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## **Poultry Manure Management**

157 citations from the Agricola Database  
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Water Quality Information Center

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### **A comparison of Eimeria oocysts isolated from litter and fecal samples from broiler houses at two farms with different management schemes during one growout.**

Stayer,-P.A.; Pote,-L.M.; Keirs,-R.W.

Poultry-sci. Champaign, IL : Poultry Science Association, 1921-. Jan 1995. v. 74 (1) p. 26-32.  
NAL Call Number: 47.8-Am33P

*Descriptors:* broilers-. eimeria-. poultry-manure. litter-. deep-litter-housing. oocysts-. feces-. coccidia-. coccidiostats-. mississippi-.

*Abstract:* Eimeria oocyst populations were monitored in broiler houses on two farms during a growout and prior to the placement of new chicks on the same litter. Numbers of oocysts in litter were enumerated at Weeks 0, 5, 6, 7, and 9 and in feces at Weeks 5, 6, and 7 in broiler houses with different management practices (both farms had identical coccidiostat programs but Farm A had a history of poor performance whereas Farm B had excellent performance records). On Farm A the number of oocysts in litter increased ( $P < .05$ ) at the time of slaughter (Week 7) and placement of a subsequent flock (Week 9) when compared with Day 0. The number of oocysts in feces on Farm A also increased ( $P < .05$ ) from Week 5 to 7. On Farm B there were no differences in numbers of oocysts in litter or feces over time. Farm B had ( $P < .05$ ) lower numbers of oocysts in litter than Farm A at Week 7. The number of oocysts in feces from Farm B were consistently lower ( $P < .05$ ) than Farm A at Weeks 5, 6, and 7. There were no differences in the species of Eimeria in litter between farms; however, there were differences in the species composition over time. Small (Eimeria mitis) and medium (primarily Eimeria acervulina) oocysts increased significantly over time, whereas the large oocysts (Eimeria tenella and Eimeria brunetti) and Eimeria maxima did not change over time. An increase ( $P < .05$ ) in large oocysts was observed in fecal samples from Farm A over time.

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**A method to determine and factors that influence in vivo solubilization of phosphates in commercial Leghorn hens.**

Rao,-S.K.; Roland,-D.A.-Sr.; Gordon,-R.W.

Poultry-sci. Champaign, IL : Poultry Science Association, Oct 1995. v. 74 (10) p. 1644-1649.  
NAL Call Number: 47.8-Am33P

*Descriptors:* hens-. calcium-phosphates. dietary-minerals. bioavailability-. solubility-. poultry-manure. ethanol-. solvents-. mineral-supplements.

*Abstract:* Experiments 1 and 2 were conducted to establish a technique for the recovery of dietary phosphates from commercial layer manure. Solutions of ethanol, 60% ethanol:40% water (vol/vol), 50% ethanol:50% water, 40% ethanol:60% water, and 100% water were tested to determine the efficacy of dicalcium phosphate recovery. Solutions containing 50% or greater ethanol were found to be most effective. Experiments 3 and 4 were conducted to determine factors that influence in vivo phosphate solubilization in commercial Leghorn hens. In Experiment 3, mono-dicalcium phosphate (Biofos), all-monocalcium phosphate (Dynafos), and tricalcium phosphate (Multifos) were fed to layers at 1.67 and 3.3 g hen/d levels. In vivo phosphate solubilization was higher ( $P$  less than or equal to .05) for Biofos and Dynafos than for Multifos. Dietary phosphate level did not consistently influence in vivo phosphate solubilization in hens. In Experiment 4, a 3 X 2 X 2 factorial arrangement consisting of three types of phosphates (Biofos, Dynafos, and Multifos), two dietary levels of added P (.3 and .6%), and two levels of dietary Ca (.88 and 3.75%) were used. In vivo phosphate solubilization decreased as Ca level was increased. In vivo solubilization of Multifos was lower than Biofos or Dynafos at both dietary Ca levels tested. These results indicate that phosphate source and calcium level but not phosphorus level, consistently influence in vivo solubilization of phosphates.

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**Accumulation and movement of phosphorus from poultry litter application on a Starr clay loam.**

Lucero,-D.W.; Martens,-D.C.; McKenna,-J.R.; Starner,-D.E.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1995. v. 26 (11/12) p. 1709-1718.

NAL Call Number: S590.C63

*Descriptors:* clay-loam-soils. grassland-soils. poultry-manure. application-to-land. surface-treatment. application-rates. phosphorus-. movement-in-soil. retention-.

*Abstract:* The poultry industry faces tremendous challenges for the economically sound and environmentally safe disposal of the massive amounts of waste it generates during production processes. This study was conducted to investigate the accumulation and downward movement of phosphorus (P) from surface application of poultry litter (PL) on a Starr clay loam (fine-loamy, mixed, thermic Fluventic Dystrochrepts). Poultry litter was surface applied to unimproved pasture at rates of 5.8, 11.4, 17.2, 22.9, and 28.7 mt/ha in 1991 and 4.1, 8.0, 12.1, 16.1, and 20.2 mt/ha in 1992, respectively. Cumulative P levels supplied by the PL over the two-year period were 105.8, 211.7, 317.5, 423.3, and 529.1 kg/ha. Phosphorus from both PL and inorganic sources accumulated in the zone of application. The Mehlich 3 (M3)-extractable P levels varied with rate of P application for each of the two years of this study. In 1992, M3-extractable P levels were increased by 2-, 4-, 6-, and 8-fold over the control by PL application in the 0 to 5 cm depth. In 1993, the highest rate of PL application (20.2 mt/ha) increased M3-extractable P levels by almost 18-fold over the control (192 mg P/kg versus 11 mg P/kg). In 1992, downward movement of P occurred into the 5.0 to 10.0 and 10.0 to 15.0 cm layers from the highest rate of PL application (28.7 mt/ha). By 1993, P moved into the 5.0 to 10.0 and 10.0 to 15.0 cm soil layers from the second highest PL application rate as well. This downward movement of surface-applied P in the Starr soil with a high fixation capacity was attributed to mobility of organic-bound P.

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**Adding value to composted manure.**

Biocycle. Emmaus, PA : JG Press, c1981-. Mar 1995. v. 36 (3) p. 61-62.

NAL Call Number: 57.8-C734

*Descriptors:* organic-fertilizers. composts-. poultry-manure. granules-. value-added. waste-utilization.

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**Addition of different sources and levels of amino acids and sugars to broiler litter before deep-stacking.**

Wang,-Z.S.; Goetsch,-A.L.; Park,-K.K.; Patil,-A.R.; Kouakou,-B.; Galloway,-D.L.-Sr.; Rossi,-J.E.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. May/June 1996. v. 56 (2/3) p. 157-

167.

NAL Call Number: TD930.A32

*Descriptors:* poultry-manure. broilers-. waste-utilization. beef-cattle. steers-. ruminants-. feeds-. maillard-reaction. nutrient-sources. lysine-. methionine-. soybean-oilmeal. sugars-. digestibility-. protein-degradation. nitrogen-.

*Abstract:* Different sources and levels of amino acids (soybean meal at 0, 10, 20 or 40% of dry matter; similar quantities of lysine and methionine in synthetic forms) and sugars were mixed with broiler litter and placed in dacron bags embedded in a deep-stack for 3 or 9 weeks to determine changes in concentrations of nitrogen fractions and digestibility in ruminants. Pepsin-insoluble nitrogen concentration after 48 h of ruminal incubation was not changed by deep-stacking for 3 wk and only slightly elevated at 9 wk. Deep-stacking did not markedly alter in situ ruminal disappearance of broiler litter nitrogen. Conversely, in situ ruminal nitrogen disappearance of soybean meal substrates was decreased by deep-stacking; the change was greater for 16 than for 48 h of ruminal incubation. Sugar addition to soybean meal substrates did not appear to enhance rumen undegradable protein concentration. In conclusion, these results suggest that potential exists to markedly increase rumen undegradable protein in soybean meal and possibly other feedstuffs high in rumen digestible protein by addition to broiler litter before deep-stacking.

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**Additive effects of 1,25-dihydroxycholecalciferol and phytase on phytate phosphorus utilization and related parameters in broiler chickens.**

Mitchell,-R.D.; Edwards,-H.M.-Jr.

Poultry-sci. Savoy, IL : Poultry Science Association, Inc. Jan 1996. v. 75 (1) p. 111-119.

NAL Call Number: 47.8-Am33P

*Descriptors:* broilers-. phytase-. calcitriol-. phosphorus-. bone-ash. phytates-. hypophosphatemic-rickets. body-weight. feed-conversion. tibia-. blood-plasma. dietary-minerals. feed-supplements. excreta-. nutrient-retention.

*Abstract:* Two experiments were conducted to compare the effects of supplementation with 1,25-dihydroxycholecalciferol [1,25-(OH)2D3] and a commercial phytase on P utilization by broiler males. Experiment 1 was conducted with three levels of total dietary P (0.45, 0.55, and 0.65%) in corn-soybean meal diets supplemented with 5 microgram/kg of 1,25-(OH)2D3, 600 units/kg of phytase, or the combination of these supplements in a factorial arrangement from 0 to 21 d in battery brooders. A second experiment was conducted with a similar design except that it was carried out in floor pens for a period of 35 d. In Experiment 1, maximal BW was obtained at 0.65% P in chicks receiving the basal diet, 0.55% P in chicks receiving phytase or 1,25-(OH)2D3, and 0.45% P in chicks fed both supplements. Bone ash for chicks receiving the basal, phytase, 1,25-(OH)2D3, and combination treatments at 0.45% total dietary P were 26.6, 34.9, 35.1, and 38.8%. There were significant interactions between phytase and 1,25(OH)2D3 for BW, bone ash, and incidence of rickets. Similar results were noticed in Experiment 2, with the exception that 1,25-(OH)2D3 had little influence on BW from 0 to 3 wk, likely due to slightly

higher dietary P. From 3 to 5 wk, BW and bone ash were increased by each supplement and further increased by their combination. These interactions suggest different mechanisms of action for these supplements in influencing phytate P utilization.

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**Agricultural and municipal compost residues for control of root-knot nematodes in tomato and pepper.**

Marull,-J.; Pinochet,-J.; Rodriguez-Kabana,-R.

Compost-sci-util. Emmaus, PA : JG Press, Winter 1997. v. 5 (1) p. 6-15.

NAL Call Number: TD796.5.C58

*Descriptors:* lycopersicon-esculentum. capsicum-annuum. meloidogyne-javanica. nematode-control. pomace-. olives-. poultry-manure. refuse-compost. organic-amendments. suppressive-soils. soil-enzymes. esterases-. enzyme-activity. spain-.

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**Agricultural composting in the United States.**

Kashmanian,-R.M.; Rynk,-R.F.

Compost-sci-util. Emmaus, PA : JG Press. Summer 1995. v. 3 (3) p. 84-88.

NAL Call Number: TD796.5.C58

*Descriptors:* composting-. on-farm-processing. surveys-. cattle-manure. poultry-. pigs-. carcasses-. poultry-manure. pig-manure. crop-residues. usa-.

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**Agronomic effectiveness of poultry manure composts. .**

Mahimairaja,-S.; Bolan,-N.S.; Hedley,-M.J.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1995. v. 26 (11/12) p. 1843-1861.

NAL Call Number: S590.C63

*Descriptors:* brassica-oleracea-var.-capitata. zea-mays. composts-. poultry-manure. rock-phosphate. sulfur-. urea-. comparisons-. crop-yield. nitrogen-. use-efficiency. phosphorus-. nutrient-uptake. recovery-. nitrate-. leaching-. residual-effects. ammonium-nitrogen. nitrate-nitrogen. movement-in-soil.

*Abstract:* Two field experiments were conducted to examine the agronomic value of poultry manure composted in the presence of both phosphate rock (PR) and elemental sulphur (So) (sulphocompost) and PR alone (phosphocompost). Winter cabbage and summer maize were used as test crops. For the first season's winter cabbage, the phosphocompost and sulphocompost were approximately 12% and 60% as effective as urea and both composts were equally effective as urea for the second season's maize crop. The greater agronomic effectiveness of sulphocompost could be attributed to the improved nitrogen (N)-use efficiency increased PR dissolution and

improved S nutrition. Distribution of nitrate-nitrogen (NO<sub>3</sub>-N) in the soil profile of field plots indicated greater potential for winter leaching of N from urea than poultry manure which could be the reason for the improved residual value of the manure reflected in summer maize yields. The results from the field experiments indicated that composting poultry manure with So and PR not only reduces environmental pollution associated with manure application, but also increases the agronomic effectiveness of manure.

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**Ameliorating subsoil acidity by surface application of calcium fulvates derived from common organic materials.**

Liu,-J.; Hue,-N.V.

Biol-fertil-soils. Berlin, Germany : Springer-Verlag. 1996. v. 21 (4) p. 264-270.

NAL Call Number: QH84.8.B46

*Descriptors:* acid-soils. soil-acidity. subsoil-. rehabilitation-. surface-treatment. calcium-chloride. calcium-carbonate. fulvic-acids. organic-salts. efficacy-. vigna-unguiculata. green-manures. poultry-manure. sewage-sludge. calcium-. movement-in-soil. leaching-. soil-toxicity. aluminum-. exchangeable-aluminum. exchangeable-calcium. cation-saturation. soil-depth. soil-ph. cation-exchange-capacity. exchangeable-cations.

*Abstract:* Subsoil acidity is a serious constraint to crop production, and is difficult to correct by conventional liming practices. Thus, a different approach to ameliorating acid subsoils was evaluated. Subsoil material of an act id Ultisol (pH 4.4) was packed into 50-cm long columns, then leached with solutions of CaCl<sub>2</sub>, CaCO<sub>3</sub> (suspension) or Ca fulvates prepared from chicken manure, cowpea green manure, or sewage sludge. The total water applied was 30.26 cm (or 800 ml) in 2 days. Thereafter, the columns were dismantled and cut into 5-cm segments for chemical analysis. The results indicated that only 2% of the added Ca from CaCO<sub>3</sub> moved past the 15-cm depth, compared to 68% from CaCl<sub>2</sub> and 35-75% from Ca fulvates. Correspondingly, CaCO<sub>3</sub> precipitated all KCl-extractable Al in the top 5 cm, but had no effect beyond the 10-cm depth. The CaCl<sub>2</sub> displaced a small but significant portion of extractable Al from the top 15 cm and redeposited some of that Al in lower depths. Similar to CaCO<sub>3</sub>, Ca fulvates from chicken manure and green manure only decreased extractable Al significantly in the top 10-cm layers, but had little effect beyond that depth. By contrast, the Ca fulvate from sewage sludge decreased Al down to the 45-cm depth. In terms of reducing Al saturation as a percentage of total extractable cations (effective cation exchange capacity), the Ca fulvates were as effective as CaCO<sub>3</sub> in the 0- to 5-cm layer, and more effective than CaCl<sub>2</sub> in any soil layer because of the increased exchangeable Ca and/or decreased Al. In general, surface application of common organic material-derived Ca fulvates can increase subsoil Ca and decrease the Al saturation percentage. However, Mg depletion and enrichment of unwanted metals (e.g., Na or heavy metals) may be a problem when leaching with these organic sources.

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**Apparent digestibility of minerals by lactating cows from a total mixed ration supplemented with poultry litter.**

Ben-Ghedalia,-D.; Miron,-J.; Yosef,-E.

J-dairy-sci. Champaign, Ill. : American Dairy Science Association. Mar 1996. v. 79 (3) p. 454-458.

NAL Call Number: 44.8-J822

*Descriptors:* dairy-cows. poultry-manure. digestibility-. dietary-minerals. calcium-. phosphorus-. magnesium-. potassium-. bioavailability-. drinking-water. chemical-composition. intake-. trace-elements. sheep-. israel-.

*Abstract:* Apparent digestibility of minerals by lactating cows from a multiple-component, conventional Israeli TMR (control) and from a TMR containing 10% poultry litter (DM basis) was examined. Ten cows in early lactation were divided into two groups of similar performance (39 kg of milk/d) and fed for ad libitum intake the two TMR for 28 d. Poultry litter contributed, as a percentage of total requirements, 44.4% of Ca, 41.0% of P, 32.0% of S, 22.8% of Mg, and 25.9% of K. Apparent digestibility of the macroelements was higher for cows fed the TMR supplemented with poultry litter than for those fed the control TMR. Apparent digestibility of the control TMR was 22.3% for Ca, 29.4% for Mg, 39.1% for P, and 62.2% for S; the apparent digestibility of the treatment TMR was 30.1% for Ca, 45.6% for Mg, 45.3% for P, and 65.6% for S. Poultry litter contributed the entire requirements of Zn, Mn, and Co; 56% of Cu; and 32% of Se. The apparent digestibility of the control TMR was 15.6% for Cu, 39.6% for Zn, 8.51% for Mn, 42.8% for Co, and 41.6% for Se, and the apparent digestibility of the treatment TMR was 27.9% for Cu, 54.0% for Zn, 17.8% for Mn, 37.0% for Co, and 63.9% for Se. Poultry litter is a good source of macro- and microelements for lactating cows and, at 10% of the TMR, could ensure against mineral deficiencies.

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### **Application of simplified phosphorus transport models to pasture fields in northwest Arkansas.**

Edwards,-D.R.; Haan,-C.T.; Sharpley,-A.N.; Murdoch,-J.F.; Daniel,-T.C.; Moore,-P.A.-Jr.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers, Mar/Apr 1996. v. 39 (2) p. 489-496.

NAL Call Number: 290.9-Am32T

*Descriptors:* pastures-. phosphorus-. runoff-. sediment-yield. orthophosphates-. transport-processes. mathematical-models. prediction-. accuracy-. rain-. runoff-water. water-quality. grazing-intensity. poultry-manure. arkansas-.

*Abstract:* Runoff transport of phosphorus (P) is often predicted from simple equations with parameters determined from data applicable primarily to row-cropped and fallow cover conditions. The applicability, accuracy, and precision of such P transport prediction equations under pasture situations are less well defined. The objectives of this study were to determine parameters of simplified runoff P transport equations for pasture fields and to assess the accuracy and precision of the equations. Runoff, sediment yield, soluble P transport, and particulate P transport data were collected from four pasture fields in northwestern Arkansas. Runoff event enrichment ratios and extraction coefficients were computed, and confidence limits on respective

predicted particulate and soluble P transport were determined. An inverse linear relationship between the natural logarithms of enrichment ratio and sediment yield was found significant for all fields, but the slopes were lower than values reported earlier for general use. Runoff event extraction coefficients were considerably higher than those typically used and were highest for runoff occurring shortly following animal manure application. The 95% confidence limits on predicted soluble and particulate P transport varied in some cases by more than an order of magnitude, indicating that significant imprecision was associated with those predictions. The data suggested that the simplified model of soluble P transport might be a reasonable description of the processes for the fields, but that modification to the particulate P transport prediction method might be necessary to improve the prediction accuracy for low event sediment yields (< 10 kg/ha).

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**Applicator for sidedressing row crops with solid wastes.**

Glancey,-J.L.; Adams,-R.K.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers. May/June 1996. v. 39 (3) p. 829-835.

NAL Call Number: 290.9-Am32T

*Descriptors:* poultry-manure. sidedressing-. applicators-. manure-spreaders. conveyors-. solid-wastes. application-to-land.

*Abstract:* A prototype applicator for sidedressing row crops with solid waste materials has been developed. As configured, the applicator can meter and deliver raw solid waste materials between rows of a growing crop without the material contacting the crop. The applicator was designed to improve the utilization of waste materials including poultry manure as nutrient sources by better matching the time of application of the waste materials to a crop's greatest nutrient demand. A preliminary design using a single screw conveyor for metering and delivering manure between rows was laboratory tested. The distribution through openings in the conveyor trough was inconsistent and the design was prone to plugging even with dry, pulverized manure. As a result, an alternate approach using individual conveyors for each row was required. Based on a computer-analysis technique to predict the application rate of available nitrogen, an alternate sidedresser configuration using individual screw conveyors for each row was designed. The solid waste sidedresser was developed as an attachment to the model 155 New Holland beater-type manure spreader. Modifications to the stock spreader included a beater shroud to promote manure pulverization, extended sides for additional box capacity, reduced tread width, increased ground clearance, and an auxiliary hydraulic system to drive the beaters and sidedresser attachment. Preliminary tests and calibrations indicate satisfactory manure delivery rates to each row. Available poultry manure application rates range from 1 810 kg/ha to approximately 11 000 kg/ha which correspond to available nitrogen application rates of 27 to 170 kg N/ha, respectively.

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### **Arthropods in litter of poultry (broiler chicken and turkey) houses.**

Rueda,-L.M.; Axtell,-R.C.

J-agric-entomol. Clemson, SC : South Carolina Entomological Society, c1984-. Jan 1997. v. 14 (1) p. 81-91.

NAL Call Number: SB599.J69

*Descriptors:* broilers-. turkeys-. poultry-manure. arthropods-. mites-. insects-. surveys-. poultry-housing. north-carolina.

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### **Availability of residual phosphorus in manured soils.**

Sharpley,-A.N.

Soil-Sci-Soc-Am-j. [Madison, Wis.] Soil Science Society of America. Sept/Oct 1996. v. 60 (5) p. 1459-1466.

NAL Call Number: 56.9-So3

*Descriptors:* ultisols-. alfisols-. pig-manure. poultry-manure. cattle-. manures-. application-to-land. soil-fertility. phosphorus-. nutrient-availability. residual-effects. release-. determination-. extraction-. iron-oxides. losses-from-soil. runoff-. eutrophication-. environmental-protection. fertilizer-requirement-determination. optimization-. water-quality. pollution-control.

*Abstract:* In many areas with confined animal operations, continual manure application has increased soil P above amounts sufficient for optimum crop yields. In these areas, it is of economic and environmental importance to determine how long high-P soils will remain above crop sufficiency and identify soils where P contents would decrease most rapidly under similar management conditions. Thus, the surface 5 cm of 23 high-P soils (85-419 mg kg<sup>-1</sup> Mehlich-3 P) in Oklahoma and Texas, which had received beef feedlot, poultry, or swine manure (90-1880 kg P ha<sup>-1</sup> yr<sup>-1</sup> for up to 35 yr) were successively extracted with Fe-oxide-impregnated paper strips to investigate residual soil P availability. A decrease in strip P with successive extractions followed the equation: Strip P = a(extraction number)-b (r<sup>2</sup> of 0.88-0.98). The rate of P release to strips (exponent b) decreased more rapidly as soil P sorption saturation increased (R<sup>2</sup> of 0.79). Phosphorus saturation also accounted for 85% of the variation in the total amount of P released to strips from manured soils in 15 successive extractions (51-572 mg kg<sup>-1</sup>). Fractionation of soil P before and after strip extraction showed bicarbonate inorganic P contributed most of the P released to strips (46%). The above equation also described soil P release in several published field studies (r<sup>2</sup> of 0.77-0.98). Thus, successive strip extraction of soil has the potential to describe soil factors controlling the availability of residual P and identify soils where high P contents may be less buffered and, thus, decrease more rapidly than others under similar management conditions.

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### **Bacterial pathogens and indicators in poultry litter during re-utilization.**

Kelley,-T.R.; Pancorbo,-O.C.; Merka,-W.C.; Thompson,-S.A.; Cabrera,-M.L.; Barnhardt,-H.M.

J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Winter 1995. v. 4 (4) p. 366-373.  
NAL Call Number: SF481.J68

*Descriptors:* broilers-. litter-. microorganisms-. bacteria-. microbial-contamination. bacterial-count. pathogens-. indicator-species. coliform-bacteria. wood-shavings. waste-utilization. storage-. disease-prevention.

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**Best management practices to limit nonpoint source pollution from pastures.**

Shreve,-B.R.; Moore,-P.A.-Jr.; Daniel,-T.C.; Edwards,-D.R.; Miller,-D.M.  
Proc-South-Pasture-Forage-Crop-Improv-Conf. New Orleans : Agricultural Research Service (Southern Region), U.S. Dept. of Agriculture, 1974-. 1996. (52nd) p. 81-87.  
NAL Call Number: 60.19-So83

*Descriptors:* pastures-. poultry-manure. application-to-land. water-pollution. pollution-control.

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**Biodegradability and microbial activities during composting of poultry litter.**

Atkinson,-C.F.; Jones,-D.D.; Gauthier,-J.J.  
Poultry-sci. Savoy, IL : Poultry Science Association, Inc. May 1996. v. 75 (5) p. 608-617.  
NAL Call Number: 47.8-Am33P

*Descriptors:* poultry-manure. composting-. microbial-degradation. sawdust-. nitrogen-content. fiber-content. volatile-compounds. indoles-. plate-count. decay-fungi. temperature-. carbon-dioxide. microbial-activities.

*Abstract:* Poultry litter is composted to reduce odor and pathogens and to improve its quality as a soil amendment. Organic material, e.g., sawdust, is added to increase the C:N ratio to achieve optimum degradation of organic C and retention of N through microbial biomass formation. However, the relative biodegradabilities of the organic material in poultry litter and the amendment are usually not known. Furthermore, it is assumed that as microorganisms metabolize organic compounds and produce CO<sub>2</sub>, they increase in biomass and, therefore, retain N. In this study, bench-scale compost reactors were used to determine the relative contributions of poultry litter and of the amendment (sawdust) to the biodegradability of a compost mix. Approximately 29% of the volatiles lost from the poultry litter mix came from the sawdust. Fiber analyses revealed that only a small portion of cellulose was degraded. Although microbial subpopulations able to degrade selected macromolecules were present at varying levels, the overall level of microorganisms did not change markedly. Populations capable of degrading bacterial cell walls were present throughout the composting period, and microbiological assays indicated that inorganic nutrients were available to support limited microbial growth. These results suggest that N compounds and inorganic nutrients are recycled, rather than fixed during composting.

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**Bioremediation of gasoline-contaminated soil using poultry litter.**

Gupta,-G.; Tao,-J.

J-environ-sci-health-Part-A,-Environ-sci-eng-toxic-hazard-substance-control. Monticello, NY : Marcel Dekker, Inc. 1996. v. A31 (9) p. 2395-2407.

NAL Call Number: TD172.J6

*Descriptors:* polluted-soils. petroleum-. contaminants-. poultry-manure. bioremediation-. soil-pollution. pollution-control.

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**Broiler and turkey litter as protein supplements for growing cattle.**

Harvey,-R.-W. (Raymond Walter), 1939-

Technical bulletin (North Carolina Agricultural Research Service) ; 308. Raleigh, N.C. : N.C. Agricultural Research Service, N.C. State University, [1996] iv, 11 p. : ill.

NAL Call Number: 100--N812-no.308

*Descriptors:* Cattle-Feeding-and-feeds. Poultry-Manure. Animal-waste-as-feed.

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**Broiler litter can enhance potted plant production.**

Flynn,-R.P.; Wood,-C.W.; Guertal,-E.A.

Highlights-agr-res. Auburn, Ala. : Agricultural Experiment Station of Auburn University, Spring 1995. v. 42 (1) p. 6-8.

NAL Call Number: 100-A11H

*Descriptors:* lactuca-sativa. pot-plants. pot-culture. broilers-. poultry-manure. refuse-compost. growing-media. nutrient-uptake. ph-. yields-.

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**Broiler litter affects growth of annuals and perennials..**

Allen,-V.V.; Behe,-B.K. Res-rep-ser. [Auburn], Ala. : Alabama Agricultural Experiment Station, Auburn University,. Oct 1995. (10) p. 2.

NAL Call Number: S541.5.A2R47

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**Broiler litter as a feed or fertilizer in livestock operations.**

Bagley,-C.P.; Evans,-R.R.

Publ-Miss-State-Univ,-Coop-Ext-Serv. State College, Miss. : Cooperative Extension Service, Mississippi State University. Apr 1995. (1998) 8 p.

NAL Call Number: 275.29-M68Ext

*Descriptors:* poultry-manure. broiler-production. fertilizers-. application-rates. feeds-. cattle-. public-opinion. safety-. feed-supplements. mississippi-.

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**Broiler litter as a fertilizer or livestock feed.**

Bagley,-C.P.; Evans,-R.R.; Burdine,-W.B.-Jr.

J-prod-agric. [Madison, WI] : American Society of Agronomy, July/Sept 1996. v. 9 (3) p. 342-346.

NAL Call Number: S539.5.J68

*Descriptors:* poultry-manure. broilers-. waste-utilization. uses-. organic-fertilizers. forage-. crop-production. application-to-land. nutrients-. management-. nutrient-content. beef-cattle. feeds-. nutritive-value. feed-conversion. performance-. farming-systems. integration-. reviews-. southeastern-states-of-usa.

*Abstract:* The growth in the broiler industry and the concomitant increase in the broiler litter generated out of these operations, coupled with increased environmental awareness, has resulted in increased interest by producers and scientists in uses for broiler litter. Long-term land applications of broiler litter have resulted in a buildup of some nutrients in certain soils. Research results indicate that annual application rates of up to 4 tons/acre of litter are acceptable, but should be accompanied by annual soil testing. Broiler litter of adequate quality is acceptable as a livestock feed, provided the litter is properly processed prior to feeding. When used as a livestock feed, the ash level in litter is of concern due to its negative effects on the nutritive value (total digestible nutrients, TDN) of litter diets containing relatively high ash levels. Based on expected levels of performance, broiler litter-based diets require varying levels of grain to meet the nutrient requirements of different classes of livestock. Broiler litter can be used as both fertilizer and livestock feed, and the combining of broiler production with a commercial beef operation represents an attractive integration of two enterprises.

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**Broiler litter on cotton.**

Mitchell,-C.C.; Burmester,-C.H.; Hattey,-J.A.; Wood,-C.W.

Proc-Beltwide-Cotton-Conf. Memphis, Tenn. : National Cotton Council of America, 1991-. 1995. v. 2 p. 1338-1340.

NAL Call Number: SB249.N6

*Descriptors:* gossypium-. poultry-manure. nitrogen-. growth-inhibitors. crop-yield. alabama-.

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**Buffer strips to improve quality of runoff from land areas treated with animal manures.**

Chaubey,-I.; Edwards,-D.R.; Daniel,-T.C.; Moore,-P.A.-Jr.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995.. p. 363-370.

NAL Call Number: TD930.A55-1995

*Descriptors:* poultry-manure. application-to-land. grass-strips. runoff-. infiltration-. water-pollution. pollution-control. mathematical-models.

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**Cardiomyopathy of ruminants induced by the litter of poultry fed on rations containing the ionophore antibiotic, maduramicin. II. Macropathology and histopathology.**

Bastianello,-S.S.; Fourie,-N.; Prozesky,-L.; Nel,-P.W.; Kellermann,-T.S.

Onderstepoort-j-vet-res. Onderstepoort : Onderstepoort Veterinary Institute, Agricultural Research Council. Mar 1995. v. 62 (1) p. 5-18.

NAL Call Number: 41.8-On1

*Descriptors:* cattle-. sheep-. poultry-manure. maduramicin-. toxicity-. pathology-. histopathology-. cardiomyopathy-. heart-. skeletal-muscle. liver-. lungs-.

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**Changes during processing in the organic matter of composted and air-dried poultry manure.**

Mondini,-C.; Chiumenti,-R.; Da-Borso,-F.; Leita,-L.; De-Nobili,-M.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. Mar 1996. v. 55 (3) p. 243-249.

NAL Call Number: TD930.A32

*Descriptors:* poultry-manure. composting-. air-drying. organic-matter. carbon-. nitrogen-. carbon-nitrogen-ratio. humification-. nutrient-content.

*Abstract:* Composting and active drying are the main techniques employed to prevent losses of NH<sub>3</sub> and development of undesirable odours from poultry manure. We studied the effects of these treatments on C and N content and stabilization of organic matter. Carbon and N contents of composted poultry manure (CPM) at the end of the processes were 82.9 and 56.1%, respectively, of the initial material, whereas the C content of dried poultry manure (DPM) remained practically the same, while the N content slightly increased with time. Nitrogen content of DPM at the end of the process was about three times higher than that of CPM (55.1 and 19.2 mg/g, respectively). The humification index (HI) showed a decreasing trend in both products, indicating the formation of humic substances in both processes, although to different extents: even at 20 days CPM showed HI values typical of a well-matured material (0.50), whereas HI for DPM at the end of the process was 1.14, indicating that this material did not achieve stabilization. Application of electrofocusing (EF) to characterize the qualitative evolution of humic substances showed a more complex EF profile in the case of CPM and confirmed the higher stabilization of OM in the composted material. CPM could be useful as a soil amendment because of its high degree of stabilization, whereas DPM can be considered mainly as an organic fertilizer, because of its high content of N. If DPM was piled for a long period its OM could achieve a high degree of humification, so increasing the agronomic quality of this fertilizer.

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### **Changes of metal forms by organic amendments to Hawaii soils.**

Li,-M.; Hue,-N.V.; Hussain,-S.K.G.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1997. v. 28 (3/5) p. 381-394.  
NAL Call Number: S590.C63

*Descriptors:* mollisols-. ultisols-. calcium-. iron-. magnesium-. manganese-. zinc-. nutrient-availability. organic-wastes. waste-utilization. poultry-manure. sewage-sludge. green-manures. application-to-land. fractionation-. hawaii-.

*Abstract:* Forms of metals in soils control their availability to plants and animals and affect the environment differently. To evaluate shifts of metal forms as affected by organic amendments, a sequential extraction procedure was used to fractionate calcium (Ca), iron (Fe), magnesium (Mg), manganese (Mn), and zinc (Zn) in two Hawaii soils amended with three organic wastes. The designated forms are water-soluble, exchangeable, sorbed, organically bound, carbonate, and residual fractions. The soils, a Mollisol (Waimanalo series) and an Ultisol (Paaloa series), were incubated at 25 degrees C +/- 2 degrees C at field capacity with either chicken manure sewage sludge, or green manure (cowpea leaves) at 0, 5, and 20 Mg.ha<sup>-1</sup> for one or five months. Organically bound metals decreased with time because of organic matter decomposition. Iron was mostly residual, but water-soluble Fe also increased in the acid Paaloa soil. Unlike Fe most forms of Ca and Mg were transformed to the exchangeable form in 5 months. There was no significant change of Mn forms during the 5-month incubation. Virtually all organically bound Zn shifted to carbonate and residual forms in the neutral Mollisol (pH 6.2), but shifted to carbonate and exchangeable forms in the acid Ultisol (pH 4.5). The solubilities and exchangeabilities of the five metals in the two soils treated with sewage sludge were not significantly different from those treated with cowpea green manure or chicken manure during the 5-month incubation. The results suggest that the additions of sewage sludge, chicken manure, or cowpea green manure to Hawaii soils at 20 Mg ha<sup>-1</sup> do not have environmentally significant impacts in terms of Ca, Mg, Fe, Mn, and Zn. On the other hand, the amendments may decrease Ca and Mg deficiencies in highly weathered, nutrient-poor soils such as Ultisols and Oxisols of the tropics.

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### **Chemical constituents in different particle size fractions of deep-stacked broiler litter.**

Cratchfield,-D.J.; Goetsch,-A.L.; Johnson,-Z.B.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. July 1996. v. 57 (1) p. 99-104.  
NAL Call Number: TD930.A32

*Descriptors:* arkansas-.

*Abstract:* The distribution of chemical constituents relating to feeding value for ruminants in different particle size fractions (sieve apertures of 4.75, 2.36, 1.18, 0.6, 0.3, 0.15, 0.075 and 0 mm) using four different sources of deep-stacked broiler litter typical of northwestern Arkansas was determined. Mean particle size of dry matter varied considerably among broiler litter sources. Differences among litter sources in particle sizes at which larger and smaller size fractions each contained 50% of crude protein and neutral detergent fiber did not coincide well

with mean particle size of dry matter. Only in dry matter retained on sieves with smallest apertures (i.e. less than 0.15 mm) did concentrations of chemical constituents differ considerably from concentrations in unsieved litter. However, only minimal dry matter was retained on sieves with the smallest apertures, suggesting little potential to enhance feeding value of broiler litter for ruminants by a simple separation into one small and one large fraction if constituting a similar proportion of total dry matter.

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**Chemical, physico-chemical and microbiological examination of town refuse compost and chicken manure as organic fertilizers.**

El-Nadi,-A.H.; Rabie,-R.K.; Abdel-Magid,-H.M.; Sabrah,-R.E.A.; Abdel-Aal,-S.I.  
J-arid-environ. London, New York, Academic Press. May 1995. v. 30 (1) p. 107-113.  
NAL Call Number: QH541.5.D4J6

*Descriptors:* refuse-compost. poultry-manure. mineral-content. nutrient-content. chemical-composition. water-holding-capacity. bacteria-. fungi-.

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**Chicken manure as a biofertilizer for wheat in the sandy soils of Saudi Arabia.**

Abdel-Magid,-H.M.; Abdel-Aal,-S.I.; Rabie,-R.K.; Sabrah,-R.E.A.  
J-arid-environ. London, New York, Academic Press. Mar 1995. v. 29 (3) p. 413-420.  
NAL Call Number: QH541.5.D4J6

*Descriptors:* triticum-aestivum. poultry-manure. application-rates. crop-yield. yield-response-functions. crop-quality. wheat-straw. nitrogen-. phosphorus-. nutrient-uptake. nutrient-availability. soil-fertility. sandy-soils. protein-content. maximum-yield. returns-. saudi-arabia.

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**Clostridium botulinum type C intoxication in feedlot steers being fed ensiled poultry litter.**

Jean,-D.; Fecteau,-G.; Scott,-D.; Higgins,-R.; Quessy,-S.  
Can-vet-j. Ottawa : Canadian Veterinary Medical Association, c1978-. Oct 1995. v. 36 (10) p. 626-628.  
NAL Call Number: 41.8-R3224

*Descriptors:* steers-. clostridium-botulinum. poultry-manure. silage-. poisoning-. symptoms-. diagnosis-. bacterial-toxins. botulism-. case-reports.

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**Comparison of broiler litter and commercial fertilizer on production of tomato, *Lycopersicon esculentum*.**

Brown,-J.E.; Gilliam,-C.H.; Shumack,-R.L.; Porch,-D.W.; Donald,-J.O.

J-veg-crop-prod. Binghamton, NY : Food Products Press, 1995. v. 1 (1) p. 53-62.  
NAL Call Number: SB320.J68

*Descriptors:* lycopersicon-esculentum. vegetable-growing. organic-fertilizers. application-rates. litter-. broilers-. npk-fertilizers. waste-utilization. nutrient-uptake. crop-yield. growth-rate. crop-production. alabama-.

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**Compost pelletization eases end use in Nigeria.**

John,-N.M.; Adeoye,-G.O.; Sridhar,-M.K.C.  
Biocycle. Emmaus, PA : JG Press, June 1996. v. 37 (6) p. 55-56.  
NAL Call Number: 57.8-C734

*Descriptors:* composts-. pelleting-. poultry-manure. research-projects. nigeria-.

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**Conservation and enrichment of forages by ensiling with poultry excreta.**

Mson,-R.; Sangodoyin,-A.Y.  
Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1995. v. 26 (15/16) p. 2683-2695.  
NAL Call Number: S590.C63

*Descriptors:* eichhornia-crassipes. panicum-maximum. silage-making. poultry-manure. waste-utilization. fodder-. nutritive-value.

*Abstract:* In this study, ensiling of poultry manure with some tropical forages was investigated as a management option for poultry wastes. Water hyacinth (*Eichhornia crassipes*) and Guinea grass (*Panicum maximum*) were ensiled with caged layer excreta (CLE) to enhance the nutritional value of the resultant fodder. Levels of CLE inclusion investigated ranged from 0% (control) to 50% (fresh weight basis). The pH, ammonia, and lactic and acetic acid contents of the resultant silage were determined at 15, 30, 45, and 60 days after ensiling. Low dry matter losses and increases in protein content with CLE additions were observed. Crude protein recoveries with 10, 30, and 50% CLE additions were 107, 126, and 99% for grass and 113, 107, and 111% for water hyacinth silages, respectively. In all silages, higher levels of acetic acid suggest that acetic acid rather than lactic acid is the main preservative in tropical forages. The introduction of manure-based silages will result in substantial reduction in the cost of feed and subsequently render livestock production more profitable. Use of weeds especially water hyacinth could reduce the nuisance it poses to waterways and water bodies.

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**Controlled composting of paper pulp sludge using the aerated static pile method.**

Sesay,-A.A.; Lasaridi,-K.; Stentiford,-E.; Budd,-T.

Compost-sci-util. Emmaus, PA : JG Press, 1993-. Winter 1997. v. 5 (1) p. 82-96.  
NAL Call Number: TD796.5.C58

*Descriptors:* composting-. paper-mill-sludge. waste-utilization. poultry-manure. litter-plant. mixtures-. physicochemical-properties. microbial-activities. respiration-. temperature-. phytotoxicity-. aeration-. composts-. stability-. fecal-flora. seed-germination. uk-.

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**Controlled, high rate composting of mixtures of food residuals, yard trimmings and chicken manure.**

Elwell,-D.L.; Keener,-H.M.; Hansen,-R.C.

Compost-sci-util. Emmaus, PA : JG Press, Winter 1996. v. 4 (1) p. 6-15.

NAL Call Number: TD796.5.C58

*Descriptors:* composting-. yards-. wastes-. food-wastes. poultry-manure. mixtures-. monitoring-. carbon-nitrogen-ratio. dry-matter. losses-. aeration-. temperature-. air-flow. oxygen-. consumption-. moisture-content. carbon-dioxide. emission-. ammonia-. gas-production.

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**Degradation of nitrogenous components in and volatilization of ammonia from litter in aviary housing systems for laying hens.**

Groot-Koerkamp,-P.W.G.; Elzing,-A.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers, Jan/Feb 1996. v. 39 (1) p. 211-218.

NAL Call Number: 290.9-Am32T

*Descriptors:* hens-. aviaries-. poultry-manure. litter-. ammonia-. volatilization-. emission-. volatile-compounds. chemical-degradation. ammonium-nitrogen. ph-. water-content. air-temperature. pollution-control. netherlands-.

*Abstract:* Ammonia emissions from poultry houses for laying hens with litter are higher than the emissions from battery houses. The emission of ammonia must be reduced and the working environment should be improved to warrant the acceptance and sustainment of aviary houses in the future. Physical and chemical relationships of the volatilization of ammonia and the degradation of organic material in litter from aviary houses for laying hens were analyzed and verified by means of experimental data, which consisted of 66 litter samples taken from 12 commercial aviary houses. The volatilization rate of ammonia from the litter was linear to the  $\text{NH}_3$  concentration in the water of the litter, whereas the  $\text{pK}_a$  of the  $\text{NH}_3\text{-NH}_4^+$  equilibrium was adjusted to 8.65. The concentration of total ammoniacal nitrogen ( $\text{NH}_3\text{+NH}_4^+$ ) in the litter found in the aviary houses, which is the result of the degradation of organic material, was approximately 4% higher per 1/10 unit of pH, 4% higher per unit of temperature (degree C), and 4% higher per 10 units of water content (g/kg). The cold winter climate appeared to have an adverse influence on the litter close to the outer walls of the aviary houses. Emissions of ammonia from litter can be reduced by maintaining a high dry matter content, a low pH or low

temperature, which minimize the degradation rate of organic nitrogen and thus the volatilization of ammonia. However, control of pH and temperature may not always be possible or acceptable in aviary houses.

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**Developing environmentally sound poultry litter management practices for sustainable cropping systems.**

Earhart,-D.R.

Sustainable Agriculture Research and Education SARE research projects Southern Region. 1995. 80 p.

NAL Call Number: S441.S8552

*Descriptors:* poultry-manure. application-rates. vegetables-. cropping-systems. nutrient-uptake. leaves-. plant-composition. nitrogen-. phosphorus-. potassium-. calcium-. magnesium-. crop-yield. nitrate-nitrogen. leaching-. soil-fertility. soil-ph. electrical-conductivity. application-. timing-. texas-. oklahoma-.

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**Dried poultry waste as a nonprotein nitrogen source for ruminants.**

Bierman,-S.; Klopfenstein,-T.; Stock,-R.; Herold,-D.

MP-Univ-Neb-Linc-Agric-Res-Div. Lincoln : Agricultural Research Division, Institute of Agriculture & Natural Resources, University of Nebraska, Lincoln, [1986?- 1996. (66-A) p. 31-33.

NAL Call Number: 100-N27M

*Descriptors:* sheep-. poultry-manure. feeds-. composition-. fattening-performance.

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**Ecology of nematodes under influence of Cucurbita spp. and different fertilizer types.**

Porazinska,-D.L.; Coleman,-D.C.

J-nematol. Lakeland, Fla. : Society of Nematologists. Dec 1995. v. 27 (45) p. 617-623.

NAL Call Number: QL391.N4J62

*Descriptors:* cucurbita-. cucurbita-maxima. plant-parasitic-nematodes. free-living-nematodes. poultry-manure. ammonium-nitrate. soil-fertility. population-density. community-ecology. cucurbitacins-. species-differences. georgia-.

*Abstract:* In a field study conducted in Georgia, cucurbit plants with high (*Cucurbita andreana*) and low (*Cucurbita maxima*) concentrations of cucurbitacins were used in combination with two types of fertilizers to investigate their effects on the community of soil nematodes. Ecological measures of soil nematode community structure such as total nematode abundance, number of genera, trophic diversity, trophic group proportions, fungivore/bacterivore ratio, and modified maturity index were assessed and compared among treatments. In general, poultry manure (an

organic source of nitrogen) and synthetic fertilizer (a nonorganic source of nitrogen) did not differ in their effects on the nematode communities throughout one growing season. Few differences between the two plant species were found for any of the nematode community measurements. Bacterial- and fungal-feeding nematodes were the most abundant trophic groups, averaging 60% and 20% of the nematode community, respectively. Trophic diversity, nematode maturity index, and fungivore/bacterivore values were lowest at the beginning and highest at the end of the experiment.

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### **Edge-of-field losses of surface-applied animal manure.**

Daniel,-T.C.; Edwards,-D.R.; Nichols,-D.J.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995.. p. 89-98.

NAL Call Number: TD930.A55-1995

*Descriptors:* poultry-manure. pig-slurry. application-rates. application-to-land. pastures-. festuca-arundinacea. rain-. runoff-. nitrogen-content. ammonia-. nitrate-nitrogen. phosphorus-. phosphates-. chemical-oxygen-demand. water-pollution. pollution-control. arkansas-.

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### **Effect of chemical amendments on ammonia volatilization from poultry litter.**

Moore,-P.A.-Jr.; Daniel,-T.C.; Edwards,-D.R.; Miller,-D.M.

J-environ-qual. Madison : American Society Of Agronomy, Mar/Apr 1995. v. 24 (2) p. 293-300.

NAL Call Number: QH540.J6

*Descriptors:* poultry-manure. chemical-treatment. calcium-hydroxide. inorganic-compounds. ferrous-sulfate. ph-. electrical-conductivity. carbon-. metals-. nitrogen-. phosphorus-. ammonia-. volatilization-.

*Abstract:* Ammonia (NH<sub>3</sub>) volatilization from poultry litter results in a buildup of atmospheric NH<sub>3</sub> in chicken houses, which is detrimental to both farm laborers and birds. Ammonia loss from litter is detrimental to the external environment because it results in acid rain, as well as low N/P ratios in litter, which increase the likelihood of excessive P runoff into adjacent water bodies. The objectives of this study were to determine the effect of various chemical amendments on NH<sub>3</sub> volatilization and selected litter characteristics after 42 d. A laboratory study was conducted using the following amendments: Ca(OH)<sub>2</sub> (calcium hydroxide), Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>.18H<sub>2</sub>O (alum), alum + CaCO<sub>3</sub>, FeSO<sub>4</sub>.7H<sub>2</sub>O (ferrous sulfate), and MLT (Multi-purpose Litter Treatment, a commercial product). Ammonia-free air was continuously passed through air-tight chambers containing amended litter and any NH<sub>3</sub> volatilized from the litter was trapped in boric acid solutions, which were titrated daily for NH<sub>3</sub> content. The study was carried out for 42 d. At this time, the litter was analyzed for pH, electrical conductivity (EC), soluble organic C (SOC), metals, and soluble and total forms of N and P. The results of this study indicated that the addition of alum to poultry litter dramatically reduces NH<sub>3</sub> volatilization (up to 99% less volatilization than controls). Decreases in volatilization resulted in higher total and soluble N in litter, which increased N/P ratios. Several of the compounds studied (particularly

alum) were effective in decreasing water-soluble P levels in litter. Therefore, we are proposing the use of alum as a litter amendment in poultry houses.

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**Effect of direct-fed microorganisms on broiler growth performance and litter ammonia level.**

Chiang,-S.H.; Hsieh,-W.M.

Asian-australas-j-anim-sci. Suweon, Korea : Asian-Australasian Association of Animal Production Societies, Apr 1995. v. 8 (2) p. 159-162.

NAL Call Number: SF55.A78A7

*Descriptors:* broilers-. probiotics-. lactobacillus-. bacillus-. streptococcus-. broiler-performance. feed-conversion. liveweight-gain. poultry-manure. ammonia-. abdominal-fat. excreta-.

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**Effect of soil pH and nitrogen source on the nutrient status in peach. II. Micronutrients.**

Cummings,-G.A.; Xie,-H.S.

J-plant-nutr. Monticello, N.Y. : Marcel Dekker Inc. 1995. v. 18 (3) p. 553-562.

NAL Call Number: QK867.J67

*Descriptors:* prunus-persica. soil-ph. nitrogen-fertilizers. trace-elements. mineral-content. leaves-. shoots-. trunks-. roots-. nutrient-availability. soil-fertility. aluminum-. manganese-. iron-. zinc-. copper-. liming-. poultry-manure. nutrient-nutrient-interactions. peach-orchard-soils. AB: The concentration of aluminum (Al), manganese (Mn), iron (Fe), zinc (Zn), and copper (Cu) in leaves, shoots, trunks, and roots, and the content of plant-available Mn and Al in soil was examined after 13-year treatments of soil pH and nitrogen (N) source in a peach orchard of North Carolina. Raising soil pH by liming tended to reduce soil Al content, but had no effect on soil Mn. Tissue Al and Mn level was decreased in high pH treatment. Poultry manure application resulted in the highest soil Mn content but the lowest soil Al. In comparison with calcium nitrate [Ca(NO<sub>3</sub>)<sub>2</sub>], ammonium sulfate [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>] increased Al availability in soil while had little effect on soil Mn. Acid-forming N, especially (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, increased the concentration of tissue Al, Mn, Zn, and Fe. The plants treated with various basic N materials similarly contained lower levels of Al or Mn. Manure treatment resulted in high tissue Cu and Zn but low tissue Fe levels. Tissue Zn was low when mineral N sources containing calcium (Ca) or sodium (Na) were applied.

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**Effect of diet on feces composition and the implications on environmental quality.**

Sloan,-D.R.; Harms,-R.H.; Barnard,-D.; Nordstedt,-R.

J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Winter 1995. v. 4 (4) p. 379-383.

NAL Call Number: SF481.J68

*Descriptors:* hens-. experimental-diets. dietary-protein. methionine-. calcium-. phosphorus-. feces-composition. nitrogen-. poultry-manure. environmental-impact.

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**Effect of dyne-o-might on bacterial and mold load in poultry litter.**

Himathongkham,-S.; Riemann,-H.; Saini,-R.

Proc-West-Poult-Dis-Conf. Davis, CA: University of California. 1996. (45th) p. 384-385.

NAL Call Number: SF995.W4

Summary in: Spanish

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**Effect of dietary protein content, litter and drinker type on ammonia emission from broiler houses.**

Elwinger,-K.; Svensson,-L.

J-agric-eng-res. London ; Orlando : Academic Press, July 1996. v. 64 (3) p. 197-208.

NAL Call Number: 58.8-J82

*Descriptors:* broilers-. poultry-housing. ammonia-. odor-emission. poultry-manure. litter-. measurement-. techniques-. comparisons-. feeds-. dietary-protein. nipple-drinkers. pollution-control. coccidiostats-. protein-intake. samples-. sweden-.

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**Effect of soil pH and nitrogen source on nutrient status in peach. I. Macronutrients.**

Xie,-H.S.; Cummings,-G.A.

J-plant-nutr. Monticello, N.Y. : Marcel Dekker Inc. 1995. v. 18 (3) p. 541-551.

NAL Call Number: QK867.J67

*Descriptors:* prunus-persica. soil-ph. nitrogen-fertilizers. mineral-content. leaves-. shoots-. trunks-. roots-. nutrient-availability. soil-fertility. calcium-. magnesium-. phosphorus-. potassium-. poultry-manure. liming-. nutrient-nutrient-interactions. peach-orchard-soils.

*Abstract:* Following 13-year treatments of soil pH and nitrogen (N) source in a peach orchard of North Carolina, the concentration of calcium (Ca), magnesium (Mg), N, phosphorus (P), and potassium (K) in leaves, shoots, trunks and roots, as well as soil pH, soil exchangeable Ca, Mg, and K content, were determined. Through liming, higher soil pH treatment enhanced soil Ca and tissue Ca level. Among six N sources examined, the highest values of soil pH and soil Ca, Mg, and K were detected following poultry manure application. Compared to ammonium sulfate [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>], calcium nitrate [Ca(NO<sub>3</sub>)<sub>2</sub>] increased soil pH and soil Ca and K content, but reduced soil Mg. For most of macronutrients examined in peach tissues, the highest levels were found in manure treatment. Mineral N sources containing Ca(NO<sub>3</sub>)<sub>2</sub> resulted in high tissue Ca and low tissue N. In the above-ground tissues, Mg concentration was relatively low following application of mineral N materials containing Ca, K, or sodium (Na). Acid-forming N, especially (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, reduced tissue Ca and P. The magnitude of impact of liming and N

source on macronutrients was tissue-type dependent, with leaves and other new growth the most sensitive ones while trunks seldom responded to the treatments.

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**Effect of dried poultry waste on performance of finishing yearling steers.**

Herold,-D.; Downs,-D.; Klopfenstein,-T.; Klemesrud,-M.

MP-Univ-Neb-Linc-Agric-Res-Div. Lincoln : Agricultural Research Division, Institute of Agriculture & Natural Resources, University of Nebraska, Lincoln, [1986?- 1997. (67-A) p. 67-69.

NAL Call Number: 100-N27M

*Descriptors:* poultry-manure. dry-feeds. supplementary-feeding. fattening-performance.

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**Effect of organic amendments on the bioremediation of cyanazine and fluometuron in soil.**

Wagner,-S.C.; Zablotowicz,-R.M.

J-environ-sci-health,-Part-B,-Pestic-food-contam-agric-wastes. New York, Marcel Dekker. 1997. v. B32 (1) p. 37-54.

NAL Call Number: TD172.J61

*Descriptors:* cyanazine-. fluometuron-. metabolites-. biodegradation-. organic-amendments. maize-meal. lolium-. poultry-. manures-. half-life. persistence-. silt-loam-soils. soil-pollution. bioremediation-.

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**Effectiveness of vegetative filter strips in controlling losses of surface-applied poultry litter constituents.**

Chaubey,-I.; Edwards,-D.R.; Daniel,-T.C.; Moore,-P.A.-Jr.; Nichols,-D.J.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers, Nov/Dec 1995. v. 38 (6) p. 1687-1692.

NAL Call Number: 290.9-Am32T

*Descriptors:* festuca-arundinacea. grass-strips. length-. poultry-manure. application-to-land. runoff-. chemical-composition. pollution-control. efficacy-. arkansas-.

*Abstract:* Vegetative filter strips (VFS) have been shown to have high potential for reducing nonpoint source pollution from cultivated agricultural source areas, but information from uncultivated source areas amended with poultry litter is limited. Simulated rainfall was used in analyzing effects of VFS length (0, 3.1, 6.1, 9.2, 15.2. and 21.4 m) on quality of runoff from fescue (*Festuca arundinacea* Schreb.) plots (1.5 x 24.4 m) amended with poultry litter (5 Mg/ha). The VFS reduced mass transport of ammonia-nitrogen (NH<sub>3</sub>-N), total Kjeldahl nitrogen (TKN), ortho-phosphorus (PO<sub>4</sub>-P), total phosphorus (TP), chemical oxygen demand (COD), and total suspended solids (TSS). Mass transport of TKN, NH<sub>3</sub>-N TP, and PO<sub>4</sub>-P were reduced by

averages of 39, 47, 40, and 39%, respectively, by 3.1 m VFS and by 81, 98, 91, and 90%, respectively, by 21.4 m VFS. Effectiveness of VFS in terms of mass transport reduction was unchanged, however, beyond 3.1 m length for TSS and COD and averaged 35 and 51%, respectively. The VFS were ineffective in removing nitrate-nitrogen from the incoming runoff. Removal of litter constituents was described very well ( $r^2 = 0.70$  to  $0.94$ ) by a first-order relationship between constituent removal and VFS length.

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**Effects of waste-disposal practices on ground-water quality at five poultry (broiler) farms in north-central Florida, 1992-93.**

Hatzell, Hilda-H. - Geological Survey (U.S.). Florida. Dept. of Environmental Protection. Water-resources investigations report ; 95-4064. Tallahassee, Fla. (227 N. Bronough St. Suite 3015 32301) : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Earth Science Information Center, Open-File Reports Section [distributor], 1995. vi, 35 p. : ill., maps  
NAL Call Number: GB701.W375--no.95-4064

*Descriptors:* Poultry-Manure-Handling-Florida. Groundwater-Florida. Water-quality-Florida.

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**Effects of phytase and 1,25-dihydroxycholecalciferol on phytate utilization and the quantitative requirement for calcium and phosphorus in young broiler chickens.**

Mitchell, R.D.; Edwards, H.M.-Jr.

Poultry-sci. Savoy, IL : Poultry Science Association, Inc. Jan 1996. v. 75 (1) p. 95-110.  
NAL Call Number: 47.8-Am33P

*Descriptors:* broilers-. nutrient-requirements. calcium-. phosphorus-. calcitriol-. phytase-. body-weight. bone-ash. blood-plasma. hypophosphatemic-rickets. mineral-deficiencies. excreta-. feed-conversion. nutrient-retention. dosage-effects. tibia-. dyschondroplasia-.

*Abstract:* Three experiments were conducted to determine the effects of supplementing 1,25-dihydroxycholecalciferol [1,25-(OH)2D3] and a commercial phytase product on Ca and P requirements of 21-d-old broiler males. These experiments were conducted with four levels of dietary Ca and P in corn-soybean diets with and without supplementation of 5 microgram/kg of 1,25-(OH)2D3, 600 units/kg of phytase, and the combination of these supplements. The results show that these levels of phytase and 1,25-(OH)2D3 can replace up to 0.1% of the inorganic P for criteria such as BW, bone ash, and plasma P. Both supplements increased phytate P retention, whereas higher levels of Ca and P decreased phytate P retention. The addition of 1,25-(OH)2D3, but not phytase, reduced Ca requirements and decreased the incidence of tibial dyschondroplasia. The combination of these levels of phytase and 1,25-(OH)2D3 replaced 0.2% inorganic P for criteria such as BW, bone ash, and P rickets. Total dietary P requirements are estimated to be between 0.55 and 0.60% at the levels of phytase and 1,25-(OH)2D3, listed above, or 0.45% when the combination is added. The Ca requirements are estimated to be 0.77% when 1,25-(OH)2D3 is added to the diet and 0.9 to 0.95% when phytase is added.

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**Effects of three fertility amendments on soil dehydrogenase activity, organic C and pH.**

Cooper,-J.M.; Warman,-P.R.

Can-j-soil-sci. Ottawa : Agricultural Institute of Canada, 1957-. May 1997. v. 77 (2) p. 281-283.

NAL Call Number: 56.8-C162

Summary in: French

*Descriptors:* sandy-loam-soils. clay-soils. poultry-manure. composts-. fertilizers-. soil-flora. microbial-activities. soil-enzymes. oxidoreductases-. enzyme-activity. soil-organic-matter. carbon-. soil-ph. soil-texture. nova-scotia.

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**Effects of poultry litter on the chronic toxicity of cadmium to common carp (Cyprinus carpio).**

Kaviraj,-A.; Ghosal,-T.K.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. June 1997. v. 60 (3) p. 239-243.

NAL Call Number: TD930.A32

*Descriptors:* fish-culture.

*Abstract:* Static 90 day bioassays were made in outdoor cement tanks (300 l capacity) with fries of common carp (Cyprinus carpio) exposed to 1.0, 2.5 and 5.0 mg/l of cadmium (Cd) treated individually and with 250 mg/l poultry litter. Addition of poultry litter significantly reduced the concentrations of dissolved Cd in water and whole body Cd in fish and plankton. In contrast, concentrations of total Cd in sediment increased under the influence of poultry litter. Cadmium showed a distinct partitioning pattern in the sediment. Addition of poultry litter did not change the partitioning pattern. Growth of fish, in respect to length and weight, was reduced by all levels of Cd exposure. In contrast, maximum weight gains, increased lengths, increased specific growth rates and yields were recorded under the influence of poultry litter alone. Addition of poultry litter reduced the ill effects on growth of fish produced by Cd and proved to be a promising tool to counter Cd pollution in aquaculture.

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**Efficacy of three nitrogen and phosphorus sources in container-grown azalea production.**

Warren,-S.L.; Bilderback,-T.E.; Tyler,-H.H.

J-environ-hortic. Washington, D.C. : Horticultural Research Institute, Sept 1995. v. 13 (3) p. 147-151.

NAL Call Number: SB1.J66

*Descriptors:* rhododendron-. container-grown-plants. slow-release-fertilizers. npk-fertilizers. top-dressings. composts-. poultry-manure. effluents-. leaching-. nutrient-uptake. north-carolina.

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**Elemental concentrations of stored whole and fractionated broiler litter.**

Kelley,-T.R.; Pancorbo,-O.C.; Merka,-W.C.; Thompson,-S.A.; Cabrera,-M.L.; Barnhart,-H.M.  
J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Fall 1996. v. 5 (3) p. 276-281.  
NAL Call Number SF481.J68

*Descriptors:* poultry-manure. recycling-. fractionation-. storage-. chemical-composition.

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**Environmental phosphorus indices in manure amended soils in the Fraser Basin of British Columbia, Canada.**

Yuan,-G.; Lavkulich,-L.M.

J-environ-sci-health,-Part-B,-Pestic-food-contam-agric-wastes. New York, Marcel Dekker. 1995.  
v. B30 (6) p. 841-857.

NAL Call Number: TD172.J61

*Descriptors:* poultry-manure. application-to-land. phosphorus-. sorption-. saturation-percentage.  
ph-. crop-production. waste-disposal. british-columbia.

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**Estimates of volumes and exposed surface areas of stored animal manures and slurries in England & Wales.**

Nicholson,-R.J.; Brewer,-A.J.

J-agric-eng-res. London ; Orlando : Academic Press. Apr 1997. v. 66 (4) p. 239-250.

NAL Call Number: 58.8-J82

*Descriptors:* animal-manures. slurries-. farm-storage. volume-. surface-area. inventories-.  
geographical-distribution. estimation-. emission-. air-pollution. ammonia-. methane-. dairy-cows.  
pigs-. poultry-. stores-. england-. wales-.

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**Evaluation of the chemical composition of manures from different organic wastes and their potential for supply of nutrients to tomato in a tropical ultisol.**

Asiegbu,-J.E.; Oikeh,-S.

Biol-agric-hortic. Oxon : A B Academic Publishers. 1995. v. 12 (1) p. 47-60.

NAL Call Number: S605.5.B5

*Descriptors:* lycopersicon-esculentum. tropical-soils. ultisols-. animal-manures. sewage-sludge.  
pig-manure. poultry-manure. organic-wastes. waste-utilization. npk-fertilizers. comparisons-.  
nutrient-content. nutrient-availability. soil-ph. use-efficiency. nutrient-uptake. application-rates.

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**Evaluation of the toxicity of alum (aluminum sulfate) in young broiler chickens.**

Huff,-W.E.; Moore,-P.A.-Jr.; Balog,-J.M.; Bayyari,-G.R.; Rath,-N.C.

Poultry-sci. Savoy, IL : Poultry Science Association, Inc. Nov 1996. v. 75 (11) p. 1359-1364.

NAL Call Number: 47.8-Am33P

*Descriptors:* broilers-. aluminum-sulfate. chicks-. dosage-. unrestricted-feeding. liveweight-gain. body-weight. feed-conversion. gizzard-. weight-. blood-serum. phosphorus-. bone-strength. tibia-. bone-ash. sulfur-. calcium-. breast-muscle. poultry-manure. litter-. intestines-. strength-.

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**Evaluation of chemical amendments to reduce ammonia volatilization from poultry litter.**

Moore,-P.A.-Jr.; Daniel,-T.C.; Edwards,-D.R.; Miller,-D.M.

Poultry-sci. Savoy, IL : Poultry Science Association, Inc. Mar 1996. v. 75 (3) p. 315-320.

NAL Call Number: 47.8-Am33P

*Descriptors:* poultry-manure. ammonia-. volatility-. aluminum-sulfate. ferrous-sulfate. silicates-. phosphorus-. ph-. nitrogen-content. production-costs. cost-benefit-analysis. runoff-water.

*Abstract:* Ammonia volatilization from poultry litter often causes high levels of atmospheric ammonia in poultry houses, which is detrimental to both farm workers and birds. Ammonia emissions from houses also aggravate environmental problems, such as acid rain, and result in a loss of fertilizer nitrogen. The objectives of this study were to determine the effect of litter amendments on ammonia volatilization and to determine the effect of these amendments on nitrogen and phosphorus content in litter. The results of this research indicate that alum [Al(2)(SO4)3.18H2O], ferrous sulfate (FeSO4.7H2O), and phosphoric acid (H3PO4) dramatically reduce ammonia volatilization from litter. The amount of ammonia lost from litter treated sodium bisulfate (NaHSO4) and a proprietary product made of Ca-Fe silicate with a phosphoric acid coating was not different from the control (untreated litter). Aluminum sulfate (alum) and ferrous sulfate reduced water soluble P concentrations in litter, whereas phosphoric acid greatly increased water-soluble P levels. The most effective compound evaluated with respect to reducing both ammonia loss and P solubility was alum.

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**Fecal bacteria in surface runoff from poultry-manured fields.**

Coyne,-M.S.; Blevins,-R.L.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995.. p. 77-87.

NAL Call Number: TD930.A55-1995

*Descriptors:* fecal-coliforms. streptococcus-. salmonella-. poultry-manure. application-to-land. grass-strips. runoff-. rain-. simulation-. erosion-control. water-pollution. pollution-control. kentucky-.

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**Feeding broiler poultry litter as an alternative waste management strategy.**

McCaskey,-T.A.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995. p. 493-502.

NAL Call Number: TD930.A55-1995

*Descriptors:* poultry-manure. feeds-. animal-feeding. cattle-. animal-diseases. animal-production. animal-nutrition. waste-utilization.

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**Feeding broiler litter to beef cows.**

Pugh,-D.G.

Proc-annu-conv-Am-Assoc-Bovine-Pract,-Conv. Stillwater, Okla. : The Association,. Jan 1995.

(27th) p. 101-103.

NAL Call Number: SF961.A5

*Descriptors:* beef-cows. cattle-feeding. litter-.

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**Growth and yield of bearing and non-bearing citrus trees fertilized with fresh and processed chicken manure.**

Ferguson,-J.J.

Proc-annu-meet-Fla-State-Hort-Soc. [S.l.] : The Society,. June 1995. v. 107 p. 29-32.

NAL Call Number: SB319.2.F6F56

*Descriptors:* citrus-sinensis-x-poncirus-trifoliata. citrus-paradisi. citrus-sinensis. poultry-manure. slow-release-fertilizers. application-rates. bearing-capacity. growth-rate. crop-yield. florida-.

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**Impact of alternating manure removal schedules on pest flies (Diptera: Muscidae) and associated predators (Coleoptera: Histeridae, Staphylinidae; Acarina: Macrochelidae) in caged-layer poultry manure in southern California.**

Mullens,-B.A.; Hinkle,-N.C.; Szijj,-C.E.

J-econ-entomol. Lanham, Md. : Entomological Society of America, 1908-. Dec 1996. v. 89 (6) p. 1406-1417.

NAL Call Number: 421-J822

*Descriptors:* musca-. fannia-. macrocheles-. carcinops-. histeridae-. staphylinidae-. predators-of-insect-pests. biological-control-agents. poultry-manure. removal-. timing-. cultural-control. nontarget-organisms. nontarget-effects. poultry-housing. insect-control. california-.

*Abstract:* Pest fly larvae and adults (*Musca*, *Fannia* spp.) and key predator arthropods (*Macrocheles* mites, *Carcinops* adults and *Histeridae* larvae, *Staphylinidae* larvae) were monitored for 2 yr on 3 southern California caged-layer poultry facilities. In each manure

cleanout cycle, all manure rows were removed initially in normal removal houses (Normal), while half of the manure was left undisturbed in alternate removal houses (Alternate). After 1 mo the remaining rows of manure were removed in the Alternate houses. In each cycle the manure fauna was sampled before removal, 1 wk after initial removal, 4 wk after initial removal (before secondary removal in Alternate houses), and 8 wk after initial removal (4 wk after secondary removal in Alternate houses). Cleanout caused significant decreases in key predator taxa 1 wk afterward and increased numbers of pest flies for 1-2 mo. Cleanout between March and May usually resulted in a resurgence of *Fannia* spp., whereas late summer cleanouts could cause *M. domestica* problems. Presence of undisturbed manure within the Alternate houses did not result in increased numbers of predaceous Coleoptera in nearby disturbed manure relative to Normal houses. Numbers of *Macrocheles* in disturbed manure after cleanout were higher when undisturbed manure was immediately adjacent. Pest flies following a cleanout were not reduced in Alternate houses relative to Normal houses. In these open-sided poultry houses, which leave a dry base manure pad at cleanout, any slight advantage of fly control afforded by alternate manure removal probably is overshadowed by the increased time and effort involved.

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**Impact of soil amendments on intermittent evaporation, moisture distribution and salt redistribution in saline-sodic clay soil columns.**

Abdel-Rahman,-H.A.; Dahab,-M.H.; Mustafa,-M.A.

Soil-sci. Baltimore : Williams & Wilkins Co., Nov 1996. v. 161 (11) p. 793-802.

NAL Call Number: 56.8-So3

*Descriptors:* saline-sodic-soils. clay-soils. soil-amendments. gypsum-. sand-. farmyard-manure. poultry-manure. sludges-. evaporation-. soil-water. spatial-distribution. salts-in-soil. movement-in-soil. leaching-. soil-water-movement. rehabilitation-.

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**Influence of organic by-products and nitrogen source on chemical and microbiological status of an agricultural soil.**

Entry,-J.A.; Wood,-B.H.; Edwards,-J.H.; Wood,-C.W.

Biol-fertil-soils. Berlin, Germany : Springer-Verlag. 1997. v. 24 (2) p. 196-204.

NAL Call Number: QH84.8.B46

*Descriptors:* soil-flora. biomass-. microbial-activities. cellulose-. decomposition-. carbon-. nitrogen-. mineralization-. agricultural-soils. cotton-gin-trash. newspapers-. wood-chips. litter-plant. organic-amendments. poultry-manure. ammonium-nitrate. soil-fertility. nutrient-availability. nitrogen-cycle. carbon-cycle. soil-organic-matter. waste-utilization.

*Abstract:* We assessed the influence of the addition of four municipal or agricultural by-products (cotton gin waste, ground newsprint, woodchips, or yard trimmings), combined with two sources of nitrogen (N), [ammonium nitrate (NH<sub>4</sub>NO<sub>3</sub>) or poultry litter] as carbon (C) sources on active bacterial, active fungal and total microbial biomass, cellulose decomposition, potential net mineralization of soil C and N and soil nutrient status in agricultural soils. Cotton gin waste as a

C source promoted the highest potential net N mineralization and N turnover. Municipal or agricultural by-products as C sources had no effect on active bacterial, active fungal or total microbial biomass, C turnover, or the ratio of net C:N mineralized. Organic by-products and N additions to soil did not consistently affect C turnover rates, active bacterial, active fungal or total microbial biomass. After 3, 6 or 9 weeks of laboratory incubation, soil amended with organic by-products plus poultry litter resulted in higher cellulose degradation rates than soil amended with organic by-products plus NH<sub>4</sub>NO<sub>3</sub>. Cellulose degradation was highest when soil was amended with newsprint plus poultry litter. When soil was amended with organic by-products plus NH<sub>4</sub>NO<sub>3</sub>, cellulose degradation did not differ from soil amended with only poultry litter or unamended soil. Soil amended with organic by-products had higher concentrations of soil C than soil amended with only poultry litter or unamended soil. Soil amended with organic by-products plus N as poultry litter generally, but not always, had higher extractable P, K, Ca, and Mg concentrations than soil amended with poultry litter or unamended soil. Agricultural soil amended with organic by-products and N had higher extractable N, P, K, Ca and Mg than unamended soil. Since cotton gin waste plus poultry litter resulted in higher cellulose degradation and net N mineralization, its use may result in faster increase in soil nutrient status than the other organic by-products and N sources that were tested.

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**Influence of nitrogen, phosphorus, and calcium in poultry manure on survival, growth, and reproduction in house fly (Diptera: Muscidae).**

Barnard,-D.R.; Harms,-R.H.; Sloan,-D.R.

Environ-entomol. Lanham, Md. : Entomological Society of America. Oct 1995. v. 24 (5) p. 1297-1301.

NAL Call Number: QL461.E532

*Descriptors:* musca-domestica. survival-. growth-. reproduction-. fecundity-. poultry-manure. nutrient-content. nitrogen-. nitrogen-content. phosphorus-. calcium-.

*Abstract:* Larval survival, pupal mass, adult emergence, fecundity, and natality in the house fly, *Musca domestica* L., are not influenced by the levels of calcium or nitrogen in feces of caged laying hens, *Gallus gallus* L. Reduced pupal mass, low fecundity, and low natality in flies are correlated with increased manure phosphorus concentration. Estimated pupal mass is inversely proportional to manure phosphorus content and decreases by 2.6 +/- 0.5 mg for each 1.0% increase in the phosphorus level. The concomitant decrease in estimated mean fecundity is 27.6 +/- 1.5 eggs per fly. Female flies that emerge from 16.5-mg pupae (larvae reared in low-phosphorus manure) produce an estimated 5 times more eggs (146.3 versus 26.6) than females that emerge from 5.2-mg pupae (larvae reared in high-phosphorus manure).

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**Influence of compost maturity on nutrient status of sunflowers.**

Baca,-M.T.; Delgado,-I.C.; De-Nobili,-M.; Esteban,-E.; Sanchez-Raya,-A.J.

Commun-soil-sci-plant-anal. New York, N.Y. : Marcel Dekker. 1995. v. 26 (1/2) p. 169-181.

NAL Call Number: S590.C63

*Descriptors:* helianthus-annuus. composts-. sugarcane-bagasse. olive-cake. poultry-manure. maturity-. nutrient-availability. iron-. zinc-. boron-. trace-element-deficiencies. plant-nutrition. mineral-nutrition. immobilization-. nitrogen-. phosphorus-. nitrification-. crop-yield. soil-fertility. nutrient-uptake. mineral-uptake.

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**Influence zone of aeration pipes and temperature variations in passively aerated composting of manure slurries.**

Sartaj,-M.; Fernandes,-L.; Patni,-N.K.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers,Nov/Dec 1995. v. 38 (6) p. 1835-1841.

NAL Call Number: 290.9-Am32T

*Descriptors:* poultry-manure. slurries-. peat-. aeration-. composting-. methodology-. temperature-profile. physicochemical-properties. pipes-. composts-. ontario-.

*Abstract:* Natural and passive aeration methods of composting under high initial moisture content condition (76%) were studied. Compost material consisted of poultry manure slurry as the waste and peat as the bulking agent. Piles were trapezoidal in section with an initial volume and height of 5 m<sup>3</sup> and 1.2 m, respectively. Correlation factors of temperature readings of identical positions in replicate piles showed that the process was quite stable and reproducible. Influence zone of passive aeration pipes was limited to the interior portion of the bottom half of the pile. Temperature distribution inside the piles indicated that passive aeration pipes were effective in providing more air than natural aeration. Passive aeration process finished two weeks earlier than natural aeration process. The final product had a dark brown color and was rich in total nitrogen and phosphorus.

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**Integration of animal waste, winter cover crops and biological antagonists for sustained management of Columbia lance and other associated nematodes on cotton.**

Barker,-K.R.; Koenning,-S.R.; Mikkelsen,-R.L.; Edmisten,-K.L.

Sustainable Agriculture Research and Education SARE research projects Southern Region.1995. 31 p.

NAL Call Number: S441.S8552

*Descriptors:* gossypium-. plant-parasitic-nematodes. poultry-manure. composts-. cover-crops. secale-cereale. green-manures. paecilomyces-. biological-control-agents. nitrogen-fertilizers. use-efficiency. nematode-control. cultural-control. biological-control. sustainability-. north-carolina.

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**Investigations on quality of litter and performance of broilers during fattening depending on stocking density.**

Kersting,-Ignaz-Schulze.  
[Hannover : s.n., 1996?] 163 p. : ill.  
NAL Call Number: DISS--F1996349  
German; Summary in: English

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**Ionic activity in soil solution as affected by application of newsprint and nitrogen sources.**

Lu,-N.; Edwards,-J.H.; Walker,-R.H.  
Compost-sci-util. Emmaus, PA : JG Press, 1993-. Spring 1997. v. 5 (2) p. 68-83.  
NAL Call Number: TD796.5.C58

*Descriptors:* zea-mays. glycine-max. gossypium-hirsutum. newspapers-. application-to-land. nitrogen-fertilizers. nutrient-sources. ammonium-nitrate. ammonia-. urea-. poultry-manure. soil-solution. ion-activity. soil-toxicity. aluminum-. bioavailability-. phytotoxicity-. soil-ph. seed-germination. dry-matter-accumulation. seedling-growth. soil-chemistry. carbon-nitrogen-ratio. chelation-. alabama-.

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**Lettuce response to composted broiler litter as a potting substrate component.**

Flynn,-R.P.; Wood,-C.W.; Guertal,-E.A.  
J-Am-Soc-Hortic-Sci. Alexandria, Va. : Nov 1995. v. 120 (6) p. 964-970.  
NAL Call Number: 81-SO12

*Descriptors:* poultry-manure. growing-media. composts-. potting-. substrates-. broilers-. peanut-husks. pine-bark. wood-shavings. mixtures-. chemical-composition. lactuca-sativa. container-grown-plants. ph-. nutrient-availability. nutrient-uptake. plant-composition. waste-utilization. indicator-plants.

*Abstract:* A glasshouse study was conducted to evaluate the suitability of composted broiler chicken (*Gallus gallus*) litter as a potting substrate using lettuce (*Lactuca sativa* L.). Broiler litters containing wood shavings or peanut hulls as bedding materials were composted with either shredded pine bark or peanut hulls. Composted materials were then combined with a commercially available potting substrate. Greatest fresh weight yield was obtained when peanut hull compost was mixed with commercial potting substrate at a ratio of 3:1. Fresh weight was less with pine bark compost than with peanut hull compost. However, there were no differences in lettuce dry weight among composts except for pine bark composted with wood-shaving broiler litter. The pH of this material was below the lettuce tolerance level for mixes at or above 50% compost. There was no evidence of lettuce physiological disorders resulting from excessive nutrient concentration. Most elements analyzed (N, P, K, Ca, Mg, Fe, Mn, Cu, Zn, and Al) were within or slightly above sufficiency ranges for Boston-type leaf lettuce. It appears that composting broiler litter for use as a potting substrate or component would be one suitable alternative to land application in the southern United States. We recommend, however, that the pH of substrates be adjusted to suit desired crop requirements.

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**Litter management is critical to food safety, performance.**

Mallinson,-E.T.; Joseph,-S.W.; Carr,-L.E.; Wabeck,-C.J.

Feedstuffs. Carol Stream, Ill. : Miller Publishing Company. May 19, 1997. v. 69 (20) p. 47-49, 52.

NAL Call Number: 286.81-F322

*Descriptors:* broiler-performance. litter-. salmonella-. disease-prevention. food-safety. poultry-housing.

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**Long-term phosphorus solubility in soils receiving poultry litter treated with aluminum, calcium, and iron amendments.**

Shreve,-B.R.; Moore,-P.A.-Jr.; Miller,-D.M.; Daniel,-T.C.; Edwards,-D.R.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1996. v. 27 (11/12) p. 2493-2510.

NAL Call Number: S590.C63

*Descriptors:* ultisols-. poultry-manure. application-to-land. phosphorus-. losses-from-soil. soil-ph. aluminum-. calcium-. iron-. additives-. solubility-. water-pollution. water-quality. pollution-control.

*Abstract:* Phosphorus (P) runoff from poultry litter applied to fields can adversely impact water quality. The majority of P in runoff from poultry litter is soluble, so decreasing the solubility of P could lessen the impact of poultry litter on water quality. The objective of this study was to determine long-term P solubility in soils receiving poultry litter treated with aluminum (Al), calcium (Ca), and iron (Fe) amendments at various soil pHs. Soil pH was adjusted to 4.0, 5.0, 6.0, 7.0, and 8.0 using elemental sulfur (S) or CaCO<sub>3</sub> with some soil left at its native pH. The pH-adjusted soil was then incubated with either no litter (control), litter alone (litter control), or litter amended with alum, Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>·16H<sub>2</sub>O, (100 or 200 g/kg), Ca(OH)<sub>2</sub> (25 or 50 g/kg), or FeSO<sub>4</sub>·7H<sub>2</sub>O (100 or 200 g/kg). The soil was then allowed to equilibrate in the dark at room temperature for 0, 7, 49, 98, and 294 days. After equilibration, soils were extracted with deionized water and soluble reactive P levels were determined. Water-soluble P levels decreased with time in all treatments, including the control and litter control treatments. Soil pH also affected soluble reactive P levels, with the lowest levels generally observed at pH 8.0. Addition of both unamended and chemically-amended litter to soil significantly increased P concentrations at all combinations of pH and sampling time. Addition of chemically-amended litter to soil significantly reduced soluble reactive P compared to unamended litter. With all treatments, an apparent equilibrium was reached at 98 d after treatment. Amendment of litter with either FeSO<sub>4</sub>·7H<sub>2</sub>O or alum resulted in the lowest soluble reactive P levels after 294 days. Use of chemical amendments to limit P solubility has potential and should be pursued as a means of reducing eutrophication of sensitive surface water where poultry litter is applied as a fertilizer.

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**Managing North Carolina's livestock waste : challenges and opportunities.**

Hoban,-Thomas-J.; Clifford,-William-B.

North Carolina Cooperative Extension Service. [Raleigh, N.C.?] : N.C. Cooperative Extension Service, 1995. 27 p. : ill.

NAL Call Number: S655.H63--1995

*Descriptors:* Manure-handling-North-Carolina. Cattle-Manure-Handling-North-Carolina. Poultry-Manure-Handling-North-Carolina. Swine-Manure-Handling-North-Carolina.

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**Managing North Carolina's poultry waste.**

Hoban,-Thomas-J.; Clifford,-William-B.

North Carolina Cooperative Extension Service. [Raleigh, N.C.?] : N.C. Cooperative Extension Service, 1995. 1 folded sheet (4 p.)

NAL Call Number: S655.H633--1995

*Descriptors:* Poultry-Manure-Handling-North-Carolina.

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**Manure nutrient production from commercial White Leghorn hens.**

Patterson,-P.H.; Lorenz,-E.S.

J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Fall 1996. v. 5 (3) p. 260-268.

NAL Call Number: SF481.J68

*Descriptors:* chickens-. hens-. poultry-manure. nutrient-content. biological-production. moisture-content. feed-intake. egg-mass. egg-production. correlation-.

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**Meloidogyne incognita infested soil amended with chicken litter.**

Riegel,-C.; Fernandez,-F.A.; Noe,-J.P.

J-nematol. Lakeland, Fla. : Society of Nematologists. Sept 1996. v. 28 (3) p. 369-378.

NAL Call Number: QL391.N4J62

*Descriptors:* meloidogyne-incognita. gossypium-hirsutum. infestation-. poultry-manure. application-rates. potassium-nitrate. soil-fertility. population-density. soil-fungi. soil-bacteria.nematode-control. plant-parasitic-nematodes. georgia-.

*Abstract:* The effects of chicken litter on *Meloidogyne incognita* in cotton, *Gossypium hirsutum* cv. DPL50 were determined in field microplots. Liners (manure and pine-shaving bedding) from a research facility and a commercial broiler house were used. Treatments consisted of 0.25%, 0.5%, and 1% litter by dry weight of soil for each kind of litter. Three control treatments consisted of soil not amended with litter, with and without nematodes, and one treatment to which mineral fertilizer was added at a nitrogen rate equivalent to that of the 0.5% litter rate, with nematodes. Microplots were inoculated at planting with 200 eggs/100 cm<sup>3</sup> soil in 1993 and

1,000 eggs/100 cm<sup>3</sup> soil in 1994. At 92 and 184 days after planting, nematode population densities decreased linearly with increasing rates of litter. Nematode numbers at midseason were larger in plots treated with mineral fertilizer than in plots treated with a rate of litter equivalent to the 0.5% rate. Fungal and bacterial population densities fluctuated throughout the growing season. Bacterial numbers had a positive linear relationship, with increasing rates of litter only in October 1993; however, significant positive relationships were observed throughout the 1994 growing season. In 1994, nematode population density at 92 days after planting decreased linearly with increasing bacterial numbers 30 days after planting. No other significant relationships between nematode densities and microbial densities were observed. Fungi and bacteria isolated from the litter and litter-amended soil were identified. Fungal genera isolated included *Acremonium*, *Aspergillus*, *Eurotium*, *Parcilymyces*, *Petriella*, and *Scopulariopsis*, whereas bacteria genera included *Arthrobacter*, *Bacillus*, and *Pseudomonas*.

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**Mineral levels of broiler house litter and forages and soils fertilized with litter.**

Smith,-S.C.; Britton,-J.G.; Enis,-J.D.; Barnes,-K.C.; Lusby,-K.S.

Proc-South-Pasture-Forage-Crop-Improv-Conf. New Orleans : Agricultural Research Service (Southern Region), U.S. Dept. of Agriculture, 1974-. 1996. (52nd) p. 125-132.

NAL Call Number: 60.19-So83

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**Minimum ventilation requirement and associated energy cost for aerial ammonia control in broiler houses.**

Xin,-H.; Berry,-I.L.; Tabler,-G.T.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers. Mar/Apr 1996. v. 39 (2) p. 645-653.

NAL Call Number: 290.9-Am32T

*Descriptors:* broilers-. chicken-housing. litter-. ammonia-. odors-. control-methods. artificial-ventilation. broiler-performance. hygiene-. cleaning-. liveweight-. feed-conversion-efficiency. carcass-condemnation. propane-. heating-costs. cost-effectiveness-analysis.

*Abstract:* Minimum ventilation rate (MVR) and bird performance of four commercial-scale broiler houses were monitored for 16 consecutive growouts. A complete house clean-out was conducted after the 7th growout and again after the 13th growout. Between the clean-outs, only caked litter was removed, and new bedding was added to the old litter. The MVR needed to control indoor aerial ammonia to within 25 to 30 ppm (MVRa), for growouts raised on old litter, largely exceeded the normal MVR (MVRn) needed for moisture control during the first week of brooding. In particular, MVRa averaged nine times MVRn on day one, and declined exponentially with bird age. Elevated MVRa during a two week brooding period requires additional propane fuel use of 136 L (36 gal) and 57 L (15 gal) per 1,000 birds, at an outside temperature of -17.8 degrees C (0 degrees F) and 10 degrees C (50 degrees F), respectively. This extra fuel or heat requirement should be considered in designing supplemental heating capacity for broiler houses using old litter. Moreover, the results obtained from this study suggest that

broilers raised on old litter are more likely to have higher carcass condemnation rate than those raised on new litter. Heating broiler houses at 35 degrees C (95 degrees F) for two days before chick placement seems helpful in extracting ammonia from old litter, but may not be cost-effective. Thus, whenever possible, house cleaning after each growout is desirable to improve energy use efficiency and indoor air quality. In particular, partial cleaning of the brooding end only would be cost-effective and is recommended.

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**Mobility of Zn, Cd and Pb in soils as affected by poultry litter extract. II. Redistribution among soil fractions.**

Li,-Z.; Shuman,-L.M.

Environ-pollut. Kidlington, Oxford, UK : Elsevier Science Limited. 1997. v. 95 (2) p. 227-234.  
NAL Call Number: QH545.A1E52

*Descriptors:* poultry-manure. zinc-. cadmium-. lead-. contaminants-. leaching-. spatial-distribution.

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**Mobility of Zn, Cd and Pb in soils as affected by poultry litter extract. I. Leaching in soil columns.**

Li,-Z.; Shuman,-L.M.

Environ-pollut. Kidlington, Oxford, UK : Elsevier Science Limited. 1997. v. 95 (2) p. 219-226.  
NAL Call Number: QH545.A1E52

*Descriptors:* poultry-manure. application-to-land. zinc-. cadmium-. lead-. contaminants-. leaching-. polluted-soils.

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**Mortality rates of fecal bacteria in subsoil amended with poultry manure.**

Zhai,-Q.; Coyne,-M.S.; Barnhisel,-R.I.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. 1995. v. 54 (2) p. 165-169.  
NAL Call Number: TD930.A32

*Descriptors:* reclaimed-soils. subsoil-. topsoil-. poultry-manure. coliform-bacteria. streptococcus-. fecal-coliforms. survival-. kentucky-.

*Abstract:* One potential utilization of poultry waste is in the reclamation of surface mine soil. However, little is known about the persistence of fecal bacteria in the buried environments of reclaimed mine soil. A laboratory study was used to determine fecal bacteria mortality during an 8 week incubation in topsoil and subsoil representative of reclaimed surface mines in western Kentucky. Manure loading rates equivalent to 37.5 and 75 Mg ha<sup>-1</sup> were used. Manure loading rates had no effect on mortality rates. Mortality rates were adequately described by a two-stage exponential decay model. The rates for the first 2 weeks of incubation were significantly greater

in subsoil than topsoil for total coliforms (0.31 log/10 cells day<sup>-1</sup> vs 0.20 log<sub>10</sub> cells day<sup>-1</sup>), fecal coliforms (0.33 log<sub>10</sub> cells day<sup>-1</sup> vs 0.22 log<sub>10</sub> cells day<sup>-1</sup>), and fecal streptococci (0.31 log<sub>10</sub> cells day<sup>-1</sup> vs 0.24 log<sub>10</sub> cells day<sup>-1</sup>). Bacterial cell numbers decreased to, or close to, detection levels (3 colony forming units g<sup>-1</sup> soil) after 8 weeks of incubation. Manure application to this subsoil does not appear to be a greater threat to environmental quality, due to fecal bacteria survival in reclaimed mine soil, than surface application in the same environment.

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**Municipal waste becomes asset to farm land: proper carbon:nitrogen ratio is key to success.**

Entry,-J.A.; Wood,-B.H.; Edwards,-J.H.; Wood,-C.W.

Highlights-agr-res. Auburn, Ala. : Agricultural Experiment Station of Auburn University, Spring 1996. v. 43 (1) p. 8-9.

NAL Call Number: 100-A11H

*Descriptors:* wood-chips. organic-wastes. waste-paper. cotton-gin-trash. composting-. carbon-nitrogen-ratio. poultry-manure. ammonium-nitrate. application-to-land. soil-ph. chemical-composition. low-input-agriculture.

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**New uses for broiler litter.**

Guertal,-E.A.; Behe,-B.K.; Kemble,-J.M.; Himelrick,-D.G.

Highlights-agr-res. Auburn, Ala. : Agricultural Experiment Station of Auburn University, Spring 1996. v. 43 (1) p. 3-4.

NAL Call Number: 100-A11H

*Descriptors:* poultry-manure. growing-media. brassica-oleracea-var.-italica. brassica-oleracea-var.-capitata. brassica-oleracea-var.-viridis. lycopersicon-esculentum. seedling-culture. container-grown-plants. alabama-.

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**Nitrate monitoring and GLEAMS simulation for poultry litter application to pine seedlings.**

Minkara,-M.Y.; Wilhoit,-J.H.; Wood,-C.W.; Yoon,-K.S.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers, Jan/Feb 1995. v. 38 (1) p. 147-152.

NAL Call Number: 290.9-Am32T

*Descriptors:* pinus-taeda. poultry-manure. leaching-. nitrate-. prediction-. nitrate-nitrogen. application-rates. weed-control. seedlings-. groundwater-pollution. water-quality. simulation-models. ammonium-nitrate. soil-fertility. alabama-.

*Abstract:* Nitrate leaching below the root zone was monitored and a water quality model was simulated for poultry litter application to pine seedlings. The six treatments used in this experiment were 4.5, 9.0, and 18.0 t/ha of poultry litter, 4.5 t/ha of poultry litter with intensive weed control, commercial fertilizer, and a control. Nitrate-N concentrations were determined from the top 80 cm of the soil profile and from water sampled 61 cm below the surface. The water quality model GLEAMS was applied to predict NO<sub>3</sub>-N concentrations in the subsurface water and in the soil profile. For all treatments, NO<sub>3</sub>-N concentrations in soil leachate far exceeded 10 mg/L during the first seven months following amendment application, but they dropped below 10 mg/L for the rest of the 15-month study period. Measured leachate concentrations were greatest for the commercial fertilizer treatment. Soil NO<sub>3</sub>-N concentrations were highest in the top 10 cm of the soil profile, but they were not significantly different from pre-treatment concentrations nine months after amendment application, nor were there any significant differences among treatments. The model accurately predicted NO<sub>3</sub>-N leachate concentrations for the poultry litter treatments, although it underestimated concentrations for the control and commercial fertilizer treatment. Simulated soil NO<sub>3</sub>-N concentrations were higher than average measured values in most cases.

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**Nitrogen and phosphorus availability in enriched, pelletized poultry litters.**

Hamilton,-C.M.; Sims,-J.T.

J-sustain-agric. Binghamton, NY : Food Products Press, 1995. v. 5 (3) p. 115-132.

NAL Call Number: S494.5.S86S8

*Descriptors:* poultry-manure. pelleting-. enrichment-. pellets-. nitrogen-. phosphorus-. nutrient-availability. mineralization-. ammonium-nitrate. comparisons-. nutrient-sources. soil-organic-matter. zea-mays. lycopersicon-esculentum. nutrient-uptake. use-efficiency. crop-yield.

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**Nitrogen and phosphorus forms in soils receiving manure.**

Sharpley,-A.N.; Smith,-S.J.

Soil-sci. Baltimore : Williams & Wilkins Co., Apr 1995. v. 159 (4) p. 253-258.

NAL Call Number: 56.8-So3

*Descriptors:* agricultural-soils. pig-slurry. poultry-manure. cattle-manure. application-to-land. application-rates. nitrogen-. phosphorus-. nutrient-availability. inorganic-compounds. organic-compounds. movement-in-soil. losses-from-soil. land-productivity. long-term-experiments. oklahoma-. texas-.

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**Nitrogen content of manure from older broiler breeders fed varying quantities of crude protein.**

Lopez,-G.; Leeson,-S.

J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Winter 1995. v. 4 (4) p. 390-394.  
NAL Call Number: SF481.J68

*Descriptors:* broilers-. hens-. dietary-protein. crude-protein. nitrogen-balance. nitrogen-. nutrient-intake. nitrogen-retention. excretion-. excreta-. nitrogen-content. uric-acid. moisture-content. limiting-amino-acids.

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**Nitrogen transformations in soil amended with poultry litter under aerobic conditions followed by anaerobic periods.**

Johnson,-W.F.-Jr.; Wolf,-D.C.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995.. p. 27-33.  
NAL Call Number: TD930.A55-1995

*Descriptors:* poultry-manure. nitrate-nitrogen. ammonium-nitrogen. carbon-. mineralization-. denitrification-. incubation-duration.silt-loam-soils.

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**Nitrous oxide loss from poultry manure-amended soil after rain.**

Coyne,-M.S.; Villalba,-A.; Blevins,-R.L.

J-environ-qual. Madison : American Society Of Agronomy, Nov/Dec 1995. v. 24 (6) p. 1091-1096.

NAL Call Number: QH540.J6

*Abstract:* Land application of poultry wastes in Kentucky will increase as the broiler industry grows. If poultry manure stimulates N<sub>2</sub>O loss from soil it will reduce the fertilizer N value of this waste. In contrast, stimulated N<sub>2</sub>O loss in grass filter strips receiving the runoff from manured fields could help reduce contamination of surface water by NO<sub>3</sub><sup>-</sup>. Our objectives were to determine (i) if poultry manure stimulated N<sub>2</sub>O loss in soil after rainfall and (ii) if there was an edge-of-field effect on N<sub>2</sub>O loss in grass filters intercepting runoff from amended soil. Soil covers were used to measure N<sub>2</sub>O loss from a well drained, poultry manure-amended, silt loam soil immediately after simulated rainfall and were also used to measure N<sub>2</sub>O loss from grass filters intercepting their surface runoff. Nitrous oxide loss from manure-amended soil was greater than from unamended controls and ranged from 5 to 13 mg N<sub>2</sub>O-N m<sup>-2</sup> h<sup>-1</sup>. The maximum N<sub>2</sub>O loss was equivalent to 3.2 kg N<sub>2</sub>O-N ha<sup>-1</sup> d<sup>-1</sup>. Nitrous oxide loss from grass filters intercepting runoff ranged from 0.1 to 1.4 mg N<sub>2</sub>O-N m<sup>-2</sup> h<sup>-1</sup> and was significantly greater than portions of the grass filters that did not intercept runoff. Nitrous oxide loss from poultry manure-amended soils was greater than N<sub>2</sub>O loss typically measured from waste-amended agricultural soils. However, it only represented up to 0.7% of the total N in the applied manure.

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### **Nutrient accumulation and nitrate leaching under broiler litter amended corn fields.**

Wood,-B.H.; Wood,-C.W.; Yoo,-K.H.; Yoon,-K.S.; Delaney,-D.P.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1996. v. 27 (15/17) p. 2875-2894.

NAL Call Number: S590.C63

*Descriptors:* zea-mays. secale-cereale. poultry-manure. fertilizers-. application-rates. application-to-land. comparisons-. environmental-impact. soil-organic-matter. carbon-. nutrient-availability. phosphorus-. potassium-. calcium-. magnesium-. copper-. zinc-. manganese-. nitrate-nitrogen. leaching-. water-quality. water-pollution. risk-. alabama-.

*Abstract:* Alabama's broiler chicken (*Gallus gallus*) industry produces large amounts of waste, which are disposed of by application to crop and pasture land. Land application of litter (manure and bedding) from broiler production can lead to contamination from losses of nutrients accumulated in soil. A study was conducted on 2 and 4% slopes from 1991 to 1993 at Belle Mina, Alabama, to determine the effects of broiler litter (BL) on soil elemental concentrations and nitrate leaching under a corn (*Zea mays* L.)- winter rye (*Secale cereale* L.) cropping system amended with either: 1) 9 mg.ha<sup>-1</sup> of BL, 2) 18 mg.ha<sup>-1</sup> of BL, or 3) commercial fertilizer (F) at a recommended rate. Soil was sampled to 100 cm prior to corn planting and subsequent to corn harvest. Soil leachate samples were collected biweekly with wick lysimeters installed at a depth of 100 cm. Litter applications increased concentrations of soil organic carbon (C), extractable phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), copper (Cu) and zinc (Zn). Post harvest soil sampling indicated leaching of soil nitrate that was generally highest under BL18. Soil electrical conductivity measurements were highest under BL18, but values were not in the range considered detrimental to crops. Nitrate-N (NO<sub>3</sub>-N) concentrations measured in soil percolate at 1-m depth on the 2% slope were higher under F than litter treatments. Both the F and BL18 treatments produced some NO<sub>3</sub>-N concentrations above the primary drinking water standard but averaged only 8.3 and 4.8 mg.L<sup>-1</sup>, respectively. The BL9 treatment consistently remained under 10 mg NO<sub>3</sub>-N.L<sup>-1</sup> with a mean concentration of 1.3 mg .L<sup>-1</sup>. Overall, litter applied a 9 mg.ha<sup>-1</sup> produced agronomic results comparable to F and appeared to be the optimal rate of application under the conditions of this study.

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### **Nutrient composition of poultry manures in England and wales.**

Nicholson,-F.A.; Chambers,-B.J.; Smith,-K.A.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. Dec 1996. v. 58 (3) p. 279-284.

NAL Call Number: TD930.A32

*Abstract:* In this study, 121 poultry manure samples were collected from commercial holdings in England and Wales. The nutrient contents of the individual manure samples varied widely. In general, broiler/turkey litters had a higher dry matter content (c. 60%) than layer manures (c. 35%), although all manure types had similar concentrations of nutrients (N, P, K, Mg, S) on a dry weight basis. Typically N:P:K ratios were 6:2:2 for layer manures and 6:2:3 for broiler/turkey litters. The readily plant available N content (ammonium-N+uric acid-N) of the

poultry manures was 30-50% of the total N. The dry matter content of poultry manures is suggested as a useful indicator of total fresh weight nutrient concentrations.

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**Nutrient content of poultry manures and the optimum rate for eggplant fruit yield in a weathered tropical ultisol.**

Opara,-C.N.; Asiegbu,-J.E.

Biol-agric-hortic. Oxon : A B Academic Publishers. 1996. v. 13 (4) p. 341-350.

NAL Call Number: S605.5.B5

*Descriptors:* solanum-melongena. cultivars-. crop-production. ultisols-. poultry-manure. nutrient-content. nitrogen-. phosphorus-. potassium-. magnesium-. application-rates. crop-yield. fruits-. yield-components. plant-nutrition. plant-composition. soil-ph. electrical-conductivity. nigeria-.

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**Nutrient status of corn as affected by application of newsprint and nitrogen source.**

Lu,-N.; Edwards,-J.H.; Walker,-R.H.

Compost-sci-util. Emmaus, PA : JG Press, Winter 1995. v. 3 (1) p. 6-18.

NAL Call Number: TD796.5.C58

*Descriptors:* zea-mays. newspapers-. soil-amendments. nitrogen-. nutrient-sources. ammonium-nitrate. urea-. ammonia-. poultry-manure. seedling-growth. biomass-production. crop-yield. grain-. plant-composition. mineral-content. soil-chemistry. soil-organic-matter. carbon-. nutrient-availability. nutrients-. soil-solution. aluminum-. soil-toxicity.

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**Nutrient values of dairying manure and poultry litter as affected by storage and handling.**

Collins,-E.R.-Jr.; Jordan,-J.D.; Dillaha,-T.A. Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995. p. 343-353.

NAL Call Number: TD930.A55-1995

*Descriptors:* cattle-manure. dairy-wastes. poultry-manure. nutrient-content. moisture-content. storage-. handling-.

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**Nutritive value of supplements containing poultry droppings/litter for sheep and goats.**

Murthy,-K.S.; Reddy,-M.R.; Reddy,-G.V.N.

Small-rumin-res. Amsterdam ; New York : Elsevier,. June 15, 1996. v. 21 (2) p. 71-75.

NAL Call Number: SF380.I52

*Descriptors:* sheep-. goats-. feed-supplements. poultry-manure. litter-. pelleted-feeds. sorghum-stalks. feed-intake. dry-matter. water-intake. digestibility-. species-differences. nutritive-value. chemical-composition.

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**Optimal farm-level use and value of broiler litter.**

Xu,-F.; Prato,-T.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995. p. 283-291.  
NAL Call Number: TD930.A55-1995

*Descriptors:* poultry-manure. application-to-land. waste-utilization. economic-analysis. profitability-. land-management. crop-management. mathematical-models. missouri-.

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**Optimizing broiler litter utilization by ruminants.**

Rankins,-D.L.-Jr.; Rude,-B.J. Proc-South-Pasture-Forage-Crop-Improv-Conf. New Orleans : Agricultural Research Service (Southern Region), U.S. Dept. of Agriculture, 1974-. 1996. (52nd) p. 117-124.

NAL Call Number: 60.19-So83

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**Organic by-product effects on soil chemical properties and microbial communities.**

Press,-C.M.; Mahaffee,-W.F.; Edwards,-J.H.; Kloepper,-J.W.

Compost-sci-util. Emmaus, PA : JG Press, Spring 1996. v. 4 (2) p. 70-80.

NAL Call Number: TD796.5.C58

*Descriptors:* sandy-loam-soils. soil-fertility. organic-amendments. newspapers-. litter-plant. wood-chips. cotton-gin-trash. nitrogen-. nutrient-sources. poultry-manure. ammonium-nitrate. carbon-nitrogen-ratio. soil-flora. communities-. populations-. population-dynamics. species-diversity. ecology-. diversity-. soil-chemistry. nitrogen-content. chemical-composition. soil-organic-matter. alabama-.

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**Organic liners for the sealing of earthen reservoirs.**

Barrington,-S.F.; Stilborne,-R.; Moreno,-R.G.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. 1995. v. 52 (2) p. 101-107.

NAL Call Number: TD930.A32

*Descriptors:* waste-water. reservoirs-. liners-. straw-. poultry-manure. cattle-manure. leakage-. reservoir-soils. sealing-. seepage-.

*Abstract:* Soil laboratory columns are used to test the sealing efficiency of organic liners made of various combinations of straw and either beeflot manure or broiler litter. In tests conducted in triplicate each liner was placed at the centre of a 0.6 m core of loam and submerged for 83 days under 3.25 m of low total solids (TS) wastewater. The liquid and contaminant seepage-rate for each liner was monitored throughout the experiment. The liner made of 85% beeflot manure and 15% straw, on a dry matter basis, gave the lowest seepage rate of  $19 \times 10^{-9}$  m s<sup>-2</sup>. This same liner limited nitrogen seepage rates well below 0.6 g m<sup>-2</sup> d<sup>-1</sup>, which is the limit required by most North American Environmental Authorities. Extrapolation of the seepage rates, which still decreased after 83 days, indicated that the best liner could reach sealing levels of  $1 \times 10^{-9}$  m s<sup>-1</sup> after 128 days.

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### **Performance of vegetative filter strips with varying pollutant source and filter strip lengths.**

Srivastava,-P.; Edwards,-D.R.; Daniel,-T.C.; Moore,-P.A.-Jr.; Costello,-T.A.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers 1958-. Nov/Dec 1996. v. 39 (6) p. 2231-2239.

NAL Call Number: 290.9-Am32T

*Descriptors:* poultry-manure. festuca-arundinacea. pastures-. runoff-. grass-strips. vegetated-waterways. biological-filtration. water-quality. pollution-control. efficacy-. field-size. nitrate-nitrogen. ammonium-nitrogen. orthophosphates-. fecal-coliforms. carbon-.

*Abstract:* Vegetative filter strips (VFS) can reduce runoff losses of pollutants such as nitrogen (N) and phosphorus (P) from land areas treated with fertilizers. While VFS effectiveness is considered to depend on lengths of pollutant source and VFS areas, there is little experimental evidence of this dependence, particularly when the pollutant source is manure-treated pasture. This study assessed the effects of pollutant source area (fescue pasture treated with poultry litter) length and VFS (fescue pasture) length on VFS removal of nitrate N (NO<sub>3</sub>-N), ammonia N (NH<sub>3</sub>-N), total Kjeldahl N (TKN), ortho-P (PO<sub>4</sub>-P), total P (TP), total organic carbon (TOC), total suspended solids (TSS), and fecal coliform (FC) from incoming runoff. This research examined poultry litter-treated lengths of 6.1, 12.2, and 18.3 m, with corresponding VFS lengths of up to 18.3 m, 12.2 m, and 6.1 m, respectively. Runoff was produced from simulated rainfall applied to both the litter-treated and VFS areas at 50 mm/h for 1 h of runoff. Pollutant concentrations in runoff were unaffected by litter-treated length but demonstrated a first-order exponential decline with increasing VFS length except for TSS and FC. Runoff mass transport of NH<sub>3</sub>-N, TKN, PO<sub>4</sub>-P, TP and TOC increased with increasing litter-treated length (due to increased runoff) and decreased (approximately first-order exponential decline) with increasing VFS length when affected by VFS length. Effectiveness of the VFS in terms of NH<sub>3</sub>-N, TKN, PO<sub>4</sub>-P, TP and TOC removal from runoff ranged from 12-75, 22-67, 22-82, 21-66, and 8-30% respectively. The data from this study can help in developing and testing models that simulate VFS performance and thus aid in the design of VFS installed downslope of pasture areas treated with animal manure.

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**Performance of forced, passive, and natural aeration methods for composting manure slurries.**

Sartaj,-M.; Fernandes,-L.; Patni,-N.K.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers. Mar/Apr 1997. v. 40 (2) p. 457-463.

NAL Call Number: 290.9-Am32T

*Descriptors* slurries-. poultry-manure. composting-. aeration-. techniques-. comparisons-. temperature-. oxygen-.

*Abstract:* Poultry manure slurry amended with sphagnum peat was composted by forced aeration (FA), passive aeration (PA) and natural aeration (NA) under high moisture conditions (76%). For each method three replicated piles were built and monitored over a period of three months. The compost piles had an initial volume of 5 m<sup>3</sup> and were 1.2 m in height. Temperature profiles of replicated positions showed a high degree of similarity suggesting that the raw compost was uniform and the process was reproducible. An ANOVA test was carried out to compare the three treatment methods using the weighted average of temperatures inside each pile. The results showed that, for the selected configuration of aeration pipes and schedule. PA (1) had a higher process rate than NA; (2) provided adequate oxygen without the adverse effect of cooling as observed in the case in FA; (3) was less laborious than FA; (4) was more effective in conserving nitrogen than FA; and (5) maintained high temperatures (>55 degrees C) for a longer time than the other two methods. FA and PA reached to a temperature of 15 degrees C, 19 days (29% reduction) and 16 days (25% reduction) sooner than NA method.

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**Phosphorus transformations in poultry litter-amended soils of the Atlantic Coastal Plain.**

Mozaffari,-M.; Sims,-J.T.

J-environ-qual. Madison : American Society Of Agronomy,. Nov/Dec 1996. v. 25 (6) p. 1357-1365.

NAL Call Number: QH540.J6

*Descriptors:* poultry-manure. leaching-. water-quality. water-pollution. watersheds-.

*Abstract:* Eutrophication is threatening water quality in Delaware's Inland Bays watershed, one of the largest aquatic ecosystems in the eastern USA and also the site of a highly concentrated poultry (*Gallus gallus*) industry. Since many (>85%) soils in this watershed are now high or excessive in P, a better understanding of P transformations in poultry litter-amended soils is needed. Our objectives were to determine the influence of poultry litter on P release from three soils from this watershed, on the amount and chemical form of soil P, and on soil P sorption capacity. Phosphorus release from litter-amended soils was determined in a 110-d leached incubation study using three soils and two litter rates (18 and 36 Mg/ha). Phosphorus was separated into nonoccluded (NOC-P), occluded P (OC-P), and calcium bound P (Ca-P) by sequential fractionation. Changes in P sorption capacity were quantified by a P sorption index. Net soluble P (NSP) released from the litter-amended soils ranged from 1.1 to 15.0 mg/kg and was <4% of the total poultry litter P added. Most NSP was in the initial leachate. Soil test P

(STP) was increased by an average of 167 and 279 mg/kg d the 18 and 36 Mg/ha rates (6.2 +/- 0.2 mg STP/Mg litter). Most of the P in the litter-amended soils (63-90%) was in the NOC-P and OC-P fractions. Phosphorus sorption index values decreased by 3 to 19% and 12 to 24% at the 18 and 36 Mg/ha rates. Future research should focus on the long-term fate and potential leachability of the P in these chemical fractions to determine whether animal waste management in this watershed should be based on P rather than N.

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### **Physical properties of solid waste materials.**

Glancey,-J.L.; Hoffman,-S.C.

Appl-eng-agric. St. Joseph, MI : American Society of Agricultural Engineers, July 1996. v. 12 (4) p. 441-446.

NAL Call Number: S671.A66

*Descriptors:* solid-wastes. waste-utilization. poultry-manure. composts-. sources-. evaluation-. physical-properties. handling-machinery. transporters-. spreaders-. design-. agricultural-engineering. application-to-land.

*Abstract:* The physical properties of several common solid waste materials including poultry manure and compost were quantified under a variety of management practices and programs. Parameters relevant to the design and analysis of handling, transporting, and spreading equipment including moisture content, bulk density, angle of repose, maximum lump size as well as the static coefficient of friction characteristics were evaluated. Poultry manures tested included fresh crust and fresh total cleanout as well as crust and total cleanout stored outside and exposed to rainfall. Fresh composted materials tested were poultry manure with poultry mortalities, municipal solid waste (MSW) with dewatered sludge, and MSW with poultry manure. Analysis of variance results indicated outside storage and exposure to rainfall of both total cleanout and crusted poultry manure significantly increased moisture content, wet bulk density, and static friction properties. The moisture contents of each of the compost materials were significantly different, but there were no significant differences in bulk density or angle of repose. Overall trends for the design and analysis of solid waste handling systems were: wet bulk densities of solid waste materials depend primarily on moisture content and can be predicted without specific knowledge of the type or source of waste, the averages and ranges of static friction values measured suggest there is little practical difference between the construction and waste materials tested, and unscreened wastes do exhibit large lump sizes which should be considered when developing handling and conveying systems.

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### **Poultry litter: forage and livestock considerations.**

Smith,-S.C.; Britton,-J.G.; Barnes,-K.C.; Enis,-J.D.; Lusby,-K.S.

OSU-ext-facts. [Stillwater, Olka. : Cooperative Extension Service, Division of Agriculture, Oklahoma State University,. Apr 1995. (F-8211) 4 p.

NAL Call Number: S544.3.O5O5

*Descriptors:* poultry-manure. environmental-protection. fertilizers-. feeds-. nutrient-content. soil-fertility. cattle-. oklahoma-.

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**Poultry litter effects on unmanaged pasture yield, nitrogen and phosphorus uptakes, and botanical composition.**

Lucero,-D.W.; Martens,-D.C.; McKenna,-J.R.; Starner,-D.E.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1995. v. 26 (5/6) p. 861-881. NAL Call Number: S590.C63

*Descriptors:* grassland-soils. pastures-. poultry-manure. application-rates. dry-matter-accumulation. nitrogen-. phosphorus-. nutrient-uptake. botanical-composition. temporal-variation. sward-renovation.

*Abstract:* The poultry industry must dispose vast amounts of waste, mainly litter (PL), generated during production processes. This study was conducted to investigate the short-term effects of various rates of PL application, i.e., cumulative 2-year totals of 9.9, 19.4, 29.3, 39.0, and 48.9 mt ha<sup>-1</sup>, to unmanaged pasture on a Starr clay loam (fine-loamy mixed thermic Fluventic Dystrochrepts). Dry matter yield, N and P concentrations, and changes in botanical composition were measured on a mixed species, tall fescue (*Festuca arundinacea* Schreb.) and bluegrass (*Poa pratensis* L.) pasture. Dry matter yields ( $r^2 = 0.99$ ), N uptake ( $r^2 = 0.99$ ), and P uptake ( $r^2 = 0.99$ ) increased curvilinearly with rate of PL application in both years. Yield increase was attributed to correction of N deficiency in pasture by the PL application. Lower levels of PL increased forage yields in 1992 compared with 1991, due to the residual effect of unmineralized N from PL applied in 1991. Nitrogen concentration in tissue increased with levels of PL application but P tissue concentration was not similarly affected. Based on environmental and economic considerations, the PL application rate of 11.4 mt ha<sup>-1</sup> in 1991 followed by 8.0 mt ha<sup>-1</sup> in 1992 was the most effective for pasture renovation when compared with the recommended inorganic N and P fertilizer rate. Forage yields on this treatment were 21.5 mt ha<sup>-1</sup> versus 21.7 mt ha<sup>-1</sup> for the inorganic N and P fertilizer treatment. All rates of applied PL increased the percentage of tall fescue (from approximately 50 percent to > 80 percent) and decreased the percentage of bluegrass in this mixed pasture. Rates of PL application of 22.9 mt ha<sup>-1</sup> and above temporarily depressed plant growth. This research indicates that PL properly tested and applied at appropriate rates is a suitable source of fertilizer for pasture renovation and production.

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**Poultry litter-treated length effects on quality of runoff from fescue plots.**

Edwards,-D.R.; Moore,-P.A.-Jr.; Daniel,-T.C.; Srivastava,-P.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers, Jan/Feb 1996. v. 39 (1) p. 105-110.

NAL Call Number: 290.9-Am32T

*Descriptors:* festuca-arundinacea. poultry-manure. application-to-land. runoff-water. water-quality. length-. nutrient-transport.

*Abstract:* Using experimental data and/or mathematical simulation models to identify practices that reduce pollution from manure-treated areas is sometimes perceived as limited by the unknown validity of extrapolating plot-scale data to larger areas and by uncertainties in modeling transport of various pollutants. The objectives of this study were to assess the effect of length of manure treatment on runoff concentrations of poultry litter constituents and to define the modes of transport (particulate versus soluble) for nitrogen (N), phosphorus (P), carbon (C), and solids. Poultry litter was applied to three 1.5- X 18.3-m fescue (*Festuca arundinacea* Schreb.) plots with runoff collection gutters installed at 3.0-m intervals along the lengths of the plots. Runoff was generated from simulated rainfall (50 mm/h for 1 h of runoff), and samples were analyzed for total Kjeldahl N (TKN), organic N (Org-N), ammonia N (NH<sub>3</sub>-N), nitrate N (NO<sub>3</sub>-N), total P (TP), total organic C (TOC), and total suspended solids (TSS). Soluble fractions of TKN, Org-N, NH<sub>3</sub>-N, TP, and TOC were also determined. Manure-treated length had no effect on runoff concentration of any parameter, indicating that a manure-treated length of only 3.0 m would have been sufficient to simulate runoff quality associated with longer manure length treatments. Proportions of TKN, Org-N, NH<sub>3</sub>-N, and TP transported in soluble form were high (greater than or equal to 74%), and over half of the TOC in the runoff was in soluble form. These results indicate that for conditions similar to those of this study, extrapolation with respect to runoff concentrations might be possible with little adaptation of the data and might simplify the design of management practices that key on edge-of-field runoff concentrations. The results with regard to modes of transport can help to better model losses of N, P, and COD and suggest that losses of these parameters will be most effectively controlled through practices that focus on reducing soluble losses rather than simply reducing erosion.

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**Poultry litter disposal in forage systems as a feed and fertilizer.**

Kee,-D.D.; Bransby,-D.I.; Duffy,-P.A.

Proc-South-Pasture-Forage-Crop-Improv-Conf. New Orleans : Agricultural Research Service (Southern Region), U.S. Dept. of Agriculture, 1974-. 1996. (52nd) p. 65-72.

NAL Call Number: 60.19-So83

*Descriptors:* environmental-impact. water-quality.

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**Poultry litter looks promising in surface mine land reclamation.**

Sibley,-J.L.; Dozier,-W.A.-Jr.; Donald,-J.O.; Himelrick,-D.G.; Wilhoit,-J.H.; Lyle,-E.S.-Jr.

Highlights-agr-res. Auburn, Ala. : Agricultural Experiment Station of Auburn University, 1954-. Summer 1996. v. 43 (2) p. 16-17.

NAL Call Number: 100-A11H

*Descriptors:* poultry-manure. coal-mined-land. reclaimed-land. revegetation-. alabama-.

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**Poultry manure management: environmentally sound options.**

Moore,-P.A.-Jr.; Daniel,-T.C.; Sharpley,-A.N.; Wood,-C.W.

J-soil-water-conserv. Ankeny, Iowa : Soil and Water Conservation Society. May/June 1995. v. 50 (3) p. 321-327.

NAL Call Number: 56.8-J822

*Descriptors:* poultry-manure. waste-utilization. uses-. application-to-land. management-. environmental-protection. phosphorus-. nitrogen-. point-sources. water-pollution. water-quality. air-quality. soil-properties. soil-fertility. arkansas-. alabama-. oklahoma-.

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**Prevalence of Salmonella in broiler flocks: effect of litter water activity, house construction, and watering devices.**

Carr,-L.E.; Mallinson,-E.T.; Tate,-C.R.; Miller,-R.G.; Russek-Cohen,-E.; Stewart,-L.E.; Opara,-O.O.; Joseph,-S.W.

Avian-dis. Kennett Square, Pa. : American Association of Avian Pathologists Inc. Jan/Mar 1995. v. 39 (1) p. 39-44.

NAL Call Number: 41.8-Av5

; Summary in: Spanish

*Descriptors:* broilers-. salmonella-. incidence-. litter-. water-. moisture-content. microbial-contamination. floors-. drinkers-.

*Abstract:* Litter samples from 24 flocks of broilers and four flocks of broiler breeders were evaluated for Salmonella contamination, water activity (Aw), and total moisture content (MC). The drag swab (DS) monitoring system was used to collect samples to detect Salmonella contamination. Simultaneously, representative samples of the uppermost surfaces of dry (loose) litter and wet (caked) litter were collected for Aw and MC analyses. On dry litter surfaces, high Aw values (0.90-0.95) were associated with flocks Salmonella positive using DS; low Aw values (0.79-0.84) were associated with flocks Salmonella-negative by DS; and transition Aw values (0.85-0.89) were associated with flocks having an increased risk for the presence of Salmonella. The association of high Aw values with Salmonella risk was not observed for wet (caked) litter surfaces. Observations suggest that limiting Aw in the litter base of broiler houses may create a less favorable environment for the multiplication of Salmonella and thus a more hygienic environment for broiler production.

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**Preventing fires in litter storage structures.**

Donald,-J.O.; Blake,-J.P.

Circ-ANR. [Auburn] Ala. : Alabama Cooperative Extension Service, Auburn University,. Jan 1995. (915) 2 p.

NAL Call Number: S544.3.A2C47

*Descriptors:* poultry-manure. storage-. methane-. heat-. fire-danger. fire-prevention.

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**Prevention of ground and surface water contamination by new agricultural management systems.**

Sharpley,-A.; Smith,-S.J.; Daniel,-J.A.

Clean water, clean environment, 21st century team agriculture, working to protect water resources conference proceedings, March 5-8, 1995, Kansas City, Missouri /. St. Joseph, Mich. : ASAE, c1995. v. 3 p. 243-246.

NAL Call Number: TD365.C54-1995

*Descriptors:* poultry-manure. application-to-land. groundwater-pollution. water-pollution. cover-crops. soil-fertility. nitrogen-. nitrate-nitrogen. ammonium-nitrogen. potassium-. phosphorus-. tillage-. no-tillage-. runoff-. subsurface-runoff. oklahoma-. texas-. arkansas-.

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**Proceedings, 1996 National Poultry Waste Management Symposium.**

Patterson,-Paul-H.; Blake,-John (John P.)

[United States] : National Poultry Waste Management Symposium Committee, 1996. xv, 354 p. : ill.

NAL Call Number: TD899.P65N3--1996

*Descriptors:* Animal-waste-Recycling-Congresses. Poultry-Manure-Handling-Congresses. Animal-waste-Congresses. Poultry-industry-Waste-disposal-Congresses.

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**Production, marketing, and utilization of broiler litter: an integrated strategy to improve sustainability.**

Busby,-F.; Brown,-P.

Agriculture in Concert with the Environment ACE research projects Southern Region. 1995. 49 p.

NAL Call Number: S441.S8557

*Descriptors:* poultry-manure. waste-utilization. soil-amendments. feeds-. management-. handling-. marketing-. factory-farming. pollution-control. arkansas-. oklahoma-.

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**Protein and energy value of dehydrated poultry excreta in diets for feedlot cattle.**

Zinn,-R.A.; Barajas,-R.; Montano,-M.; Shen,-Y.

J-anim-sci. Champaign, Ill. : American Society of Animal Science. Oct 1996. v. 74 (10) p. 2331-2335.

NAL Call Number: 49-J82

*Descriptors:* steers-. protein-digestibility. feedlots-. energy-digestibility. poultry-manure. dehydrated-fodders. nitrogen-content. chemical-composition. amino-acids. digesta-. duodenum-. feces-composition. tapioca-. feed-intake. dry-matter. energy-content. uric-acid. organic-matter. digestible-energy.

*Abstract:* Four Holstein steers (222 kg) with cannulas in the rumen and proximal duodenum were used in a crossover design experiment to evaluate the energy and protein value of dehydrated poultry excreta (DPE). Dietary treatments contained (DM basis) 4% alfalfa hay, 8% sudangrass hay, 49% flaked barley, 8% cane molasses, 3% yellow grease, .8% urea, 1.4% limestone, .3% mineral salt, and .4% chromic oxide, plus 25% of either tapioca pellets or DPE. The DPE contained 42% ash and 27% CP (6% true protein). Substituting DPE for tapioca decreased the DE value of the diet ( $P < .01$ ). The estimated DE value of the DPE was 1.36 Mcal/kg (.34 Mcal NEm/ kg). There were no treatment effects ( $P > .10$ ) on microbial N flow to the small intestine or ruminal microbial efficiency (grams of microbial N/kilogram of OM fermented). The addition of DPE increased ( $P < .05$ ) the flow of non-ammonia and feed N to the small intestine. The estimated ruminal escape N value of DPE was 22%, although very little of this was true protein. Dehydrated poultry excreta did not increase ( $P > .10$ ) flow of alpha-amino N to the small intestine. Ruminal degradability of uric acid was 96%. Total tract true digestibility of N in DPE was 84%. It is concluded that the NE value of DPE is markedly overestimated in current tables of feeding standards. Less than 10% of the N in DPE escapes the rumen as true protein N.

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**Pupal parasitoids (Hymenoptera: Pteromalidae) of filth flies (Diptera: Muscidae, Calliphoridae) breeding in refuse and poultry and livestock manure in South Korea.**

Rueda,-L.M.; Roh,-P.U.; Ryu,-J.L.

J-med-entomol. Lanham, Md. : The Entomological Society of America. Jan 1997. v. 34 (1) p. 82-85.

NAL Call Number: 421-J828

*Descriptors:* stomoxys-calcitrans. chrysomya-megacephala. musca-domestica. lucilia-sericata. spalangia-nigroaenea. spalangia-nigra. muscidifurax-raptor. pachycrepoideus-vindemmiae. nasonia-vitripennis. pupae-. parasitoids-. parasites-of-insect-pests. breeding-places. refuse-. animal-manures. biological-control-agents. korea-republic.

*Abstract:* Five species of hymenopterous parasitoids were found parasitizing pupae of house flies. *Musca domestica* L. in poultry and livestock facilities, refuse dump sites, and garbage dumpsters: *Spalangia nigroaena* Curtis, *S. Nigra* (Latrielle), *Muscidifurax raptor* Girault & Sanders, *Pachycrepoideus vindemiae* (Rondani) and *Nasonia vitripennis* (Walker). Four hymenopterous parasitoids (*S. nigroaenea*, *S. nigra*, *M. raptor* and *P. vindemiae*) were recovered from the pupae of stable flies, *Stomoxys calcitrans* (L.), and blowflies, *Chrysomya megacephal* (F.). Only 2 parasitic species (*S. nigroaena* and *P. vindemiae*) were recovered from the pupae of blowflies, *Phaenicia sericata* (Meigen). *S. nigroaena* was the most prevalent parasitic species recovered in caged-layer houses, beef cattle barns, refuse dumps, and garbage dumpsters. *P. vindemiae* was the most abundant parasitic species in swine barns.

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**Reaction in soil of phosphorus released from poultry litter.**

Robinson,-J.S.; Sharples,-A.N.

Soil-Sci-Soc-Am-j. [Madison, Wis.] Soil Science Society of America. Sept/Oct 1996. v. 60 (5) p. 1583-1588.

NAL Call Number: 56.9-So3

*Descriptors:* phosphorus-fertilizers. nutrient-sources. potassium-phosphates. poultry-manure. leachates-. phosphorus-. bioavailability-. nutrient-availability. sorption-. sorption-isotherms. fractionation-. fertilizer-requirement-determination. environmental-protection. water-quality. pollution-control.

*Abstract:* Poultry production generates large amounts of litter or manure, which can be a valuable source of P for crops. However, litter application rates are usually based on data for mineral P fertilizer recommendations. In order to determine if this is agronomically and environmentally sound, the availability, fractions, and sorptivity of P from poultry litter or KH<sub>2</sub>PO<sub>4</sub> were determined in six Oklahoma soils following incubation for up to 28 d. An average 50% more P from KH<sub>2</sub>PO<sub>4</sub>- treated (78 mg kg<sup>-1</sup>) than from leachate-treated soils (52 mg kg<sup>-1</sup>) was bioavailable, as determined by extraction with Fe-oxide-impregnated paper strips, after 28-d incubations. Conversely, more NaHCO<sub>3</sub>-extractable P was found in leachate-treated (66 mg kg<sup>-1</sup>) than KH<sub>2</sub>PO<sub>4</sub>-treated soils (42 mg kg<sup>-1</sup>). Calculated from Langmuir isotherms, P sorption maxima averaged 548 mg kg<sup>-1</sup> for leachate-treated and 304 mg kg<sup>-1</sup> for KH<sub>2</sub>PO<sub>4</sub>-treated soils, while binding energies averaged 0.527 and 0.456 L mg<sup>-1</sup>, respectively. The higher P sorption maxima and binding energies of leachate-treated soils may result from the formation of Ca-P complexes, given the increased Ca content of these soils. The different reaction in soil of P added as poultry litter leachate to that added as KH<sub>2</sub>PO<sub>4</sub>, indicates manure application rates should be based on soil tests that are sensitive to P source-dependent sorption characteristics and/or manure trials, and not just on mineral fertilizer trials.

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**Reduction of phosphorus in runoff from field-applied poultry litter using chemical amendments.**

Shreve,-B.R.; Moore,-P.A.-Jr.; Daniel,-T.C.; Edwards,-D.R.; Miller,-D.M.

J-environ-qual. Madison : American Society Of Agronomy,. Jan/Feb 1995. v. 24 (1) p. 106-111.

NAL Call Number: QH540.J6

*Descriptors:* poultry-manure. application-rates. application-to-land. aluminum-sulfate. ferrous-sulfate. chemical-treatment. phosphorus-. losses-from-soil. runoff-. festuca-arundinacea. crop-yield. pollution-control. arkansas-.

*Abstract:* Field applications of poultry litter at rates to meet forage N requirements normally result in an over-application of P. Chemical amendments have the potential to reduce the solubility of manure P through precipitation and/or adsorption reactions. This study was conducted to determine the effects of two chemical amendments, alum (Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>.14H<sub>2</sub>O) and

ferrous sulfate ( $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ ), on P concentrations and load in runoff and to evaluate the effects of amended litter on forage production. Litter was broadcast applied to fescue (*Festuca arundinacea* Schreb.) plots at  $11.2 \text{ Mg ha}^{-1}$  alone and in combination with alum or ferrous sulfate (1:5 amendment/litter). Rainfall simulators were used to produce three runoff events at 2, 9, and 16 d after litter application. Alum reduced the P concentrations in runoff by 87 and 63% of that from litter done for the first and second runoff events, respectively, whereas ferrous sulfate decreased runoff P concentration by 77 and 48%, respectively. Both chemical amendments resulted in significant reductions ( $P < 0.05$ ) in total P load for the first runoff event. Litter application significantly increased fescue yields, with total forage yield having the greatest response to alum-amended litter. Mean forage yield with alum amended litter was  $2358 \text{ kg ha}^{-1}$ , compared with a mean yield of  $1847 \text{ kg ha}^{-1}$  with litter alone. This was probably due to decreased  $\text{NH}_3$  volatilization with the alum treatment. The combination of decreased P loss and increased forage yields suggest that alum-amended litter has substantial promise for use as an environmental and economic management tool in the poultry industry.

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### **Relationship of fertilization with chicken manure and concentrations of estrogens in small streams.**

Shore,-L.S.; Correll,-D.L.; Chakraborty,-P.K.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995.. p. 155-162.  
NAL Call Number: TD930.A55-1995

*Descriptors:* estrogens-. testosterone-. concentration-. poultry-manure. sewage-. sludges-. adverse-effects. plants-. fishes-. lakes-. streams-. water-quality. water-pollution.

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### **Release of nitrogen and phosphorus from poultry litter.**

Robinson,-J.S.; Sharpley,-A.N.

J-environ-qual. Madison : American Society Of Agronomy, Jan/Feb 1995. v. 24 (1) p. 62-67.  
NAL Call Number: QH540.J6

*Descriptors:* poultry-manure. application-to-land. leaching-. nitrogen-. phosphorus-. rain-. drying-temperature. water-quality. water-pollution. usa-.

*Abstract:* In areas of intensive poultry production, large amounts of litter produced are often applied as fertilizer to local agricultural land. To assess the agronomic and water quality implications of poultry litter applications, we quantified the effects of recurring, simulated rainfall (5 X 50-min rainfalls of  $2.54 \text{ cm h}^{-1}$ ) alternated with different drying temperatures (4, 20, 30, and 35 degrees C for 1 h) on the release of dissolved N and dissolved P from two types of poultry litter (pine bark shavings and wheat straw-based). Amounts of under leached were equivalent to a  $10 \text{ Mg ha}^{-1}$  application, containing an average of  $360 \text{ kg N ha}^{-1}$  and  $158 \text{ kg P ha}^{-1}$ . A total of  $74 \text{ kg ha}^{-1} \text{ NH}_4\text{-N}$ , which accounted for >95% of the dissolved N, and  $14 \text{ kg ha}^{-1}$  inorganic P were released by the end of five rainfalls (averaged for the two types of poultry litter, and for all drying temperatures). Although the pattern of N and P release from litter was similar

for all during periods, the magnitude of losses was a function of drying temperature. The average portion of total N present in the litters released as NH<sub>4</sub>-N during five rainfalls decreased from 22% for litter dried at 4 degrees C to 18% for litter dried at 35 degrees C. This decrease was attributed to an increase in N volatilization at the higher temperature. Conversely, the portion of litter P released as dissolved inorganic P, increased from 8% at 4 degrees C to 10% at 35 degrees C. Thus, the influence of drying temperature on the released of N and P should be considered when determining the optimum timing of poultry litter application. It is suggested that the timing of poultry litter application should coincide with active periods of crop growth to combine maximum agronomic productivity with minimum edge-of-field losses of N and P to surface and groundwaters. As much as 60% of the N and 40% of the P released during the five rainfalls was test during the first rainfall. This initial rapid N and P release stresses the importance of avoiding litter applications during periods of heavy rainfall.

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**Respiration in broiler litter slurry surface applied to soil.**

Adams,-T.T.; Thompson,-S.A.; Cabrera,-M.L.; Eiteman,-M.A.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. May 1997. v. 60 (2) p. 123-129.

NAL Call Number: TD930.A32

*Abstract:* Respiration in broiler litter slurry that was surface applied to soil was examined for the purpose of determining the feasibility of enriching closed crop canopies with carbon dioxide. An estimated flux density of 1.11 g CO<sub>2</sub> m<sup>-2</sup> h<sup>-1</sup> was calculated to be required from a ground source to obtain a maximum average increase in photosynthate of 23% for C3 plants. Litter, as received from the farm, was stored at 24 degrees C for 72 days in a closed container (approximating conditions for deep stack storage). The stored litter was made into a slurry and stored at 24 degrees C in a closed container for 23 days (approximating conditions in a manure storage pond). When stored slurry, inoculated 10% by volume with fresh litter slurry aged for seven days, was applied to soil at the rate of 0.13 ml cm<sup>-2</sup> (12,890 l ha<sup>-1</sup>) an average flux density of 5.32 g CO<sub>2</sub> m<sup>-2</sup> h<sup>-1</sup> was measured.

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**Response of Kentucky-31 tall fescue to broiler litter and composts made from broiler litter.**

Wilkinson,-S.R.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1997. v. 28 (3/5) p. 281-299.

NAL Call Number: S590.C63

*Descriptors:* festuca-arundinacea. nitrogen-fertilizers. nutrient-sources. application-rates. poultry-manure. composts-. paper-. boric-acid. comparisons-. nutrient-uptake. nitrogen-. phosphorus-. potassium-. boron-. dry-matter. phytotoxicity-. plant-composition. nutrient-content. recovery-.

*Abstract:* Recycled paper treated with boric acid (BA) is gaining acceptance as bedding in broiler houses. Applying this litter to Kentucky 31 (K-31) tall fescue, Festuca Arundinacea Shreb, pastures raises the issue of potential boron (B) toxicity. There is also the question of nitrogen (N)

availability from composts made with borated paper and broiler manure. The effect of five N sources at 224, 448, and 896 kg N/ha in a factorial arrangement plus an unfertilized control and high nitrogen-phosphorus-potassium (NPK) + additional boron at 45 kg B/ha on growth and NPKB uptake of K-31 tall fescue was determined in a greenhouse during the spring of 1992. The five N sources were (1) inorganic salts, (2) compost made from hen manure, broiler manure, fescue hay and bark (M1), (3) fresh broiler litter (M2), (4) compost made from broiler manure and borated paper bedding (M3), (5) compost from hen manure, oak leaves, broiler litter (M4). The soil was Cecil sandy clay loam subsoil. Six harvests were made at 4-cm cutting heights for determination of dry matter, N, P, K, and B uptake in tops, stubble, roots, and residue. Relative yield response of M2 was 65% of that from inorganic NPK, whereas the yield of the three composts was 22-30% of that from inorganic NPK. Over 50% of the N applied in compost residue remained at the soil surface. Boron toxicity to K-31 as estimated from yield reduction or from visual symptoms did not occur from 20 kg B/ha in compost made with borated paper (M3). However a 12% yield reduction did occur at the 45 kg B/ha rate from inorganic B. Industry efforts to reduce the amount of boric acid used in the treatment of recycled paper, the high mobility of B in humid areas, the apparent ability of K-31 tall fescue to tolerate massive quantities of compost and high rates of B application suggest that the application of the broiler litter from houses where BA-treated recycled paper is used as bedding would be environmentally safe at application rates based on N requirements of K-31 tall fescue.

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#### **Response of laying hens to diets varying in crude protein or available phosphorus.**

Leeson,-S.; Caston,-L.J.

J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Fall 1996. v. 5 (3) p. 289-296.

NAL Call Number: SF481.J68

*Descriptors:* chickens-. hens-. pullets-. strain-differences. crude-protein. dietary-protein. phosphorus-. dietary-minerals. methionine-. lysine-. feed-supplements. feed-intake. body-weight. laying-performance. egg-production. egg-mass. egg-characters. interactions-. poultry-manure.

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#### **Response of Tifway 2 bermudagrass to fresh or composted broiler litter containing boric acid-treated paper bedding.**

Wilkinson,-S.R.

Commun-soil-sci-plant-anal. Monticello, N.Y. : Marcel Dekker Inc. 1997. v. 28 (3/5) p. 259-279.

NAL Call Number: S590.C63

*Descriptors:* cynodon-dactylon. boron-. phytotoxicity-. poultry-manure. composts-. application-to-land. paper-. boric-acid. wood-shavings. nitrogen-fertilizers. nutrient-sources. nutrient-uptake. plant-composition. recovery-. phosphorus-. nitrogen-. waste-utilization.

*Abstract:* Recycled paper treated with boric acid (BA) is gaining acceptance as bedding in broiler production houses. Applying this litter, or compost made from this litter, to turf raises an issue of boron (B) toxicity. There is also the question of nitrogen (N) availability from composts made

from borated paper and broiler manure. The objective of this study was to determine if broiler house litter containing recycled BA-treated paper poses a toxicity hazard to bermudagrass turf (*Cynodon dactylon* L. pers X C. Transvaalensis, Burt-Davis) when applied at agronomic N rates. The effects of five N sources at rates equivalent to 224, 448, and 896 kg N/ha in a factorial arrangement plus an unfertilized control and a high nitrogen-phosphorus-potassium (NPK) treatment with B at 22 kg B/ha on bermudagrass were determined in pot culture during the summer of 1992. The five NPKB sources were (M1) compost made from broiler manure, BA-treated paper and yard refuse; (M2) fresh broiler manure with BA paper bedding; (M3) fresh broiler manure with pine shavings bedding; (M4) inorganic NPK; and (M5) inorganic NPK and BA. The soil was Cecil sandy clay loam subsoil. Top growth was harvested four times at 4 cm height with tops, roots, and stubble harvested at the fifth and final harvest. Composted litter was higher in water content and lower in NPK and B than fresh litter. As a result, over four times the mass had to be applied to achieve the desired N inputs. Boron concentrations in M1 on a dry matter basis were 290, M2 = 390, M3 = 52 mg B/kg, respectively. The NPK gave highest yields and compost (M1) gave the lowest yields. Yield response of fresh manure + BA paper was not different from fresh manure + pine shavings. Nitrogen recovery in plant growth from composts was very low. Nitrogen recovery in compost residue at the soil surface was very high. Nitrogen recoveries for BA paper litter and pine shavings litter were similar. No visual symptoms of B toxicity were observed, although a 16% yield reduction occurred at 22.4 kg B/ha at the 896 kg N/ha rate from NPK. Boron recovery in plant growth was negligible, but considerable B remained in the residue at the soil surface. Yield response efficiency was M1 = 2.5, M2 = 4.8, M3 = 5.3, NPK = 15.5 NPKB = 14.3 mg DM/mg N, respectively. Plant top N recovery response efficiency in mg N recovered/mg N per pot was 0.07, 0.15, 0.165, 0.63, and 0.58 for M1, M2, M3, NPK, and NPKB, respectively. Adding stubble, roots, and residue to total N recovery resulted in the following recoveries: M1 = 0.97, M2 = 0.25, M3 = 0.35, NPK = 0.73, NPKB = 0.68 mg N/mg N applied. The risk of B toxicity to Tifway 2 bermudagrass from compost or manure containing BA-treated paper is minimal if N rates are in the agronomic utilization range.

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### **Restoration of productivity to a desurfaced soil with livestock manure, crop residue, and fertilizer amendments.**

Larney,-F.J.; Janzen,-H.H.

Agron-j. Madison, Wis. : American Society of Agronomy, [1949-. Nov/Dec 1996. v. 88 (6) p. 921-927.

NAL Call Number: 4-AM34P

*Descriptors:* triticum-aestivum. cattle-manure. composts-. mixtures-. wood-shavings. poultry-manure. pig-manure. crop-residues. alfalfa-hay. pisum-sativum. hay-. barley-straw. organic-fertilizers. nitrogen-fertilizers. phosphorus-fertilizers. wheat-straw. crop-yield. grain-. soil-fertility. nitrate-nitrogen. eroded-soils. phosphorus-. nutrient-uptake. dry-matter-accumulation. waste-utilization.

*Abstract:* Many agricultural fields on the semiarid Canadian prairies have areas of inherently low productivity associated with loss of soil quality due to erosion. This study compared the efficacy of various amendments in restoring productivity to a desurfaced fine-loamy, mixed Typic

Haploboroll (Lethbridge series) in southern Alberta. In spring 1992, 14 amendment treatments (including livestock manures, crop residues, combinations of straw and chemical fertilizer, and fertilizer alone) were applied to a site where the Ap horizon (approximately 15-cm depth) had been mechanically removed to simulate erosion. The manures and crop materials were incorporated into the degraded surface on an equivalent dry-weight basis at 20 Mg ha<sup>-1</sup>. The plots were seeded to spring wheat (*Triticum aestivum* L.) in 1992, 1993, and 1994. The overall best amendments were hog manure, poultry manure, and alfalfa hay. In all years, yields from desurfaced plots amended with hog or poultry manure were not significantly different from plots with no topsoil removal. Nitrate-N concentration in the 0 to 60-cm soil depth explained 71% of the variation in restorative ability of the amendments, while extractable P concentrations in the 0- to 15-cm depth explained 16% of this variation. Results demonstrate that livestock manures and crop residues can restore productivity to eroded soils by substituting for lost topsoil. Application of high rates of manure to severely eroded soils offers a means of utilizing the large amounts of manure generated by southern Alberta feedlot operations.

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### **Role of the poultry manure pad in manure drying and its potential relationship to filth fly control.**

Mullens,-B.A.; Hinkle,-N.C.; Szijj,-C.E.

J-agric-entomol. Clemson, SC : South Carolina Entomological Society, c1984-. Oct 1996. v. 13 (4) p. 331-337.

NAL Call Number: SB599.J69

*Descriptors:* diptera-. poultry-manure. drying-. moisture-content. absorption-. height-. surface-roughness. cultural-control. insect-control.

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### **Simulation of runoff transport of animal manure constituents.**

Wang,-Y.; Edwards,-D.R.; Daniel,-T.C.; Scott,-H.D.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers, July/Aug 1996. v. 39 (4) p. 1367-1378.

NAL Call Number: 290.9-Am32T

*Descriptors:* poultry-manure. application-to-land. runoff-. losses-from-soil. nutrient-transport. geological-sedimentation. nitrogen-. phosphorus-. prediction-. surface-water. water-quality. simulation-models. mathematical-models. hydrological-factors.

*Abstract:* Runoff losses of land-applied animal manure constituents can adversely affect the quality of downstream waters. Reliable mathematical simulation models can help estimate runoff losses of animal manure constituents and identify management measures to reduce these losses. The objective of this study was to develop and calibrate an event-based simulation model to describe the runoff transport of solids (soil and manure particles) and nutrients (nitrogen and phosphorus) from areas treated with animal manure. The resulting model, consisting of linked hydrology, soil/manure transport, and nutrient transport components, is process-oriented and

uses measurable parameters to the greatest degree possible. The three components of the model were calibrated sequentially (hydrology, soil/manure transport, and nutrient transport, in order) using data from plot-scale field experiments involving grassed plots treated with poultry litter. The calibrated parameter values were generally consistent with previously published values. Transport of total suspended solids, ammonia-nitrogen, dissolved phosphorus, and total phosphorus was well-predicted by the model. Transport of nitrate-nitrogen, however, was overpredicted by approximately an order of magnitude, while total Kjeldahl nitrogen transport was underpredicted by approximately an order of magnitude. Improvements in model structure (e.g., using different equations to describe the release of nitrate from the litter to the soil and assuming a significant proportion of organic nitrogen to be soluble) and parameter selection appear warranted to improve prediction of nitrate and total Kjeldahl nitrogen losses.

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**Soil and solid poultry waste nutrient management and water quality.**

Chapman,-S.L.

Poultry-sci. Savoy, IL : Poultry Science Association, Inc. July 1996. v. 75 (7) p. 862-866.

NAL Call Number: 47.8-Am33P

*Descriptors:* poultry-manure. water-pollution. nitrogen-. phosphorus-. groundwater-pollution. application-to-land. application-rates. arkansas-.

*Abstract:* Concerns about the impacts of nitrogen, phosphorus, and pathogens on surface and ground water quality has forced the poultry industry to implement voluntary waste management guidelines for use by growers. In some states, animal waste guidelines are being enforced by regulatory agencies. Strategies that growers may use to properly dispose of poultry waste include: 1) local land application as a fertilizer; 2) offsite marketing for use as a fertilizer or soil amendment, feed additive, or energy source; and 3) chemical additives that will immobilize nitrogen and phosphorus in the manure or litter. If properly followed, these and other innovative strategies should be adequate to protect surface and ground water quality without adversely affecting the economics of poultry production.

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**Soil and fecal coliform trapping by grass filter strips during simulated rain.**

Coyne,-M.S.; Gilfillen,-R.A.; Rhodes,-R.W.; Blevins,-R.L.

J-soil-water-conserv. Ankeny, Iowa : Soil and Water Conservation Society. July/Aug 1995. v. 50 (4) p. 405-408.

NAL Call Number: 56.8-J822

*Descriptors:* agricultural-land. poultry-manure. application-to-land. grass-strips. filters-. soil-. fecal-coliforms. runoff-. surface-water. water-quality. microbial-contamination. soil-conservation. erosion-control. kentucky-.

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**Strategies to reduce environmental pollution from animal manure: principles and nutritional management--a review.**

Paik,-I.K.; Blair,-R.; Jacob,-J.

Asian-australas-j-anim-sci. Suweon, Korea : Asian-Australasian Association of Animal Production Societies, c1988-. Dec 1996. v. 9 (6) p. 615-635.

NAL Call Number: SF55.A78A7

*Descriptors:* animal-husbandry. animal-manures. livestock-feeding. sustainability-. application-to-land. composting-. waste-treatment. waste-disposal. poultry-manure. anaerobic-digesters. feed-supplements. dietary-protein. excretion-. feed-additives. phytase-. phosphorus-. nitrogen-. odor-abatement. literature-reviews.

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**Substitution of phytase for inorganic phosphorus for turkey hens.**

Ledoux,-D.R.; Zyla,-K.; Veum,-T.L.

J-appl-poult-res. Athens, GA : Applied Poultry Science, Inc., Summer 1995. v. 4 (2) p. 157-163.

NAL Call Number: SF481.J68

*Descriptors:* turkeys-. hens-. phytase-. phosphorus-. bioavailability-. dietary-minerals. calcium-. feed-intake. liveweight-gain. body-composition. digits-. bone-ash. bone-strength. excretion-. poultry-manure. breast-muscle. legs-. abdominal-fat. blood-plasma.

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**Successful bioremediation with compost.**

Biocycle. Emmaus, PA : JG Press, c1981-. Feb 1995. v. 36 (2) p. 57-59.

NAL Call Number: 57.8-C734

*Descriptors:* polluted-soils. petroleum-. contamination-. bioremediation-. composts-. poultry-manure.

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**Suppression of seedling damping-off disease in potting mix containing animal manure composts.**

Ringer,-C.E.; Millner,-P.D.; Teerlinck,-L.M.; Lyman,-B.W. Compost-sci-util. Emmaus, PA : JG Press. Spring 1997. v. 5 (2) p. 6-14.

NAL Call Number: TD796.5.C58

*Descriptors:* cucumis-sativus. raphanus-sativus. seedlings-. pythium-ultimum. rhizoctonia-solani. damping-off. composts-. cattle-manure. dairy-cattle. steers-. poultry-manure. horse-manure. sources-. plant-disease-control. growing-media. suppression-. suppressive-soils. age-. nitrate-nitrogen. nitrite-. ammonium-nitrogen. nitrogen-content. electrical-conductivity. soil-ph. chemical-properties.

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**Temperature and chemical changes during composting of broiler litter.**

Flynn,-R.P.; Wood,-C.W.

Compost-sci-util. Emmaus, PA : JG Press, Summer 1996. v. 4 (3) p. 62-70.

NAL Call Number: TD796.5.C58

*Descriptors:* composting-. poultry-manure. broilers-. wheat-straw. peanut-husks. paper-mill-sludge. pine-bark. mixtures-. dry-matter. nitrogen-content. carbon-. temperature-. electrical-conductivity. ph-. mass-. losses-. carbon-nitrogen-ratio. measurement-. temporal-variation.

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**The agricycling system : the creation of agricultural resources through the recycling of animal waste.**

Applied Chemical Technology, Inc. and Advanced Agriculture Technology, Inc.

Red Bay, Ala. : Advanced Agriculture Technology, Inc., [1996?] 5, [4] leaves

NAL Call Number: TD930.2.A37--1996

*Descriptors:* Animal-waste-Recycling. Animal-waste-as-feed. Organic-fertilizers. Broilers-Poultry-Manure.

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**The effect of animal manure applications on the forms of soil phosphorus.**

Robinson,-J.S.; Sharpley,-A.N.; Smith,-S.J.

Animal waste and the land-water interface /. Boca Raton : Lewis Publishers, c1995.. p. 43-48.

NAL Call Number: TD930.A55-1995

*Descriptors:* cattle-manure. poultry-manure. pig-slurry. application-to-land. phosphorus-availability-. soil-ph. spatial-distribution. soil-fertility. texas-. oklahoma-.

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**The effects of sodium bisulfate on poultry house ammonia, litter pH, litter pathogens and insects, and bird performance.**

Terzich,-M.

Proc-West-Poult-Dis-Conf. Davis, Calif. : University of California. 1997. (46th) p. 71-74.

NAL Call Number: SF995.W4

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**The feasibility of poultry litter transportation from environmentally sensitive areas to Delta row crop production.**

Govindasamy,-R.; Cochran,-M.J.

Agric-resour-econ-rev. Newark, DE : Northeastern Agricultural and Resource Economics

Association, [1993-. Apr 1995. v. 24 (1) p. 101-110.  
NAL Call Number: HD1773.A2N6

*Descriptors:* poultry-manure. transport-. environmental-protection. costs-. feasibility-. land-improvement. land-productivity. soil-amendments. economic-analysis. pollution-control. spatial-equilibrium-analysis. mathematical-models. arkansas-.

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**The importance of the beetle *Alphitobius diaperinus* in poultry litter as a vector of *Salmonella* sp. and *Escherichia coli* in poultry farms in Mexico.**

Davila,-M.; Rebollo,-M.; Tellez,-G.

Proc-West-Poult-Dis-Conf. Davis, Calif. : University of California. 1996. (45th) p. 291-293.

NAL Call Number: SF995.W4

Spanish; Summary in: English

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**The influence of ammonium and methods for removal during the anaerobic treatment of poultry manure.**

Krylova,-N.I.; Khabiboulline,-R.E.; Naumova,-R.P.; Nagel,-M.A.

J-chem-technol-biotechnol. Chichester, West Sussex, England : John Wiley & Sons, Ltd. Sept 1997. v. 70 (1) p. 99-105.

NAL Call Number: TP1.J686

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**The use of the excretion of nitrogen compounds as an indirect index of the adequacy of dietary protein in chickens.**

Figares,-I.F.; Nieto,-R.; Aguilera,-J.F.; Prieto,-C.

Anim-sci. Penicuik, [Scotland] : British Society of Animal Science, 1995-. Oct 1996. v. 63 (pt.2) p. 307-314.

NAL Call Number: SF1.A56

*Descriptors:* chickens-. dietary-protein. excreta-. nitrogen-content. methionine-. feed-supplements. nitrogen-balance. protein-intake. protein-quality. urea-. ammonium-nitrogen. ratios-. age-differences. uric-acid.

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**Trace elemental characterization of composted poultry manure.**

Ihnat,-M.; Fernandes,-L.

Bioresour-technol. Oxford, U.K. : Elsevier Science Limited. Aug 1996. v. 57 (2) p. 143-156.

NAL Call Number: TD930.A32

*Abstract:* Aerobically composted poultry manure was comprehensively characterized with respect to elemental content. Total, water-extractable and 1N nitric-acid-extractable concentrations of 21 trace, minor and major elements: Al, Ba, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, S, Sr, Ti, V and Zn, were determined in manure slurry composted with barley/oat straw or sphagnum peat moss bulking agents. Levels originated predominantly from the manure and total concentrations in composts, expressed as mg/kg on a dry basis, ranged from 0.2 for Cd, 2-5 for Cr, Mo, Ni, Pb, Ti and V, to 37000 for Ca. Extractable concentrations varied with extractant and element from a low of 2% of total for Ba with water to 100% for most elements with acid. Nitric acid facilitated quantitative leaching of virtually every element tested with the exception of Mo. Cadmium, Na and Rb were fairly completely leached out with both water and acid. The effect of composting time for four elements with sufficient data, Cu, Fe, Mn and Zn, suggested a hint of immobilization of Mn and Zn with respect to water extraction and of Cu and Fe with respect to acid extraction and increased lability of Mn and Zn to acid extraction after composting.

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**Urban and agricultural wastes for use as mulches on avocado and citrus and for delivery of microbial biocontrol agents.**

Casale,-W.L.; Minassian,-V.; Menge,-J.A.; Lovatt,-C.J.; Pond,-E.; Johnson,-E.; Guillement,-F. J-hortic-sci. Ashford : Headley Brothers Ltd. Mar 1995. v. 70 (2) p. 315-332.

NAL Call Number: 80-J825

*Descriptors:* mangifera-indica. citrus-. crop-production. mulches-. agricultural-wastes. wood-chips. grass-clippings. leaves-. rice-husks. alfalfa-hay. cattle-manure. hay-. poultry-manure. almonds-. hulls-. peanut-husks. orange-peel. composts-. sewage-sludge. mushroom-compost. refuse-compost. orchards-. substrates-. biological-control-agents. trichoderma-harzianum. gliocladium-virens. pseudomonas-fluorescens. growth-. phytotoxicity-. ammonia-. chemical-composition. cellulose-. carbohydrates-. nitrogen-content. california-.

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**Use of poultry litter or manure for root-knot nematode management on vegetables and field crops.**

Fortnum,-B.

Agriculture in Concert with the Environment ACE research projects Southern Region. 1995. 31 p.

NAL Call Number: S441.S8557

*Descriptors:* poultry-manure. meloidogyne-. plant-parasitic-nematodes. developmental-stages. population-density. ammonia-. volatilization-. cucurbita-. gossypium-. lycopersicon-. crop-yield. soil-ph. nematode-control. cultural-control. low-input-agriculture. south-carolina. georgia-.

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**Use of poultry manure and plant cultivation for the reclamation of burnt soils.**

Vazquez,-F.J.; Petrikova,-V.; Villar,-M.C.; Carballas,-T.

Biol-fertil-soils. Berlin, Germany : Springer-Verlag. 1996. v. 22 (3) p. 265-271.

NAL Call Number: QH84.8.B46

*Descriptors:* cambisols-. forest-soils. burnt-soils. reclamation-. recovery-. vegetation-. pisum-sativum. vicia-sativa. trifolium-repens. lotus-corniculatus. lolium-perenne. growth-. dry-matter-accumulation. poultry-manure. application-rates. aggregates-. stability-. soil-degradation. erosion-control. soil-structure. formation-. fixation-.

*Abstract:* Annual (*Pisum sativum* L. and *Vicia sativa* L.) and perennial (*Trifolium repens* L. and *Lotus corniculatus* L.) leguminous species were grown in pots containing samples from the ash layers of two Cambisols under *Pinus sylvestris* L., which has been affected by high-intensity wildfires 3 and 15 days before the sampling. The gramineous *Lolium perenne* L. was cultivated as a second plant after *Trifolium* and *Lotus* harvesting. Three treatments were compared: soils without fertilization and soils fertilized with two doses of poultry manure (1 and 2 g total N kg<sup>-1</sup> dry soil). The aim of the work was to study the capacity of the ash layer to sustain vegetation and the influence of plants and organic manure on the recovery of vegetation cover, ash layer fixation and soil structure formation to avoid erosion. The ash samples were able to sustain vegetation without fertilization. The organic manure increased the yields of all the plants tested, the lower dose being the optimal for the first crop whereas the higher dose was beneficial for the second crop. The annual legumes grew very quickly. The mixture of *Trifolium* and *Lotus* seemed very suitable for reclamation of soil degraded by wildfires because *Trifolium* produced more phytomass than *Lotus* in the first growing stages whereas the development of *Lotus* was higher in the later growing stages. Ash layer conditions did not inhibit nodulation, which was, however, stimulated by the organic manure, particularly in the case of *Lotus*. *Lolium* after perennial legumes was the best plant combination because it produced the highest phytomass, particularly root phytomass, and thus improved vegetation cover and ash layer fixation. All the plants tested improved the formation of soil aggregates, particularly the combination of perennial legumes and *Lolium*. However, wet aggregate stability was higher when plants were grown on soils fertilized with poultry manure than when plants were cropped on unmanured soils, which points to the favourable influence of the organic manure on soil aggregation.

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**Uses and management of broiler litter in Grundy County.**

Roberts,-R.K.; Finley,-C.D.; Raj-Raman,-D.

Tenn-agri-sci. Knoxville, TN : University of Tennessee, Agricultural Experiment Station, Fall 1995. (176) p. 14-19.

NAL Call Number: S451.T2T46

*Descriptors:* poultry-manure. tennessee-.

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**Vegetative filter strip removal of metals in runoff from poultry litter-amended fescuegrass plots.**

Edwards,-D.R.; Moore,-P.A.-Jr.; Daniel,-T.C.; Srivastava,-P.; Nichols,-D.J.

Trans-ASAE. St. Joseph, Mich. : American Society of Agricultural Engineers. Jan/Feb 1997. v. 40 (1) p. 121-127.

NAL Call Number: 290.9-Am32T

*Descriptors:* poultry-manure. runoff-. grass-strips. copper-. iron-. potassium-. sodium-. nickel-. zinc-. biological-filtration. vegetated-waterways. festuca-arundinacea. water-quality. chemical-composition. application-to-land. application-rates. arkansas-.

*Abstract:* Runoff from land areas amended with poultry (*Gallus gallus domesticus*) manure can contain elevated concentrations of metals such as Cu, Fe, and Zn. Vegetative filter strips (VFS) can reduce runoff concentrations of animal manure components, but reported studies have typically focused on nutrients and solids rather than metals. This experiment assessed the impact of VFS length (0 to 12 m) on concentrations and mass losses of Cu, Fe, K, Na, Ni, and Zn in runoff from fescuegrass (*Festuca arundinacea* Schreb.) plots (1.5 m wide X 6 and 12 m long) treated with poultry litter. The runoff was produced from simulated rainfall applied at 50 mm h<sup>-1</sup> until 1 h of runoff had occurred. Runoff Ni concentrations were below detection levels in all cases. Concentrations of Cu, Fe, K, Na, and Zn did not differ between litter-treated plot lengths but were significantly (p

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**Water quality and poultry production.**

King,-A.J.

Poultry-sci. Savoy, IL : Poultry Science Association, Inc. July 1996. v. 75 (7) p. 852-853.

NAL Call Number: 47.8-Am33P

*Descriptors:* poultry-. water-quality. regulations-. poultry-manure. feeds-. methane-production. water-pollution.

*Abstract:* Mineral and microbial content of water affects the performance of poultry. Because poultry production can adversely affect water quality, the Environmental Protection Agency monitors and regulates its impact. Management of nonpoint source water contamination is especially important. If properly managed, litter, a valuable secondary commodity associated with poultry production, can be used as fertilizer, food, or energy.

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**Whitefly populations in greenhouse cantaloup as affected by poultry manure and inorganic nitrogen fertilizer application.**

Rubeiz,-I.G.; Aslam,-M.; Chahine,-H.; Al-Assir,-I.A.

Biol-agric-hortic. Oxon : A B Academic Publishers. 1995. v. 12 (3) p. 227-281.

NAL Call Number: S605.5.B5

*Descriptors:* cucumis-melo. bemisia-tabaci. populations-. population-density. nitrogen-fertilizers. organic-fertilizers. poultry-manure. ammonium-sulfate. greenhouse-culture.

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