No.	Records	Request
1	6575	CORN
2	7394	ZEA
3	7043	MAYS
4	7785	MAIZE
5	13221	CORN or ZEA MAYS OR MAIZE
6	16957	PY=2004
* 7	609	#5 and (PY=2004)

Record 1 of 609 - AGRICOLA 1998-2004/09
AU: Fageer,-A.S.M.; Babiker,-E.E.; El-Tinay,-A.H.
TI: Effect of malt pretreatment and/or cooking on phytate and essential amino acids contents and in vitro protein digestibility of corn flour.
SO: Food chemistry. 2004 Nov., v. 88, issue 2 p. 261-265.

Record 2 of 609 - AGRICOLA 1998-2004/09
AU: Paul,-D.; Vanlalchhuanga,-R.
TI: Effect of earthworms on incorporated tree litter and the available soil nitrogen and maize yield.
SO: Tropical science. 2004, v. 44, no. 1 p. 20-22.

Record 3 of 609 - AGRICOLA 1998-2004/09
AU: Billate,-R.D.; Maghirang,-R.G.; Casada,-M.E.
TI: Measurement of particulate matter emissions from corn receiving operations with simulated hopper-bottom trucks.
SO: Transactions of the ASAE. 2004 Mar-Apr, v. 47, no. 2 p. 521-529.
AB: Dust emissions from grain elevator operations can be a safety and health risk as well as a nuisance. Fundamental data on air entrainment and dust emission are needed for designing adequate and effective dust emission control methods. This study measured the amount of entrained air and emitted dust during corn receiving operations at an elevator operated by the USDA-ARS Grain Marketing and Production Research Center in Manhattan, Kansas. Shelled corn (maize) was unloaded from a storage bin, representing a hopper-bottom truck, to the receiving pit at rates of 17 to 262 kg/s and drop heights of 38 to 56 cm. Airflow rates were measured with propeller anemometers. The emission rates of total suspended particulates (TSP) and particulate matter smaller than 10 micrometer aerodynamic diameter (PM10) were measured with high-volume particulate samplers. The amount of air entrained per unit volume of grain decreased with increasing grain flow rate (0. 26 to 2.07 m3/m3). The emission rates of TSP (8.3 to 52.1 g/ metric ton of grain received) and PM10 (0.6 to 6.1 g/t) decreased with increasing grain flow rate and decreasing drop height.

Record 4 of 609 - AGRICOLA 1998-2004/09
AU: Brabec,-D.L.; Maghirang,-R.G.; Casada,-M.E.
TI: Effectiveness of a high-pressure water-fogging system in controlling dust emissions at grain receiving.
SO: Transactions of the ASAE. 2004 Mar-Apr, v. 47, no. 2 p. 505-511.
AB: Grain dust at the receiving area is a fire hazard, a health concern, and a sanitation problem and should be controlled. The effectiveness of a high-pressure water-fogging system in controlling grain dust emissions was evaluated with corn and wheat while spouting 2.1 m3 (60 bu) of grain into a test chamber. Dust/fog emissions and deposits along with entrained airflows

were measured for four fog treatments, a control, and an air-blower treatment at each of two grain flow rates. The uncontrolled dust emissions varied with grain type and grain flow rate. Water-fog sprays, when applied across the top of the test chamber, redirected the airflow downstream of the spray nozzles and reduced dust emissions significantly. Dust reductions ranged from 60% to 84% for corn and from 35% to 73% for wheat. However, the sprays produced significant fog emissions and deposits in proportion to the liquid supply. At the highest spray rate (855 g/min), fog emission was 32 g/min (3.8%), and fog deposits ranged from 1.4 to 7.1 mg/cm2/min.

Record 5 of 609 - AGRICOLA 1998-2004/09
AU: Grigg,-B.C.; Southwick,-L.M.; Fouss,-J.L.; Kornecki,-T.S.
TI: Climate impacts on nitrate loss in drainage waters from a southern alluvial soil.
SO: Transactions of the ASAE. 2004 Mar-Apr, v. 47, no. 2 p. 445-451.
AB: Fertilizer nitrogen transported via agricultural drainage has caused eutrophication of nearby surface waters. In the Lower Mississippi River Valley region, periods of drought are occurring more frequently. The impacts of drought on nutrient loss from agricultural lands of this region have not been reported. Field studies were used to evaluate the impact of climate (rainfall) on nitrate loss from agricultural fields in both normal (1996) and drought (1999) periods at the Ben Hur Water Quality Site in Baton Rouge, Louisiana. Four replicates of two treatments, surface drainage only (SUR) and surface drainage + deep controlled drainage (DCD), were initiated on 0.21 ha plots planted to corn (Zea mays L.). After each rainfall/runoff event, the volumes of runoff and subsurface drainage were analyzed for soluble nitrate concentration and loss. No significant drainage treatment impacts were found on runoff volume and nitrate loss in runoff. Nitrate loss in runoff was impacted by climate, with a four-fold decrease in nitrate loss during the drought, caused by decreased volume of runoff. Conversely, the mass of nitrate loss in leachate increased two-fold during the drought. Diverting subsurface drainage effluent (DCD) to surface receiving waters increased nitrate transport to these waters by 2.6 times in the normal climate, and over ten-fold during the drought, compared to SUR management. In either climate, but particularly during drought, subsurface drainage could potentially accelerate eutrophication of receiving waters of this region. When compared to DCD, these results suggest that SUR should be the water management practice in this region.

Record 6 of 609 - 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 7 of 609 - AGRICOLA 1998-2004/09
AU: Tobias,-I.; Palkovics,-L.
TI: An unusual feature at the N-terminal end of the coat protein of Maize dwarf mosaic virus isolated in Hungary.
SO: Journal of phytopathology. 2004 Aug., v. 152, no. 7 p. 445-447.

Record 8 of 609 - AGRICOLA 1998-2004/09
AU: Pronczuk,-M.; Bojanowski,-J.; Warzecha,-R.
TI: Effect of leaf infection by Kabatiella zeae on stalk rot prevalence and grain yield of maize hybrids.
SO: Journal of phytopathology. 2004 Aug., v. 152, no. 7 p. 410-415.

Record 9 of 609 - AGRICOLA 1998-2004/09
AU: Chikoye,-D.; Schulz,-S.; Ekeleme,-F.
TI: Evaluation of integrated weed management practices for maize in the northern Guinea savanna of Nigeria.
SO: Crop protection. 2004 Oct., v. 23, issue 10 p. 895-900.
AB: Field trials were conducted in 1999 and 2000 in the northern Guinea savanna of Nigeria to evaluate the potential of several weed management practices to reduce early weed competition in maize. The treatments were different combinations of the herbicide mixture metolachlor + atrazine at 5 L ha-1, the cover crop velvetbean (Mucuna cochinchinensis), hoe weeding at 2, 4, and 6 weeks or at 4 and 8 weeks after planting (WAP) maize, maize density: high (60,000 plants ha-1), medium (40,000 plants ha-1), low (25,000 plants ha-1) and a farmer's control consisting of a single weeding at 4 WAP and low maize density. Results showed that maize grain yield was significantly higher in the treatment in which either the herbicide mixture or velvetbean was combined with 40,000 maize plants ha-1 and weeded thrice. The lowest maize grain yield was obtained with the farmer's control. Weed dry matter was 60% more in the farmer's control than in velvetbean combined with 40,000 maize plants ha-1 and weeded three times. The farmer's control was higher in weed species diversity with Setaria pallide-fusca, Vernonia galamensis, and Boerhavia erecta as the dominant species. Sporobolus pyramidalis and Thelepogon elegans were the dominant weeds in the herbicide treatment and velvetbean plots, respectively. Herbicide or velvetbean in combination with medium maize density and weeding three times (2, 4, and 6 WAP) is recommended for weed management in the northern Guinea savanna.

Record 10 of 609 - AGRICOLA 1998-2004/09
AU: Hristov,-A.N.; Grandeen,-K.L.; Ropp,-J.K.; Greer,-D.
TI: Effect of Yucca schidigera-based surfactant on ammonia utilization in vitro, and in situ degradability of corn grain.
SO: Animal feed science and technology. 2004 Aug. 2, v. 115, no. 3-4 p. 341-355.

Record 11 of 609 - AGRICOLA 1998-2004/09
AU: Melkonian,-J.; Yu,-L.X.; Setter,-T.L.
TI: Chilling responses of maize (Zea mays L.) seedlings: root hydraulic conductance, abscisic acid, and stomatal conductance.
SO: Journal of experimental botany. 2004 Aug., v. 55, no. 403 p. 1751-1760.

Record 12 of 609 - AGRICOLA 1998-2004/09
AU: Schraut,-D.; Ullrich,-C.I.; Hartung,-W.
TI: Lateral ABA transport in maize roots (Zea mays): visualization by immunolocalization.
SO: Journal of experimental botany. 2004 Aug., v. 55, no. 403 p. 1635-1641.

Record 13 of 609 - AGRICOLA 1998-2004/09

AU: Ma,-Q.; Wauchope,-R.D.; Ma,-L.; Rojas,-K.W.; Malone,-R.W.; Ahuja,-L.R.

TI: Test of the Root Zone Water Quality Model (RZWQM) for predicting runoff of atrazine, alachlor and fenamiphos species from conventional-tillage corn mesoplots.

SO: Pest management science. 2004 Mar., v. 60, issue 3 p. 267-276.

AB: The Root Zone Water Quality Model (RZWQM) is a comprehensive, integrated physical, biological and chemical process model that simulates plant growth and movement of water, nutrients and pesticides in a representative area of an agricultural system. We tested the ability of RZWQM to predict surface runoff losses of atrazine, alachlor, fenamiphos and two fenamiphos oxidative degradates against results from a 2-year mesoplot rainfall simulation experiment. Model inputs included site-specific soil properties and weather, but default values were used for most other parameters, including pesticide properties. No attempts were made to calibrate the model except for soil crust/seal hydraulic conductivity and an adjustment of pesticide persistence in near-surface soil. Approximately 2.5 («0.9), 3.0 («0.8) and 0.3 («0.2)% of the applied alachlor, atrazine and fenamiphos were lost in surface water runoff, respectively. Runoff losses in the 'critical' events - those occurring 24 h after pesticide application - were respectively 91 («5), 86 («6) and 96 («3)% of total runoff losses for these pesticides. RZWQM adequately predicted runoff water volumes, giving a predicted/observed ratio of 1.2 («0.5) for all events. Predicted pesticide concentrations and loads from the 'critical' events were generally within a factor of 2, but atrazine losses from these events were underestimated, which was probably a formulation effect, and fenamiphos losses were overestimated due to rapid oxidation. The ratios of predicted to measured pesticide concentrations in all runoff events varied between 0.2 and 147, with an average of 7. Large over-predictions of pesticide runoff occurred in runoff events later in the season when both loads and concentrations were small. The normalized root mean square error for pesticide runoff concentration predictions varied between 42 and 122%, with an average of 84%. Pesticide runoff loads were predicted with a similar accuracy. These results indicate that the soil-water mixing model used in RZWQM is a robust predictor of pesticide entrainment and runoff.

Record 14 of 609 - AGRICOLA 1998-2004/09

AU: Ma,-Q.; Wauchope,-R.D.; Rojas,-K.W.; Ahuja,-L.R.; Ma,-L.; Malone,-R.W.

TI: The pesticide module of the Root Zone Water Quality Model (RZWQM): testing and sensitivity analysis of selected algorithms for pesticide fate and surface runoff.

SO: Pest management science. 2004 Mar., v. 60, issue 3 p. 240-252.

AB: The Root Zone Water Quality Model (RZWQM) is a one-dimensional, numerical model for simulating water movement and chemical transport under a variety of management and weather scenarios at the field scale. The pesticide module of RZWQM includes detailed algorithms that describe the complex interactions between pesticides and the environment. We have simulated a range of situations with RZWQM, including foliar interception and washoff of a multiply applied insecticide (chlorpyrifos) to growing corn,

and herbicides (alachlor, atrazine, flumetsulam) with pH-dependent soil sorption, to examine whether the model appears to generate reasonable results. The model was also tested using chlorpyrifos and flumetsulam for the sensitivity of its predictions of chemical fate and water and pesticide runoff to various input parameters. The model appears to generate reasonable representations of the fate and partitioning of surface- and foliar-applied chemicals, and the sorption of weakly acidic or basic pesticides, processes that are becoming increasingly important for describing adequately the environmental behavior of newer pesticides. However, the kinetic sorption algorithms for charged pesticides appear to be faulty. Of the 29 parameters and variables analyzed, chlorpyrifos half-life, the Freundlich adsorption exponent, the fraction of kinetic sorption sites, air temperature, soil bulk density, soil-water content at 33 kPa suction head and rainfall were most sensitive for predictions of chlorpyrifos residues in soil. The latter three inputs and the saturated hydraulic conductivity of the soil and surface crusts were most sensitive for predictions of surface water runoff and water-phase loss of chlorpyrifos. In addition, predictions of flumetsulam (a weak acid) runoff and dynamics in soil were sensitive to the Freundlich equilibrium adsorption constant, soil pH and its dissociation coefficient.

Record 15 of 609 - AGRICOLA 1998-2004/09

AU: Aziz,-N.H.; Moussa,-L.A.A.; Far,-F.M.E.

TI: Reduction of fungi and mycotoxins formation in seeds by gamma-radiation.

SO: Journal of food safety. 2004 July, v. 24, no. 2 p. 109-127.

AB: Ninety samples of maize, chick-peas and groundnut seeds collected from the Egyptian market were found to be heavily contaminated by molds. Alternaria, Aspergillus, Cladosporium, Eurotium, Fusarium, Mucor, Penicillium and Rhizopus were the most common fungal genera isolated from nondisinfected seeds. Aspergillus alutaceus, A. flavus, Fusarium verticillioides and F. oxysporum were isolated from all surface-disinfected seeds and were reported to produce ochratoxin A, aflatoxin B1 and zearalenone, respectively. Irradiation at a dose 4.0 kGy reduced the mold growth greatly relative to unirradiated controls. There was no growth at dose 5.0 kGy. On the basis of the radiation survival data, the decimal reduction values D10 for A. alutaceus, A. flavus and F. verticilliodies were 0.70. 2.10 and 0.93 kGy in maize. A dose of 5 kGy inhibited the toxigenic molds and mycotoxin formation in seeds. Aflatoxin B1 and ochratoxin A were detected in maize and chick-peas, whereas zearalenone was detected in maize samples. Application of radiation at a dose of 6.0 kGy detoxified aflatoxin B1 by 74.3B76.7%, ochratoxin A by 51.3-96.2% and zearalenone by about 78%.

Record 16 of 609 - AGRICOLA 1998-2004/09

AU: Huang,-F.; Subramanyam,-B.

TI: Responses of Corcyra cephalonica (Stainton) to pirimiphos-methyl, spinosad, and combinations of pirimiphos-methyl and synergized pyrethrins.

SO: Pest management science. 2004 Feb., v. 60, issue 2 p. 191-198.

AB: Field control failures with pirimiphos-methyl against the rice moth, Corcyra cephalonica (Stainton), in Weslaco, Texas, USA, led

us to investigate the susceptibility of this particular strain to pirimiphos-methyl, spinosad, pyrethrins synergized with piperonyl butoxide, and pirimiphos-methyl combined with synergized pyrethrins. In laboratory bioassays, 50 eggs of C cephalonica were exposed to untreated and insecticide-treated corn and sunflower seeds to determine larval survival after 21 days, egg-to-adult emergence after 49 days, and larval damage to seeds at both exposure periods. Pirimiphos-methyl at both 4 and 8 mg kg-1 did not prevent larval survival or egg-to-adult emergence of C cephalonica on either corn or sunflower seeds, and seed damage was evident at both rates. The C cephalonica strain was highly susceptible to spinosad at 0.5 and 1 mg kg-1. At both spinosad rates, reduction in larval survival, egg-to-adult emergence, and seed damage relative to the control treatment was > = 93% on both corn and sunflower seeds. Pirimiphos-methyl and spinosad were generally more effective against C cephalonica on corn than sunflower seeds. The C cephalonica strain was completely controlled on corn treated with 1.5 mg kg-1 of pyrethrins synergized with 15 mg kg-1 of piperonyl butoxide. Many larvae survived and became adults on corn treated with synergized pyrethrins at < = 0.75 mg kg-1. Corn treated with pirimiphos-methyl at 4, 6 or 8 mg kg-1 in combination with 0.38 to 1.5 mg kg-1 of synergized pyrethrins reduced larval survival by > = 95%, egg-to-adult emergence by > = 97%, and seed damage by > = 94%. Our results suggest that the C cephalonica strain can be controlled on corn by combining pirimiphos-methyl with synergized pyrethrins or with synergized pyrethrins at the labeled rate. Although spinosad is not currently labeled for use on stored corn and sunflower seeds, it appears to be effective against C cephalonica on both commodities at very low rates.

Record 17 of 609 - AGRICOLA 1998-2004/09

AU: Xie,-J.; Zhao,-Y.

TI: Use of vacuum impregnation to develop high quality and nutritionally fortified frozen strawberries.

SO: Journal of food processing and preservation. 2004 July, v. 28, no. 2 p. 117-132.

AB: Strawberries (Totem) were vacuum impregnated (VI) before freezing with cryoprotectants of high fructose corn syrup (HFCS) or high methoxyl pectin (HMP) to improve quality, and with calcium and zinc salts to enhance the nutritional value of the product. The VI process consisted of a 15 min vacuum at 50 mm Hg and 30 min restoration at atmospheric pressure. VI pretreatment significantly increased the calcium and zinc content of frozen strawberries. VI with cryoprotectant improved the textural quality and reduced drip loss of frozen-thawed strawberries in comparison with untreated strawberries. Calcium in the VI solutions further increased the firmness of frozen-thawed strawberries, and zinc improved the color stability of the strawberries during the impregnation and freeze-thawing process.

Record 18 of 609 - AGRICOLA 1998-2004/09

AU: Singh,-J.; Singh,-N.

TI: Effect of process variables and sodium alginate on extrusion behavior of nixtamalized corn grit.

SO: International journal of food properties. 2004, v. 7, no. 2 p. 329-340.

Record 19 of 609 - AGRICOLA 1998-2004/09

AU: Castro,-M.F.P.M.-de; Shephard,-G.S.; Sewram,-V.; Vicente,-E.; Mendonca,-T.A.; Jordan,-A.C.

TI: Fumonisins in Brazilian corn-based foods for infant consumption.

SO: Food additives and contaminants. 2004 July, v. 21, no. 7 p. 693-699.

AB: A survey of 196 samples of corn-based infant foods from 13 cities of Sao Paulo State, Brazil, was carried out to investigate the fumonisin contamination in the products. Based on their ingredients, the products were divided into seven groups: infant cereal designated as types A-D, corn meal, corn starch and instant cereal baby food. Although certain infant food samples were free of fumonisin contamination (<20 microgram kg-1; corn starch and infant cereals of type A, B and D), contamination levels in the other products (corn meal, instant corn-based baby food and cereal type C) were of concern, particularly those in corn meal. All samples in these categories contained fumonisins. The mean level for total fumonisins (FB1 + FB2 + FB3) in corn meal was 2242 microgram kg-1 (maximum 8039 microgram kg-1), in instant corn-based baby food was 437 (maximum 1096) microgram kg-1 and in infant cereal type C was 664 (maximum 1753) microgram kg-1.

Record 20 of 609 - AGRICOLA 1998-2004/09

AU: Royer,-D.; Humpf,-H.U.; Guy,-P.A.

TI: Quantitative analysis of Fusarium mycotoxins in maize using accelerated solvent extraction before liquid chromatography/ atmospheric pressure chemical ionization tandem mass spectrometry.

SO: Food additives and contaminants. 2004 July, v. 21, no. 7 p. 678-692.

AB: A method for the simultaneous quantitative determination of deoxynivalenol (DON), fumonisin B1 (FB1) and zearalenone (ZEN) in maize by liquid chromatography-atmospheric pressure chemical ionization tandem mass spectrometry (LC-APCIMS/MS), using stable isotopically labelled and structural analogues internal standards, is described. The procedure involves accelerated solvent extraction followed by two solid-phase clean-up steps on strong anion exchange resin and a Mycosep column. Typical recoveries were calculated by spiking blank maize at three different concentrations for deoxynivalenol (200, 400 and 1000 microgram kg-1) at 70%, for fumonisin B1 (100, 200 and 1000 microgram kg-1) at 90%, and for zearalenone (50, 100 and 200 microgram kg-1) at 40%. LC-APCIMS/MS analyses were realized in collision-induced dissociation on an ion-trap instrument to provide a high degree of selectivity and sensitivity. Extraction of ions from two transition reactions, monitored by LC-APCIMS/MS for each analyte, enabled a limit of detection for DON, FB1 and ZEN at, respectively, 10, 20 and 3 microgram kg-1, and a limit of quantification at, respectively, 50, 50 and 10 microgram kg-1. The robustness of the method was also evaluated with the analysis of wheat samples.

Record 21 of 609 - AGRICOLA 1998-2004/09

AU: Bashir,-K.; Husnain,-T.; Fatima,-T.; Latif,-Z.; Mehdi,-S.A.; Riazuddin,-S.

TI: Field evaluation and risk assessment of transgenic indica basmati rice.
SO: Molecular breeding new strategies in plant improvement. 2004 May, v. 13, no. 4 p. 301-312.
AB: We report the first field trial of different transgenic lines of Indica Basmati rice (B-370) expressing cry1Ac and cry2A genes. Different transgenic lines were grown under field conditions for two consecutive years, according to RCBD and Split Plot Design respectively. All the biosafety measures were taken into consideration. Sixty neonate larvae of yellow stem borer were artificially infested into each plant in three installments. Data was recorded in terms of dead hearts and white heads at vegetative and flowering stage respectively. Transgenic lines exhibited inherent ability to protect rice plants from target insects ($p<0.01$). Natural infestations of rice skipper and rice leaf folder were also observed and transgenic plants were statistically superior to their untransformed counterparts. Green house whole plant bioassays were done by infesting two 2nd instar larvae of rice leaf folder per tiller. Transgenics were 96% more resistant than untransformed control plants. The presence of cry genes was observed with Dot blot, PCR and Southern blot analysis, while ELISA and Western blot analysis confirmed the expression of Cry proteins. All lines expressed higher level of Cry proteins when compared with commercially released cultivars of Bt cotton, maize and potato. It was also observed that although toxin titer substantially decreased with increasing age of the plants, it remained well within the limits to kill the target insects. Morphological studies showed significant variation for days to maturity, plant height and panicle length. Cooking qualities of seeds harvested from these lines were compared with the untransformed control. The transgenic lines had no effect on non-target insects (insects belonging to orders other than diptera and lepidoptera) and germination of three local varieties of wheat. Chances of gene spread were calculated at a level of 0.18% cross pollination in experimental lines.

Record 22 of 609 - AGRICOLA 1998-2004/09
AU: Bortfeld,-M.; Auffarth,-K.; Kahmann,-R.; Basse,-C.W.
TI: The Ustilago maydis a2 mating-type locus genes Iga2 and rga2 compromise pathogenicity in the absence of the mitochondrial p32 family protein Mrb1.
SO: Plant cell. 2004 Aug., v. 16, no. 8 p. 2233-2248.
AB: The Ustilago maydis mrb1 gene specifies a mitochondrial matrix protein with significant similarity to mitochondrial p32 family proteins known from human and many other eukaryotic species. Compatible mrb1 mutant strains were able to mate and form dikaryotic hyphae; however, proliferation within infected tissue and the ability to induce tumor development of infected maize (Zea mays) plants were drastically impaired. Surprisingly, manifestation of the mrb1 mutant phenotype selectively depended on the a2 mating type locus. The a2 locus contains, in addition to pheromone signaling components, the genes lga2 and rga2 of unknown function. Deletion of lga2 in an a2deltamrb1 strain fully restored pathogenicity, whereas pathogenicity was partially regained in an a2deltamrb1deltarga2 strain, implicating a concerted action between Lga2 and Rga2 in compromising pathogenicity in deltamrb1 strains. Lga2 and Rga2 localized to

mitochondria and Mrb1 interacted with Rga2 in the yeast two-hybrid system. Conditional expression of lga2 in haploid cells reduced vegetative growth, conferred mitochondrial fragmentation and mitochondrial DNA degradation, and interfered with respiratory activity. The consequences of lga2 overexpression depended on the expression strength and were greatly exacerbated in deltamrb1 mutants. We propose that Lga2 interferes with mitochondrial fusion and that Mrb1 controls this activity, emphasizing a critical link between mitochondrial morphology and pathogenicity.

Record 23 of 609 - AGRICOLA 1998-2004/09
AU: Ludy,-C.; Lang,-A.
TI: How to catch foliage-dwelling spiders (Araneae) in maize fields and their margins: a comparison of two sampling methods.
SO: Journal of applied entomology. 2004 Aug., v. 128, no. 7 p. 501-509.

Record 24 of 609 - AGRICOLA 1998-2004/09
AU: Torney,-F.; Partier,-A.; Says-Lesage,-V.; Nadaud,-I.; Barret,-P.; Beckert,-M.
TI: Heritable transgene expression pattern imposed onto maize ubiquitin promoter by maize adh-1 matrix attachment regions: tissue and developmental specificity in maize transgenic plants.
SO: Plant cell reports. 2004 July, v. 22, no. 12 p. 931-938.
AB: Matrix attachment regions (MARs) have been used to enhance transgene expression and to reduce transgene expression instability in various organisms. In plants, contradictory data question the role of MAR sequences. To assess the use of MAR sequences in maize, we have used two well-characterized MARs from the maize adh-1 region. The MARs have been cloned either 5' to or at both sides of a reporter gene expression cassette to reconstitute a MAR-based domain. Histochemical staining revealed a new transgene expression pattern in roots of regenerated plants and their progeny. Furthermore, MARs systematically induced variegation. We show here that maize adh-1 MARs are able to modify transgene expression patterns as a heritable trait, giving a new and complementary outcome following use of MARs in genetic transformation.

Record 25 of 609 - AGRICOLA 1998-2004/09
AU: Al-Saghir,-S.; Thurner,-K.; Wagner,-K.H.; Frisch,-G.; Luf,-W.; Razzazi-Fazeli,-E.; Elmadfa,-I.
TI: Effects of different cooking procedures on lipid quality and cholesterol oxidation of farmed salmon fish (Salmo salar).
SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5290-5296.
AB: Salmon fillets were steamed, or pan-fried without oil, with olive oil, with corn oil, or with partially hydrogenated plant oil. The exchange between the salmon and the pan-frying oils was marginal, but it was detectable as slight modifications in the fatty acid pattern and the tocopherol contents according to the oil used. Primary and secondary oxidation products were only slightly increased or remained unchanged, which indicated a slight lipid oxidation effect due to the heating procedures applied. The same was observed for tocopherol levels, which remained almost stable and were not affected by the oxidation process. The sum of

cholesterol oxidation products (COPs) increased after the heating processes from 0.9 microgram/g in the raw sample to 6.0, 4.0, 4.4, 3.3, and 9.9microgram/g extracted fat in pan-fried without oil, with olive oil, corn oil, partially hydrogenated plant oil, and steamed, respectively. A highly significant correlation was found between the fatty acid pattern and the total amount of COPs ($r2 = 0.973$, $p < 0.001$). No change has been determined in the n-3 fatty acids content and in the polyunsaturated/saturated-ratio of the cooked salmon fillets. Moderate pan-frying (6 min total) and steaming (12 min) of salmon did not accelerate lipid oxidation but significantly increased the content of COPs. The highest increase of COPs was found through steaming, mainly due to the longer heat exposure. The used frying oils did not influence the outcome; no significant difference between heat treatment with or without oil has been determined.

Record 26 of 609 - AGRICOLA 1998-2004/09

AU: Shukla,-A.; Nycholat,-C.; Subramanian,-M.V.; Anderson,-R.J.; Devine,-M.D.

TI: Use of resistant ACCase mutants to screen for novel inhibitors against resistant and susceptible forms of ACCase from grass weeds.

SO: Journal of agricultural and food chemistry. 2004 Aug. 11, v. 52, no. 16 p. 5144-5150.

AB: The aryloxyphenoxypropionic acid (AOPP) and cyclohexanedione (CHD) herbicides inhibit the first committed enzyme in fatty acid biosynthesis, acetyl CoA carboxylase (ACCase). The frequent use of AOPP and CHD herbicides has resulted in the development of resistance to these herbicides in many grass weed species. New herbicides that inhibit both the susceptible and resistant forms of ACCase in grass weeds would have obvious commercial appeal. In the present study, an attempt was made to identify molecules that target both the herbicide-sensitive and -resistant forms of ACCase. Seven experimental compounds, either CHD-like or AOPP-CHD hybrids, were synthesized and assayed against previously characterized susceptible and resistant forms of ACCase. All seven compounds inhibited ACCase from sensitive biotypes of Setaria viridis and Eleusine indica (I50 values from 6.4 to >100 micromolar) but were not particularly potent compared to some commercialized herbicides (I50 values of 0.08-5.6 micromolar). In almost all cases, the I50 values for each compound assayed against the resistant ACCases were higher than those against the corresponding sensitive ACCase, indicating reduced binding to the resistant ACCases. One compound, a CHD analogue, was almost equally effective against the resistant and susceptible ACCases, although it was not a very potent ACCase inhibitor per se (I50 of 51 and 76 micromolar against susceptible ACCase from S. viridis and E. indica, respectively). The AOPP-CHD hybrid molecules also inhibited some of the resistant ACCases, with I50 values ranging from 6.4 to 50 micromolar. These compounds may be good leads for developing ACCase inhibitors that target a wider range of ACCase isoforms, including those found in AOPP- and CHD-resistant weed biotypes.

Record 27 of 609 - AGRICOLA 1998-2004/09

AU: Bourguet,-D.

TI: Resistance to Bacillus thuringiensis toxins in the European corn

borer: what chance for Bt maize.
SO: Physiological entomology. 2004 Aug., v. 29, no. 3 p. 251-256.

Record 28 of 609 - 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 29 of 609 - 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 30 of 609 - AGRICOLA 1998-2004/09
AU: Tamim,-N.M.; Angel,-R.; Christman,-M.
TI: Influence of dietary calcium and phytase on phytate phosphorus hydrolysis in broiler chickens.
SO: Poultry science. 2004 Aug., v. 83, no. 8 p. 1358-1367.
AB: The effect of Ca and phytase on phytate phosphorus (PP) hydrolysis was studied in vitro and in vivo. In vitro, PP hydrolysis by a 3-phytase and a 6-phytase was studied at pH 2.5 and 6.5 with Ca added at levels equivalent to 0, 0.1, 0.2, 0.4, 0.7, or 0.9% of the diet. Irrespective of enzyme, Ca at a level as low as 0.1% reduced (P < 0.05) PP hydrolysis at pH 6.5. To test these effects in vivo, 22-d-old male broilers were fed 1 of 6 diets (10 replicate pens of 4 birds per diet) for 30 h. The experimental design was a 3 x 2 factorial arrangement of 3 phytase treatments (0, 500 U of phytase A/kg of diet, and 500 U of phytase B/kg of diet) and 2 added Ca levels (0 and 0.5% from CaCO3) to a corn-soy basal diet. Adding Ca to the diet resulted in a reduction (P < 0.05) in ileal PP disappearance from 69.2 to 25.4% when the 0 and 0.5% added Ca diets were fed, respectively, and in apparent ileal Ca and P absorption (46.3 to 33.6% and 67.9 to 29.4% when 0 and 0.5% Ca were added, respectively). Inclusion of a 3-phytase improved (P < 0.05) ileal PP disappearance from 25.4 to 58.9% in diets containing 0 and 0.5% added Ca, but the improvement was less pronounced with a 6-phytase. Apparent ileal Ca absorption was improved (P < 0.05) when Ca, phytase, or both were added to the diet.

Record 31 of 609 - AGRICOLA 1998-2004/09
AU: Zaidi,-P.H.; Srinivasan,-G.; Cordova,-H.S.; Sanchez,-C.
TI: Gains from improvement for mid-season drought tolerance in tropical maize (Zea mays L.).
SO: Field crops research. 2004 Sept. 10, v. 89, issue 1 p. 135-152.

Record 32 of 609 - 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 33 of 609 - AGRICOLA 1998-2004/09

AU: Skark,-C.; Zullei-Seibert,-N.; Willme,-U.; Gatzemann,-U.; Schlett, -C.

TI: Contribution of non-agricultural pesticides to pesticide load in surface water.

SO: Pest management science. 2004 June, v. 60, issue 6 p. 525-530.

AB: Two small creeks, tributaries of the River Ruhr near Schwerte, Federal Republic of Germany, were investigated to reveal the regional agricultural and non-agricultural sources of pesticide inputs and the main pathways to surface water. In addition, the receiving water was monitored for pesticides. The watersheds are situated at the northern margin of the Rhenian Schiefergebirge, a highland landscape in North-Rhine-Westphalia. Solid carboniferous shale is covered by a shallow layer of quaternary unconsolidated rock (porous aquifer thickness <5 m). Occurrence of herbicides such as chlortoluron, isoproturon and terbuthylazine in surface water could be due to their broad agricultural application in regional dominant crops, such as barley, wheat and maize. Occurrence of diuron and glyphosate results from their use in residential settlements and industrial areas as well as from weed control on railway tracks. Atrazine concentrations up to 0.8 microgram litre-1 indicated recent use of this herbicide, which has been banned since 1991, and was also the result of non-agricultural applications. Pathways for pesticide input to the receiving waters were related to both surface run-off and underground passage. Two-thirds of the observed diuron load in the surface water resulted from an input by run-off. This was expected as a result of total herbicide application targets to sealed surfaces infringing current regulations and recommendations. Diuron load varied between 0.6 and 1.2% of the estimated amount applied annually in the investigated catchments.

Non-agricultural pesticide use contributed more than two-thirds of the whole observed pesticide load in the tributaries and at least one-third in the River Ruhr.

Record 34 of 609 - AGRICOLA 1998-2004/09
AU: Tardieu,-D.; Bailly,-J.D.; Benard,-G.; Tran,-T.S.; Guerre,-P.
TI: Toxicity of maize containing known levels of fumonisin B1 during force-feeding of ducks.
SO: Poultry science. 2004 Aug., v. 83, no. 8 p. 1287-1293.
AB: The toxicity of maize containing known doses of fumonisin B1 (FB1) was investigated in mallard ducks during force-feeding. Seventy-five ducks at 12 wk of age were randomly divided into 3 groups of 25, and received control maize, naturally contaminated maize containing 20 mg/kg of FB1, or a mixture of control and contaminated maize (50/50, vol/vol). Force-feeding was performed during 12 d that correspond to a final average feed intake of approximately 10 kg of maize per duck. At the end of the study, 8% mortality was observed in ducks fed 20 mg of FB1/kg of feed, whereas no mortality occurred in the other groups. Liver weight, and plasma concentrations of protein, cholesterol, alanine aminotransferase (ALAT), and lactate dehydrogenase (LDH) were increased by force-feeding, whereas feed conversion ratio appeared decreased by the toxin. Microscopic examination of the liver showed that steatosis was mostly macrovacuolar in control ducks, whereas it was microvacuolar in ducks fed 20 mg of FB1/kg of feed. Free sphingolipid concentrations were measured in liver and plasma. Sphinganine (Sa) and sphinganine to sphingosine (Sa/So) ratio were increased in all treatment groups. These parameters were not affected by force-feeding and all individual values obtained in the treated ducks were higher than those obtained in control ducks. Our results suggest that free Sa level and Sa/So ratio can be used to reveal exposure of ducks to FB1 at doses of 10 mg/kg or greater in feed.

Record 35 of 609 - AGRICOLA 1998-2004/09
AU: Murungu,-F.S.; Chiduza,-C.; Nyamugafata,-P.; Clark,-L.J.; Whalley,-W.R.; Finch-Savage,-W.E.
TI: Effects of 'on-farm seed priming' on consecutive daily sowing occasions on the emergence and growth of maize in semi-arid Zimbabwe.
SO: Field crops research. 2004 Sept. 10, v. 89, issue 1 p. 49-57.

Record 36 of 609 - AGRICOLA 1998-2004/09
AU: Cakir,-R.
TI: Effect of water stress at different development stages on vegetative and reproductive growth of corn.
SO: Field crops research. 2004 Sept. 10, v. 89, issue 1 p. 1-16.

Record 37 of 609 - 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 38 of 609 - 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 39 of 609 - AGRICOLA 1998-2004/09
AU: Li,-S.M.; Li,-L.; Zhang,-F.S.; Tang,-C.
TI: Acid phosphatase role in chickpea/maize intercropping.
SO: Annals of botany. 2004 Aug., v. 94, no. 2 p. 297-303.
AB: Background and aims Organic P comprises 30-80 % of the total P in

most agricultural soils. It has been proven that chickpea facilitates P uptake from an organic P source by intercropped wheat. In this study, acid phosphatase excreted from chickpea roots is quantified and the contribution of acid phosphatase to the facilitation of P uptake by intercropped maize receiving phytate is examined. Methods For the first experiment using hydroponics, maize (Zea mays 'Zhongdan No. 2') and chickpea (Cicer arietinum 'Sona') were grown in either the same or separate containers, and P was supplied as phytate, KH2PO4 at 0.25 mmol P L-1, or not at all. The second experiment involved soil culture with three types of root separation between the two species: (1) plastic sheet, (2) nylon mesh, and (3) no barrier. Maize plants were grown in one compartment and chickpea in the other. Phosphorus was supplied as phytate, Ca(H2PO4)2 at 50 mg P kg-1, or no P added. Key results In the hydroponics study, the total P uptake by intercropped maize supplied with phytate was 2.1-fold greater than when it was grown as a monoculture. In the soil experiment, when supplied with phytate, total P uptake by maize with mesh barrier and without root barrier was 2.2 and 1.5 times, respectively, as much as that with solid barrier. In both experiments, roots of both maize and chickpea supplied with phytate and no P secreted more acid phosphatase than those with KH2PO4 or Ca(H2PO4)2. However, average acid phosphatase activity of chickpea roots supplied with phytate was 2-3-fold as much as maize. Soil acid phosphatase activity in the rhizosphere of chickpea was also significantly higher than maize regardless of P sources. Conclusions Chickpea can mobilize organic P in both hydroponic and soil cultures, leading to an interspecific facilitation in utilization of organic P in maize/chickpea intercropping.

Record 40 of 609 - 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 41 of 609 - AGRICOLA 1998-2004/09

AU: Coleman,-C.E.; Yoho,-P.R.; Escobar,-S.; Ogawa,-M.

TI: The accumulation of alpha-zein in transgenic tobacco endosperm is stabilized by co-expression of beta-zein.

SO: Plant and cell physiology. 2004 July, v. 45, no. 7 p. 864-871.

AB: The cysteine-poor alpha-zein is the major prolamin storage protein fraction in maize endosperm and is localized in the interior of protein bodies with delta-zein, whereas the

hydrophobic cysteine-rich beta- and gamma-zein are found on the exterior of the PB. In transgenic tobacco endosperm expressing zein genes, alpha-zein was unstable unless co-expressed with gamma-zein. Here we showed that alpha-zein was also stabilized by beta-zein. Small accretions of alpha- and beta-zeins, similar in appearance to maize protein bodies, were localized to the endoplasmic reticulum within tobacco endosperm cells. The zein proteins were also localized to protein storage vacuoles in a more dispersed pattern, suggesting that they were transported there after they were post-translationally sequestered into the ER.

Record 42 of 609 - AGRICOLA 1998-2004/09
AU: Cheng,-Z.J.; Hardy,-R.W.
TI: Effects of microbial phytase supplementation in corn distiller's dried grain with solubles on nutrient digestibility and growth performance of rainbow trout, Oncorhynchus mykiss.
SO: Journal of applied aquaculture. 2004, v. 15, no. 3-4 p. 83-100.

Record 43 of 609 - AGRICOLA 1998-2004/09
AU: Stieger,-P.A.; Meyer,-A.D.; Kathmann,-P.; Frundt,-C.; Niederhauser,-I.; Barone,-M.; Kuhlemeier,-C.
TI: The orf13 T-DNA gene of Agrobacterium rhizogenes confers meristematic competence to differentiated cells.
SO: Plant physiology. 2004 July, v. 135, no. 3 p. 1798-1808.
AB: Plant infections by the soil bacterium Agrobacterium rhizogenes result in neoplastic disease with the formation of hairy roots at the site of infection. Expression of a set of oncogenes residing on the stably integrated T-DNA is responsible for the disease symptoms. Besides the rol (root locus) genes, which are essential for the formation of hairy roots, the open reading frame orf13 mediates cytokinin-like effects, suggesting an interaction with hormone signaling pathways. Here we show that ORF13 induced ectopic expression of KNOX (KNOTTED1-like homeobox) class transcription factors, as well as of several genes involved in cell cycle control in tomato (Lycopersicon esculentum). ORF13 has a retinoblastoma (RB)-binding motif and interacted with maize (Zea mays) RB in vitro, whereas ORF13, bearing a point mutation in the RB-binding motif (ORF13*), did not. Increased cell divisions in the vegetative shoot apical meristem and accelerated formation of leaf primordia were observed in plants expressing orf13, whereas the expression of orf13* had no influence on cell division rates in the shoot apical meristem, suggesting a role of RB in the regulation of the cell cycle in meristematic tissues. On the other hand, ectopic expression of LeT6 was not dependent on a functional RB-binding motif. Hormone homeostasis was only altered in explants of leaves, whereas in the root no effects were observed. We suggest that ORF13 confers meristematic competence to cells infected by A. rhizogenes by inducing the expression of KNOX genes and promotes the transition of infected cells from the G1 to the S phase by binding to RB.

Record 44 of 609 - AGRICOLA 1998-2004/09
AU: Lopez-Valenzuela,-J.A.; Gibbon,-B.C.; Holding,-D.R.; Larkins,-B.A.
TI: Cytoskeletal proteins are coordinately increased in maize genotypes with high levels of eEF1A.
SO: Plant physiology. 2004 July, v. 135, no. 3 p. 1784-1797.

AB: The opaque2 (o2) mutation increases the Lys content of maize (Zea mays) endosperm by reducing the synthesis of zein storage proteins and increasing the accumulation of other types of cellular proteins. Elongation factor 1A (eEF1A) is one of these proteins, and its concentration is highly correlated with the amount of other Lys-containing proteins in the endosperm. We investigated the basis for this relationship by comparing patterns of protein accumulation and gene expression between a high (Oh51Ao2) and a low (Oh545o2) eEF1A inbred, as well as between high and low eEF1A recombinant inbred lines obtained from their cross. The content of alpha-zein and several cytoskeletal proteins was measured in high and low eEF1A inbred lines, and the levels of these proteins were found to correlate with that of eEF1A. To extend this analysis, we used an endosperm expressed sequence tag microarray to examine steady-state levels of RNA transcripts in developing endosperm of these genotypes. We identified about 120 genes coordinately regulated in association with eEF1A content. These genes encode proteins involved in several biological structures and processes, including the actin cytoskeleton, the endoplasmic reticulum, and the protein synthesis apparatus. Thus, higher levels of eEF1A in o2 mutants may be related to a more extensive cytoskeletal network surrounding the rough endoplasmic reticulum and increased synthesis of cytoskeleton-associated proteins, all of which contribute significantly to the Lys content of the endosperm.

Record 45 of 609 - AGRICOLA 1998-2004/09

AU: Gallagher,-C.E.; Matthews,-P.D.; Li,-F.; Wurtzel,-E.T.

TI: Gene duplication in the carotenoid biosynthetic pathway preceded evolution of the grasses.

SO: Plant physiology. 2004 July, v. 135, no. 3 p. 1776-1783.

AB: Despite ongoing research on carotenoid biosynthesis in model organisms, there is a paucity of information on pathway regulation operating in the grasses (Poaceae), which include plants of world-wide agronomic importance. As a result, efforts to either breed for or metabolically engineer improvements in carotenoid content or composition in cereal crops have led to unexpected results. In comparison to maize (Zea mays), rice (Oryza sativa) accumulates no endosperm carotenoids, despite having a functional pathway in chloroplasts. To better understand why these two related grasses differ in endosperm carotenoid content, we began to characterize genes encoding phytoene synthase (PSY), since this nuclear-encoded enzyme appeared to catalyze a rate-controlling step in the plastid-localized biosynthetic pathway. The enzyme had been previously associated with the maize Y1 locus thought to be the only functional gene controlling PSY accumulation, though function of the Y1 gene product had never been demonstrated. We show that both maize and rice possess and express products from duplicate PSY genes, PSY1 (Y1) and PSY2; PSY1 transcript accumulation correlates with carotenoid-containing endosperm. Using a heterologous bacterial system, we demonstrate enzyme function of PSY1 and PSY2 that are largely conserved in sequence except for N- and C-terminal domains. By database mining and use of ortholog-specific universal PCR primers, we found that the PSY duplication is prevalent in at least eight subfamilies of the Poaceae, suggesting that this duplication event preceded evolution of the

Poaceae. These findings will impact study of grass phylogeny and breeding of enhanced carotenoid content in an entire taxonomic group of plant crops critical for global food security.

Record 46 of 609 - AGRICOLA 1998-2004/09
AU: Parsons,-R.L.; Luloff,-A.E.; Hanson,-G.D.
TI: Can we identify key characteristics associated with grazing-management dairy systems from survey data.
SO: Journal of dairy science. 2004 Aug., v. 87, no. 8 p. 2748-2760.
AB: Discriminant analysis was used to identify farms using confinement and grazing-production systems from mail survey data of 2074 dairy farmers in Pennsylvania, Vermont, Virginia, and North Carolina. Survey respondents included 45.1% of the farms using confinement management; 13.5% of farms practicing intensive grazing, defined as moving cows to new pasture at least every 3 d; and 41.4% of farms using nonintensive grazing. Farmers using confinement management had significantly more cows, higher milk production, more crop acreage, higher debt, used automatic takeoff milking units (ATO), fed total mixed rations (TMR), and were more satisfied. In general, dairy farmers who grazed their milking cows had smaller herds, fewer acres, but had more acres per cow and made less use of technology. However, farmers practicing intensive grazing were significantly younger, more educated, less experienced, more likely to use computers, and farmed less acreage than other graziers or farmers on confinement farms. The discriminant function correctly classified 70% of the total sample when divided into confinement and overall grazing categories. However, the discriminant function correctly classified only 36% of intensive-grazing farms in comparison to confinement farms. Significant variables identified using ordinary least squares as being related to confinement management were milk per cow, acres of corn, use of ATO and TMR, debt greater than 40%, and residence in North Carolina. Significant variables associated with grazing management were acres of pasture, future use of pasture, education, and residence in Vermont. The analysis indicated that the discriminant function could correctly classify confinement and nonintensive-grazing management but was unable to reliably differentiate between confinement and intensive-grazing farms.

Record 47 of 609 - AGRICOLA 1998-2004/09
AU: Core,-J.
TI: New milling methods improve corn ethanol production.
SO: Agricultural research. 2004 July, v. 52, no. 7 p. 16-17.

Record 48 of 609 - 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 49 of 609 - AGRICOLA 1998-2004/09

AU: Burkholder,-K.M.; Guyton,-A.D.; McKinney,-J.M.; Knowlton,-K.F.

TI: The effect of steam flaked or dry ground corn and supplemental phytic acid on nitrogen partitioning in lactating cows and ammonia emission from manure.

SO: Journal of dairy science. 2004 Aug., v. 87, no. 8 p. 2546-2553.

AB: The effect of starch source and supplemental phytic acid (PA) on N partitioning and excretion and ammonia volatilization from dairy manure was evaluated with 8 midlactation cows. Cows were randomly assigned to treatments in replicated 4 x 4 Latin squares with four 18-d periods. Diets were 61% forage, 25% starch, 17.2% crude protein, and 31% neutral detergent fiber and included dry ground corn (DG) or steam flaked corn (SF) with no supplemental P (L; 0.34% P) or supplemental purified PA (0.45% P) to provide additional P from a non-mineral source. Total collection of milk, urine, and feces was conducted on d 16 to 18 of each period. Cows fed SF had lower dry matter (DM) intakes than those fed DG, which, in addition to increased starch digestibility and ruminal fermentation, contributed to higher DM digestibility. Cows fed SF had reduced feces and urine excretion compared with cows fed DG. Also, N intake for cows fed SF was lower, and N digestibility was higher, compared with cows fed DG; therefore, N excretion in both feces and urine was reduced in these cows. Despite the differences in DM intake, lactation performance was not affected by starch sources. Therefore, the efficiency of N utilization increased with SF. Addition of PA did not affect N intake or utilization. Feces and urine were subsampled from each cow, and wet feces and urine were mixed in sealed chambers in the proportions excreted. Ammonia volatilization was measured for 36 h using acid traps sampled on a planned time course. Nitrogen at time zero (Ao), rate of ammonia emission (k), and residual N (R)

were calculated using the exponential decay model At = Ao e-kt + R. Rate of ammonia loss from mixed feces and urine was lower from cows fed SF than from those fed DG. Altering dietary starch source to improve nutrient digestibility and to reduce N excretion by lactating cows may provide opportunity to reduce ammonia losses from manure.

Record 50 of 609 - AGRICOLA 1998-2004/09

AU: Ebling,-T.L.; Kung,-L.-Jr.

TI: A comparison of processed conventional corn silage to unprocessed and processed brown midrib corn silage on intake, digestion, and milk production by dairy cows.

SO: Journal of dairy science. 2004 Aug., v. 87, no. 8 p. 2519-2536.

AB: We studied the effects of mechanical processing and type of hybrid on the nutritive value of corn silage for lactating cows. Treatments were brown midrib (BMR) corn silage that was unprocessed (U-BMR), BMR corn silage that was processed (P-BMR), and a conventional corn silage that was processed (P-7511). All silages were harvested at a theoretical chop length of 19 mm. The chemical compositions of the silages were similar among treatments except that BMR silages were lower in lignin and higher in protein than P-7511. Brown midrib silages had greater 30-h in situ and in vitro NDF digestion than did P-7511, and processing had no effect on 30-h in situ and in vitro fiber digestion, but it increased in situ starch digestion after 3 and 12 h of incubation. Both processed silages had a smaller proportion of particles >1.91 cm and fewer whole corn kernels compared with unprocessed silage. Lactating cows were fed a total mixed ration (TMR) consisting of 42% of each silage type, 40% concentrate, 10% alfalfa silage, and 8% alfalfa hay (DM basis). Cows fed TMR containing P-BMR ate more DM and produced more milk than cows fed P-7511. At feeding, the TMR containing U-BMR had a larger proportion of particles >1.91 cm when compared with the TMR of cows fed processed silages, and after 24 h the difference was even greater, indicating that cows fed unprocessed corn silage sorted more. Cows fed TMR with P-7511 and P-BMR had greater total tract digestibility of organic matter, crude protein, and starch compared with cows fed U-BMR. In vivo digestibility of neutral detergent fiber was greatest for cows fed P-BMR when compared with the other treatments.

Record 51 of 609 - AGRICOLA 1998-2004/09

AU: Plaizier,-J.C.

TI: Replacing chopped alfalfa hay with alfalfa silage in barley grain and alfalfa-based total mixed rations for lactating dairy cows.

SO: Journal of dairy science. 2004 Aug., v. 87, no. 8 p. 2495-2505.

AB: The effects of replacing chopped alfalfa hay with alfalfa silage in a fine barley grain and alfalfa-based total mixed ration (TMR) were evaluated. Diets contained (dry matter basis) 53.0% commercial energy supplement, 10.3% commercial protein supplement, and 9.7% corn silage. Diets varied in inclusion of chopped alfalfa hay and alfalfa silage, and contained either 20.0% chopped alfalfa hay and 7.0% alfalfa silage, 10.0% chopped alfalfa hay and 17.0% alfalfa silage, or 27.0% alfalfa silage. Contents of crude protein, neutral detergent fiber (NDF), acid detergent fiber, and minerals did not differ among diets. Replacing chopped alfalfa hay with alfalfa silage decreased

dietary dry matter, and increased dietary soluble protein and physical effective NDF calculated as the proportion of dietary NDF retained by the 8- and 19-mm screens of the Penn State Particle Separator (peNDFNDF) from 13.3 to 15.6% DM. Replacing chopped alfalfa hay with alfalfa silage did not affect dry matter intake, rumen pH, rumen volatile fatty acids, blood lactate, milk fat, and milk protein percentage, but did decrease blood glucose, tended to increase blood urea, and numerically decreased milk yield and milk protein yield. A wider range in peNDFNDF and a higher inclusion of corn silage might have resulted in greater differences in rumen fermentation and milk production among diets. The pH of rumen fluid samples collected 4 h after feeding varied from 5.90 to 5.98, and milk fat percentage varied from 2.50 to 2.60% among diets. These values suggest that mild subacute ruminal acidosis was induced by all diets.

Record 52 of 609 - 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 53 of 609 - AGRICOLA 1998-2004/09

AU: Kolliker-Ott,-U.M.; Bigler,-F.; Hoffmann,-A.A.

TI: Field dispersal and host location of Trichogramma brassicae is influenced by wing size but not wing shape.

SO: Biological control theory and applications in pest management.

2004 Sept., v. 31, no. 1 p. 1-10.

AB: This study evaluates if wing size and wing shape could be used to predict the dispersal and host location of mass reared Trichogramma egg parasitoids in the field. Commercially produced Trichogramma brassicae wasps were released in a corn field and recaptured on Ostrinia nubilalis egg cards. The effects of distance from the release point and day since release on wing size and shape of recaptured wasps were evaluated. Wing size of wasps had an impact on recapture probability, but this association was complicated by the fact that wing size effects changed with distance from the release point and time since release. Wing size increased with recapture distance from the release point on both recapture days. However, wasps recaptured on the day of the release had larger wings than those recaptured on the next day, while wasp wings of the release sample were on average of intermediate size. One possible explanation of this pattern is that wasps with larger wings moved out of the experimental area by the end of the release day, leaving behind only wasps with smaller wings to be recaptured on the next day. Unlike in an earlier study, no effect of wing shape on field fitness was detected, although rearing host may affect wing shape. Because wing size is related not only to the host location ability but also to the recapture distance and time of T. brassicae wasps in the field, this effect must be accounted for in the sampling design employed when using this proxy as a measure of field fitness. As wing size influences dispersal and host location in the field, it may be a valuable parameter in quality assessments of mass reared Trichogramma wasps.

Record 54 of 609 - AGRICOLA 1998-2004/09

AU: Ge,-L.; Chen,-H.; Jiang,-J.F.; Zhao,-Y.; Xu,-M.L.; Xu,-Y.Y.; Tan,-K.H.; Xu,-Z.H.; Chong,-K.

TI: Overexpression of OsRAA1 causes pleiotropic phenotypes in transgenic rice plants, including altered leaf, flower, and root development and root response to gravity.

SO: Plant physiology. 2004 July, v. 135, no. 3 p. 1502-1513.

AB: There are very few root genes that have been described in rice as a monocotyledonous model plant so far. Here, the OsRAA1 (Oryza sativa Root Architecture Associated 1) gene has been characterized molecularly. OsRAA1 encodes a 12.0-kD protein that has 58% homology to the AtFPF1 (Flowering Promoting Factor 1) in Arabidopsis, which has not been reported as modulating root development yet. Data of in situ hybridization and OsRAA1::GUS transgenic plant showed that OsRAA1 expressed specifically in the apical meristem, the elongation zone of root tip, steles of the branch zone, and the young lateral root. Constitutive expression of OsRAA1 under the control of maize (Zea mays) ubiquitin promoter resulted in phenotypes of reduced growth of primary root, increased number of adventitious roots and helix primary root, and delayed gravitropic response of roots in seedlings of rice (Oryza sativa), which are similar to the phenotypes of the wild-type plant treated with auxin. With overexpression of OsRAA1, initiation and growth of adventitious root were more sensitive to treatment of auxin than those of the control plants, while their responses to 9-hydroxyfluorene-9-carboxylic acid in both transgenic line and wild type showed similar results. OsRAA1 constitutive expression also caused longer leaves and sterile

florets at the last stage of plant development. Analysis of northern blot and GUS activity staining of OsRAA1::GUS transgenic plants demonstrated that the OsRAA1 expression was induced by auxin. At the same time, overexpression of OsRAA1 also caused endogenous indole-3-acetic acid to increase. These data suggested that OsRAA1 as a new gene functions in the development of rice root systems, which are mediated by auxin. A positive feedback regulation mechanism of OsRAA1 to indole-3-acetic acid metabolism may be involved in rice root development in nature.

Record 55 of 609 - 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 56 of 609 - AGRICOLA 1998-2004/09
AU: Wang,-F.; Du,-G.; Li,-Y.; Chen,-J.
TI: Optimization of cultivation conditions for the production of gamma-cyclodextrin glucanotransferase by Bacillus macorous.
SO: Food biotechnology. 2004 July, v. 18, no. 2 p. 251-264.
AB: The production of gamma-cyclodextrin glucanotransferase (gamma-CGTase) from Bacillus macorous WSH02-06 was optimized in shake flasks using conventional sequential techniques and statistical experimental design. Effects of nutrients including carbon and nitrogen sources, cation ions, initial pH, and temperature on gamma-CGTase production were investigated. Corn starch, peptone, Mn2+, and Zn2+ were found to be essential for obtaining high gamma-CGTase activity and biomass. The promoting effect of manganese and zinc on enzyme production has not been reported previously. According to the results of orthogonal array experiment, the optimal culture medium for high gamma-CGTase activity was determined. Maximal gamma-CGTase activity obtained in the optimized culture broth was about 250 U/mL which was 10-fold higher than that obtained in the basal medium. Time course of cell growth and gamma-CGTase production in a 7 l fermenter showed that enzyme production was growth associated, and that maximum gamma-CGTase activity reached 277 U/mL in 17 h.

Record 57 of 609 - AGRICOLA 1998-2004/09
AU: Quero,-C.; Bau,-J.; Guerrero,-A.; Renou,-M.
TI: Responses of the olfactory receptor neurons of the corn stalk borer Sesamia nonagrioides to components of the pheromone blend and their inhibition by a trifluoromethyl ketone analogue of the main component.
SO: Pest management science. 2004 July, v. 60, issue 7 p. 719-726.
AB: Two types of olfactory hairs and three types of olfactory receptor neurons (ORN) have been characterized on the antennae of male Sesamia nonagrioides Lef for the first time. Type A sensilla housed a cell which fired large spikes in response to (Z)-11-hexadecenyl acetate (Z11-16:Ac), the major component of the sex pheromone, and a second cell firing smaller spikes in response to (Z)-11-hexadecenal (Z11-16:Ald), a minor component of the pheromone blend. Type B sensilla housed one cell firing large spikes to Z11-16:Ac and a cell firing smaller spikes to another minor component of the pheromone blend, (Z)-11-hexadecenyl

alcohol (Z11-16:OH). No cell responding to dodecyl acetate, another minor component of the natural extract, was found. Fluorinated ketones were tested as inhibitors of the cell responses to pheromone compounds. The fluorinated derivatives tested, (Z)-11-hexadecenyl trifluoromethyl ketone (Z11-16:TFMK), n-hexadecyl trifluoromethyl ketone (16:TFMK), (Z,E)-9,11-tetradecadienyl trifluoromethyl ketone (Z9,E11-14:TFMK), 3-octylthio-1,1,1-trifluoropropan-2-one (OTFP), (Z)-11-tetradecenyl trifluoromethyl ketone (Z11-14:TFMK) and 1,1-difluoro-(Z)-11-hexadecenyl methyl ketone (Z11-16:DFMK), had no or only weak excitatory effects. However, the neuron responses to the pheromone compounds were significantly decreased in the presence of a constant stimulation with Z11-16:TFMK and the effect was reversible. The latencies of the responses to the acetate and aldehyde cells were significantly increased. The effects were not specific, since Z11-16:TFMK also inhibited the responses of the ORNs of Spodoptera littoralis Boisd. Correspondingly, Z9,E11-14:TFMK, an analogue of the main component of the pheromone of this latter insect, inhibited responses of S nonagrioides ORNs. Implications of these results on the utilization of Z11-16:TFMK as a communication disruptant are discussed.

Record 58 of 609 - AGRICOLA 1998-2004/09

AU: Ruhland,-M.; Engelhardt,-G.; Pawlizki,-K.

TI: Distribution and metabolism of D/L-, L- and D-glufosinate in transgenic, glufosinate-tolerant crops of maize (Zea mays L ssp mays) and oilseed rape (Brassica napus L var napus).

SO: Pest management science. 2004 July, v. 60, issue 7 p. 691-696.

AB: The aim of the present study was to determine whether post-emergence application of glufosinate to transgenic crops could lead to an increase in residues or to the formation of new, hitherto unknown metabolites. Transgenic oilseed rape and maize plants were treated separately with L-glufosinate, D-glufosinate or the racemic mixture. Whereas about 90% of the applied D-glufosinate was washed off by rain and only 5-6% was metabolised, 13-35% of the applied L-glufosinate remained in the form of metabolites and unchanged herbicide in both transgenic maize and oilseed rape. The main metabolite was N-acetyl-L-glufosinate with total residues of 91% in oilseed rape and 67% in maize, together with small amounts, of 5% in oilseed rape and 28% in maize, of different methylphosphinyl fatty acids. These metabolites were probably formed from L-glufosinate by deamination and subsequent decarboxylation. The residues were distributed in all fractions of the plants, with the highest contents in treated leaves and the lowest in the grains (0.07-0.3% in maize and 0.4-0.6% in oilseed rape). There was no indication of an accumulation of total residues or of residue levels above the official tolerances for glufosinate.

Record 59 of 609 - AGRICOLA 1998-2004/09

AU: Hofius,-D.; Hajirezaei,-M.R.; Geiger,-M.; Tschiersch,-H.; Melzer,-M.; Sonnewald,-U.

TI: RNAi-mediated tocopherol deficiency impairs photoassimilate export in transgenic potato plants.

SO: Plant physiology. 2004 July, v. 135, no. 3 p. 1256-1268.

AB: Tocopherols (vitamin E) are lipophilic antioxidants presumed to

play a key role in protecting chloroplast membranes and the photosynthetic apparatus from photooxidative damage. Additional nonantioxidant functions of tocopherols have been proposed after the recent finding that the Suc export defective1 maize (Zea mays) mutant (sxd1) carries a defect in tocopherol cyclase (TC) and thus is devoid of tocopherols. However, the corresponding vitamin E deficient1 Arabidopsis mutant (vte1) lacks a phenotype analogous to sxd1, suggesting differences in tocopherol function between C4 and C3 plants. Therefore, in this study, the potato (Solanum tuberosum) ortholog of SXD1 was isolated and functionally characterized. StSXD1 encoded a protein with high TC activity in vitro, and chloroplastic localization was demonstrated by transient expression of green fluorescent protein-tagged fusion constructs. RNAi-mediated silencing of StSXD1 in transgenic potato plants resulted in the disruption of TC activity and severe tocopherol deficiency similar to the orthologous sxd1 and vte1 mutants. The nearly complete absence of tocopherols caused a characteristic photoassimilate export-defective phenotype comparable to sxd1, which appeared to be a consequence of vascular-specific callose deposition observed in source leaves. CO2 assimilation rates and photosynthetic gene expression were decreased in source leaves in close correlation with excess sugar accumulation, suggesting a carbohydrate-mediated feedback inhibition rather than a direct impact of tocopherol deficiency on photosynthetic capacity. This conclusion is further supported by an increased photosynthetic capacity of young leaves regardless of decreased tocopherol levels. Our data provide evidence that tocopherol deficiency leads to impaired photoassimilate export from source leaves in both monocot and dicot plant species and suggest significant differences among C3 plants in response to tocopherol reduction.

Record 60 of 609 - AGRICOLA 1998-2004/09
AU: Andrews,-D.L.; Garcia-Pedrajas,-M.D.; Gold,-S.E.
TI: Fungal dimorphism regulated gene expression in Ustilago maydis. I. Filament up-regulated genes.
SO: Molecular plant pathology. 2004 July, v. 5, issue 4 p. 281-293.

Record 61 of 609 - AGRICOLA 1998-2004/09
AU: Bergvinson,-D.; Garcia-Lara,-S.
TI: Genetic approaches to reducing losses of stored grain to insects and diseases.
SO: Current opinion in plant biology. 2004 Aug., v. 7, no. 4 p. 480-485.

Record 62 of 609 - AGRICOLA 1998-2004/09
AU: Azevedo,-R.A.; Lea,-P.J.; Damerval,-C.; Landry,-J.; Bellato,-C.M.; Meinhardt,-L.W.; Le-Guilloux,-M.; Delhaye,-S.; Varisi,-V.A.; Gaziola,-S.A.
TI: Regulation of lysine metabolism and endosperm protein synthesis by the Opaque-5 and Opaque-7 maize mutations.
SO: Journal of agricultural and food chemistry. 2004 July 28, v. 52, no. 15 p. 4865-4871.
AB: Two high lysine maize endosperm mutations, opaque-5 (o5) and opaque-7 (o7), were biochemically characterized for endosperm protein synthesis and lysine metabolism in immature seeds. Albumins, globulins, and glutelins, which have a high content of

lysine, were shown to be increased in the mutants, whereas zeins, which contain trace concentrations of lysine, were reduced in relation to the wild-type lines B77xB79+ and B37+. These alterations in the storage protein fraction distribution possibly explain the increased concentration of lysine in the two mutants. Using two-dimensional polyacrylamide gel electrophoresis of proteins of mature grains, variable amounts of zein polypeptides were detected and considerable differences were noted between the four lines studied. The analysis of the enzymes involved in lysine metabolism indicated that both mutants have reduced lysine catabolism when compared to their respective wild types, thus allowing more lysine to be available for storage protein synthesis.

Record 63 of 609 - AGRICOLA 1998-2004/09
AU: Lid,-S.E.; Meeley,-R.B.; Min,-Z.; Nichols,-S.; Olsen,-O.A.
TI: Knock-out mutants of two members of the AGL2 subfamily of MADS-box genes expressed during maize kernel development.
SO: Plant science. 2004 Sept., v. 167, issue 3 p. 575-582.

Record 64 of 609 - AGRICOLA 1998-2004/09
AU: Ferguson,-L.M.; Carson,-M.L.
TI: Spatial diversity of Setosphaeria turcica sampled from the eastern United States.
SO: Phytopathology. 2004 Aug., v. 94, no. 8 p. 892-900.
AB: Randomly amplified polymorphic DNA (RAPD) markers and mating type were used to examine regional population structure of Setosphaeria turcica in the eastern United States. Of 251 maize-infecting isolates studied, 155 multilocus haplotypes were identified using 21 RAPD markers. Twelve isolates of the most common haplotype were identified from seven states and represented 5.2% of the sample. Although variation in genetic diversity was greatest within states rather than between either regions or states within regions, multidimensional scaling based on average taxonomic distances among state samples showed a close association of samples from IL, OH, IN, IA, MN, MI/WI, and NC. Isolates from GA/SC, VA/TN, PA/NY, and FL were distant from this core group that included midwestern states and NC and were distinct from one another. The high genotypic diversity, near equal mating type frequencies, and gametic phase equilibrium in samples from several states are inconsistent with a strictly clonal population. The population genetic structure of S. turcica is likely the result of both asexual and sexual reproduction. It is not clear whether sexual recombination actually occurs in the eastern United States or occurs elsewhere in tropical America and recombinant genotypes migrate to North America.

Record 65 of 609 - AGRICOLA 1998-2004/09
AU: Carson,-M.L.; Stuber,-C.W.; Senior,-M.L.
TI: Identification and mapping of quantitative trait loci conditioning resistance to southern leaf blight of maize caused by Cochliobolus heterostrophus race O.
SO: Phytopathology. 2004 Aug., v. 94, no. 8 p. 862-867.
AB: A random set of recombinant inbred (RI) lines (F2:7) derived from the cross of the inbred lines Mo17 (resistant) and B73 (susceptible) were evaluated for resistance to southern leaf blight (SLB) caused by Cochliobolus heterostrophus race O. The RI

lines were genotyped at a total of 234 simple sequence repeat, restriction fragment length polymorphism, or isozyme loci. Field plots of the RI lines were inoculated artificially with an aggressive isolate of C. heterostrophus race O in each of two growing seasons in North Carolina. Lines were rated for percent SLB severity two (1996) or three (1995) times during the grain-filling period. Data also were converted to area under the disease progress curve (AUDPC) and analyzed using the composite interval mapping option of the PLABQTL program. When means of disease ratings over years were fitted to models, a total of 11 quantitative trait loci (QTLs) were found to condition resistance to SLB, depending upon which disease ratings were used in the analyses. When the AUDPC data were combined and analyzed over environments, seven QTLs, on chromosomes 1, 2, 3, 4, 7, and 10 were found to come from the resistant parent Mo17. An additional QTL for resistance on chromosome 1 came from the susceptible parent B73. The eight identified QTLs accounted for 46% of the phenotypic variation for resistance. QTL x environment interactions often were highly significant but, with one exception, were the result of differences in the magnitude of QTL effects between years and not due to changes in direction of effects. QTLs on the long arm of chromosome 1 and chromosomes 2 and 3 had the largest effects, were the most consistently detected, and accounted for most of the phenotypic variance. No significant additive x additive epistatic effects were detected. These data support earlier reports of the polygenic inheritance of resistance to SLB of maize.

Record 66 of 609 - AGRICOLA 1998-2004/09

AU: Chen,-L.M.; Li,-K.Z.; Miwa,-T.; Izui,-K.

TI: Overexpression of a cyanobacterial phosphoenolpyruvate carboxylase with diminished sensitivity to feedback inhibition in Arabidopsis changes amino acid metabolism.

SO: Planta. 2004 July, v. 219, no. 3 p. 440-449.

AB: Phosphoenolpyruvate carboxylase (EC 4.1.1.31) from Synechococcus vulcanus (SvPEPC) is a unique enzyme, being almost insensitive to feedback inhibition at neutral pH. In order to assess its usefulness in metabolic engineering of plants, SvPEPC was expressed in Arabidopsis thaliana (L.) Heynh. under the control of the cauliflower mosaic virus 35S promoter. About one-third of the transformants of the T1 generation showed severe visible phenotypes such as leaf bleaching and were infertile when grown on soil. However, no such phenotype was observed with Arabidopsis transformed with Zea mays L. PEPC (ZmPEPC) for C4 photosynthesis, which is normally sensitive to a feedback inhibitor, l-malate. For the SvPEPC transformants of the T2 generation, which had been derived from fertile T1 transformants, three kinds of phenotype were observed when plants were grown on an agar medium containing sucrose: Type-I plants showed poor growth and a block in true leaf development; Type-II plants produced a few true leaves, which were partially bleached; Type-III plants were apparently normal. In Type-I plants, total PEPC activity was increased about 2-fold over the control plant but there was no such increase in Type-III plants. The phenotypes of Type-I plants were rescued when the sucrose-containing agar medium was supplemented with aromatic amino acids. Measurement of the free amino acid content in whole seedlings of Type-I transformants revealed that the

levels of the aromatic amino acids Phe and Tyr were lowered significantly as compared with the control plants. In contrast, the levels of several amino acids of the aspartic and glutamic families, such as Asn, Gln and Arg, were markedly enhanced (4- to 8-fold per plant fresh weight). However, when the medium was supplemented with aromatic amino acids, the levels of Asn, Gln, and Arg decreased to levels slightly higher than those of control plants, accompanied by growth recovery. Taken together, it can be envisaged that SvPEPC is capable of efficiently exerting its activity in the plant cell environment so as to cause imbalance between aromatic and non-aromatic amino acid syntheses. The growth inhibition of Type-I plants was presumed to be primarily due to a decreased availability of phosphoenolpyruvate, one of the precursors for the shikimate pathway for the synthesis of aromatic amino acids and phenylpropanoids. The possible usefulness of SvPEPC as one of the key components for installing the C4-like pathway is proposed.

Record 67 of 609 - AGRICOLA 1998-2004/09
AU: Hernandez,-M.; Duplan,-M.N.; Berthier,-G.; Vaitilingom,-M.; Hauser,-W.; Freyer,-R.; Pla,-M.; Bertheau,-Y.
TI: Development and comparison of four real-time polymerase chain reaction systems for specific detection and quantification of Zea mays L.
SO: Journal of agricultural and food chemistry. 2004 July 28, v. 52, no. 15 p. 4632-4637.
AB: Four real-time polymerase chain reaction systems aiming at the specific detection and quantification of maize DNA are described. They have been developed in four independent laboratories targeting different maize sequences, i.e., alcohol dehydrogenase (Adh1), high mobility group protein (hmga), invertase A (ivr1), and zein, respectively. They were all fully specific, showing a very similar quantification accuracy along a number of distantly related maize cultivars and being either single or low copy number genes. They were highly sensitive and exhibited limits of quantification below 100 maize genomic copies. In consequence, they are considered suitable for use as maize specific endogenous reference genes in DNA analyses, including GMO quantitative tests.

Record 68 of 609 - AGRICOLA 1998-2004/09
AU: Prutz,-G.; Dettner,-K.
TI: Effect of Bt corn leaf suspension on food consumption by Chilo partellus and life history parameters of its parasitoid Cotesia flavipes under laboratory conditions.
SO: Entomologia experimentalis et applicata. 2004 June, v. 111, issue 3 p. 179-187.

Record 69 of 609 - AGRICOLA 1998-2004/09
AU: Ellsbury,-M.M.; Lee,-R.E.-Jr.
TI: Supercooling and cold-hardiness in eggs of western and northern corn rootworms.
SO: Entomologia experimentalis et applicata. 2004 June, v. 111, issue 3 p. 159-163.

Record 70 of 609 - AGRICOLA 1998-2004/09
AU: Wanjura,-D.F.; Maas,-S.J.; Winslow,-J.C.; Upchurch,-D.R.

TI: Scanned and spot measured canopy temperatures of cotton and corn.
SO: Computers and electronics in agriculture. 2004 July, v. 44, issue 1 p. 33-48.

Record 71 of 609 - AGRICOLA 1998-2004/09
AU: Koike,-S.; Inoue,-H.; Mizuno,-D.; Takahashi,-M.; Nakanishi,-H.; Mori,-S.; Nishizawa,-N.K.
TI: OsYSL2 is a rice metal-nicotianamine transporter that is regulated by iron and expressed in the phloem.
SO: Plant journal. 2004 Aug., v. 39, no. 3 p. 415-424.
AB: We identified 18 putative yellow stripe 1 (YS1)-like genes (OsYSLs) in the rice genome that exhibited 36-76% sequence similarity to maize iron(III)-phytosiderophore transporter YS1. Of particular interest was OsYSL2, the transcripts of which were not detected in the roots of either iron-sufficient or iron-deficient plants, but dramatic expression was induced in the leaves by iron deficiency. Based on the nucleotide sequence, OsYSL2 was predicted to encode a polypeptide of 674 amino acids containing 14 putative transmembrane domains. OsYSL2:green fluorescent protein (GFP) was localized in the plasma membrane of onion epidermal cells. Promoter:beta-glucuronidase (GUS) analysis revealed that OsYSL2 was expressed in companion cells in iron-sufficient roots. GUS activity was increased in companion cells, but no GUS staining was observed in epidermal or cortex cells, even in iron-deficient roots. In the leaves and leaf sheaths of iron-sufficient rice, GUS staining was observed in phloem cells of the vascular bundles. In iron-deficient leaves, the OsYSL2 promoter was active in all tissues with particularly strong GUS activity evident in companion cells. The phloem-specific expression of the OsYSL2 promoter suggests that OsYSL2 is involved in the phloem transport of iron. Strong OsYSL2 promoter activity was also detected in developing seeds. Electrophysiological measurements using Xenopus laevis oocytes showed that OsYSL2 transported iron(II)-nicotianamine (NA) and manganese(II)-NA, but did not transport iron(III)-phyosiderophore. These results suggest that OsYSL2 is a rice metal-NA transporter that is responsible for the phloem transport of iron and manganese, including the translocation of iron and manganese into the grain.

Record 72 of 609 - AGRICOLA 1998-2004/09
AU: DiDonato,-R.J.-Jr.; Roberts,-L.A.; Sanderson,-T.; Eisley,-R.B.; Walker,-E.L.
TI: Arabidopsis Yellow Stripe-Like2 (YSL2): a metal-regulated gene encoding a plasma membrane transporter of nicotianamine-metal complexes.
SO: Plant journal. 2004 Aug., v. 39, no. 3 p. 403-414.
AB: The Yellow Stripe-Like (YSL) family of proteins has been identified based on sequence similarity to maize Yellow Stripe1 (YS1), the transporter responsible for the primary uptake of iron from the soil. YS1 transports iron that is complexed by specific plant-derived Fe(III) chelators called phytosiderophores (PS). Non-grass species of plants neither make nor use PS, yet YSL family members are found in non-grass species (monocot, dicot, gymnosperm, and moss species) including Arabidopsis thaliana. YSLs in non-grasses have been hypothesized to transport metals complexed by nicotianamine (NA), an iron chelator that is

structurally similar to PS and which is found in all higher plants. Here we show that Arabidopsis YSL2 (At5g24380) transports iron and copper when these metals are chelated by NA. YSL2 is expressed in many cell types in both roots and shoots, suggesting that diverse cell types obtain metals as metal-NA complexes. YSL2 transcription is regulated by the levels of iron and copper in the growth medium. Based on its expression pattern, a major function of the YSL2 appears to be in the lateral movement of metals in the vasculature.

Record 73 of 609 - AGRICOLA 1998-2004/09
AU: Phister,-T.G.; O'Sullivan,-D.J.; McKay,-L.L.
TI: Identification of bacilysin, chlorotetaine, and iturn A produced by Bacillus sp. strain CS93 isolated from pozol, a Mexican fermented maize dough.
SO: Applied and environmental microbiology. 2004 Jan., v. 70, no. 1 p. 631-634.
AB: Three antimicrobial compounds produced by Bacillus sp. strain CS93 isolated from pozol were identified by using high-performance liquid chromatography and mass spectrometry. The three compounds were iturin, bacilysin, and chlorotetaine. Production of these compounds by CS93 could account for the medicinal properties attributed to pozol.

Record 74 of 609 - AGRICOLA 1998-2004/09
AU: Al-Kaisi,-M.; Licht,-M.A.
TI: Effect of strip tilage on corn nitrogen uptake and residual soil nitrate accumulation compared with no-tillage and chisel plow.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1164-1171.

Record 75 of 609 - AGRICOLA 1998-2004/09
AU: Reinbott,-T.M.; Conley,-S.P.; Blevins,-D.G.
TI: No-tillage corn and grain sorghum response to cover crop and nitrogen fertilization.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1158-1163.

Record 76 of 609 - AGRICOLA 1998-2004/09
AU: Vina,-A.; Gitelson,-A.A.; Rundquist,-D.C.; Keydan,-G.; Leavitt,-B. ; Schepers,-J.
TI: Monitoring maize (Zea mays L.) phenology with remote sensing.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1139-1147.

Record 77 of 609 - AGRICOLA 1998-2004/09
AU: Herrmann,-A.; Taube,-F.
TI: The range of the critical dilution curve for maize (Zea mays L.) can be extended until silage maturity.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1131-1138.

Record 78 of 609 - AGRICOLA 1998-2004/09
AU: Wiatrak,-P.J.; Wright,-D.L.; Marois,-J.J.; Sprenkel,-R.
TI: Corn hybrids for late planting in the Southeast.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1118-1124.

Record 79 of 609 - AGRICOLA 1998-2004/09
AU: Duiker,-S.W.; Hartwig,-N.L.
TI: Living mulches of legumes in imidazolinone-resistant corn.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 1021-1028.

Record 80 of 609 - AGRICOLA 1998-2004/09
AU: Rashid,-M.T.; Voroney,-R.P.
TI: Land application of oily food waste and corn production on amended soils.
SO: Agronomy journal. 2004 July-Aug, v. 96, no. 4 p. 997-1004.

Record 81 of 609 - AGRICOLA 1998-2004/09
AU: Appleton,-D.J.; Rand,-J.S.; Priest,-J.; Sunvold,-G.D.; Vickers,-J. R.
TI: Dietary carbohydrate source affects glucose concentrations, insulin secretion, and food intake in overweight cats.
SO: Nutrition research. 2004 June, v. 24, no. 6 p. 447-467.
AB: This study was undertaken to assess the impact of dietary carbohydrate source on food intake, body composition, glucose tolerance, insulin sensitivity, and glucose and insulin concentrations in overweight and obese cats with reduced insulin sensitivity. Sixteen overweight and obese cats were divided into two groups and randomly allocated one of two extruded diets formulated to contain similar starch content (33%) from different cereal sources (sorghum and corn versus rice). Meal response, glucose tolerance and insulin sensitivity tests were performed before and after a 6-week weight-maintenance phase and after an additional 8-week free-access feeding phase. Dual energy x-ray absorptiometry (DEXA)Æderived body composition was determined in each cat before the study and after each test phase. Food intake was measured daily and body weight measured twice weekly for the duration of the study. When compared with the sorghum/corn-based diet, cats fed the rice-based diet consumed more energy and gained more weight in response to free-access feeding. Cats fed the rice-based diet also tended to have higher glucose concentrations and insulin secretion in response to a glucose load or a test meal. We conclude that a sorghum and corn blend is a superior carbohydrate source than rice for overweight cats with glucose intolerance and reduced insulin sensitivity. Such a diet may help to minimize overeating and additional weight gain, and may also reduce the risk of developing type 2 diabetes mellitus.

Record 82 of 609 - AGRICOLA 1998-2004/09
AU: McLaughlin,-J.E.; Boyer,-J.S.
TI: Glucose localization in maize ovaries when kernel number decreases at low water potential and sucrose is fed to the stems.
SO: Annals of botany. 2004 July, v. 94, no. 1 p. 75-86.
AB: Background and Aims Around the time of anthesis, young ovary development in maize (Zea mays) is vulnerable to 2 or 3 d of water deficits that inhibit photosynthesis. Abortion can result, and fewer kernels are produced. A breakdown of stored ovary starch is associated with the abortion and was investigated in the present study by localizing the breakdown product glucose in the ovaries. Methods Ovary glucose was localized with fluorescent Resorufin. Insoluble invertase was localized in vivo and soluble invertase in situ. Sucrose was infused into the stems to vary the sugar flux to the ovaries. Key Results At high water potential (high psiw), photosynthesis was rapid in the parent. The upper pedicel of the ovaries had a high activity of insoluble acid invertase and a large amount of glucose and starch. Because the invertase was wall-bound, sucrose hydrolysis appeared to occur in

the pedicel apoplast. Soluble invertase was undetected inside the pedicel cells but was present in the nucellus cells where low concentrations of glucose occurred. This created a glucose gradient between pedicel and nucellus that favoured glucose uptake by the developing ovary. At low psiw, photosynthesis was inhibited, pedicel glucose and starch were depleted, the glucose gradient became negligible, and abortion occurred. When sucrose was fed, glucose, starch and the glucose gradient were maintained somewhat and were normally distributed in the ovaries. Abortion was diminished. Conclusions The apoplast hydrolysis of sucrose unloaded from phloem is similar to that described by others during later development when embryo and endosperm are present and separated from the parent by an apoplast. The disappearance of the glucose gradient at low psiw may have inhibited glucose movement into the ovary. The low glucose in the ovaries may have a role in the abortion response.

Record 83 of 609 - 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 84 of 609 - AGRICOLA 1998-2004/09

AU: Chintu,-R.; Mafongoya,-P.L.; Chirwa,-T.S.; Kuntashula,-E.; Phiri,-D.; Matibini,-J.

TI: Propagation and management of Gliricidia sepium planted fallows in sub-humid eastern Zambia.

SO: Experimental agriculture. 2004 July, v. 40, no. 3 p. 341-352.

AB: Gliricidia sepium features prominently as a soil replenishment tree in planted coppicing fallows in eastern Zambia. Its usual method of propagation, through nursery seedlings, is costly and may possibly hinder wider on-farm adoption. We compared fallows propagated by potted and bare root seedlings, direct seeding and stem cuttings, in terms of tree coppice biomass production, soil inorganic N availability and post-fallow maize yields under semi-arid conditions. We hypothesized that cutting fallows initially in May (off-season) would increase subsequent seasonal coppice biomass production as opposed to cutting them in November (at cropping). The tree survival and biomass order after two years was: potted = bare root > direct > cuttings. The post-fallow maize productivity sequence was: fertilized maize = potted = bare root > direct > cuttings = no-tree unfertilized controls, across seasons. However, farmers may prefer directly seeded fallows owing to their cost effectiveness. Soil inorganic N and maize yield were significantly higher in May-cut than in November-cut fallows. Preseason topsoil inorganic N and biomass N input correlated highly with maize yields. This implies that bothparameters may be used to predict post-fallow crop yields.

Record 85 of 609 - AGRICOLA 1998-2004/09

AU: Chintu,-R.; Mafongoya,-P.L.; Chirwa,-T.S.; Mwale,-M.; Matibini,-J.

TI: Subsoil nitrogen dynamics as affected by planted coppicing tree legume fallows in eastern Zambia.

SO: Experimental agriculture. 2004 July, v. 40, no. 3 p. 327-340.

AB: Nitrogen (N) is a major nutrient that limits crop production in southern Africa. We hypothesized that coppicing tree legumes, which are integrated in cropping systems, would intercept leaching nutrients and could also increase topsoil N in nutrient-depleted soils. This hypothesis was verified in three ongoing experiments at Msekera (experiments 1 and 2) and Kagoro (experiment 3) in Zambia. Planted tree fallows of Gliricidia sepium, Leucaena leucocephala, Acacia angustisma, and Sesbania sesban were compared with natural fallows and with continuous maize cropping with or without fertilizer (no-tree) controls. Top and subsoil samples were taken in the tree treatments and in the no-tree controls to establish short and long-term tree effects on soil N dynamics. 15N was introduced at various soil depths down to 2 m to determine the vertical root-reach of coppicing trees. Samples taken on two different dates showed that planted trees are capable of capturing subsoil N. The amounts retrieved by trees in experiment 2 did not vary with depth or dates except for A. angustisma which retrieved more N from the top 0.20 m than from the subsoil. L. leucocephala and G. sepium had similar characteristics in terms of coppice biomass production and N content, and both species rooted to at least 2 m. G. sepium in a mixture with S. sesban, retrieved more applied N than when planted alone, implying that mixed fallows may be effective in resource capture. There was more inorganic-N in the topsoil of coppiced fallows was significantly higher than in unfertilized

maize plots. Subsoil N accumulation was evident under fertilized maize plots. There was less subsoil nitrate-N beneath planted trees than beneath mono-cropped maize plots indicating that trees probably retrieved subsoil N. Maize yields subsequent to coppicing tree fallows were at least 170% higher than unfertilized controls indicating improved soil fertility status in the tree systems.

Record 86 of 609 - AGRICOLA 1998-2004/09

AU: Emechebe,-A.M.; Ellis-Jones,-J.; Schulz,-S.; Chikoye,-D.; Douthwaite,-B.; Kureh,-I.; Tarawali,-G.; Hussaini,-M.A.; Kormawa,-P.; Sanni,-A.

TI: Farmers' perception of the Striga problem and its control in northern Nigeria.

SO: Experimental agriculture. 2004 Apr., v. 40, no. 2 p. 215-232.

AB: The parasitic angiosperms, Striga hermonthica and S. gesnerioides, obligate root parasites endemic in sub-Saharan Africa, constitute severe constraints to cereal and legume production in West and Central Africa. Over the years, a range of effective component technologies has been identified for Striga control in Africa. The potential of these technologies has been demonstrated under researcher-managed conditions. To promote farmer testing of the technologies, community workshops were conducted in 42 rural communities in Kaduna State, northern Nigeria. These revealed that agriculture was the main source of livelihood for most households. The three most important crops, maize, sorghum and pearl millet are attacked by S. hermonthica, regarded as the major constraint to crop production, often causing 70-100% crop loss. Farmers recognised two types of Striga damage (underground and aboveground), with greater damage being caused by underground Striga. Farmers attributed increasing incidence and severity of Striga damage to lack of capital, poor soil fertility, infestation of previously uninfested land by Striga seeds, and continuous cropping of host crops. The most widely used among the 15 existing Striga control techniques identified by the farmers were hoe weeding and hand pulling, application of inorganic fertilizer and manure, crop rotations, fallowing, and early planting. In assessing possible control measures farmers considered increased crop yield, reduced Striga reproduction and Striga emergence, greater crop vigour, and increased soil fertility as positive attributes. Negative attributes comprised increased labour requirement, higher costs, increased risk of crop damage or yield reduction, and lower quantity and quality of produce. Overall, a legume-cereal rotation was the most highly rated control option for S. hermonthica management evaluated by the farmers. The implications of these results are examined with respect to farmers' adoption and adaptation of Striga control options beyond the experimental plots.

Record 87 of 609 - AGRICOLA 1998-2004/09

AU: Kanton,-R.A.L.; Dennett,-M.D.

TI: Water uptake and use by morphologically contrasting maize/pea cultivars in sole and intercrops in temperate conditions.

SO: Experimental agriculture. 2004 Apr., v. 40, no. 2 p. 201-214.

AB: Growth and water use of sole crops and intercrops of morphologically contrasting maize and pea cultivars were measured

in two years. The maize cultivars were Nancis with erectophile and Sophy with planophile leaves and the pea cultivars Maro a leafy pea and Princess a semi-leafless pea. In the first part of the season water use was lower for sole maize but intercrops and sole pea used similar amounts of water. By 90 days after sowing, when peas had matured, all crops had used similar amounts of water. Maize had slightly greater water use efficiency than peas. Cultivars Nancis and Princess tended to have greater water use efficiency than Sophy and Maro respectively. Intercrops produced more dry matter than sole crops and therefore had consistently greater water use efficiencies.

Record 88 of 609 - AGRICOLA 1998-2004/09

AU: Yang,-Z.; Midmore,-D.J.

TI: Experimental assessment of the impact of defoliation on growth and production of water-stressed maize and cotton plants.

SO: Experimental agriculture. 2004 Apr., v. 40, no. 2 p. 189-199.

AB: In this study, different levels of defoliation were imposed on a determinate species (maize) and a relatively indeterminate species (cotton). The aim was to quantify the effects of defoliation on plant growth and production, under either optimum or water-stressed conditions. Under well-watered conditions, 33% defoliation twice (conducted 28 and 35 days after emergence) resulted in a 16% reduction in grain yield of maize while 67% defoliation once (conducted 28 days after emergence) had no significant effect on yield. Under water stress, the grain yields of maize plants with 33% (twice) and 67% defoliation were 13.5% and 25% greater than that of non-defoliated control plants, respectively. For cotton, the reproductive yields (seed and lint) with 33% and 67% defoliation (conducted 43 days after emergence) were reduced, under well-watered conditions, by 28% and 37% of that of the non-defoliated control, respectively. Defoliated cotton plants lost less fruiting forms (squares and young bolls) than non-defoliated plants during water stress. Therefore, under water stress the harvestable product of cotton plants with 67% defoliation was double that of non-defoliated control plants. In non-defoliated cotton plants, a second flush of flowering after release from water-stress permitted further compensatory fruit set and boll harvest. Defoliated plants did not show such levels of compensation. Defoliation significantly reduced water use by maize and cotton. The relative yield advantage of defoliated plants under water-stress conditions can be attributed to defoliation-induced improvement in water status as reflected in measures of photosynthetic rate and stomatal conductance. Under anticipated drought stress, defoliation could be an important management practice to reduce drought-induced yield decrease, but this needs to be tested under field conditions.

Record 89 of 609 - AGRICOLA 1998-2004/09

AU: Kuntashula,-E.; Mafongoya,-P.L.; Sileshi,-G.; Lungu,-S.

TI: Potential of biomass transfer technologies in sustaining vegetable production in the wetlands (dambos) of eastern Zambia.

SO: Experimental agriculture. 2004 Jan., v. 40, no. 1 p. 37-51.

AB: Farmers grow vegetables widely during the dry season in wetlands known locally as dambos in southern Africa. Declining soil fertility is one of the major factors limiting smallholder vegetable production in the dambos of eastern Zambia. An

experiment was initiated with 43 farmers with the objective of assessing the agronomic and economic feasibility of foliar biomass of gliricidia (Gliricidia sepium) and leucaena (Leucaena leucocephala) for production of cabbage, onion and a subsequent maize crop during the dry season. The treatments were, on a dry-matter basis, 8 and 12 t ha-1 gliricidia, 12 t ha-1 leucaena and 10 t ha-1 manure+half the recommended fertilizer rate, inorganic fertilizer at recommended rate, and a control without any inputs. Direct field measurements and informal enquiries were used for evaluating the effects of different treatments. The highest cabbage and onion yields were obtained from manure+half-rate fertilizer application. The gliricidia biomass transfer technology produced cabbage, onion and maize yields comparable with the full fertilizer application. In both cabbage and onion, manure+fertilizer gave generally higher net incomes. Biomass transfer also recorded higher net incomes than the control, and required lower cash inputs than the fully fertilized crop. Net incomes of the biomass treatments were substantially reduced by the labour costs for pruning and incorporation of the biomass. The results indicate that the gliricidia biomass transfer technology could be used as an alternative to inorganic fertilizers for vegetable production in dambos.

Record 90 of 609 - AGRICOLA 1998-2004/09

AU: Murungu,-F.S.; Chiduza,-C.; Nyamugafata,-P.; Clark,-L.J.; Whalley, -W.R.

TI: Effect of on-farm seed priming on emergence, growth and yield of cotton and maize in a semi-arid area of Zimbabwe.

SO: Experimental agriculture. 2004 Jan., v. 40, no. 1 p. 23-36.

AB: The effects of on-farm seed priming (i.e. seed soaking) on the emergence, growth and yield of cotton and maize were studied in the field in the south-eastern lowveld of Zimbabwe. Experiments were conducted on both crops in the 1999/2000 and 2000/2001 seasons and, in the 2001 winter season, on maize only. The interaction of priming with tillage (ox-drawn ploughing or hand-hoeing) and simulated sowing rainfall regimes (irrigations of 15 mm, 30 mm or 45 mm at planting) was studied. Priming usually increased the rate of emergence in maize, but always decreased final percent emergence in cotton. In the 2000/2001 season, there was an interaction between priming and simulated sowing rainfall regimes such that the 15 mm treatment gave a smaller adverse effect of priming in cotton than the 30 and 45 mm treatments. In maize, however, the 15 mm treatment gave an adverse rather than a positive effect of priming on emergence. There was little effect of tillage on emergence or growth. Priming did not affect the relative growth rate of cotton or maize , although plants grown from primed maize seed were consistently larger at any given date throughout the 2001 winter season. Plants from primed seed also flowered and matured earlier in the winter 2001 season. There were no significant effects of priming on yield, except in the 1999/2000 season, where priming decreased yield in cotton. It was concluded that the effect of priming can depend on crop species.

Record 91 of 609 - AGRICOLA 1998-2004/09

AU: Seghers,-D.; Wittebolle,-L.; Top,-E.M.; Verstraete,-W.; Siciliano, -S.D.

TI: Impact of agricultural practices on the Zea mays L. endophytic community.
SO: Applied and environmental microbiology. 2004 Mar., v. 70, no. 3 p. 1475-1482.
AB: Agricultural practices are known to alter bulk soil microbial communities, but little is known about the effect of such practices on the plant endophytic community. We assessed the influence of long-term applications (20 years) of herbicides and different fertilizer types on the endophytic community of maize plants grown in different field experiments. Nested PCR-denaturing gradient gel electrophoresis (DGGE) analyses targeting general bacteria, type I or II methanotrophs, actinomycetes, and general fungi were used to fingerprint the endophytic community in the roots of Zea mays L. Low intraplant variability (reproducible DGGE patterns) was observed for the bacterial, type I methanotroph, and fungal communities, whereas the patterns for endophytic actinomycetes exhibited high intraplant variability. No endophytic amplification product was obtained for type II methanotrophs. Cluster and stability analysis of the endophytic type I methanotroph patterns differentiated maize plants cultivated by using mineral fertilizer from plants cultivated by using organic fertilizer with a 100% success rate. In addition, lower methanotroph richness was observed for mineral-fertilized plants than for organically fertilized plants. The use of herbicides could not be traced by fingerprinting the endophytic type I methanotrophs or by evaluating any other endophytic microbial group. Our results indicate that the effect of agrochemicals is not limited to the bulk microbial community but also includes the root endophytic community. It is not clear if this effect is due to a direct effect on the root endophytic community or is due to changes in the bulk community, which are then reflected in the root endophytic community.

Record 92 of 609 - AGRICOLA 1998-2004/09
AU: Michalczuk,-L.; Wawrzynczak,-D.
TI: Hormonal control of axillary bud dormancy in strawberry - axillary shoot growth and development in In Vitro cultures of transgenic strawberry carrying maize IAA-glucose synthetase gene.
SO: Acta horticulturae. 2004 Feb., no. 649 p. 165-168.

Record 93 of 609 - AGRICOLA 1998-2004/09
AU: Iijima,-M.; Higuchi,-T.; Watanabe,-A.; Bengough,-A.G.
TI: Method to quantify root border cells in sandy soil.
SO: Soil biology and biochemistry. 2004 Sept., v. 36, no. 9 p. 1517-1519.
AB: Root border cells are cells that detach from the growing root cap, and serve both physical and biological roles in the rhizosphere. Most work on border cells has been confined to agar, or hydroponic culture, because of the difficulty in separating them from soil particles. We present a new method to separate the root border cells from soil, and quantify border cell numbers in non-sterile sandy loam soil at contrasting matric potentials (-20 and -300 kPa). Recovery rates of 90±1% were achieved using a combination of surfactants, sonication, and centrifugation. Root border cell numbers in the dry soil (1.4 x 10(3) after 24 h) were significantly decreased as compared with those in the wetter soil

(1.7 x 10(3) after 24 h). Possible reasons for the decreased release of border cells are discussed.

Record 94 of 609 - AGRICOLA 1998-2004/09

AU: Garbeva,-P.; Voesenek,-K.; Elsas,-J.D.-van

TI: Quantitative detection and diversity of the pyrrolnitrin biosynthetic locus in soil under different treatments.

SO: Soil biology and biochemistry. 2004 Sept., v. 36, no. 9 p. 1453-1463.

AB: The prevalence of antibiotic production loci in soil is a key issue of current research aimed to unravel the mechanisms underlying the suppressiveness of soil to plant pathogens. Pyrrolnitrin (PRN) is a key antibiotic involved in the suppression of a range of phytopathogenic fungi. Therefore, field soils from different agricultural regimes, including permanent grassland, arable land under common agricultural rotation and arable land under maize monoculture, were investigated in respect of the prevalence of pyrrolnitrin biosynthetic loci. Primers for detection of the prnD gene were used for initial PCR/ hybridisation-based assessments. By this method, evidence was obtained for the contention that PRN production loci were most prevalent in grasslands, however, robust quantitative data were not achieved. To quantify the prevalence of PRN biosynthetic loci, we designed a TaqMan PCR system based on the prnD gene for the real-time quantitative detection of this production locus in soil. The system was found to be specific for prnD sequences from Pseudomonas, Serratia and Burkholderia species. Using pure culture DNA, the prnD gene was detectable down to a level of 60 fg, or approximately 10 gene copies, per amplification reaction. Application of the system to soil DNA spiked with different levels of the target DNA indicated that, in a soil DNA background, specific amplification could be obtained to about the same level of sensitivity. Field soil samples obtained from the different agricultural regimes were then screened for the prevalence of prnD with the real-time PCR system. The quantitative data obtained suggested a strongly enhanced presence of prnD genes in grassland or grassland-derived plots, as compared to the prevalence of this biosynthetic locus in the arable land plots. The implications of these findings are placed in the context of the suppressiveness of soil to phytopathogens, notably Rhizoctonia solani AG3.

Record 95 of 609 - AGRICOLA 1998-2004/09

AU: Nguefack,-J.; Leth,-V.; Amvam-Zollo,-P.H.A.; Mathur,-S.B.

TI: Evaluation of five essential oils from aromatic plants of Cameroon for controlling food spoilage and mycotoxin producing fungi.

SO: International journal of food microbiology. 2004 Aug. 1, v. 94, no. 3 p. 329-334.

AB: Five essential oils (EO) extracted from Cymbopogon citratus, Monodora myristica, Ocimum gratissimum, Thymus vulgaris and Zingiber officinale were investigated for their inhibitory effect against three food spoilage and mycotoxin producing fungi, Fusarium moniliforme, Aspergillus flavus and Aspergillus fumigatus. Five strains of each fungus were tested. The agar dilution technique was used to determine the inhibitory effect of each EO on the radial growth of the fungus, and a dose response

was recorded. The EO from O. gratissimum, T. vulgaris and C. citratus were the most effective and prevented conidial germination and the growth of all three fungi on corn meal agar at 800, 1000 and 1200 ppm, respectively. Moderate activity was observed for the EO from Z. officinale between 800 and 2500 ppm, while the EO from M. myristica was less inhibitory. These effects against food spoilage and mycotoxin producing fungi indicated the possible ability of each essential oil as a food preservative. A comparative test on the preservative ability of the EO from O. gratissimum and potassium sorbate against A. flavus at pH 3.0 and 4.5 showed that the EO remained stable at both pH, whereas the efficacy of potassium sorbate was reduced at higher pH. We concluded that the EO from O. gratissimum is a potential food preservative with a pH dependent superiority against potassium sorbate, and these are novel scientific information.

Record 96 of 609 - AGRICOLA 1998-2004/09

AU: Kennedy,-I.R.; Choudhury,--A.T.M.A.; Kecskes,-M.L.

TI: Non-symbiotic bacterial diazotrophs in crop-farming systems: can their potential for plant growth promotion be better exploited.

SO: Soil biology and biochemistry. 2004 Aug., v. 36, no. 8 p. 1229-1244.

AB: Biological N2 fixation (BNF) by associative diazotrophic bacteria is a spontaneous process where soil N is limited and adequate C sources are available. Yet the ability of these bacteria to contribute to yields in crops is only partly a result of BNF. A range of diazotrophic plant growth-promoting rhizobacteria participate in interactions with C3 and C4 crop plants (e.g. rice, wheat, maize, sugarcane and cotton), significantly increasing their vegetative growth and grain yield. We review the potential of these bacteria to contribute to yield increases in a range of field crops and outline possible strategies to obtain such yield increases more reliably. The mechanisms involved have a significant plant growth-promoting potential, retaining more soil organic-N and other nutrients in the plant-soil system, thus reducing the need for fertiliser N and P. Economic and environmental benefits can include increased income from high yields, reduced fertiliser costs and reduced emission of the greenhouse gas, N2O (with more than 300 times the global warming effect of CO2), as well as reduced leaching of NO3--N to ground water. Obtaining maximum benefits on farms from diazotrophic, plant growth promoting biofertilisers will require a systematic strategy designed to fully utilise all these beneficial factors, allowing crop yields to be maintained or even increased while fertiliser applications are reduced.

Record 97 of 609 - 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 98 of 609 - AGRICOLA 1998-2004/09

AU: Hristov,-A.N.; Price,-W.J.; Shafii,-B.

TI: A meta-analysis examining the relationship among dietary factors, dry matter intake, and milk and milk protein yield in dairy cows.

SO: Journal of dairy science. 2004 July, v. 87, no. 7 p. 2184-2196.

AB: This meta-analysis was undertaken to determine the impact of dietary components on dry matter intake (DMI), milk yield (MY), and milk protein yield (MPY) in Holstein dairy cows. Diets (n = 846) from 256 feeding trials published in Volumes 73 through 83 of the Journal of Dairy Science were evaluated for nutrient composition using 2 diet evaluation models: CPM Dairy (a computer program based on the principles of the Cornell Net Carbohydrate and Protein System) and NRC (2001). Data were analyzed with and without the effect of stage of lactation as a dummy variable (< 100 d in milk or > = 100 d in milk). A mixed model regression analysis was used to completely investigate the potential relationships among composition variables and DMI, MY, and MPY. Protein and carbohydrate fractions were the main components within the DMI models, and DMI played a dominant role in estimating MY and MPY. Inclusion of stage of lactation substantially improved the MY models but did not affect model fits or residual structure for DMI and MPY.

Record 99 of 609 - AGRICOLA 1998-2004/09

AU: Bernard,-J.K.; West,-J.W.; Trammell,-D.S.; Cross,-G.H.

TI: Influence of corn variety and cutting height on nutritive value of silage fed to lactating dairy cows.

SO: Journal of dairy science. 2004 July, v. 87, no. 7 p. 2172-2176.

AB: Two corn varieties predicted to differ in digestibility were harvested at 2 cutting heights (10.2 or 30.5 cm) to determine effects on the nutrient content of the resulting silage, nutrient intake, nutrient digestibility, and production of lactating cows fed such corn silage originally harvested at two-thirds milk line. Acid detergent fiber (ADF) concentration was higher and in vitro true dry matter (DM) digestibility (IVTDMD) was lower for the variety predicted to have average digestibility. An interaction was observed between variety and cutting height because of decreased ADF and increased IVTDMD for the average digestibility variety cut at 30.5 vs. 10.2 cm; no differences were observed for the higher digestibility variety at each cutting height. When silages were fed to 32 Holstein cows in a 5-wk randomized design trial, DM intake, milk yield, and milk composition were similar. There was an interaction between variety and cutting height for DM intake and total tract apparent digestibility of DM, crude protein, and neutral detergent fiber because of lower intake and digestibility for the diets containing either the high cut, average quality variety or low cut, higher quality variety. These results suggest that increasing the cutting height to 30.5 cm does not improve silage quality or improve milk yield of cows. Although the 2 varieties selected for this trial were predicted to differ in digestibility, these differences were not great enough to influence milk yield or composition of lactating cows.

Record 100 of 609 - AGRICOLA 1998-2004/09
AU: Cook,-R.; Carter,-A.; Westgate,-P.; Hazzard,-R.
TI: Optimum timing of an application of corn oil and Bacillus thuringiensis to control lepidopteran pests in sweet corn.
SO: HortTechnology. 2004 July-Sept, v. 14, no. 3 p. 307-314.

Record 101 of 609 - AGRICOLA 1998-2004/09
AU: Curtis,-P.D.; Rowland,-E.D.; Jensen,-P.G.; Hoffmann,-M.P.
TI: Obstructive non-woven fiber barriers for reducing red-winged blackbird damage to sweet corn.
SO: Crop protection. 2004 Sept., v. 23, no. 9 p. 819-823.
AB: Red-winged blackbirds (Agelaius phoeniceus L.) annually destroy substantial amounts of sweet corn (Zea mays L.) during the summer. No-choice feeding trials were conducted to assess the efficacy of spraying sweet corn ears with obstructive polymer fibers (ethylene vinyl acetate, EVA) as a means of reducing damage by blackbirds. Experiments were conducted with captive blackbirds and standing sweet corn between 18 September and 10 October 1997 and 1998. Relative to control ears, fiber treatment reduced the percentage of ears with husk damage by 10-12% ($P<0.03$), and kernel damage by 10-11% ($P< or = 0.01$). However, once birds had penetrated the husk, the percentage of kernels lost was similar for fiber-treated and control ears. Currently, this technique is not cost effective. However, with improvements in application of this technology, obstructive non-woven EVA fibers could reduce bird damage to sweet corn and other crops, and may compliment existing integrated pest management techniques.

Record 102 of 609 - 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 103 of 609 - AGRICOLA 1998-2004/09

AU: Penn,-C.J.; Mullins,-G.L.; Zelazny,-L.W.; Warren,-J.G.; McGrath,-J.M.

TI: Surface runoff losses of phosphorus from Virginia soils amended with turkey manure using phytase and high available phosphorus corn diets.

SO: Journal of environmental quality. 2004 July-Aug, v. 33, no. 4 p. 1431-1439.

AB: Many states have passed legislation that regulates agricultural P applications based on soil P levels and crop P uptake in an attempt to protect surface waters from nonpoint P inputs. Phytase enzyme and high available phosphorus (HAP) corn supplements to poultry feed are considered potential remedies to this problem because they can reduce total P concentrations in manure. However, less is known about their water solubility of P and potential nonpoint-source P losses when land-applied. This study was conducted to determine the effects of phytase enzyme and HAP corn supplemented diets on runoff P concentrations from pasture soils receiving surface applications of turkey manure. Manure from five poultry diets consisting of various combinations of phytase enzyme, HAP corn, and normal phytic acid (NPA) corn were surface-applied at 60 kg P ha-1 to runoff boxes containing tall fescue (Festuca arundinacea Schreb.) and placed under a rainfall simulator for runoff collection. The alternative diets caused a decrease in manure total P and water soluble phosphorus (WSP)

compared with the standard diet. Runoff dissolved reactive phosphorus (DRP) concentrations were significantly higher from HAP manure-amended soils while DRP losses from other manure treatments were not significantly different from each other. The DRP concentrations in runoff were not directly related to manure WSP. Instead, because the mass of manure applied varied for each treatment causing different amounts of manure particles lost in runoff, the runoff DRP concentrations were influenced by a combination of runoff sediment concentrations and manure WSP.

Record 104 of 609 - 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 105 of 609 - 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 106 of 609 - AGRICOLA 1998-2004/09

AU: Marchetti,-R.; Ponzoni,-G.; Spallacci,-P.

TI: Simulating nitrogen dynamics in agricultural soils fertilized with pig slurry and urea.

SO: Journal of environmental quality. 2004 July-Aug, v. 33, no. 4 p. 1217-1229.

AB: Within the framework of an interregional project in the Emilia Romagna region of northern Italy, the coupled MACROÆSOILN model was chosen to estimate soil protective capacity against pollutants. The aim of our study was to evaluate the model to better identify key parameters and processes that influence N losses in agricultural soils. Nitrate N content was monitored in soil under corn (Zea mays L.) fertilized with urea and/or pig slurry, in two field experiments performed on four different soils: a Fienili clay, a Barco-like silt, a Sant'Omobono silt loam, and a La Boaria silty clay soil. Measurements were compared with model predictions. For all soils, nitrate content was underestimated on average by 24 to 88% at lower N rates; it was overestimated by 1 to 104% at higher N rates. The root mean square error (RMSE) was equal to 81.1%. Simulation of crop N uptake and soil water flow, estimation of the ammonia losses at pig slurry spreading, and N transformation parameter setting were considered as possible error sources. The calibration of crop N

uptake gave rise to good model efficiency index values. The RMSE for the simulation of soil water content varied between 9.8 and 20.2%. A more accurate setting of the ammonia losses and of the feces transformation parameter values could allow the RMSE for the simulation of soil nitrate content to be reduced by no more than 10 to 15%. It is possible for the model not to include the simulation of processes that could have relevant effects on the soil N dynamics.

Record 107 of 609 - AGRICOLA 1998-2004/09
AU: Anselin,-L.; Bongiovanni,-R.; Lowenberg-DeBoer,-J.
TI: A spatial econometric approach to the economics of site-specific nitrogen management in corn production.
SO: American journal of agricultural economics. 2004 Aug., v. 86, no. 3 p. 675-687.
AB: The objective of this study is to determine the potential for using spatial econometric analysis of combine yield monitor data to estimate the site-specific crop response functions. The specific case study is for site-specific nitrogen (N) application to corn production in Argentina. Spatial structure of the yield data is modeled with landscape variables, spatially autoregressive error and groupwise heteroskedasticity. Results suggest that N response differs by landscape position, and that site-specific application may be modestly profitable. Profitability depends on the model specification used, with all spatial models consistently indicating profitability, whereas the nonspatial models do not.

Record 108 of 609 - AGRICOLA 1998-2004/09
AU: Park,-D.S.; Peterson,-C.; Zhao,-S.; Coats,-J.R.
TI: Fumigation toxicity of volatile natural and synthetic cyanohydrins to stored-product pests and activity as soil fumigants.
SO: Pest management science. 2004 Aug., v. 60, issue 8 p. 833-838.
AB: Insecticidal fumigation toxicity of natural and synthetic cyanohydrins was evaluated with four stored-product pests: the lesser grain borer, Rhyzopertha dominica (F), the red flour beetle, Tribolium castaneum Herbst, the saw-toothed grain beetle Oryzaephilus surinamensis L, the maize weevil, Sitophilus zeamais (Motsch) and the house fly, Musca domestica L. The fumigation LC50 values were calculated by probit analysis. For house flies, all but one of the cyanohydrins tested were more potent than 1,3-dichloropropene (Telone). Three were as efficacious as chloropicrin. For the lesser grain borer, all cyanohydrins tested were more insecticidal than dichloropropene, and all but one were more potent than chloropicrin. Four were as insecticidal as dichlorvos. The acetate of 1-cyano-1-hydroxy-2-propene (CHP-ace) was also tested in soil for antifungal and antibacterial activity, and inhibition of weed seed germination. CHP-ace reduced the total soil bacterial and fungal counts significantly, and was effective in inhibiting the germination of weed seeds in soil, indicating a broad spectrum of activity as a soil fumigant.

Record 109 of 609 - AGRICOLA 1998-2004/09
AU: Eason,-A.; Tim,-U.S.; Wang,-X.
TI: Integrated modeling environment for statewide assessment of groundwater vulnerability from pesticide use in agriculture.

SO: Pest management science. 2004 Aug., v. 60, issue 8 p. 739-745.
AB: Atrazine, a herbicide widely used for corn production in the Midwest, has been detected in groundwater of several states, and has been identified as a possible human carcinogen. With the widespread use of pesticides in crop production, and the frequent detection of these chemicals in groundwater, large-scale risk assessments would help water resource managers to identify areas that are more susceptible to contamination and implement practices to ameliorate the problem. This paper presents an integrated, visual and interactive system for predicting potential environmental risks associated with pesticide contamination at spatial scales ranging from fields to landscapes and regions. The interactive system extends the predictive ability of the Pesticide Root Zone Model Release 2.0 (PRZM-2) to a landscape and statewide scale through integration with a geographic information system (GIS), graphical user interface and environmental databases. Predictions of statewide (Iowa) vulnerability of groundwater from atrazine leaching below the unsaturated zone were made to demonstrate the utility of the system, and the results were used in risk assessment. In the example application, atrazine fate and transport were evaluated using long-term climatic data (1980-1989) in combination with several environmental databases (eg STATSGO soils database) and exposure risks were expressed in terms of the probability of the predicted pesticide concentrations exceeding the maximum contaminant level (MCL) for drinking water. The results indicate that the predicted pesticide concentrations were significantly lower than the EPA-established MCL. In addition to providing an interactive environment for landscape-level assessment of potential risks from pesticide leaching, the system significantly reduces the time and resources needed to organize and manipulate data for use with PRZM-2, and provides an analytical framework for evaluating groundwater-leaching impacts of pesticide management practices.

Record 110 of 609 - AGRICOLA 1998-2004/09
AU: Ehsani,-M.R.; Upadhyaya,-S.K.; Mattson,-M.L.
TI: Seed location mapping using RTK GPS.
SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 909-914.
AB: The potential use of a real-time kinematics (RTK) GPS receiver for seed mapping with a high level of accuracy was investigated. High-accuracy seed mapping can potentially be used in weed control and plant-specific crop management. A four-row Salvo 650 vacuum planter was retrofitted with an RTK GPS receiver. Four seed detector sensors (one per planting unit) were mounted directly above the planter shoes. These sensors detected the seeds as they fell through seed tubes. Two low-cost single-board computers were used to acquire data in real time and display it in the tractor cab. The first computer was interfaced to the RTK GPS unit to determine seed location and forward speed. The second computer was interfaced to a display unit mounted in the cab. The first computer obtained the GPS time and UTM coordinates every second and stored them with a reference time (time tag). This computer also monitored the seed detector sensors, time-tagged the seeds from each unit, and stored the information in memory. The second computer monitored the first computer and reported the plante'rs performance through the display unit mounted in the

tractor cab. Field tests were conducted to check the performance of this planter over two growing seasons. The first year test results indicated a need to control the sensitivity of the seed detector sensors used for seed detection. The second year tests showed that the improved system performed very well. The differences between the actual plant and the seed map generated by the RTK GPS based planter were in the range of 30 to 38 mm.

Record 111 of 609 - 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 112 of 609 - 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 113 of 609 - AGRICOLA 1998-2004/09

AU: Crofcheck,-C.L.; Montross,-M.D.

TI: Effect of stover fraction on glucose production using enzymatic hydrolysis.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 841-844.

AB: Corn stover was fractionated into three fractions: cobs, stalks, and leaves and husks. The fractions were dried and ground through a 2 mm screen. Samples of the three fractions and whole corn stover with and without NaOH pretreatment were subjected to enzymatic hydrolysis in order to determine the effect of fractionation on glucose production. The average amounts of glucose released after 60 h of hydrolysis from pretreated cobs, leaves and husks, stalks, and whole stover were 0.50, 0.36, 0.28, and 0.36 g/g dry biomass, respectively. The average amounts of glucose released after 60 h of hydrolysis from nonpretreated cobs, leaves and husks, stalks, and whole stover were 0.32, 0.23, 0.17, and 0.20 g/g dry biomass, respectively. Pretreatment resulted in an average increase of 60% in glucose production for all fractions and whole stover. The effect of stover fraction type on glucose production was significant with and without pretreatment. By collecting the fractions of the corn stover with the highest glucose potential (all the cobs and 74% of the leaves and husks) and leaving the remaining fraction (26% of the leaves and husks, and all the stalks) in the field for erosion control, the glucose potential of the collected biomass would increase by 21%. This could represent a decrease of up to 17% in the cost of ethanol production. This indicates that fractionation and collection of the biomass with the highest glucose potential may produce a higher quality feedstock for glucose production.

Record 114 of 609 - AGRICOLA 1998-2004/09

AU: Li,-Y.; Ruan,-R.; Chen,-P.L.; Liu,-Z.; Pan,-X.; Lin,-X.; Liu,-Y.; Mok,-C.K.; Yang,-T.

TI: Enzymatic hydrolysis of corn stover pretreated by combined dilute alkaline treatment and homogenization.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 821-825.

AB: Corn stover, the most abundant agricultural residue in the U.S., is a potential feedstock for production of bioethanol because of

its high content of carbohydrates, but an efficient pretreatment is required prior to enzymatic hydrolysis. In this study, a combination of NaOH treatment and homogenization was used as a pretreatment to enhance the enzymatic hydrolysis of corn stover. The combined pretreatment increased the enzymatic hydrolysis of corn stover five times compared to the control. The effectiveness of such pretreatment was found to be a function of NaOH concentration and particle size. Within the NaOH concentration range of 0.1 to 1.0 N, best performance of this combined pretreatment was achieved at 0.3 N NaOH. There is a significant cross effect of homogenization and NaOH treatment. Among the three particle sizes tested (the particle size was not directly measured; it passed through screens with openings of 2 mm, 0.707 mm, and 0.25 mm respectively), 2 mm was found to maximize the economic benefit of the pretreatment.

Record 115 of 609 - AGRICOLA 1998-2004/09

AU: Dabney,-S.M.; Wilson,-G.V.; McGregor,-K.C.; Foster,-G.R.

TI: History, residue, and tillage effects on erosion of loessial soil.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 767-775.

AB: Studies have shown that no-till (NT) management reduces soil erosion relative to chisel/disk-tillage (CT) and that this benefit may increase over time. There are fewer data, however, to separate the erosion-reduction contributions of surface residue mulch from those of improved soil properties under NT. The objective of this study was to quantify these separate contributions for a silt loam soil (Glossic Fragiudalf) used for corn (Zea mays L.) production in northern Mississippi for five to ten years with either CT or NT. The experiment had ten treatments. Two were normal CT and NT managements in which a crop was planted but had not emerged prior to simulated rainfall. The other eight treatments had surface crop residues removed and comprised a 2 x 2 x 2 factorial arrangement of two tillage histories (CTh or NTh), two levels of tillage immediately prior to rainfall simulation (disturbed or not disturbed), and two levels of residue removal (residue removed just prior to simulated rainfall or residue removed one year prior to simulated rainfall). Simulated rainfall was applied at a rate of 65 mm h-1 in a three-storm sequence on 10.7 x 3.7 m areas. NT exhibited greater runoff but much lower sediment losses than CT. Residue removal doubled erosion for both tillage histories. Surface disturbance decreased runoff from the first storm following tillage but increased total soil loss 26% to 47%. With residues removed, long-term NTh resulted in one-third the soil loss of CTh, and similar benefits were observed with or without surface disturbance. This residual benefit of NTh was lost within one year of fallow after residue removal. These results demonstrate that the erosion resistance of NT areas is due to both residue cover and improved soil quality factors. Although the erosion-resisting soil quality factors developed over several years of NT management may be lost within a single year of fallow management, these factors may protect the soil from excessive erosion if NT fields that must occasionally be tilled are quickly returned to NT management.

Record 116 of 609 - AGRICOLA 1998-2004/09

AU: Sharda,-V.N.; Dhyani,-B.L.
TI: Economic analysis of conventional and conservation bench terrace systems in a sub-humid climate.
SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 711-720.
AB: Water scarcity, accelerated soil erosion, and food security are the basic concerns in rain-dependent agricultural systems. The conservation bench terrace (CBT) system, in conjunction with water harvesting and recycling techniques, is an efficient conservation measure for in situ rain water harvesting, minimizing soil erosion, and sustaining productivity in arid, semi-arid, and sub-humid climates. Economic analysis has revealed that the CBT system exhibited 71.7% and 58.5% higher net present value (NPV), respectively, when compared to a rainfed maize-wheat system and a conventional system of sloping borders (i.e., making plots on slopes at 2% to 4%) with supplemental irrigation from harvested runoff. Various combinations of conventional and CBT systems were analyzed for economic efficiency, nutrient loss, and food security under different probabilities of runoff-producing rainfall by extrapolating the experimental data. The pure CBT system was found to be inadequate to generate sufficient runoff to provide even one pre-sowing irrigation of 5 cm depth to winter wheat crop. In contrast, pure conventional and a combination of conventional and CBT systems in the ratios of 50:50 and 75:25 had the potential to yield runoff more than sufficient to provide two supplemental irrigations to wheat crop at all probability levels. However, these systems result in higher soil and nutrient losses. The conventional and CBT systems in the ratio of 25:75 produced sufficient runoff to provide two irrigations with negligible overflow. Benefit cost ratio (BCR), payback period (PBP), and internal rate of return (IRR) criteria favor the pure CBT system owing to its low initial investment on pond construction for less runoff storage. However, NPV was always superior for combinations of conventional and CBT systems in the ratios of 25:75 or 50:50 over other combinations. Total maize-equivalent and energy production criteria also confirm that these two combinations perform better than the others. It is thus concluded that conventional and CBT systems in the ratios of 50:50 or 25:75 are the best choices to maximize economic returns, ensure food security, minimize soil and nutrient losses, and produce sufficient runoff for harvesting and recycling under rainfed cropping systems in sub-humid climates.

Record 117 of 609 - AGRICOLA 1998-2004/09
AU: Lippman,-Z.; Gendrel,-A.V.; Black,-M.; Vaughn,-M.W.; Dedhia,-N.; McCombie,-W.R.; Lavine,-K.; Mittal,-V.; May,-B.; Kasschau,-K.D.
TI: Role of transposable elements in heterochromatin and epigenetic control.
SO: Nature. 2004 July 22, v. 430, no. 6998 p. 471-476.
AB: Heterochromatin has been defined as deeply staining chromosomal material that remains condensed in interphase, whereas euchromatin undergoes de-condensation. Heterochromatin is found near centromeres and telomeres, but interstitial sites of heterochromatin (knobs) are common in plant genomes and were first described in maize. These regions are repetitive and late-replicating. In Drosophila, heterochromatin influences gene expression, a heterochromatin phenomenon called position effect variegation. Similarities between position effect variegation in

Drosophila and gene silencing in maize mediated by "controlling elements" (that is, transposable elements) led in part to the proposal that heterochromatin is composed of transposable elements, and that such elements scattered throughout the genome might regulate development. Using microarray analysis, we show that heterochromatin in Arabidopsis is determined by transposable elements and related tandem repeats, under the control of the chromatin remodelling ATPase DDM1 (Decrease in DNA Methylation 1). Small interfering RNAs (siRNAs) correspond to these sequences, suggesting a role in guiding DDM1. We also show that transposable elements can regulate genes epigenetically, but only when inserted within or very close to them. This probably accounts for the regulation by DDM1 and the DNA methyltransferase MET1 of the euchromatic, imprinted gene FWA, as its promoter is provided by transposable-element-derived tandem repeats that are associated with siRNAs.

Record 118 of 609 - AGRICOLA 1998-2004/09

AU: Wauchope,-R.D.; Truman,-C.C.; Johnson,-A.W.; Sumner,-H.R.; Hook,-J.E.; Dowler,-C.C.; Chandler,-L.D.; Gascho,-G.J.; Davis,-J.G.

TI: Fenamiphos losses under simulated rainfall: plot size effects.

SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 669-676.

AB: The purpose of this study was to compare two commonly used runoff experimental methods, which have different scales, on measurements of runoff and associated fenamiphos and metabolite losses over a 2-year period. Methods used were 15 m wide by 43 m long (645 m2) mesoplots and 1.8 m wide by 3 m long (5.4 m2) microplots, under simulated rainfall (25 mm h-1 for 2 h) at 1, 14, and 28 d after fenamiphos application. Mesoplots and microplots were established parallel to a 3% slope on a Tifton loamy sand (Plinthic Kandiudult). All plots were planted to corn (Zea mays L.). Target application rate for fenamiphos was 6.7 kg ha-1. Runoff totals and maximum rates for meso- and microplots were similar, with approximately 25% of the rainfall running off mesoplots and approximately 28% running off microplots. Runoff totals and maximum rates from meso- and microplots were each positively correlated (R2 = 0.89). In both years, fenamiphos lost in runoff decreased with each rainfall event (1, 14, and 28 d after application). The majority of fenamiphos lost in runoff was in the fenamiphos sulfoxide form. Fenamiphos sulfoxide lost over both years from mesoplots ranged from 51% to 93% of the total fenamiphos lost, and loss from microplots ranged from 47% to 100% of the total fenamiphos lost. Runoff from meso- and microplots 1 d after fenamiphos application, a "reasonable worst-case" event, had the greatest fenamiphos losses among events. Total losses of fenamiphos for this event averaged 1.2% (CV = 26%) of applied amount for mesoplots and 1.3% (CV = 47%) of applied amount for microplots. Maximum (seasonal) fenamiphos losses for meso- and microplots were 1.4% of applied for mesoplots and 2.6% of applied for microplots. A positive correlation was obtained between microplots and mesoplots for total losses of fenamiphos + metabolites (R2 = 0.88), fenamiphos parent (R2 = 0.89), and fenamiphos sulfoxide (R2 = 0.81). Relatively poor agreement was found for relatively small losses of fenamiphos sulfone between plot types (R2 = 0.34). Microplots and mesoplots yielded statistically similar results in terms of runoff and fenamiphos losses; thus, microplot results can be extrapolated up to larger

mesoplot areas under these conditions. This has implications for field-scale management and watershed assessment in the Coastal Plain region of the southeast U.S. in that microplot and rainfall simulation results could be useful as statistically valid input datasets to estimate runoff and associated fenamiphos losses from larger areas.

Record 119 of 609 - AGRICOLA 1998-2004/09
AU: Cambardella,-C.A.; Moorman,-T.B.; Andrews,-S.S.; Karlen,-D.L.
TI: Watershed-scale assessment of soil quality in the loess hills of southwest Iowa.
SO: Soil and tillage research. 2004 Aug., v. 78, issue 2 p. 237-247.

Record 120 of 609 - AGRICOLA 1998-2004/09
AU: Marques-da-Silva,-J.R.; Alexandre,-C.
TI: Soil carbonation processes as evidence of tillage-induced erosion.
SO: Soil and tillage research. 2004 Aug., v. 78, issue 2 p. 217-224.

Record 121 of 609 - 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 122 of 609 - AGRICOLA 1998-2004/09
AU: Wilkerson,-J.B.; Hancock,-J.H.; Moody,-F.H.; Newman,-M.A.
TI: Design of a seed-specific application system for in-furrow chemicals.
SO: Transactions of the ASAE. 2004 May-June, v. 47, no. 3 p. 637-645.
AB: In-furrow chemical inputs such as fungicides, insecticides, and nematicides are generally applied at planting as a continuous band of material. Focusing these applications at the seed and minimizing the amount of chemical applied between seeds has potential to significantly reduce in-furrow inputs. An in-furrow seed-specific application system was developed to apply discrete bands of liquid chemical to individual seeds during planting. Each seed was detected in the seed tube, seed arrival time at the furrow was estimated, and a chemical band was applied as the seed landed in the furrow. The seed-specific applicator was evaluated at three field speeds and four spray band lengths during corn and cotton plantings. Accuracy of spray band placement, measured as percent of seeds observed within a sprayed band of soil, ranged from 63% to 97% in corn and from 56% to 98% in cotton, depending on field speed and spray band length. As spray band length increased from 3.8 to 7.6 cm, accuracy (averaged across speeds) increased from 76% to 91% in corn and from 72% to 95% in cotton. Accuracy and field speed were inversely related, with highest accuracies observed at the slowest speed. While the applicator performed well, further improvements may be possible, especially when operating at high field speeds. Substantial in-furrow material savings are feasible and depend on desired seeding rates and spray band lengths.

Record 123 of 609 - AGRICOLA 1998-2004/09
AU: Lapen,-D.R.; Topp,-G.C.; Gregorich,-E.G.; Curnoe,-W.E.
TI: Least limiting water range indicators of soil quality and corn

production, eastern Ontario, Canada.
SO: Soil and tillage research. 2004 Aug., v. 78, issue 2 p. 151-170.

Record 124 of 609 - 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 125 of 609 - AGRICOLA 1998-2004/09
AU: Oikeh,-S.O.; Menkir,-A.; Maziya-Dixon,-B.; Welch,-R.M.; Glahn,-R. P.
TI: Assessment of iron bioavailability from twenty elite late-maturing tropical maize varieties using an in vitro digestion/Caco-2 cell model.
SO: Journal of the science of food and agriculture. 2004 Aug. 15, v. 84, issue 10 p. 1202-1206.
AB: An in vitro digestion/Caco-2 cell model was used to assess iron bioavailability of twenty elite late-maturing tropical maize varieties grown in three diverse agroecologies in West and Central Africa (WCA). Kernel-iron concentration of the varieties, averaged across locations, varied from 19.2 to 24.4 mg kg-1, while mean kernel-zinc concentration ranged between 19.4 and 24.6 mg kg-1. Significant differences in iron bioavailability were observed among varieties, but the environment had no significant effect. Mean bioavailable iron ranged between 14% below and 43% above the reference control variety, TZB-SR. Variety DMR-LSR-Y with the highest concentrations of kernel-iron and -zinc of 24-25 mg kg-1 across the three locations had a similar quantity of bioavailable iron as the reference control, TZB-SR. In the long run this variety could be potentially effective in reducing iron deficiency because of its high kernel-iron. The most promising varieties were Mid-altitude STR synthetic and ACR91SUWAN-1-SRC1. They had kernel-iron and -zinc levels of 22-24 mg kg-1 and bioavailable iron 24-36% higher than the reference control, TZB-SR. Additional research is necessary to determine if the increases in kernel-iron concentration and bioavailable iron observed in this study can significantly improve the iron status of individuals in WCA at risk for iron deficiency.

Record 126 of 609 - AGRICOLA 1998-2004/09
AU: Velluti,-A.; Sanchis,-V.; Ramos,-A.J.; Marin,-S.
TI: Effect of essential oils of cinnamon, clove, lemon grass, oregano and palmarosa on growth of and fumonisin B1 production by Fusarium verticillioides in maize.
SO: Journal of the science of food and agriculture. 2004 Aug. 15, v. 84, issue 10 p. 1141-1146.
AB: The ability of cinnamon, clove, lemon grass, oregano and palmarosa essential oils to prevent growth of and fumonisin B1 (FB1) production by Fusarium verticillioides at different water activity (0.95 and 0.995 aw) and temperature (20 and 30 ÀC) levels in irradiated maize grain was evaluated. All the essential oils inhibited growth of F verticillioides isolates under all conditions tested, but FB1 production was only inhibited at 30 ÀC and 0.995 a(w). Moreover, stimulation of toxin production was found under certain environmental conditions. None of the essential oils showed a significantly greater ability to inhibit

FB1 production when compared with the others. At 1000 mg essential oil kg-1 maize the essential oils showed a greater inhibitory effect on growth of F verticillioides than at 500 mg kg-1, but there was no difference in FB1 production between the two levels of essential oil.

Record 127 of 609 - AGRICOLA 1998-2004/09

AU: Mosha,-T.C.E.; Bennink,-M.R.

TI: Protein quality of drum-processed cereal-bean-sardine composite supplementary foods for preschool-age children.

SO: Journal of the science of food and agriculture. 2004 Aug. 15, v. 84, issue 10 p. 1111-1118.

AB: Acute, severe undernutrition during childhood remains a common health problem in many parts of the world and makes a significant contribution to childhood mortality. This study was conducted to evaluate the protein quality and growth/rehabilitation potential of supplementary foods developed from locally produced materials in Tanzania. Six diets, namely rice meal (RM), bean meal (BM), rice-bean meal (RBM), rice-bean-sardines meal (RBSM), corn-bean-sardines meal (CBSM) and corn-bean meal (CBM), were formulated to maximise the amino acid score as recommended by FAO/WHO/UNU for preschool children. Biological qualities of the diets, including apparent and true protein digestibility, net protein retention ratio, food efficiency ratio, protein digestibility-corrected amino acid score and rehabilitation potential, were evaluated using Sprague Dawley weanling rats. Net protein retention ratio varied significantly ($p < 0.05$) among control diet (0.93), RBSM (0.92), CBSM (0.86), RM (0.66), RBM (0.44), CBM (0.28), BM (0.12) and corn meal (CM) diet (-0.40). True protein digestibility ranged between 82 and 99%, with BM showing the lowest digestibility. The protein digestibility-corrected amino acid scores were 100% (control diet), 77% (CBSM), 89% (RBSM), 58% (RM), 90% (RBM), 47% (CBM), 85% (BM) and 48% (CM). Two test diets, CBSM and RBSM, showed the greatest potential to support growth and rehabilitation of undernourished rats, while CBM, RBM, BM and CM did not display acceptable growth. These results suggest that cereal-bean-sardine composites are of high quality and have potential for use as supplementary/rehabilitation foods for preschool- and school-age children as well as adults.

Record 128 of 609 - AGRICOLA 1998-2004/09

AU: Morgavi,-D.P.; Beauchemin,-K.A.; Nsereko,-V.L.; Rode,-L.M.; McAllister,-T.A.; Wang,-Y.

TI: Trichoderma enzymes promote Fibrobacter succinogenes S85 adhesion to, and degradation of, complex substrates but not pure cellulose.

SO: Journal of the science of food and agriculture. 2004 Aug. 15, v. 84, issue 10 p. 1083-1090.

AB: The effects of an enzyme preparation from Trichoderma longibrachiatum (TE) on adhesion and growth of the fibrolytic rumen bacterium Fibrobacter succinogenes S85 was studied to gain a better understanding of the action of feed enzyme additives on fibre digestion by ruminants. Adhesion experiments were performed on crystalline cellulose, corn silage and alfalfa hay. Adhesion of F succinogenes to cellulose was negatively related to the concentration of TE ($p < 0.05$). At the highest concentration used, TE reduced adhesion to cellulose from 65 to 39%. For corn

silage and alfalfa hay, TE stimulated adhesion at low levels ($p < 0.05$) but this effect was lost at higher levels. Culture experiments were performed on crystalline cellulose and corn silage. The presence of TE in media containing cellulose failed to increase substrate disappearance or gas production although it increased numbers of non-adherent bacteria ($p < 0.05$). When corn silage was used, the addition of TE increased NDF disappearance ($p < 0.05$) at 24 and 48 h (33 and 52% in controls versus 53 and 65% in TE treatments). Growth rate and gas production were also stimulated ($p < 0.05$). We conclude that, for cellulose, the hydrolytic enzymes in TE obstructed available binding sites decreasing bacterial adherence. Fibrobacter succinogenes digested cellulose efficiently and addition of exogenous cellulases did not further increase substrate disappearance. However, for complex plant substrates, low concentration of TE increased bacterial adhesion and plant (corn) fiber degradation.

Record 129 of 609 - AGRICOLA 1998-2004/09

AU: Shukla,-S.; VanToai,-T.T.; Pratt,-R.C.

TI: Expression and nucleotide sequence of an INS (3) P1 synthase gene associated with low-phytate kernels in maize (Zea mays L.).

SO: Journal of agricultural and food chemistry. 2004 July 14, v. 52, no. 14 p. 4565-4570.

AB: Most of the phosphorus (P) in maize (Zea mays L.) kernels is in the form of phytic acid. A low phytic acid (lpa) maize mutant, lpa1-1, displays levels reduced by 66%. A goal of genetic breeding is development of low phytic acid feedstocks to improve P nutrition of nonruminant animals and reduce the adverse environmental impacts of excess P in manure. The genetic basis of the lpa1-1 mutation is not known, but previous genetic mapping has shown both the mutant phenotype and the Ins (3) P1 synthase (MIPS) gene, which encodes the first enzyme, myo-inositol phosphate synthase, in the phytic acid biosynthetic pathway, map to the same chromosomal region in maize. Research was conducted to determine the expression of the MIPS gene in lpa1-1 and wild-type kernels with similar genetic backgrounds and to ascertain if variation in the MIPS coding sequence could be inferred to be the basis of the mutation. MIPS enzyme activity determined by TLC was reduced 2-3-fold in mutant kernels. RT-PCR-based experiments using primers specific for the 1S-MIPS sequence indicated gene expression was reduced 50-60% in the mutant. Sequence analysis of the MIPS genomic sequence revealed 10 exons and 9 introns that are identical in both mutant and wild-type developing kernels. These findings support an association between reduced MIPS gene activity and low phytic acid content, but additional research should examine the promoter, the 5'UTR, or transcriptional controlling elements of the MIPS gene to ascertain the possible presence of a genetic lesion in those regions.

Record 130 of 609 - AGRICOLA 1998-2004/09

AU: De-la-Campa,-R.; Miller,-J.D.; Hendricks,-K.

TI: Fumonisin in tortillas produced in small-scale facilities and effect of traditional masa production methods on this mycotoxin.

SO: Journal of agricultural and food chemistry. 2004 July 14, v. 52, no. 14 p. 4432-4437.

AB: Four small tortilla plants were visited in Cameron County, Texas,

where observations were made on their production methods. Samples of liquids and solids were collected at each stage of the nixtamalization process, and the pH was recorded. Samples were analyzed for fumonisin B1 (FB1) using an immunoaffinity column/ HPLC method chosen for its sensitivity for FB1. It was found that production methods were highly variable among the producers visited, with major differences particularly in the amount of lime added and boiling times. As reported by others working in Mexico and Central America, FB1 was found in some tortillas. This led to studies of the effects of the various recipes and across a greater range of initial FB1 concentration/damaged corn than has typically been reported. Five initial concentrations of FB1 were tested using irradiated corn kernels inoculated with Fusarium verticillioides MRC 826 as the source of FB1. The amount of FB1 detected in the masa and tortillas decreased as the concentration of Ca(OH)2 increased, and boiling time had no apparent effect. Unexpectedly, as the initial concentrations were increased in the corn prior to nixtamalization, greater percentage reductions in FB1 were observed.

Record 131 of 609 - 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 132 of 609 - 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 133 of 609 - AGRICOLA 1998-2004/09
AU: Shang,-S.H.; Li,-X.; Mao,-X.; Lei,-Z.D.
TI: Simulation of water dynamics and irrigation scheduling for winter wheat and maize in seasonal frost areas.
SO: Agricultural water management. 2004 Aug. 1, v. 68, issue 2 p. 117-133.

Record 134 of 609 - 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 135 of 609 - AGRICOLA 1998-2004/09
AU: Moose,-S.P.; Dudley,-J.W.; Rocheford,-T.R.
TI: Maize selection passes the century mark: a unique resource for 21st century genomics.
SO: Trends in plant science. 2004 July, v. 9, no. 7 p. 358-364.

Record 136 of 609 - AGRICOLA 1998-2004/09
AU: Oyediran,-I.O.; Hibbard,-B.E.; Clark,-T.L.
TI: Prairie grasses as hosts of the western corn rootworm (Coleoptera: Chrysomelidae).
SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 740-747.
AB: We evaluated 21 prairie grass species thought to be among those dominant 200 yr ago in the western Great Plains as larval hosts of the western corn rootworm, Diabrotica virgifera virgifera LeConte. Maize, Zea mays L., and sorghum, Sorghum bicolor L., were included as positive and negative controls. Twenty pots of each test species were planted, and each pot was infested 5 wk later with 20 neonate western corn rootworm larvae. Four pots within each of four replications were randomly assigned a sample date for larval extraction. The remaining pot from each replication was used to monitor adult emergence. At 5, 10, 15, and 20 d after infestation, pot contents from assigned pots were placed in Tullgren funnels equipped with 60 W-lights for extraction of larvae. The percentage of larvae recovered, larval head capsule width, and adult emergence varied significantly among the grass species. The percentage of larvae recovered from western wheatgrass, Pascopyrum smithii (Rydb.); pubescent wheatgrass, Elytrigia intermedia (Host); and side-oats grama, Bouteloua curtipendula Michx., was not significantly different than that from maize when sample dates were combined. The number of adults produced from pubescent wheatgrass was not significantly different than the number produced from maize. The average dry weight and head capsule width of adults produced from grass species were not significantly different than the head capsule widths and dry weights of those adults from maize. Overall, adults were produced from 14 of the 23 species evaluated. The results from this study are discussed in relation to the potential ancestral hosts of western corn rootworm larvae and in relation to resistance management of transgenic maize.

Record 137 of 609 - AGRICOLA 1998-2004/09
AU: Clark,-T.L.; Hibbard,-B.E.
TI: Comparison of nonmaize hosts to support western corn rootworm (Coleoptera: Chrysomelidae) larval biology.
SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 681-689.
AB: With the recent commercialization of transgenic

rootworm-resistant maize with high levels of antibiosis to larval feeding, the biology of western corn rootworm, Diabrotica virgifera virgifera LeConte, on hosts beyond maize, Zea mays L., has become an important topic for which data are limited. Larval survivorship and growth parameters were monitored on the roots of 29 plant species comprised of maize, maize-field weeds, native prairie grasses, forage grasses, and small grain crops. Data on larval recovery and growth (measured as increases in head capsule width and accumulation of dry weight) were recorded at five samplings (6, 10, 14, 20, and 24 d) after initial infestation of the 29 species. Recovery and growth parameters were analyzed for inter- and intraspecific differences within and among sampling dates. Larvae survived at least 6 d after infestation on 27 species and 24 d on 23 plant species. Larval recovery and growth were impacted by both species and time after infestation. Growth and development of larvae were significantly slower on most plant species beyond maize; however, 18 of the species had larvae develop to the second instar, whereas larvae on 14 species developed to the third instar. Adults were recovered from five plant species in addition to maize. Because rootworm-resistant transgenic maize with high levels of antibiosis has become a part of the agroecosystem, weeds in grassy maize fields as well as adjacent forage grass species may become more important in the western corn rootworm life cycle, particularly because genes conferring resistance to postemergent herbicides such as glyphosate are stacked with transgenic rootworm-resistant maize hybrids.

Record 138 of 609 - AGRICOLA 1998-2004/09

AU: Isard,-S.A.; Spencer,-J.L.; Mabry,-T.R.; Levine,-E.

TI: Influence of atmospheric conditions on high-elevation flight of western corn rootworm (Coleoptera: Chrysomelidae).

SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 650-656.

AB: A variant of the western corn rootworm, Diabrotica virgifera virgifera LeConte (Coleoptera: Chrysomelidae), that circumvents crop rotation by flying out of cornfields to lay eggs in fields planted to other crops is presenting new management challenges to producers in the eastern Corn Belt. The rotation-resistant variant was first noted in east central Illinois and quickly dispersed to northern Indiana, southern Michigan, and northwestern Ohio. The spread of this variant throughout this region seems to be a result of high-altitude daytime flight. In this study, measurements of beetle flight activity at 10 m above ground level and meteorological factors are analyzed to evaluate the influence of atmospheric conditions on high-elevation flight of western corn rootworm. Collections of beetles from 72 d in July and August 2000-2002 reveal two pronounced peaks in high-elevation western corn rootworm flight, the first between 0645 and 1100 hours and the second between 1700 and 2030 hours. Low temperatures, high wind speeds, and darkness were found to limit beetle flight activity; however, within the range of weather conditions conducive to aerial movement, the level of flight activity was not strictly related to the values of individual environmental factors. Instead, peaks in western corn rootworm flight activity at 10-m elevation corresponded to predictable transitions in atmospheric conditions above the fields.

Record 139 of 609 - 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 140 of 609 - AGRICOLA 1998-2004/09

AU: Hough-Goldstein,-J.A.; Vangessel,-M.J.; Wilson,-A.P.

TI: Manipulation of weed communities to enhance ground-dwelling arthropod populations in herbicide-resistant field corn.

SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 577-586.

AB: Herbicide treatments were used in glyphosate-resistant field corn , Zea mays L., to produce treatments with weeds growing for varying periods of time in a replicated field trial conducted in three different fields over 3 yr. Increased weediness increased the activity-density of Harpalus pensylvanicus (DeGeer) (Coleoptera: Carabidae), the most common carabid species collected in pitfall traps. Field crickets, Gryllus spp. (Orthoptera: Gryllidae), showed a similar response, with generally higher numbers caught in weedier plots. Other ground-dwelling arthropod species showed variable responses to weediness. Wolf spiders (Lycosidae) showed an apparent response to fresh organic matter and dead weed thatch after herbicide treatments in 2002. Although several arthropods common in the field plots ate second instar western corn rootworms, Diabrotica virgifera virgifera LeConte (Coleoptera: Chrysomelidae), when the rootworms were presented to them on filter paper in the laboratory, rootworms were not consumed when presented to potential predators under a thin layer of soil. Predation on exposed larvae placed in the field for 24 h did not differ by treatment, possibly because the major species that differed by treatment were primarily herbivorous or omnivorous. Corn yields were lower in the weedy check plots all 3 yr, but no significant reduction in yield occurred in treatments with weeds present for 21, 31, or 41 d after planting, or in plots treated with preemergence herbicide only.

Record 141 of 609 - 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 142 of 609 - AGRICOLA 1998-2004/09

AU: Qureshi,-J.A.; Buschman,-L.L.; Ramaswamy,-S.B.; Throne,-J.E.; Whaley,-P.M.

TI: Evaluation of rubidium chloride and cesium chloride incorporated in a meridic diet to mark Diatraea grandiosella (Lepidoptera: Crambidae) for dispersal studies.

SO: Environmental entomology. 2004 June, v. 33, no. 3 p. 487-498.

AB: Southwestern corn borers, Diatraea grandiosella Dyar, were reared on a control meridic diet and diets that incorporated rubidium chloride (RbCl) or cesium chloride (CsCl) at the rate of 1000 microgram/g (1 g/liter of wet diet) to evaluate the effects on biology of D. grandiosella and to determine whether the resulting adults are marked with the rubidium (Rb) and cesium (Cs) physiological markers. The effects of RbCl and CsCl on survival, diet consumption, larval and pupal weight, developmental time, adult deformity, adult longevity, fecundity, and adult dry weight were generally minor and seldom reached statistically significant proportions. Males and females mated successfully when paired in different combinations across treatments. Graphite furnace atomic absorption spectrophotometer and neutron activation analysis were both effective in detecting Rb and Cs in male and female adults reared on RbCl and CsCl diets. Rb and Cs concentrations of males and females reared on RbCl and CsCl diets were above the background levels found in adults reared on the control diet. Rb and Cs can be used as physiological markers to mark D. grandiosella in dispersal experiments.

Record 143 of 609 - AGRICOLA 1998-2004/09

AU: Leiva-Neto,-J.T.; Grafi,-G.; Sabelli,-P.A.; Dante,-R.A.; Woo,-Y.M. ; Maddock,-S.; Gordon-Kamm,-W.J.; Larkins,-B.A.

TI: A dominant negative mutant of cyclin-dependent kinase A reduces endoreduplication but not cell size or gene expression in maize endosperm.

SO: Plant cell. 2004 July, v. 16, no. 7 p. 1854-1869.

AB: Cells in maize (Zea mays) endosperm undergo multiple cycles of endoreduplication, with some attaining DNA contents as high as 96C and 192C. Genome amplification begins around 10 d after pollination, coincident with cell enlargement and the onset of starch and storage protein accumulation. Although the role of endoreduplication is unclear, it is thought to provide a mechanism that increases cell size and enhances gene expression.

To investigate this process, we reduced endoreduplication in transgenic maize endosperm by ectopically expressing a gene encoding a dominant negative mutant form of cyclin-dependent kinase A. This gene was regulated by the 27-kD gamma-zein promoter, which restricted synthesis of the defective enzyme to the endoreduplication rather than the mitotic phase of endosperm development. Overexpression of a wild-type cyclin-dependent kinase A increased enzyme activity but had no effect on endoreduplication. By contrast, ectopic expression of the defective enzyme lowered kinase activity and reduced by half the mean C-value and total DNA content of endosperm nuclei. The lower level of endoreduplication did not affect cell size and only slightly reduced starch and storage protein accumulation. There was little difference in the level of endosperm gene expression with high and low levels of endoreduplication, suggesting that this process may not enhance transcription of genes associated with starch and storage protein synthesis.

Record 144 of 609 - AGRICOLA 1998-2004/09

AU: Goodman,-C.D.; Casati,-P.; Walbot,-V.

TI: A multidrug resistance-associated protein involved in anthocyanin transport in Zea mays.

SO: Plant cell. 2004 July, v. 16, no. 7 p. 1812-1826.

AB: Anthocyanin biosynthesis is one of the most thoroughly studied enzymatic pathways in biology, but little is known about the molecular mechanisms of its final stage: the transport of the anthocyanin pigment into the vacuole. We have identified a multidrug resistanceÆassociated protein (MRP), ZmMrp3, that is required for this transport process in maize (Zea mays). ZmMrp3 expression is controlled by the regulators of anthocyanin biosynthesis and mirrors the expression of other anthocyanin structural genes. Localization of ZmMRP3 in vivo shows its presence in the tonoplast, the site at which anthocyanin transport occurs. Mutants generated using antisense constructs have a distinct pigmentation phenotype in the adult plant that results from a mislocalization of the pigment as well as significant reduction in anthocyanin content, with no alteration in the anthocyanin species produced. Surprisingly, mutant plants did not show a phenotype in the aleurone. This appears to reflect the presence of a second, highly homologous gene, ZmMrp4, that is also coregulated with the anthocyanin pathway but is expressed exclusively in aleurone tissue. This description of a plant MRP with a role in the transport of a known endogenous substrate provides a new model system for examining the biological and biochemical mechanisms involved in the MRP-mediated transport of plant secondary metabolites.

Record 145 of 609 - AGRICOLA 1998-2004/09

AU: Guo,-M.; Rupe,-M.A.; Zinselmeier,-C.; Habben,-J.; Bowen,-B.A.; Smith,-O.S.

TI: Allelic variation of gene expression in maize hybrids.

SO: Plant cell. 2004 July, v. 16, no. 7 p. 1707-1716.

AB: Allelic expression variation of nonimprinted autosomal genes has recently been uncovered in mouse hybrids and humans. The allelic expression variation is attributed to differences in noncoding DNA sequences and does not involve epigenetic regulation or gene imprinting. This expression variation is suggested to play

important roles in determining phenotypic diversity. Virtually nothing is known about such allele-specific expression variation in a hybrid plant where two alleles are compared in the same genetic context. We examined parental transcript accumulation in maize (Zea mays) hybrids using allele-specific RT-PCR analysis. Among 15 genes analyzed, 11 showed differences at the RNA level, ranging from unequal expression of the two alleles (biallelic) to expression of a single allele (monoallelic). Maternal or paternal transmission had little effect on the allele-specific transcript ratio of nearly all genes analyzed, suggesting that parent-of-origin effect was minimal. We analyzed the allelic difference in genetically contrasting hybrids and hybrids under high planting density and drought stress. Whereas a genetically improved modern hybrid expressed both alleles, a less improved old hybrid frequently showed mono-allelic expression. Furthermore, the two alleles in the hybrid responded differentially to abiotic stresses. The results of allele-specific regulation in different tissues in responding to environment and stress suggest an unequivalent function of the parental alleles in the hybrid, which may have an impact on heterosis.

Record 146 of 609 - AGRICOLA 1998-2004/09

AU: Malcomber,-S.T.; Kellogg,-E.A.

TI: Heterogeneous expression patterns and separate roles of the SEPALLATA gene LEAFY HULL STERILE1 in grasses.

SO: Plant cell. 2004 July, v. 16, no. 7 p. 1692-1706.

AB: SEPALLATA (SEP) genes exhibit distinct patterns of expression and function in the grass species rice (Oryza sativa) and maize (Zea mays), suggesting that the role of the genes has changed during the evolution of the family. Here, we examine expression of the SEP-like gene LEAFY HULL STERILE1 (LHS1) in phylogenetically disparate grasses, reconstruct the pattern of gene expression evolution within the family, and then use the expression patterns to test hypotheses of gene function. Our data support a general role for LHS1 in specifying determinacy of the spikelet meristem and also in determining the identity of lemmas and paleas; these two functions are separable, as is the role of the gene in specifying floret meristems. We find no evidence that LHS1 determines flower number; it is strongly expressed in all spikelet meristems even as they are producing flowers, and expression is not correlated with eventual flower number. LHS1 expression in only the upper flowers of the spikelet appears to be the ancestral state; expression in all flowers is derived in subfamily Pooideae. LHS1 expression in pistils, stamens, and lodicules varies among the cereals. We hypothesize that LHS1 may have affected morphological diversification of grass inflorescences by mediating the expression of different floral identity genes in different regions of the floret and spikelet.

Record 147 of 609 - 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 148 of 609 - AGRICOLA 1998-2004/09

AU: Kelm,-M.; Wachendorf,-M.; Trott,-H.; Volkers,-K.; Taube,-F.

TI: Performance and environmental effects of forage production on sandy soils. III. Energy efficiency in forage production from grassland and maize for silage.

SO: Grass and forage science the journal of the British Grassland Society. 2004 Mar., v. 59, no. 1 p. 69-79.

AB: Based on experimental data gathered in a research project on nitrogen fluxes in intensive dairy farming in Northern Germany, an analysis of fossil energy input and energy efficiency in forage production from permanent grassland and maize for silage was conducted. Field experiments comprised different defoliation systems and different rates of mineral N fertilizer and slurry application. Each change from grazing to cutting in grassland systems reduced the energy efficiency. Energy efficiency consistently decreased with increasing rates of mineral N application. In the production of maize for silage, maximum energy efficiency was obtained with an application of 50 kg N ha-1 from slurry only. Net energy yields of maize for silage were much higher than that of grassland when compared at the same level of fossil energy and nitrogen fertilizer input. Considering both nitrate-leaching losses and a necessary minimum quantity of grass herbage in a well-balanced ration, it is suggested that a high proportion of maize for silage in combination with N-unfertilized grass/clover swards used in a mixed cutting/grazing system represents a good trade-off between the leaching of nitrates and energy efficiency.

Record 149 of 609 - 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 150 of 609 - AGRICOLA 1998-2004/09

AU: Hirashima,-M.; Takahashi,-R.; Nishinari,-K.

TI: Effects of citric acid on the viscoelasticity of cornstarch pastes.

SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 2929-2933.

AB: The effects of citric acid on the rheological properties of cornstarch pastes were studied by steady shear and dynamic oscillatory viscoelasticity, intrinsic viscosity measurements and microscopic observation. The pH of cornstarch dispersion was adjusted between 6.0 and 3.0. The viscosity of the pastes was increased by lowering the pH (between 5.5 and 3.6), while the viscosity of samples with pH below 3.5 decreased further than that of the control (pH = 6.3). Citric acid promoted the collapse of starch granules; however, adding excessive citric acid led to the hydrolysis of glucose chains. No decrease in the viscoelasticity was observed for cornstarch pastes by adding acid at 25 ÀC after gelatinization.

Record 151 of 609 - AGRICOLA 1998-2004/09

AU: Bojja,-R.S.; Cerny,-R.L.; Proctor,-R.H.; Du,-L.

TI: Determining the biosynthetic sequence in the early steps of the fumonisin pathway by use of three gene-disruption mutants of Fusarium verticillioides.

SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 2855-2860.

AB: Fumonisins are polyketide-derived mycotoxins produced by Fusarium verticillioides, a fungal pathogen of corn plants. Although a gene cluster for the biosynthesis of fumonisins has been cloned, the biosynthetic pathway is still not clear. We have used three gene-disrupted mutants, designated deltaFUM1, deltaFUM6, and deltaFUM8, to study the early steps of the pathway. Fumonisins were not produced in single-strain cultures of the deltaFUM1, deltaFUM6, and deltaFUM8 mutants. However, fumonisins were produced by deltaFUM1 or deltaFUM8 mutants when they were cocultured with the deltaFUM6 mutant. No fumonisins were produced when the deltaFUM1 and deltaFUM8 mutants were cocultured. These results suggest that the deltaFUM6 mutant produces a fumonisin intermediate that can be further metabolized by fumonisin biosynthetic enzymes in the deltaFUM1 and deltaFUM8 mutants. To isolate the potential intermediates produced by deltaFUM6, we followed a time course of cocultures of the deltaFUM1 and

deltaFUM6 and the deltaFUM8 and deltaFUM6 mutants. Liquid chromatographic-mass spectrometric data suggested that metabolites having the general carbon skeleton of fumonisins with 1-4 hydroxyl groups were accumulated over a 7-day period. These results indicate that fumonisin biosynthesis starts with Fum1p-catalyzed carbon-chain assembly followed by the Fum8p-catalyzed alanine condensation. The resulting product then can be further oxidized by Fum6p and other enzymes.

Record 152 of 609 - AGRICOLA 1998-2004/09

AU: Lee,-N.A.; Wang,-S.; Allan,-R.D.; Kennedy,-I.R.

TI: A rapid aflatoxin B1 ELISA: development and validation with reduced matrix effects for peanuts, corn, pistachio, and soybeans.

SO: Journal of agricultural and food chemistry. 2004 May 19, v. 52, no. 10 p. 2746-2755.

AB: Among the competitive ELISAs for aflatoxins that have been described, few have been adequately validated for reduced matrix effects. Using an aflatoxin B1 (AFB1)-specific polyclonal antibody (produced from AFB1-oxime conjugated to bovine serum albumin (BSA)) and AFB1- and AFB2-enzyme conjugates, four direct competitive ELISAs based on 96-microwell plates (two standard assays and two rapid assays) were developed, paying special attention to producing a robust assay relatively free of interferences for a range of agricultural products. The antibody was AFB1-specific, detecting only AFB1 in a mixture of four aflatoxins (AFB1, AFB2, AFG1, and AFG2), but showed significant cross-reaction with AFG1 (57-61%) when an individual compound was tested. Standard assays (long assays) exhibited higher sensitivities than rapid assays (short assays) with IC50 values of 12 « 1.5 and 9 « 1.5 microgram/kg in sample (with 1 in 5 dilution of sample extract) for AFB1 and AFB2-enzyme conjugates, respectively. These assays have narrower detection ranges (7.1-55. 5 microgram/kg in sample) and required dilution of sample extracts to overcome solvent and matrix interferences, making these assays less ideal as analytical methods. Rapid assays exhibited IC50 values of 21.6 « 2.7 and 12 microgram/kg in sample for AFB1- and AFB2-enzyme conjugates, respectively. These assays have ideally broader detection ranges (4.2-99.9 microgram/kg in sample) and showed no methanol effects up to 80% with significantly reduced matrix interferences as a result of the shorter incubation times and increasing the amounts of enzyme conjugate used. Therefore, the rapid assays were formatted to perform without a need for extract dilution. The rapid assays can be completed within 15 min, potentially suitable for receival bays where quick decision-making to segregate low and high contamination is critical. Further validation using the rapid assay with AFB1-enzyme conjugate indicated relatively good recoveries of AFB1 spiked in corn, peanuts, pistachio, and soybeans, which were free from significant matrix effects. It can be concluded that this rapid assay would be suitable for monitoring aflatoxin AFB1 at current legal maximum residue limits of 10 microgram/kg in food such as corn, peanuts, pistachio, and soybeans.

Record 153 of 609 - AGRICOLA 1998-2004/09

AU: Herman,-R.A.; Phillips,-A.M.; Collins,-R.A.; Tagliani,-L.A.;

Claussen,-F.A.; Graham,-C.D.; Bickers,-B.L.; Harris,-T.A.; Prochaska,-L.M.

TI: Compositional equivalency of Cry1F corn event TC6275 and conventional corn (Zea mays L.).

SO: Journal of agricultural and food chemistry. 2004 May 5, v. 52, no. 9 p. 2726-2734.

AB: Maize (Zea mays L.) plants have been transformed to express a Cry1F insecticidal crystal protein originally isolated from Bacillus thuringiensis Berliner. This protein controls lepidopteran pests of maize, including the European corn borer, Ostrinia nubilalis (Hubner). As part of the safety assessment for crops containing transgenes, a compositional analysis of the food and feed is conducted. This analysis is designed to detect unintended changes in the nutrient and antinutrient content of the raw commodities produced by the crop due to the insertion of the genes into the genomic DNA of the plant (pleotropic effects). Samples of transgenic and nontransgenic maize forage and grain were collected from six field sites located in the U.S. and Canada. Forage samples were analyzed for proximates and minerals, and grain was further analyzed for fatty acids, amino acids, vitamins, secondary metabolites, and antinutrients. Results demonstrated that maize expressing the Cry1F protein was equivalent to nontransgenic maize with respect to these important components. Comparison of the variability within the nontransgenic and transgenic hybrid, as compared to composition values reported in the literature, suggest that factors other than transgenes may contribute more substantially to the composition of crops.

Record 154 of 609 - AGRICOLA 1998-2004/09

AU: Sinagawa-Garcia,-S.R.; Rascon-Cruz,-Q.; Valdez-Ortiz,-A.; Medina-Godoy,-S.; Escobar-Gutierrez,-A.; Paredes-Lopez,-O.

TI: Safety assessment by in vitro digestibility and allergenicity of genetically modified maize with an amaranth 11S globulin.

SO: Journal of agricultural and food chemistry. 2004 May 5, v. 52, no. 9 p. 2709-2714.

AB: Prospective testing for allergenicity of proteins obtained from sources with no prior history of causing allergy has been difficult to perform. Thus, the objective of this work was to assess the food safety of genetically modified maize with an amaranth globulin protein termed amarantin. Transgenic maize lines evaluated showed, in relation to nontransgenic, 4-35% more protein and 0-44% higher contents of specific essential amino acids. Individual sequence analysis with known amino acid sequences, reported as allergens, showed that none of these IgE elicitors were identified in amarantin. Amarantin was digested within the first 15 min by Simulated Gastric Fluid treatment as observed by Western blot. Expressed amarantin did not induce important levels of specific IgE antibodies in BALB/c mice, as analyzed by ELISA. We conclude that the transgenic maize with amarantin is not an important allergenicity inducer, just as nontransgenic maize.

Record 155 of 609 - AGRICOLA 1998-2004/09

AU: Jiratanan,-T.; Liu,-R.H.

TI: Antioxidant activity of processed table beets (Beta vulgaris var, conditiva) and green beans (Phaseolus vulgaris L.).

SO: Journal of agricultural and food chemistry. 2004 May 5, v. 52, no. 9 p. 2659-2670.

AB: It has been shown that thermal processing of tomatoes and sweet corn results in increased antioxidant activities despite the loss of vitamin C. Until now, it is unclear whether this positive effect of thermal processing occurs with all crop produce. Therefore, analysis of a root vegetable (beets) and of a legume (green beans) was undertaken to address this question. Antioxidant activity of beets processed under typical commercial processing conditions remained constant despite an 8% loss of vitamin C, a 60% loss of color, and 30% loss of dietary folate. There was a slight but significant 5% increase in phenolic content of processed beets. In contrast, vitamin C and dietary folate content of green beans remained constant, whereas a 32% reduction in phenolic compounds occurred after typical commercial processing conditions. The antioxidant activity of green beans was reduced by 20%. These findings along with previous works suggest that the effects of thermal processing vary with the respective produce crop type. It also reinforces the concept that optimal health benefits may be achieved when a wide variety of plant foods (fruits, vegetables and whole grains) and preparation methods are incorporated into the diet.

Record 156 of 609 - AGRICOLA 1998-2004/09

AU: Orav,-A.; Stulova,-I.; Kailas,-T.; Muurisepp,-M.

TI: Effect of storage on the essential oil composition of Piper nigrum L. fruits of different ripening states.

SO: Journal of agricultural and food chemistry. 2004 May 5, v. 52, no. 9 p. 2582-2586.

AB: The qualitative and quantitative composition of the essential oil from black, green, and white pepper was determined by using a simultaneous distillation and extraction micromethod for oil isolation and gas chromatography (GC)/flame ionization detection (FID) and GC/mass spectrometry (MS) analysis techniques. The most abundant compounds in pepper oils were (E)-beta-caryophyllene (1. 4-70.4%), limonene (2.9-38.4%), beta-pinene (0.7-25.6%), delta-3-carene (1.7-19.0%), sabinene (0-12.2%), alpha-pinene (0.3-10.4%), eugenol (0.1-41.0%), terpinen-4-ol (0-13.2%), hedycaryol (0-9.1%), beta-eudesmol (0-9.7%), and caryophyllene oxide (0.1-7.2%). Green pepper corn obtained by a sublimation drying method gave more oil (12.1 mg/g) and a much higher content of monoterpenes (84.2%) in the oil than air-dried green pepper corn (0.8 mg/g and 26.8%, respectively). The oil from ground black pepper contained more monoterpenes and less sesquiterprnes and oxygenated terpenoids as compared to green and white pepper oils. After 1 year of storage of pepper samples in a glass vessel at room temperature, the amount of the oils isolated decreased, the content of terpenes decreased, and the amount of oxygenated terpenoids increased. Differently from other pepper samples, 1 year storage of green pepper corn raised the oil amount more than twice of both drying methods.

Record 157 of 609 - AGRICOLA 1998-2004/09

AU: Mol,-R.; Filek,-M.; Dumas,-C.; Matthys-Rochon,-E.

TI: Cytoplasmic calcium in silk trichomes after pollen grain reception and post-pollination changes of the electric potential in pistil tissues of maize.

SO: Plant science. 2004 June, v. 166, issue 6 p. 1461-1469.

Record 158 of 609 - AGRICOLA 1998-2004/09
AU: Serdaroglu,-M.; Degirmencioglu,-O.
TI: Effects of fat level (5%, 10%, 20%) and corn flour (0%, 2%, 4%) on some properties of Turkish type meatballs (koefte).
SO: Meat science. 2004 Oct., v. 68, no. 2 p. 291-296.
AB: In this study the effects of fat level (5%, 10% and 20%) and corn flour (CF 0%, 2% and 4%) on chemical composition, cooking characteristics and sensory properties of Turkish type meatballs were evaluated. Cooking characteristics were evaluated by measuring cooking yield, fat retention, moisture retention, reduction in diameter and thickness and shrinkage. At each fat level, incorporation of CF significantly increased protein content but had no significant effect on fat content of cooked meatballs. Decreasing the fat content from 20% to 5% significantly increased cooking yield and fat retention. Meatballs formulated with 20% fat had the highest reduction in diameter. CF had no effect on reduction in diameter. CF reduced shrinkage in meatballs formulated with 5% or 10% fat and increased moisture retention in treatments formulated with 5% or 10% fat. Sensory evaluation indicated that decreasing fat level resulted in lower texture and overall palatability scores. CF had no detrimental effect on sensory properties except appearance.

Record 159 of 609 - AGRICOLA 1998-2004/09
AU: Heinemann,-J.A.; Sparrow,-A.D.; Traavik,-T.
TI: Is confidence in the monitoring of GE foods justified.
SO: Trends in biotechnology. 2004 July, v. 22, no. 7 p. 331-336.

Record 160 of 609 - AGRICOLA 1998-2004/09
AU: Guo,-L.; Piao,-X.S.; Li,-D.; Li,-S.Y.
TI: The apparent digestibility of corn by-products for growing-finishing pigs In vivo and In vitro.
SO: Asian-Australasian journal of animal sciences. 2004 Mar., v. 17, no. 3 p. 379-385.

Record 161 of 609 - AGRICOLA 1998-2004/09
AU: McCormick,-S.P.; Harris,-L.J.; Alexander,-N.J.; Ouellet,-T.; Saparno,-A.; Allard,-S.; Desjardins,-A.E.
TI: Tri1 in Fusarium graminearum encodes a P450 oxygenase.
SO: Applied and environmental microbiology. 2004 Apr., v. 70, no. 4 p. 2044-2051.
AB: Gibberella zeae (asexual state Fusarium graminearum) is a major causal agent of wheat head blight and maize ear rot in North America and is responsible for contamination of grain with deoxynivalenol and related trichothecene mycotoxins. To identify additional trichothecene biosynthetic genes, cDNA libraries were prepared from fungal cultures under trichothecene-inducing conditions in culture and in planta. A gene designated LH1 that was highly expressed under these conditions exhibited only moderate (59%) similarity to known trichothecene biosynthetic cytochrome P450s. To determine the function of LH1, gene disruptants were produced and assessed for trichothecene production. Gene disruptants no longer produced 15-acetyldeoxynivalenol, which is oxygenated at carbon 7 (C-7) and C-8, but rather accumulated calonectrin and

3-deacetylcalonectrin, which are not oxygenated at either C-7 or C-8. These results indicate that gene LH1 encodes a cytochrome P450 responsible for oxygenation at one or both of these positions. Despite the relatively low level of DNA and amino acid sequence similarity between the two genes, LH1 from G. zeae is the probable homologue of Tri1, which encodes a cytochrome P450 required for C-8 oxygenation in F. sporotrichioides.

Record 162 of 609 - AGRICOLA 1998-2004/09

AU: Herrera-Cabrera,-B.E.; Castillo-Gonzalez,-F.; Sanchez-Gonzalez,-J. J.; Hernandez-Casillas,-J.M.; Ortega-Pazkca,-R.A.; Major-Goodman,-M.

TI: Diversity of Chalqueno maize.

SO: Agrociencia. 2004 Mar-Apr, v. 38, no. 2 p. 191-206.

Record 163 of 609 - AGRICOLA 1998-2004/09

AU: Wang,-X.; Geng,-X.; Egashira,-Y.; Sanada,-H.

TI: Purification and characterization of a feruloyl esterase from the intestinal bacterium Lactobacillus acidophilus.

SO: Applied and environmental microbiology. 2004 Apr., v. 70, no. 4 p. 2367-2372.

AB: Dietary ferulic acid (FA), a significant antioxidant substance, is currently the subject of extensive research. FA in cereals exists mainly as feruloylated sugar ester. To release FA from food matrices, it is necessary to cleave ester cross-linking by feruloyl esterase (FAE) (hydroxycinnamoyl esterase; EC 3.1.1.73). In the present study, the FAE from a human typical intestinal bacterium, Lactobacillus acidophilus, was isolated, purified, and characterized for the first time. The enzyme was purified in successive steps including hydrophobic interaction chromatography and anion-exchange chromatography. The purified FAE appeared as a single band in sodium dodecyl sulfate-polyacrylamide gel electrophoresis, with an apparent molecular mass of 36 kDa. It has optimum pH and temperature characteristics (5.6 and 37ÀC, respectively). The metal ions Cu2+ and Fe3+ (at a concentration of 5 mmol liter-1) inhibited FAE activity by 97.25 and 94.80%, respectively. Under optimum pH and temperature with 5-O-feruloyl-L-arabinofuranose (FAA) as a substrate, the enzyme exhibited a Km of 0.0953 mmol liter-1 and a Vmax of 86.27 mmol liter-1 min-1 mg-1 of protein. Furthermore, the N-terminal amino acid sequence of the purified FAE was found to be A R V E K P R K V I L V G D G A V G S T. The FAE released FA from O-(5-O-feruloyl-alpha-L-arabinofuranosyl)-(1 to 3)-O-beta-D-xylopyranosyl-(1 to 4)-D-xylopyranose (FAXX) and FAA obtained from refined corn bran. Moreover, it released two times more FA from FAXX in the presence of added xylanase.

Record 164 of 609 - AGRICOLA 1998-2004/09

AU: Yang,-M.; Wardzala,-E.; Johal,-G.S.; Gray,-J.

TI: The wound-inducible Lls1 gene from maize is an orthologue of the Arabidopsis Acd1 gene, and the LLS1 protein is present in non-photosynthetic tissues.

SO: Plant molecular biology. 2004 Jan., v. 54, no. 2 p. 175-191.

AB: Previous studies indicated that the lethal leaf spot 1 lesion mimic locus of maize (ZmLls1) encodes a novel cell protective function in plants. Here we show that the accelerated cell death 1 (acd1) locus of Arabidopsis thaliana corresponds to gene

At3g44880 on chromosome 3. Proof that the Acd1 gene is an orthologue of ZmLls1 is provided by in vivo complementation of the acd1 mutant by the ZmLls1 gene. The Atlls1 lesion mimic phenotype was delayed in a chlorophyll a oxygenase (CAO) mutant chlorina1 background which is deficient in chlorophyll b synthesis. The interpretation that the cell protective function of LLS1 is linked with the removal of a phototoxic chlorophyll intermediate is supported by the recent report that the maize Lls1 gene encodes pheophorbide a oxygenase (PaO). Western blot analysis demonstrates that the LLS1 protein is present constitutively in all photosynthetic plant tissues. A transient increase in Lls1 gene expression by about 50-fold upon physical wounding of maize leaves indicates that the function of Lls1 is regulated in response to stress. We show that the LLS1 protein is also present at low levels in non-photosynthetic tissues including etiolated leaves suggesting that the ability to degrade chlorophyll exists in a standby mode in plant cells.

Record 165 of 609 - 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 166 of 609 - AGRICOLA 1998-2004/09

AU: Bynum,-E.D.--Jr.; Xu,-W.; Archer,-T.L.

TI: Potential efficacy of spider mite-resistant genes in maize testcrosses.

SO: Crop protection. 2004 July, v. 23, no. 7 p. 625-634.

AB: Tropically adapted maize (Zea mays L) germplasm resistant to spider mite species (Acari: Tetranychidae) may contribute to host plant-resistant hybrids for western Great Plains States where spider mite populations are an economic problem. This study evaluated (1) the efficacy of seven mite-resistant maize inbred lines as sources of resistance in testcrosses with B73 and Mo17

and (2) the agronomic performance of F1 hybrids. Mite-resistant lines (S1-S5, S7, and S9), susceptible check inbred lines (B73 and Mo17), testcrosses between resistant and susceptible lines, and susceptible test hybrids (B73xMo17 and Pioneer hybrid 34K77) were arranged in randomized complete block design with three replications at Halfway, TX in 1997, 1998, and 2002 and at Lubbock, TX in 2001 and 2002. Resistance was evaluated for differences in spider mite infestations and feeding damage following augmented infestations just prior to tassel. Weekly samples showed that mite infestations and damages among genotypes varied greatly across weeks and between locations and years. Total mite densities, total damage ratings, mite per damage ratios (M/D), and a seasonal damage ratio (SDR) were calculated from weekly samples. The combined analysis of variance showed that environment, entry, environment x entry interaction was significant for total mite density. Environment and entries were significant for total damage ratings, M/D, and SDR. Testcrosses (S2xB73, S3xB73, S9xB73, S1xMo17, S2xMo17, and S3xMo17, S4xMo17, S5xMo17, and S9xMo17) had significantly lower mite damage than the check hybrid, B73xMo17, at the $P<0.05$ level. Damage to testcrosses S1xB73, S5xB73, and S7xMo17 were significantly different ($P<0.01$) from the check hybrid, B73xMo17 and the testcross S7xB73 had a highly significant reduction in damage ($P< 0.001$). Broad-sense heritability estimates indicated a large portion of resistance for these selection criteria were associated to genetic factors. Resistant testcrosses provided greater protection from spider mite feeding than did check hybrids across all environments.

Record 167 of 609 - AGRICOLA 1998-2004/09

AU: Hou,-G.; Kramer,-V.L.; Wang,-Y.S.; Chen,-R.; Perbal,-G.; Gilroy,-S.; Blancaflor,-E.B.

TI: The promotion of gravitropism in Arabidopsis roots upon actin disruption is coupled with the extended alkalinization of the columella cytoplasm and persistent lateral auxin gradient.

SO: Plant journal. 2004 July, v. 39, no. 1 p. 113-125.

AB: The actin cytoskeleton has been implicated in regulating plant gravitropism. However, its precise role in this process remains uncertain. We have shown previously that disruption of the actin cytoskeleton with Latrunculin B (Lat B) strongly promoted gravitropism in maize roots. These effects were most evident on a clinostat as curvature that would exceed 90 despite short periods of horizontal stimulation. To probe further the cellular mechanisms underlying these enhanced gravity responses, we extended our studies to roots of Arabidopsis. Similar to our observations in other plant species, Lat B enhanced the response of Arabidopsis roots to gravity. Lat B (100 nm) and a stimulation time of 5-10 min were sufficient to induce enhanced bending responses during clinorotation. Lat B (100 nm) disrupted the fine actin filament network in different regions of the root and altered the dynamics of amyloplasts in the columella but did not inhibit the gravity-induced alkalinization of the columella cytoplasm. However, the duration of the alkalinization response during continuous gravistimulation was extended in Lat B-treated roots. Indirect visualization of auxin redistribution using the DR5:b-glucuronidase (DR5:GUS) auxin-responsive reporter showed that the enhanced curvature of Lat B-treated roots during

clinorotation was accompanied by a persistent lateral auxin gradient. Blocking the gravity-induced alkalinization of the columella cytoplasm with caged protons reduced Lat B-induced curvature and the development of the lateral auxin gradient. Our data indicate that the actin cytoskeleton is unnecessary for the initial perception of gravity but likely acts to downregulate gravitropism by continuously resetting the gravitropic-signaling system.

Record 168 of 609 - AGRICOLA 1998-2004/09

AU: George,-M.L.C.; Regalado,-E.; Li,-W.; Cao,-M.; Dahlan,-M.; Pabendon,-M.; Warburton,-M.L.; Xianchun,-X.; Hoisington,-D.

TI: Molecular characterization of Asian maize inbred lines by multiple laboratories.

SO: Theoretical and applied genetics. 2004 June, v. 109, no. 1 p. 80-91.

AB: This study focuses on the standardization of techniques across laboratories to enable multiple datasets to be compared and combined in order to obtain reliable and robust wide-scale patterns of diversity. A set of protocols using a core collection of simple sequence repeat (SSR) markers, reference lines and standard alleles, plus a common system of allele nomenclature, was adopted in the study of maize genetic diversity in a network of laboratories in Asia. Pair-wise allele comparisons of the reference lines, done to assess the general agreement between datasets from four laboratories, showed error rates (raw) ranging from 5.8% to 9.7%, which were reduced to less than 8% after adjustments of correctable errors, and further reduced to less than 6% after the exclusion of all markers with greater than 10% individual error rates. Overall, 45% of the total mismatches were due to frameshift errors, 39% to wrong allele size, 15% to failed amplification and 1% to extra alleles. Higher genetic similarity values of the reference lines were achieved using fewer markers with data of higher quality rather than with more markers of questionable quality. Cluster analysis of the merged datasets showed the lines from southern China to be highly diverse, falling into six of the seven clusters observed and all well represented by tester lines. The lines from Indonesia fell into five of six groups, with two main groups represented by tester lines. The CIMMYT lines developed for the Asian region showed a relatively narrow genetic base, falling in two out of seven and in three out of six clusters in China and Indonesia, respectively. In contrast to the case in southern China where 95% of the lines clustered separately from the CIMMYT lines, lines in the Indonesian breeding program show a closer relationship with the CIMMYT lines, reflecting a long history of germplasm exchange.

Record 169 of 609 - AGRICOLA 1998-2004/09

AU: Zhao,-B.Y.; Ardales,-E.; Brasset,-E.; Claflin,-L.E.; Leach,-J.E.; Hulbert,-S.H.

TI: The Rxo1/Rba1 locus of maize controls resistance reactions to pathogenic and non-host bacteria.

SO: Theoretical and applied genetics. 2004 June, v. 109, no. 1 p. 71-79.

AB: Infiltration of different maize lines with a variety of bacterial pathogens of maize, rice and sorghum identified qualitative

differences in resistant reactions. Isolates from two bacterial species induced rapid hypersensitive reactions (HR) in some maize lines, but not others. All isolates of the non-host pathogen Xanthomonas oryzae pv. oryzicola (bacterial leaf streak disease of rice) and some isolates of the pathogenic bacterium Burkholderia andropogonis induced HR when infiltrated into maize line B73, but not Mo17. Genetic control of the HR to both bacteria segregated as a single dominant gene. Surprisingly, both phenotypes mapped to the same locus, indicating they are either tightly linked or controlled by the same gene. The locus maps on the short arm of maize chromosome six near several other disease-resistance genes. Results indicate the same type of genes may contribute to both non-host resistance and resistance to pathogens.

Record 170 of 609 - AGRICOLA 1998-2004/09
AU: Liu,-Y.; Mi,-G.; Chen,-F.; Zhang,-J.; Zhang,-F.
TI: Rhizosphere effect and root growth of two maize (Zea mays L.) genotypes with contrasting P efficiency at low P availability.
SO: Plant science. 2004 Aug., v. 167, issue 2 p. 217-223.

Record 171 of 609 - AGRICOLA 1998-2004/09
AU: Gu,-Y.S.; Decker,-E.A.; McClements,-D.J.
TI: Influence of pH and iota-carrageenan concentration on physicochemical properties and stability of beta-lactoglobulin-stabilized oil-in-water emulsions.
SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3626-3632.
AB: The influence of pH and iota-carrageenan concentration on the properties of beta-lactoglobulin (beta-Lg)-stabilized oil-in-water emulsions was investigated by measuring the particle charge, particle size distribution, and creaming stability. Emulsions containing droplets stabilized by beta-Lg were produced by homogenization, and then, iota-carrageenan was added. At pH 3, the droplet charge did not change for iota-carrageenan concentrations less than or equal to 0.1 wt % but decreased rapidly at high concentrations, while the mean particle diameter increased slightly as the iota-carrageenan concentration was increased. These results suggest that the interaction between iota-carrageenan and beta-Lg was weak at pH 3 probably because some sulfate groups were protonated (pK(a) = 2). At pH 4 and pH 5, the droplet charge decreased dramatically as the iota-carrageenan concentration was increased from 0 to 0.15 wt %, but droplet aggregation and creaming occurred in the emulsions, indicating that interfacial complexes between iota-carrageenan and beta-Lg could not stabilize the emulsions, probably due to bridging flocculation. At pH 6, the droplet charge in the primary emulsions was negative and became more negative as the iota-carrageenan concentration was increased. The mean particle diameter was relatively small at all iota-carrageenan concentrations, and emulsions were stable to creaming after 1 week of storage. We propose that carrageenan adsorbed to the droplet surfaces and increased the electrostatic repulsion between droplets. At pH 7 and pH 8, the droplet charge did not change as the iota-carrageenan concentration was increased, but these emulsions became unstable to creaming above a critical carrageenan concentration, which was attributed to depletion

flocculation.

Record 172 of 609 - AGRICOLA 1998-2004/09

AU: Ogawa,-S.; Decker,-E.A.; McClements,-D.J.

TI: Production and characterization of O/W emulsions containing droplets stabilized by lecithin-chitosan-pectin multilayerd membranes.

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3595-3600.

AB: The possibility of producing stable oil-in-water (O/W) emulsions containing oil droplets surrounded by multiple layer interfacial membranes from food grade ingredients has been demonstrated. These emulsions were produced using a three stage process that relies on the adsorption of charged biopolymers to oppositely charged surfaces. Emulsions (0.5 wt % corn oil, 0.1 wt % lecithin, 0.0078 wt % chitosan, 0.02 wt % pectin, and 100 mM acetic acid, pH 3.0) containing oil droplets stabilized by lecithin-chitosan-pectin membranes were formed using this interfacial layer-by-layer deposition process. The droplets in these emulsions had good stability to aggregation over a wide range of pH values and salt concentrations (pH 4-8 at 0 mM NaCl and pH 3-8 at 100 mM NaCl). This technology could be extremely useful to the food industry for the creation of O/W emulsions with improved properties or novel applications, e.g., improved stability to environmental stresses, protection of labile substances, controlled release, and triggered release.

Record 173 of 609 - AGRICOLA 1998-2004/09

AU: Prado,-M.; Casqueiro,-J.; Iglesias,-Y.; Cepeda,-A.; Barros-Velazquez,-J.

TI: Application of a polymerase chain reaction (PCR) method as a complementary tool to microscopic analysis for the detection of bones and other animal tissues in home-made animal meals.

SO: Journal of the science of food and agriculture. 2004 Apr. 30, v. 84, issue 6 p. 505-512.

AB: A polymerase chain reaction (PCR) method was compared with a variation of the official microscopic technique (Directive 98/88/EC) for the detection in animal meals of cereals (wheat and corn) and animal parts (bone, feathers, meat, liver, fat and blood). Microscopy successfully detected animal bones in raw feeds with a sensitivity of 1 g kg-1, while the sensitivity of the PCR method was in the range of 5-10 g kg-1. Microscopy also allowed the detection of animal bones and feathers in feeds processed at 115 and 133ÀC but failed to detect other animal materials. The PCR method successfully detected cereals (wheat and corn) as well as meat, bone, liver, fat and feathers after processing at 115ÀC for 20 min. Heating at 133ÀC under overpressure (autoclave) conditions resulted in more intense DNA fragmentation and lower DNA extractability. Nevertheless, bone and liver, as well as wheat and corn in home-made animal meals, were successfully detected even after heating at 133ÀC for 20 min.

Record 174 of 609 - 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 175 of 609 - 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 176 of 609 - AGRICOLA 1998-2004/09

AU: Huang,-H.Y.; Pan,-T.M.

TI: Detection of genetically modified maize MON810 and NK603 by multiplex and real-time polymerase chain reaction methods.

SO: Journal of agricultural and food chemistry. 2004 June 2, v. 52, no. 11 p. 3264-3268.

AB: In this study, the event-specific primers for insecticide-resistant maize, MON810, and herbicide-tolerance maize , NK603, have been designed. Simplex PCR and multiplex PCR detection method have been developed. The detection limit of the multiplex PCR is 0.5% for MON810 and NK603 in 50 ng of the template for one reaction. Quantitative methods based on real-time quantitative PCR were developed for MON810 and NK603. Plasmid pMulM2 as reference molecules for the detection of MON810 and NK603 was constructed. Quantification range was from 0.5 to 100% in 100 ng of the DNA template for one reaction. The precision of real-time Q-PCR detection methods, expressed as coefficient of variation for MON810 and NK603 varied from 1.97 to 8.01% and from 3.45 to 10.94%, respectively. The range agreed with European interlaboratories test results (25%). According to the results, the methods for quantitative detection of genetically modified maize were acceptable.

Record 177 of 609 - AGRICOLA 1998-2004/09

AU: Tudoreanu,-L.; Phillips,-C.J.C.

TI: Empirical models of cadmium accumulation in maize, rye grass and soya bean plants.

SO: Journal of the science of food and agriculture. 2004 June, v. 84, issue 8 p. 845-852.

AB: Linear regression of published values for soil parameters and cadmium concentrations in plant tissues offers the opportunity to develop uptake coefficients that can be applied in a wide range of circumstances. A widespread literature search was performed which identified publications from the last 20 years containing information on cadmium uptake by maize and rye grass plants. After discarding experiments with inadequate data or parameters, 10 and eight papers were chosen for maize and rye grass respectively to develop linear models that related pH and cadmium concentration in the growth media (soil in pots or nutrient solution) to cadmium concentration in maize or rye grass plants (excluding roots). Cadmium concentrations in both maize and rye grass were positively correlated with soil cadmium concentration, and in the case of maize negatively correlated with soil pH. They were also negatively correlated with the product of soil cadmium concentration and soil pH, demonstrating that at high soil cadmium concentration a high soil pH reduced plant cadmium

concentration. A further model of data generated from one experiment with soya beans demonstrated that other factors, such as soil temperature, can have a major influence on uptake.

Record 178 of 609 - AGRICOLA 1998-2004/09

AU: Jaimez,-J.; Fente,-C.A.; Franco,-C.M.; Cepeda,-A.; Vazquez,-B.I.

TI: A survey of the fungal contamination and presence of ochratoxin A and zearalenone on Spanish feed and raw materials.

SO: Journal of the science of food and agriculture. 2004 June, v. 84, issue 8 p. 832-840.

AB: The incidence of fungal contamination in 91 samples of feed and raw materials used for animal feeding in Spain has been studied. Sample analysis was accomplished in a new culture medium to which a beta-cyclodextrin had been added, and a comparison with other more usual culture media was performed. Ochratoxin A (OTA) and zearalenone (ZEA) contamination of all the samples was evaluated by RP-HPLC with fluorescence detection. The fungal genera found, such as Penicillium and Fusarium, included mycotoxigenic strains as OTA and ZEA (33.3 and 26.4% incidence respectively). One sample of corn and another of cotton seed were contaminated with levels of OTA above the 5 and/or 10 microgram kg-1 recommended by the legislation of several European countries, whereas none of the samples contaminated with ZEA surpassed the legislation limits suggested by the official agencies.

Record 179 of 609 - AGRICOLA 1998-2004/09

AU: Petursson,-S.; Decker,-E.A.; McClements,-D.J.

TI: Stabilization of oil-in-water emulsions by cod protein extracts.

SO: Journal of agricultural and food chemistry. 2004 June 16, v. 52, no. 12 p. 3996-4001.

AB: The ability of two protein fractions extracted from cod to form and stabilize oil-in-water emulsions was examined: a high salt extracted fraction (HSE protein) and a pH 3 acid extracted fraction (AE protein). Both fractions consisted of a complex mixture of different proteins, with the predominant one being myosin (200 kDa). The two protein fractions were used to prepare 5 wt % corn oil-in-water emulsions at ambient temperature (pH 3.0, 10 mM citrate-imidazole buffer). Emulsions with relatively small mean droplet diameters (d3,2 < 1 micrometer) and good creaming stability (> 9 days) could be produced at protein concentrations greater than or equal to 0.2 wt % for both fractions. The isoelectric point of droplets stabilized by both protein fractions was pH ~ 5. The emulsions were stable to droplet flocculation and creaming at relatively low pH (less than or equal to 4) and NaCl concentrations (less than or equal to 150 mM) when stored at room temperature. In the absence of salt, the emulsions were also stable to thermal treatment (30-90 ÀC for 30 min), but in the presence of 100 mM NaCl droplet flocculation and creaming were observed in some of the emulsions, particularly those stabilized by the AE fraction. The results suggest that protein fractions extracted from cod can be used as emulsifiers to form and stabilize food emulsions.

Record 180 of 609 - AGRICOLA 1998-2004/09

AU: Stagsted,-J.; Bendixen,-E.; Andersen,-H.J.

TI: Identification of specific oxidatively modified proteins in chicken muscles using a combined immunologic and proteomic

approach.
SO: Journal of agricultural and food chemistry. 2004 June 16, v. 52, no. 12 p. 3967-3974.
AB: Muscle proteins are generally believed to be key players in free radical processes that eventually lead to oxidative deterioration or modifications of meat proteins resulting in alterations in functionality, for example, gel-forming ability, emulsification properties, and water-binding capacity. This study addresses protein oxidation in chicken muscles using a combined immunologic and proteomic approach and identifies specific proteins that contain carbonyls and/or 3-nitrotyrosine (3-NT). Whereas Wga-enolase was the predominant carbonyl-reactive species among the water-soluble muscle proteins, several other proteins (actin, heat shock protein 70, and creatine kinase) contained carbonyls and/or 3-nitrotyrosine. Finally, this approach was used to demonstrate differential susceptibility of water-soluble muscle proteins toward oxidation in chickens fed a low-antioxidant diet compared with chickens fed a diet supplemented with antioxidant-rich fruits/vegetables.

Record 181 of 609 - AGRICOLA 1998-2004/09
AU: Terrab,-A.; Escudero,-M.L.; Gonzalez-Miret,-M.L.; Heredia,-F.J.
TI: Colour characteristics of honeys as influenced by pollen grain content: a multivariate study.
SO: Journal of the science of food and agriculture. 2004 Mar., v. 84, issue 4 p. 380-386.
AB: A chromatic analysis by tristimulus colorimetry and a pollen analysis (pollen grains contained in each honey sample, considering their volume and geometrical shape) were carried out on 33 Eucalyptus unifloral honeys; the colour of the pollen grains was also considered. Multiple linear regression (MLR) and partial least squares regression (PLSR) were used to establish equations relating the chromatic variables to the pollen data, ie number and morphology of the pollen grains, thus allowing the prediction of the ultimate colour from the botanical characteristics. The results obtained show that lightness (L*) is significantly ($p < 0.05$) related to the pollen type Olea europaea; on the other hand, the variable that better relates to the chroma (C*ab) is the Zea mays pollen type.

Record 182 of 609 - AGRICOLA 1998-2004/09
AU: Rombo,-G.O.; Taylor,-J.R.N.; Minnaar,-A.
TI: Irradiation of maize and bean flours: effects on starch physicochemical properties.
SO: Journal of the science of food and agriculture. 2004 Mar., v. 84, issue 4 p. 350-356.
AB: In an earlier study (Rombo GO et al, J Sci Food Agric 81: 497-502 (2001)) it was found that the in vitro starch digestibility of raw and cooked maize and bean flours was increased by irradiation of the flours at 2.5 kGy, but there was a reduction in starch digestibility at doses above 2.5 kGy. Experiments were performed to determine what effects irradiation had on the molecular properties of the starch in maize and bean flours. Increasing irradiation dose caused an increased proportion of Wgb(1-3)- and Wgb(1-4)-bonded starch in bean and maize flours. Starch containing Wgb-bonds is only partially digestible by porcine pancreatic Wga-amylase, and this may in part explain the

reduction in starch digestibility at higher doses. Size exclusion-high-performance liquid chromatography showed that higher irradiation doses led to a reduction in the molecular size of amylopectin in both bean and maize starches, which presumably involved debranching and an increase in the production of short, straight-chain molecules. With increased irradiation dose there was an increase in the crystallinity of the amylopectin fraction of the bean starch as shown by differential scanning calorimetry, presumably at least in part due to Wgb-bonding and amylopectin depolymerisation. These two factors and their interrelated effects are probably responsible for the observed slight reduction in maize and bean porridge starch digestibility reported previously.

Record 183 of 609 - AGRICOLA 1998-2004/09

AU: Gonzalez,-R.; Reguera,-E.; Mendoza,-L.; Figueroa,-J.M.; Sanchez-Sinencio,-F.

TI: Physicochemical changes in the hull of corn grains during their alkaline cooking.

SO: Journal of agricultural and food chemistry. 2004 June 16, v. 52, no. 12 p. 3831-3837.

AB: The alkaline cooking of corn in a solution of Ca(OH)2 to produce corn-based foods is oriented to make corn proteins available, to incorporate Ca to the cooked grains, and also to remove the corn hull. This process (nixtamalization) is known in Mexico and Guatemala from prehispanic times; however, the effect of the alkaline cooking on the corn hull remains poorly documented. In this work, the physicochemical changes that take place in the corn hull during its cooking in a saturated solution of Ca(OH)2 were studied using infrared, X-ray diffraction, 13C cross-polarization/ magic-angle spinning (CP/MAS) NMR, confocal imaging microscopy, differential scanning calorimetry, and thermogravimetry techniques. The main effect of this treatment on the hull is the removal of hemicelluloses and lignin, increasing the hull permeability and, as a consequence, facilitating the entry of the alkaline solution into the corn kernel. No significant changes were observed in the cellulose fiber network, which remains as native cellulose I, with a crystalline index, according to 13C CP/ MAS NMR spectra, of 0.60. The alkaline treatment does not allow the cellulose fibers to swell and their regeneration in the form of cellulose(II). It seems any attempt to make use of the Ca binding capacity of the hull to increase the Ca availability in nixtamalized corn-based foods requires a separated treatment for the hull and kernel. On alkaline cooking, the hull hemicellulose fraction dissolves, losing its ability to bind Ca as a way to incorporate this element into foods elaborated from nixtamalized corn.

Record 184 of 609 - AGRICOLA 1998-2004/09

AU: Fukushima,-R.S.; Hatfield,-R.D.

TI: Comparison of the acetyl bromide spectrophotometric method with other analytical lignin methods for determining lignin concentration in forage samples.

SO: Journal of agricultural and food chemistry. 2004 June 16, v. 52, no. 12 p. 3713-3720.

AB: Present analytical methods to quantify lignin in herbaceous plants are not totally satisfactory. A spectrophotometric method,

acetyl bromide soluble lignin (ABSL), has been employed to determine lignin concentration in a range of plant materials. In this work, lignin extracted with acidic dioxane was used to develop standard curves and to calculate the derived linear regression equation (slope equals absorptivity value or extinction coefficient) for determining the lignin concentration of respective cell wall samples. This procedure yielded lignin values that were different from those obtained with Klason lignin, acid detergent acid insoluble lignin, or permanganate lignin procedures. Correlations with in vitro dry matter or cell wall digestibility of samples were highest with data from the spectrophotometric technique. The ABSL method employing as standard lignin extracted with acidic dioxane has the potential to be employed as an analytical method to determine lignin concentration in a range of forage materials. It may be useful in developing a quick and easy method to predict in vitro digestibility on the basis of the total lignin content of a sample.

Record 185 of 609 - AGRICOLA 1998-2004/09

AU: Calabro,-S.; Williams,-B.A.; Piccolo,-V.; Infascelli,-F.; Tamminga,-S.

TI: A comparison between buffalo (Bubalus bubalis) and cow (Bos taurus) rumen fluids in terms of the in vitro fermentation characteristics of three fibrous feedstuffs.

SO: Journal of the science of food and agriculture. 2004 May, v. 84, issue 7 p. 645-652.

AB: Rumen fluids from fistulated buffalos (Italy-BRF) and cows (Netherlands-CRF) were used as inocula to determine the fermentation kinetics of three forages. These were corn silage (CS), grass silage (GS) and wheat straw (WS) which had originated from both regions, giving six substrates in total. Fermentation kinetics was assessed by the measurement of cumulative gas production. Organic matter (OM) loss and volatile fatty acid (VFA) concentration at the end of the fermentation period were also determined. Both BRF and CRF ranked the substrates in the same order for total VFA, total gas production and the maximum rate of substrate degradation (CS > GS > WS). However, while the ranking of substrates was the same for both species, the absolute values differed significantly between the two inocula. Gas production, expressed as cumulative volume per unit mass of incubated (OMCV, ml g-1) and as cumulative volume per unit mass of OM degraded (OM ml g-1) for CRF was consistently higher than that for BRF for all substrates ($p < 0.0001$). VFA production, particularly of acetic and butyric acids, was significantly ($p < 0.0001$) lower for BRF than for CRF, though the digestibility of OM was the same for both inocula. VFA production predicted by the use of stoichiometric equations was generally higher than the observed gas production. These equations also predicted that the calculated amount of OM utilised for microbial growth was higher for BRF than for CRF. This may explain why diets having the same energy content but less protein can be fed to buffalo since they seem to have a lower requirement for protein compared with cattle. This possibility will need to be investigated in vivo. Given the similar ranking of feedstuffs between the two sources of inocula, these results suggest that either inoculum would be suitable for use in the cumulative gas production test as a

measure of feedstuff evaluation. However, given the differences in absolute values, it is recommended that inocula from the species which will receive the feedstuff should be used.

Record 186 of 609 - AGRICOLA 1998-2004/09
AU: Liu,-C.S.; Glahn,-R.P.; Liu,-R.H.
TI: Assessment of carotenoid bioavailability of whole foods using a Caco-2 cell culture model coupled with an in vitro digestion.
SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4330-4337.
AB: Epidemiological studies have shown that consumption of carotenoid-rich fruits and vegetables is associated with a reduced risk of developing chronic diseases. Wgb-Carotene, Wga-carotene, and Wgb-cryptoxanthin are precursors of vitamin A, a nutrient essential for human health. However, little is known about the bioavailability of carotenoids from whole foods. This study characterized the intestinal uptake performance of carotenoids using monolayers of differentiated Caco-2 human intestinal cells and mimicked human digestion to assess carotenoid absorption from carrots and corn. Results showed that Caco-2 cellular uptake of Wgb-carotene and zeaxanthin was higher than that of lutein. Uptake performances of pure carotenoids and carotenoids from whole foods by Caco-2 cells were both curvilinear, reaching saturated levels after 4 h of incubation. The time kinetics and dose response of carotenoid uptake presented a similar pattern in Caco-2 cells after plating for 2 and 14 days. Furthermore, the applicability of this new model was verified with whole grain corn, showing that cooked corn grain significantly enhanced carotenoid bioavailability. These results support the feasibility of the in vitro digestion cell model for assessing carotenoid absorption from whole foods as a suitable and cost-effective physiological alternative to current methodologies.

Record 187 of 609 - AGRICOLA 1998-2004/09
AU: Tananuwong,-K.; Reid,-D.S.
TI: Differential scanning calorimetry study of glass transition in frozen starch gels.
SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4308-4317.
AB: The effects of initial water content, maximum heating temperature, amylopectin crystallinity type, and annealing on the glass transition of starch gels were studied by differential scanning calorimetry (DSC). The glass transition temperatures of the frozen gels measured as the onset (T(g,onset*)) or midpoint temperature (T(g,midpoint*)), heat capacity change during the glass transition (deltaC(p)), unfrozen water of starch gels, and additional unfrozen water (AUW) arising from gelatinization were reported. The results show that T(g,onset*) and T(g,midpoint*) of the partially gelatinized gels are independent of the initial water content, while both of the T(g*) values of the fully gelatinized gel increase as the initial water content increases. These observations might result from the difference in the level of structural disruption associated with different heating conditions, resulting in different gel structures as well as different concentrations of the sub-T(g) unfrozen matrix. The amylopectin crystallinity type does not greatly affect T(g,onset*)

and T(g,midpoint*) of the gels. Annealing at a temperature near T(g,onset*) increases both T(g,onset*) and T(g,midpoint*) of the gels, possibly due to an increase in the extent of the freeze concentration as evidenced by a decrease in AUW. Annealing results in an increase in the deltaC(p) value of the gels, presumably due to structural relaxation. A devitrification exotherm may be related to AUW. The annealing process decreases AUW, thus also decreasing the size of the exotherm.

Record 188 of 609 - AGRICOLA 1998-2004/09

AU: George,-C.; Ridley,-W.P.; Obert,-J.C.; Nemeth,-M.A.; Breeze,-M.L.; Astwood,-J.D.

TI: Composition of grain and forage from corn rootworm-protected corn event MON 863 is equivalent to that of conventional corn (Zea mays L.).

SO: Journal of agricultural and food chemistry. 2004 June 30, v. 52, no. 13 p. 4149-4158.

AB: Insect-protected corn hybrids containing event MON 863 protect corn plants against feeding damage from corn rootworm (Diabrotica), a major North American insect pest. Corn event MON 863 contains a gene that expresses an amino acid sequence variant of the wild-type Cry3Bb1 insecticidal protein from Bacillus thuringiensis. The purpose of this study was to compare the composition of corn containing event MON 863 with that of conventional nontransgenic corn. Compositional analyses were conducted to measure proximates, fiber, amino acids, fatty acids, minerals, folic acid, thiamin, riboflavin, vitamin E, antinutrients, and certain secondary metabolites in grain and proximates and fiber content in forage collected from a total of eight field sites in the U.S. and Argentina. Compositional analyses demonstrated that the grain and forage of event MON 863 are comparable in their nutritional content to the control corn hybrid and conventional corn. These comparisons, together with the history of the safe use of corn as a common component of animal feed and human food, support the conclusion that corn event MON 863 is compositionally equivalent to, and as safe and nutritious as, conventional corn hybrids grown commercially today.

Record 189 of 609 - 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 190 of 609 - AGRICOLA 1998-2004/09
AU: Al-Eryan,-M.A.S.; El-Tabbakh,-S.S.
TI: Forecasting yield of corn, Zea mays infested with corn leaf aphid, Rhopalosiphum maidis.
SO: Journal of applied entomology. 2004 May, v. 128, no. 4 p. 312-315.

Record 191 of 609 - AGRICOLA 1998-2004/09
AU: Schell,-D.J.; Riley,-C.J.; Dowe,-N.; Farmer,-J.; Ibsen,-K.N.; Ruth,-M.F.; Toon,-S.T.; Lumpkin,-R.E.
TI: A bioethanol process development unit: initial operating experiences and results with a corn fiber feedstock.
SO: Bioresource technology. 2004 Jan., v. 91, no. 2 p. 179-188.

Record 192 of 609 - AGRICOLA 1998-2004/09
AU: Elliot,-B.
TI: Companion planting and the Three Sisters.
SO: Small farm today. 2004 Mar-Apr, v. 21, no. 2 p. 16-17.

Record 193 of 609 - AGRICOLA 1998-2004/09
AU: Mankin,-R.W.
TI: Microwave radar detection of stored-product insects.
SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 1168-1173.
AB: A microwave radar system that senses motion was tested for capability to detect hidden insects of different sizes and activity levels in stored products. In initial studies, movements of individual adults or groups of Lasioderma serricorne (F.), Oryzaephilus surinamensis (L.), Attagenus unicolor (Brahm), and Tribolium castaneum (Herbst) were easily detected over distances up to 30 cm in air. Boxes of corn meal mix and flour mix were artificially infested with 5-100 insects to estimate the reliability of detection. The likelihood that a box was infested was rated by the radar system on a quantitative scale. The ratings were significantly correlated with the numbers of infesting insects. The radar system has potential applications in management programs where rapid, nondestructive targeting of incipient insect infestations would be of benefit to the producers and consumers of packaged foods.

Record 194 of 609 - AGRICOLA 1998-2004/09
AU: Siqueira,-H.A.A.; Moellenbeck,-D.; Spencer,-T.; Siegfried,-B.D.
TI: Cross-resistance of Cry1Ab-selected Ostrinia nubilalis (Lepidoptera: Crambidae) to Bacillus thuringiensis delta-endotoxins.
SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 1049-1057.
AB: Corn plants expressing the toxin from Bacillus thuringiensis (Berliner) have proven to be effective in controlling lepidopteran pests such as the European corn borer, Ostrinia nubilalis (Hubner) (Lepidoptera: Crambidae). Several Bt toxins are being tested and

incorporated into crop genomes, although tests for cross-resistance among different toxins have been limited by a lack of resistant colonies. Four different colonies of O. nubilalis selected with full-length Cry1Ab incorporated into artificial diet developed significant levels of resistance (2.0- to 10-fold) within 10 generations. Additionally, selection with Cry1Ab resulted in decreased susceptibility to a number of other toxins to which the selected colonies were not previously exposed. Significantly, levels of resistance were highest to Cry1Ac with resistance ratios up to 51.0-fold. Low levels (less than five-fold) of cross-resistance were detected with Cry1F. In contrast, Cry9C susceptibility was unaffected by selection with Cry1Ab. These results indicate that the availability of multiple toxins could improve resistance management strategies, provided cross-resistance among toxins is not a factor.

Record 195 of 609 - AGRICOLA 1998-2004/09
AU: Stern,-D.B.; Hanson,-M.R.; Barkan,-A.
TI: Genetics and genomics of chloroplast biogenesis: maize as a model system.
SO: Trends in plant science. 2004 June, v. 9, no. 6 p. 293-301.

Record 196 of 609 - AGRICOLA 1998-2004/09
AU: O'Rourke,-P.K.; Hutchison,-W.D.
TI: Binomial sequential sampling plans for late instars of European corn borer (Lepidoptera: Crambidae), corn earworm (Lepidoptera: Noctuidae), and damaged kernels in sweet corn ears.
SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 1003-1008.
AB: Late-season infestations of European corn borer, Ostrinia nubilalis (Hbner), and corn earworm, Helicoverpa zea (Boddie), were sampled to develop binomial sequential sampling plans for larval infestations and damaged kernels in sweet corn, Zea mays L. , ears, near harvest. Fields were sampled to obtain a range of larval densities likely to be encountered over a range of infestation levels and field conditions. Binomial sampling plans were developed for O. nubilalis larvae, H. zea larvae, O. nubilalis, and H. zea larvae combined, and for damaged sweet corn kernels. Observed densities ranged from 0.01 to 4.40 larvae per ear for O. nubilalis, 0.005-1.62 larvae per ear for H. zea, and 0.004-36.12 damaged kernels per ear. Results of resampling analyses, based on the proportion of ears infested with one or more larvae, or damaged kernels, indicated an average sample size of 34-37 ears was necessary to classify whether larval infestations, or the incidence of damaged kernels, exceeded 5%. Two operating characteristic curves are presented for each of the four sampling plans. Initial results, with upper bounds of 0.10, and a (type I) and (type II) error rates at 0.10 and 0.05, respectively, resulted in a 90% probability of making the correct management decision at infestation levels >10%. To improve performance of the sampling plans, we modified the binomial plans by reducing the upper bound to 0.075, while maintaining the same error rates. This plan resulted in a higher probability (>95%) of making the correct management decision to reject a sweet corn load when infestation levels are >10%.

Record 197 of 609 - 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 198 of 609 - AGRICOLA 1998-2004/09
AU: Somashekar,-D.; Rati,-E.R.; Chandrashekar,-A.
TI: PCR-restriction fragment length analysis of aflR gene for differentiation and detection of Aspergillus flavus and Aspergillus parasiticus in maize.
SO: International journal of food microbiology. 2004 May 15, v. 93, no. 1 p. 101-107.
AB: Contamination of food and feedstuffs by Aspergillus species and their toxic metabolites is a serious problem as they have adverse effects on human and animal health. Hence, food contamination monitoring is an important activity, which gives information on the level and type of contamination. A PCR-based method of detection of Aspergillus species was developed in spiked samples of sterile maize flour. Gene-specific primers were designed to target aflR gene, and restriction fragment length polymorphism (RFLP) of the PCR product was done to differentiate Aspergillus flavus and Aspergillus parasiticus. Sterile maize flour was inoculated separately with A. flavus and A. parasiticus, each at several spore concentrations. Positive results were obtained only after 12-h incubation in enriched media, with extracts of maize inoculated with A. flavus (10(1) spores/g) and A. parasiticus (10(

4) spores/g). PCR products were subjected to restriction endonuclease (HincII and PvuII) analysis to look for RFLPs. PCR-RFLP patterns obtained with these two enzymes showed enough differences to distinguish A. flavus and A. parasiticus. This approach of differentiating these two species would be simpler, less costly and quicker than conventional sequencing of PCR products.

Record 199 of 609 - AGRICOLA 1998-2004/09

AU: Qureshi,-J.A.; Buschman,-L.L.; Throne,-J.E.; Ramaswamy,-S.B.

TI: Oil-soluble dyes incorporated in meridic diet of Diatraea grandiosella (Lepidoptera: Crambidae) as markers for adult dispersal studies.

SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 836-845.

AB: Mark-release-recapture experiments to study insect dispersal require the release of marked insects that can be easily identified among feral conspecifics. Oil-soluble dyes have been used successfully to mark various insect species. Two oil-soluble dyes, Sudan Red 7B (C.I. 26050) and Sudan Blue 670 (C.I. 61554), were added to diet of the southwestern corn borer, Diatraea grandiosella Dyar, and evaluated against an untreated control diet. Survival, diet consumption, larval and pupal weight, development time, fecundity, longevity, and dry weight of the adults were measured. Adults reared on the three diets were also tested for mating success. Some minor effects were observed for southwestern corn borers reared on the marked diets. Eggs, larvae, pupae, and adults were all reliably marked and readily identifiable. Adults retained color for their entire life span. Adults from each diet mated successfully with adults from the other diets. F1 progeny from the different mating combinations survived to the second instar but tended to lose the marker after 3-4 d on untreated diet. Both Sudan Red 7B and Sudan Blue 670 can be used to mark southwestern corn borer adults and thus should be useful for mark-release-recapture dispersal studies. The dyes will also be useful for short-term studies with marked larvae and oviposition behavior.

Record 200 of 609 - AGRICOLA 1998-2004/09

AU: Kuang,-X.; Calvin,-D.D.; Knapp,-M.C.; Poston,-F.L.

TI: Female European corn borer (Lepidoptera: Crambidae) ovarian developmental stages: their association with oviposition and use in a classification system.

SO: Journal of economic entomology. 2004 June, v. 97, no. 3 p. 828-835.

AB: Reproductive development of female European corn borer, Ostrinia nubilalis (Hbner), was investigated and a classification system proposed. Females collected in a blacklight trap during 1982 and 1983 were dissected and their reproductive system examined. Female reproductive systems were divided into six stages based on ovum development within the ovarioles, ovum depletion, ovariole appearance, and fat body color and shape. The female reproductive systems were also staged on the basis of spermatophore appearance. The time necessary to classify a female is also reported. Based on the classification system, the relationship between female age and stage of ovarian development was quantified under three temperature regimes. Females were found to

experience a 3- to 5-d preoviposition period before initiation of egg deposition under optimal temperature conditions. This delay between adult emergence and initiation of egg laying corresponded with more advanced ovarian developmental stages collected in blacklight traps and indicates that actively ovipositing females are primarily being collected in blacklight traps.