, we studied the effect of heating on the antioxidant activity at 160 and 190 ÀC. Also, the MF, containing the polyphenolic substances, was used for measurements of the radical scavenging capacity toward the most important oxygen free radicals, superoxide anion (O2ç-) and hydroxyl (HOç) radicals. Results showed that soybean oil and EVOO had the highest antioxidant potential and thermal stability. In the case of soybean oil, the antioxidant capacity is the result of its high content of Wgc- and delta-tocopherols (with the highest antioxidant capacity and thermostabilities), whereas in EVOO, the antioxidant potential is the result of the combination of specific antioxidant polyphenols, which are acting additionally as effective stabilizers of Wga-tocopherol. The high content of EVOO in tyrosol, hydrotyrosol, and oleuropein and other polyphenolics with radical scavenging abilities toward superoxide anion and hydroxyl radical suggests that olive oil possesses biological properties that could partially account for the observed beneficial health effects of the Mediterranean diet.

Record 200 of 401 - AGRICOLA 1998-2004/09

AU: Seifert,-S.T.; Krause,-R.; Gloe,-K.; Henle,-T.

TI: Metal complexation by the peptide-bound Maillard reaction products N(epsilon)-carboxymethyllysine.

SO: Journal of agricultural and food chemistry. 2004 Apr. 21, v. 52, no. 8 p. 2347-2350.

AB: Although the Maillard reaction between proteins and carbohydrates is of central importance for food processing and in vivo processes, only little is known about changes of the metal-binding properties induced by protein glycation. The purpose of this study was to examine the complex formation of the quantitatively important peptide-bound Maillard reaction products (MRPs) N(epsilon)-fructoselysine and N(epsilon)-carboxymethyllysine with the biologically relevant metal ions copper(II) and zinc(II). The MRPs were synthesized as the N(alpha)-hippuryllysine derivatives in order to block the coordination

function of the alpha-amino group. Stability constant measurements were performed in aqueous solution using pH potentiometry. N(alpha)-Hippuryl-N(epsilon)-fructoselysine forms moderate Cu(II) complexes (Log10 K1 = 5.8; Log10 K2 = 4.0) but fails to form any complexes with Zn(II). N(alpha)-Hippuryl-N-carboxymethyllysine gives slightly stronger complexes with Cu(II) (Log10 K1 = 7.3; Log10 K2 = 6.3), but again no complexation with Zn(II) was observed. These results show that post-translational modification of proteins by carbohydrates leads to the formation of new coordination centers for metal ions within a protein chain. Further studies are necessary to clarify the consequences of this phenomenon in terms of protein quality and physiological processes.