State Nutrient Management Information:
CSREES Southern Region
(AL, AR, FL, GA, KY, LA, MI, NC, NM, OK, SC, TN, TX)

CSRRES Nutrient Management Meeting
Southern Region, Atlanta, GA, May 3-4, 2004

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	ALABAMA	ARKANSAS	FLORIDA
General Information on Nutrient Management			
How many, where and what are your state nutrient TMDLs?	• 24 out of 115 listed waterbodies are nutrient impaired. 97 of the 115 have EPA approved TMDLs. • They are scattered throughout the state with a particular concentration in the Coosa River watershed, Cahaba River Watershed, Upper Warrior Watershed, and parts of the Tennessee River basin.	• Currently, there are no Nutrient-based TMDLs in the State associated with Nonpoint or agricultural sources.	• Yes, 1 • Lake Okeechobee phosphorus TMDL
Is there a state-managed soil-testing program? If yes, who runs it and how is it funded?	• Yes • Operated by Auburn University • Funded entirely by fees for service ($8 for routine analysis)	• Yes • It is run by the University of Arkansas Experiment Station. • Our program is free to the public. It is funded by the State through the collection of a special fee associated with fertilizer sales.	• Yes • Univ. of Florida-IFAS Extension Soil Testing Lab • Diagnostic analysis for state and county faculty is free; all other users must pay a per-sample fee that funds the lab.
Does your state have rules that regulated fertilizer and/or lime regulations?	• Yes	• Yes, the Arkansas State Plant Board administers fertilizer and lime laws in Arkansas.	• Yes, the Florida Dept. of Agriculture and Consumer Services regulates fertilizer and lime. FDACS specifies what information must be on the fertilizer label and runs random quality tests on product samples taken at blending plants and in the field.

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How many faculty are conducting nutrient management research at your institution and what are there areas?	• 4 individuals (all with multiple appointments and multiple responsibilities): 1) Waste management 2) Traditional soil fertility 3) Soil chemistry 4) Water quality	• 7: 4 in water quality; 2 soil chemistry / fertility; 1 forages	• Numerous faculty (too many to count) conduct nutrient management research. Departments they belong to include Soil and Water Science, Horticultural Science, Environmental Horticulture, Agronomy, and Ag & Biological Engineering. Many faculty at various off-campus Research and Education Centers also conduct nutrient management research.
Is there an active process to conduct updated soil test correlation/ calibration research? How is it funded?	• Some ongoing, long-term research. • Traditionally state-funded, but funding appears to be in serious jeopardy; some research has already been discontinued with more likely to be discontinued in the near future.	• There is still some calibration/correlation going on that is funded through the above-mentioned collection of fertilizer fees. The expenditure of this money is overseen by the Soil Testing & Research Advisory Board.	• Some work is being done to calibrate a P soil test for citrus, funded by citrus growers who tax themselves to fund applied research. • Some calibration work is being done as a part of studies that are evaluating BMP effectiveness. Funding sources: FDACS, Florida Dept. of Environmental Protection (FDEP), Water Management Districts (WMDs), and the fertilizer industry.
Are there soil fertility/nutrient management course(s) and/or a degree program targeting soil chemistry/nutrient management? Is it integrated into watershed training/degree programs?	• Yes • It is integrated into "environmental soils" but not specifically targeting watersheds.	• Yes, an Environmental Soil and Water Science major is offered through the Crop Soil and Environmental Sciences Department. Course ESWM 3023: Agricultural Waste Management specifically covers principles of Nutrient Management Planning. Also, a special topics/continuing education course is offered through the Poultry Science Center of Excellence.	• Yes, we have undergraduate and graduate level "Environmental Nutrient Management" and graduate level "Soil Fertility" courses. Environmental Nutrient Management is a required core course for all Soil and Water Science graduate students. • One of the Soil and Water Science Dept. major program areas is "Management of Nutrients, Pesticides and Wastes." Most every student in this thrust area has water quality as a component of their research, even the "soil fertility" students.
Nutrient Management Regulations			
Are there state-level nutrient management regulations?	• YES!	• Yes	• Yes

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If yes, do the regulations pertain to commercial fertilizer, animal waste and/or biosolids?	• All of these, but specifically animal waste management through State AFO/CAFO regulations	• Commercial fertilizer • Animal Manure • Biosolids	• Biosolids only
If yes, when did the regulations occur and what nutrient sources did they affect?	• 1999 – All nutrients used on AFOs and CAFOs.	• Regulation 5 governing the handling of liquid animal waste was implemented on July 24, 1992 (Based on NRCS standards, traditionally N focused). • In 2003, the General Assembly of Arkansas passed Acts 1059, 1060, and 1061 which defines nutrient sensitive areas and requires nutrient management plans for all sources of nutrients applied on 2.5 contiguous acres or a greater. Also requires poultry operations of >2,500 birds to register with the State. Will go into effect sometime in 2004.	• For biosolids, when the USEPA 503 regulations became effective in the 1990s, a state version of them was adopted by FDEP. This state version is only slightly more restrictive than the 503 regulations.
What are your state nutrient management regulations by source?	• State Environmental Agency and NRCS (State Nutrient Management Code 590) • http://www.aces.edu/department/aawm/CAFORule12100.pdf (AFO/CAFO Rules) • http://www.aces.edu/department/aawm/al590.pdf (NRCS Nutrient Mgmt. Code 590	• Under Regulation 5, all facilities that handle liquid animal manures must obtain a nutrient management plan originally based on N. Will have to have plans updated to a P basis. Handling facilities are subject to inspections and all permit holders must attend mandatory training (2.5 to 4 hours) coordinated by UAEX. • Act 1059 requires that nutrient management plan preparers must be certified by the State. The certification training will be conducted by UAEX. The Act also requires that those who apply nutrients in nutrient sensitive areas to be certified by the State. UAEX will conduct certification training. Those affected range from homeowners in nutrient sensitive areas that apply to 2.5 contiguous acres or more to commercial applicators.	

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		• Act 1061 establishes nutrient-sensitive (surplus) areas where nutrient applications must follow guidelines established by the state and be based on a nutrient management plan or default to State-established "protective rates."	
Which state agencies are involved in state regulations?	• Alabama Department of Environmental Management (ADEM) and USDA-NRCS • ADEM AFO/CAFO rules defer to NRCS Best Management Practices for standards	• The Arkansas Department of Environmental Quality administers Regulation 5 and EPA CAFO regulations. • The Arkansas Soil and Water Conservation Commission administers Acts 1059 and 1061.	• Florida Dept. of Environment Protection
Do you have state agency committee for nutrient management and if so, which agencies participate on the committee?	• Some input from an Interagency Animal Waste Management Team but NRCS makes the rules – sometimes with input from University research and extension. The Interagency Animal Waste Management Team consists of individuals from Ala. Coop. Extension, USDA-NRCS; Ala. Dept. Environmental Management; Ala. Dept. Agric., Ala. Poultry & Egg Assoc., Ala. Farmers Federation, and others as they wish to participate.	• Not formally; however, there is a good working partnership between Arkansas and Soil and Water Conservation, NRCS, Arkansas Department of Environmental Quality, and the University of Arkansas System.	• No
Nutrient Management Plans			
Who can write nutrient management plans? Who reviews the plans?	• For CAFOS, only Qualified Credentialed Professionals or Professional Engineers; plans reviewed and approved by NRCS; practically, however, only NRCS written plans have been approved. Anyone can do an AFO plan as long as it meets NRCS best management practices. Recently, CNMP Technical Service Providers trained and certified by NRCS can perform this function.	• This depends on the purpose of the plan. If the plan is to meet the New State Regulations, then the plan must be written by a State-certified planner. The ASWCC will review with help from the local Conservation Districts. If it is to meet Regulation 5 or AFO/CAFO, then NRCS and/or approved technical service providers. These would be reviewed by NRCS.	• NRCS personnel and Technical Service Providers (third party vendors) certified by NRCS. NRCS reviews and approves the plans.
Are nutrient management plans part of a permit?	• For CAFOs only.	• They are for Regulation 5 (Liquid Waste) and CAFO systems.	• No

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Are nutrient management plans available to the public?	• No	• Under the new State Laws, they are protected from the Freedom of Information Act and do not have to be disclosed to the public.	• Yes
Is there software or other tools for plans?	• Yes	• There is a spreadsheet developed by the UA-CES to calculate the Arkansas P-Index for pastures.	• Yes, NRCS has developed software. Florida is a pilot demonstration state for Manure Management software developed in a multi-state and multi-agency effort.
How many nutrient management plans have been written?	• Currently, there are 628 registered CAFOs in Alabama who are required to have CNMPs. No record is kept of AFOs who may have plans.	• Unsure, but there have been requests for over 5,000.	• 148,500 acres of land area were covered by a nutrient management plan at the end of Sept 2003.
Educational Resources			
What is (are) the major website(s) for nutrient management in your state?	• http://www.aces.edu/dept/aawm/ • This site is maintained by the Alabama Cooperative Extension System.	• The major website for nutrient management is being developed and will be available at www.uaex.edu.	• http://nutrients.ifas.ufl.edu • There is also an NRCS website.
What educational programs are available to producers?	• The AU/ACES Animal Waste Management Team (a component of the larger Interagency Animal Waste Management Team) routinely presents/promotes/schedules one to four-hour continuing education programs to meet and exceed state CAFO requirement of 6 hours per year.	• Information on nutrient management planning is available locally through our County offices. Currently, we are scheduling educational meetings with local complex managers of poultry integrators to discuss the new regulations and nutrient management planning. 10 meetings have been held since Jan. 1, 2004, with more scheduled. • Nutrient applicator certification will be available this summer/fall for producers and homeowners who want to spread their own nutrients on 2.5 contiguous acres in nutrient-sensitive watersheds. • The UAEX provides mandatory annual training for all liquid waste permit holders.	• Educational programs are now in development. • An educational program for Indian River citrus growers is available as a result of voluntary adoption of the Indian River BMP manual. • CCA training for those producers who are CCAs. • TSP training is also open to producer participation.
What educational programs are available to planners?	• This is handled through the state NRCS office.	• The UAEX will be delivering certification training to planners who wish to be certified by the state.	• 3-day technical service provider training – must pass a test to "graduate."

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What educational programs are available to reviewers?	• Reviewers of what?	• All of our programs are available to reviewers. However, we strongly recommend that they take the nutrient planner certification training.	• Reviewers take the same classes as planners.
Animal Waste			
AFO numbers?	• 4,000 +	• > 6,000 counting Poultry, Swine, and Dairies inclusive of CAFOs.	• About 100, of which about 50 are dairy, 50 are poultry, and a handful are horse.
CAFO numbers?	• 628	• 99 Swine CAFO permits	• About 250-300
What will your state need to do to meet CAFO standards?	• ADEM's existing AFO/CAFO Rules meet the standard of the newly-enacted EPA CAFO Rule.	• Shift from N-based NMP to ones to that consider P on existing liquid manure systems. Modify state regulations to incorporate dry manure CAFO in the permitting process and develop revised NMP for them.	• Meet FDEP requirements.
What are state requirements for farms with excessive nutrients?	• All AFOs are required to follow NRCS Best Management Practices, which includes implementing a nutrient management plan. However, weak enforcement and lack of training is a major obstacle toward accomplishing this.	• Manure in excess of PI-determined application rates must be move off farm.	• Develop and implement a nutrient management plan.
Are manure brokers or individuals that purchase animal waste subject to nutrient management planning regulations? If yes, what are the regulations?	• Yes, Alabama was the first state to implement a Certified Animal Waste Vendor training and certification program in 1998 before the actual AFO/CAFO Rules required it in 1999. Certification is by the Ala. Department of Agriculture. Training is by Cooperative Extension.	• Not specifically the brokers, but anyone who writes plans or applies nutrients must be state certified.	• No
Phosphorus Risk Assessment			
Is there a P risk index (or assessment tool) for your state? What is the web address if it is available on the internet?	• Yes • http://www.aces.edu/department/aawm/PINDEXFinal2001.pdf (DOCUMENT) • http://www.aces.edu/department/aawm/pindexws.pdf (WORKSHEET)	• Yes, there is the Arkansas P-Index for Pastures for dry manure. We are currently working on the one for liquid waste. As part of a court settlement, the U of A has developed ESPI, a P-Index developed specifically for the Eucha-Spavinaw basin in Northwest Arkansas.	• Yes • http://nutrients.ifas.ufl.edu

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When was the P risk assessment required in your state?	• 2001	• In January 2003, when the new State laws were passed.	• November 13, 2000
What are the major inputs to your P risk assessment?	• (1)Soil test; (2) P application rate*; (3) Application method*; (4) Grazing animals; (5) Underground outlets*; (6) Erosion rate*; (7) Hydrologic soil group*; (8) Field slope; (9) P application distance to water*; (10) Filter strip width; and (11) Distance to impaired or outstanding waters* *highest weighted factors	• Source terms – Soluble P additions, STP (Melich 3 (1:7)) • Transport – NRCS Runoff curve number, soil erosion estimated from RULSE, flooding frequency, application method, application timing, and grazing management.	• A site-specific set of criteria describing P transport characteristics of the soil and the management of various P inputs.
Is there a maximum soil test P level where animal waste is not allowed to apply?	• No	• There are no environmental thresholds for STP. However under court order in the Eucha-Spavinaw basin in Northwest Arkansas, there is a 400-lb/A STP threshold that applies.	• No
Are there tools or educational programs available on the P risk assessment?	• Yes, but the Alabama P Risk Index is so very simple (by design) that very little education is necessary for its use.	• Yes. There is a spreadsheet developed by the UA-CES to calculate the Arkansas P-Index for pastures. Also, there are handouts. New fact sheets are under review for release in the near future.	• Yes, the Florida Phosphorus Index.
Are there any field studies/surveys that were conducted to assess the accuracy of P risk assessment related to water quality?	• None specific; surveys were conducted to assess the impact of the P index on P application.	• There have been a couple, but not nearly enough, so our approach has been to use it as a risk assessment planning tool and not as a predictive tool.	• Yes, grant-funded research to validate the P index in the field is underway using both dairy and poultry farm sites.
Summary			
General nutrient management needs		• Resources, time, money, personnel, increased scientific information, etc.	• BMP effectiveness assessment. • Yield expectation database, especially under improved production technology. • Continued soil test calibration. • Organic material (biosolids, manure, compost) mineralization rate estimates.

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What are your state's greatest needs related to nutrient management plan development or implementation?	• Getting nutrient management plans written and implemented by 3,500 small AFO poultry producers; we feel that NMPs written by the AFO owner-operator, however incomplete, will more likely be implemented.	• Resources, time, money, personnel, increased scientific information, etc.	• Funding for basic studies. • Verification of UF-IFAS soil test calibration and fertilization recommendations for new cultivars and improved production technology (e.g. microirrigation and fertigation).
Additional comments	• CAFOs are taken care of by state law; however, most of the nutrients are produced by small AFOs who fall through the cracks because of a lack of state resources.		• Florida has made a concerted effort to develop BMP manuals with producer involvement, followed by voluntary adoption of the BMPs by producers. There are now at least nine different BMP manuals in Florida assigned to various commodities and/or regions. If a producer signs up for the program (indicating that various BMPs will be adopted), the state grants them a presumption of compliance with water quality standards and a waiver of liability should it be later determined that a production operation has polluted waters, assuming the producer can document that the established BMPs were implemented.

	GEORGIA	KENTUCKY	LOUISIANA
General Information on Nutrient Management			
How many, where and what are your state nutrient TMDLs?	• None for nutrients. Georgia does not currently have nutrient standards. EPD is currently developing standards. Some streams are out of compliance for biota partially because of high nutrient loading, but primarily because of excess sedimentation.	• I know of one stream with a nutrient TMDL: Fleming Creek.	• 151 sub segments are impaired statewide due to nutrients. Of the 151 impaired sub segments, 11 TMDLs have been developed. Note that one TMDL can cover more than one sub segment.
Is there a state-managed soil testing program? If yes, who runs it and how is it funded?	• Yes • UGA Ag & Env. Services Lab. Funded partially by state dollars, partially by user fees.	• Yes. A lab is operated by the UK College of Agric., Div. of Regulatory Services. Samples are submitted by Coop. Ext. Agents. Funding is from a combination of samples fees, fertilizer tax & state	• No

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		appropriations.	
Does your state have rules that regulate fertilizer and/or lime regulations?	• Yes, GA Dept. of Ag. Has fertilizer and lime regulations, but neither concerns application rates. They deal with consumer protection (labeling).	• The Div. of Reg. Services also regulates fertilizer analysis. The KY Dept. of Agriculture, Bureau of Weights & Measures regulates lime analysis.	• No
How many faculty are conducting nutrient management research at your institution and what are their areas?	• 2 faculty, phosphorus and nitrogen issues, lime and pH.	• Three faculty. P availability related to adsorption capacity; P in runoff water related to P soil test; P soil test change related to P additions; nutrient cycling in cropping systems.	• There are approximately 20 faculty members conducting nutrient management research/demonstration work in the following area: Microbiology, Hydrology, Ag Engineering, Agronomy, Horticulture, Forestry, Soil Chemistry, Ag Economy, Soil Science, Dairy Production, Wildlife and Fisheries, and Animal Nutrition and Animal Science.
Is there an active process to conduct updated soil test correlation/ calibration research? How is it funded?	• No	• Yes, hatch projects and small grants.	• Yes, it is ongoing.
Are there soil fertility/nutrient management course(s) and/or a degree program targeting soil chemistry/nutrient management? Is it integrated into watershed training/degree programs?		• Yes, there is an undergraduate course for nutrient mgt., a graduate course on nutrient mgt., a graduate course in soil chemistry; an undergraduate course on land application of waste materials; and a graduate course in biogeochemistry. A degree program at BS level is Plant and Soil Science with an emphasis in Soil Environmental Science; the MS program is Plant and Soil Science with emphasis in Soils; and at PhD level, a student majors in Soil Science while working through a prescribed course program that would emphasize Nutrient Management. The programs are not integrated into a watershed training degree or program.	• Yes, not integrated into a watershed degree program.

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Nutrient Management Regulations			
Are there state-level nutrient management regulations?	• Yes	• Yes. In Kentucky, these regulations are through the Kentucky Agricultural Water Quality Act and the subsequent Agric. Water Quality Plan that requires a nutrient management best management practice.	• No
If yes, do the regulations pertain to commercial fertilizer, animal waste and/or biosolids?	• Animal waste • Biosolids	• The reps apply to all sources of nutrients that are applied to any 10 acres or more of agricultural land.	• N/A
If yes, when did the regulations occur and what nutrient sources did they affect?	• Biosolids 1970s • Swine Waste 2000 • Liquid Dairy and Poultry 2001 • Dry Poultry Manure 2003	• The Agric. Water Quality Plan had to be fully implemented by October 23, 2001. A nutrient mgt. best management practice is a required part of the Plan.	• N/A
What are your state nutrient management regulations by source?	• Biosolids require a state permit for class B biosolids (meets EPA 503 requirements). • Swine – State permit for 300 to 1,000 AU; NPDES permit for 1,000 to 3,000 AU; Individual NPDES permit for over 3,000AU. For all permitted farms, CNMP written by certified planner, certified operator on each farm. • Dairy and Liquid Poultry – State permit for 300 to 1,000 AU; NPDES permit for 1,000 to 3,000 AU; General or Individual NPDES permit for over 3,000 AU. For all permitted farms, CNMP by certified planner, certified operator on each farm. • Dry poultry systems – NPDES permit over 1,000 AU, CNMP written, followed, retained on the farm. No certified operator or planner required.	• The nutrient mgt. part of the AWQ Plan is solely based on NRCS Tech. Guide 590 standards for Kentucky.	• N/A

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Which state agencies are involved in state regulations?	• Environmental Protection Division of Department of Natural Resource • Georgia Department of Agriculture	• KY Agric. Water Quality Authority administered under KY Div. of Conservation. Regulatory enforcement lies with the KY Division of Water.	• Louisiana Dept. of Environmental Quality
Do you have state agency committee for nutrient management and if so, which agencies participate on the committee?	• Ad Hoc committee for animal waste management includes UGA, GA Dept. of Ag., NRCS, USDA ARS, State Soil and Water Conservation Commission • Ad Hoc committee on Georgia P-Index (same cooperators)	• 9 state and Federal agencies on KY Water Quality Authority. Extension, NRCS, FSA, KY Dept. of Agric., KY Dep. of Health, KY Geol. Survey & KY Div. of Forestry, Conservation, & Water. Others include 3 farmers, KY Farm Bureau, 1 environmentalist, & 1 from KY Assn. Cons. Districts.	• No
Nutrient Management Plans			
Who can write nutrient management plans? Who reviews the plans?	• For liquid systems, plans written by a Certified Plan Writer (certified by GA Dept. of Ag.), plans reviewed by GA Dept. of Ag., then given to EPD for approval. • For dry systems, plans can be written by any "trained" individual. Not submitted for review unless requested.	• Under the Agric. Water Quality Plan, any producer can either write their own plan or hire the plan written for them. The law or subsequent plan does not require review of the plans.	• NRCS Personnel both writes and reviews plans.
Are nutrient management plans part of a permit?	• Yes for liquid systems. • For dry systems, plan is required, but not submitted as part of permit application.	• In general, no. If the producer is designated as a CAFO, then the plan is part of what is submitted to Div. of Water to apply for CAFO permit.	• No
Are nutrient management plans available to the public?	• Yes for liquid systems; no for dry systems unless plan is turned in to EPD.	• NO. The General Assembly enacted a law specifically exempting the AWQ Plan from the KY Open Records Act.	• The public can obtain nutrient management plans from the NRCS for their individual operation. The plans are not open for public viewing.
Is there software or other tools for plans?	• Yes – UGA extension software available for field level nutrient balance; P-Index calculation; nutrient generation; and total CNMP development for dairy, poultry, and swine.	• Yes	• NRCS utilizes their software.
How many nutrient management plans have been written?	• Wet systems – approximately 250 • Dry systems – unknown	• To date, the KY Div. of Conservation indicates the more than 58,700 KY farmers have voluntarily indicated they have water quality plans.	• NRCS does not have the number of plans available. There are 10,526 acres that are currently under NMPs.

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What is (are) the major website(s) for nutrient management in your state?	• http://www.engr.uga.edu/service/extension/agp2/aware/policies.html (AWARE) Easily accessible via www.agp2.org • http://aesl.ces.uga.edu/ (Ag. And Env. Services Lab)	• http://www.ca.uky.edu/enri • http://www.nrcs.usda.gov/technical/efotg/	• LSU AgCenter website • NRCS • LDEQ
Educational Resources			
What educational programs are available to producers?	• Annual Certified Operator Training (2-day), numerous presentations at commodity meetings and farmer meetings throughout the state. • Numerous programs for dry poultry plan development and implementation. • Nutrient Management training for commercial fertilizer dealers and consultants. • Certified crop advisors educational programs. • Some homeowner training at county level. • Green Industry training.	• There is a software pkg. for developing Ag. Water Quality Plans available through Extension that includes the necessary Nut. Mgt. information.	• Master Farmer Program, individual group educational meeting, on-farm visits by area and county agents, field days.
What educational programs are available to planners?	• Annual CNMP Plan Writers Certification Training (2-day). • Various other trainings through professional organizations.	• A partnership effort in training has been carried out since Nov. 2000 for professionals involved in nut. mgt. planning.	• None
What educational programs are available to reviewers?	• None at this time. Can attend workshops for Certified Plan Writers.	• Those potentially involved in reviewing plans with the KY Div. of Water were participants in the training for professionals and producers writing plans.	• None
Animal Waste			
AFO numbers?	• 75 swine, 120 dairies, 3,500 dry poultry (estimated)	• Not known	• Approximately 400 dairies and 500 poultry operations. No swine operations of any significant size. No dairies meet the threshold for CAFO. Three horse tracks will meet the criteria for CAFO.
CAFO numbers?	• 15 swine, 16 dairies, 25 wet poultry, 600 dry poultry (estimated)	• Approx. 250, most of which are broiler operations.	• Approximately 175 operations will meet the criteria for CAFO including horses.

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What will your state need to do to meet CAFO standards?	• Revisions have already been written into rules to meet new EPA regulations.	• They are in the process of finalizing changes in state CAFO regulations. Currently, they have regulations in place that will be changed to fully comply with Federal regulations.	• Develop a permitting process for producers meeting standards.
What are state requirements for farms with excessive nutrients?	• None specifically, except that this must be addressed in the CNMP.	• None specifically. All farms are under the Agric. Water Quality Plan requirements.	• None
Are manure brokers or individuals that purchase animal waste subject to nutrient management planning regulations? If yes, what are the regulations?	• Yes, they are regulated, but only have minimal regulations concerning nutrient management (observing buffers, keeping litter piles covered, and applying at agronomic rates).	• Brokers are not subject to nutrient mgt. regulations. However, if someone directly purchases any nutrient source to apply directly to his/her farm land, then this application must be according to current AWQ Plan.	• No
Phosphorus Risk Assessment			
Is there a P risk index (or assessment tool) for your state? What is the web address if it is available on the internet?	• Yes http://www.engr.uga.edu/service/extension/agp2/aware/nut_manage.html then click on Georgia P-Index.	• Listed under Nutrient Management training for the following: http://www.ca.uky.edu/enri	• Louisiana will utilize the NRCS P.I. once regulations/permits are implemented.
When was the P risk assessment required in your state?	• As of October 31, 2002	• October 23, 2001. Currently, KY allows producers to choose between direct soil test P option or use KY P Index.	• It is not required.
What are the major inputs to your P risk assessment?	• Mehlich 1 Soil Test P, Organic and inorganic P application rates, method, and timing, runoff Curve number, soil erosion estimate, ground water level, buffers.	• Land slope, P soil test, Time of application, Soil Group, Land cover %, Method of application, Distance to water body, Vegetative buffer width, +/- Ag. Impaired watershed, and MLRA.	• N/A

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Is there a maximum soil test P level where animal waste is not allowed to apply?	• No	• Technically, No. At 400 lb P/A w/M III, producers must select either P soil test or P Index option to assess further use of nutrients.	• No threshold.
Are there tools or educational programs available on the P risk assessment?	• Yes, the P-Index is a computer tool and is presented in all educational efforts on nutrient management.	• Yes. This is part of the earlier mentioned training program. Phase III of the training is on-farm using P risk assessment factors.	• Master Farmer Program addresses P.I.
Are there any field studies/surveys that were conducted to assess the accuracy of P risk assessment related to water quality?	• A survey is currently being developed, but no data available yet.	• Yes.	• Ongoing studies.
Summary			
General nutrient management needs	• Need more soil test/correlation research, especially P, but also N. • Data evaluating P-index accuracy. • Atmospheric losses of N from organic and inorganic sources (what form of N?). • Data evaluating the effectiveness of nutrient management on water quality. • Determining nutrient requirements as affected by the adoption of conservation tillage practices. • Determining crop toxicity from excess application of various metals to soils. • Determining crop response for new crop varieties including horticultural crops.	• P research related to more soil types and P in runoff water. More data on P soil test values and P in runoff water.	• More research in regards to BMP validity, nutrient management strategies, and alternative uses of animal wastes. • Educational materials and programs regarding nutrient management. • Better integration of water quality/nutrient management courses with degree programs. • More “on farm” demonstration projects regarding animal waste management. **Note: Each of the above “needs” require additional funds.

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What are your state's greatest needs related to nutrient management plan development or implementation?	• User-friendly method for calculating erosion for P-index • Quantitative evaluation of effectiveness of BMPs. • Assessing/improving nitrogen release coefficients from organic sources. • Improved software for CNMP development (more consistent across state lines).	• Overcoming producer apathy.	Nutrient Management Development: • A cooperative effort and agreement between Technical Service Providers and governmental agencies qualified to write nutrient management plans. • Educational efforts directed toward producers regarding the severity of the issues facing their industry. Implementation: • Educational programming that teaches sound science brought about by replicated research in the regions where the NMP implementation is to take place.
Additional comments			• Louisiana producers have been basically regulation-free regarding agricultural waste and nutrient management. The LSU AgCenter has been conducting educational programs targeting agricultural producers regarding nutrient management for the past several years in order to instill and understanding of the issues at hand.

	MISSISSIPPI	NEW MEXICO	NORTH CAROLINA
General Information on Nutrient Management			
How many, where and what are your state nutrient TMDLs?	• Mississippi is currently developing TMDLs on a rotating basin process although the state consent degree necessitates some be developed extraordinary to the basin process. Numeric criteria for nutrients in streams are being developed, so currently produced nutrient TMDLs use proxy indicators such as ammonia nitrogen.	• We do have TMDLs calculated for nutrients but the source of the nutrients may not be from CAFO/AFOs. We also have streams that are on the 303(d) list for nutrients but a TMDL has not been done yet (so essentially none as they relate to CAFO/AFO.)	• Yes, 1 • Neuse River Basin N TMDL

	MISSISSIPPI	NEW MEXICO	NORTH CAROLINA
Is there a state-managed soil testing program? If yes, who runs it and how is it funded?	• The Mississippi State University Extension Service operates a soil testing laboratory that is funded by user fees and legislatively appropriated funds.	• No • There is a soil testing laboratory on the NMSU campus available to homeowners and farmers paid for at their expense.	• Yes • NC Department of Agriculture and Consumer Services • Soil testing is free to producers, and therefore funded by the state. • Waste and plant tissue analysis is paid for by the users.
Does your state have rules that regulated fertilizer and/or lime regulations?	• The Mississippi Department of Agriculture and Commerce administers the state Fertilizer, Lime, and Soil/Plant Amendment Laws. Substances sold as one of these products must be registered with MDAC and the State Chemist.	• Yes • State fertilizer law • Biosolids • Manure and effluent water on permitted facilities only.	• Yes • The NCDA&CS Plant Industry Fertilizer Section website, including laws, regulations and publications, may be found on the internet at http://www.ncagr.com/plantind/fert.htm.
How many faculty are conducting nutrient management research at your institution and what are there areas?	• Eight faculty are involved in agronomic based nutrient management research. Other faculty are involved in other facets of nutrient management. In addition, there is a significant investment of ARS effort in nutrient management research in the state.	• Two: manure reuse in crops/water quality (1), Mineral nutrition of ornamental plants (1), Soil/Plant systems (1) – retired.	• Seven: 2 = phosphorus, 1 = Christmas and fruit trees, 1=horticultural crops, 1=precision ag, 1=water quality, 1=nitrogen
Is there an active process to conduct updated soil test correlation/ calibration research? How is it funded?	• At this time, our soil test correlation/ calibration work concerns rice nutrient management using inorganic fertilizers funded by entities in the rice industry.	• Some work being done but it is not coordinated. Usually rely on commodity donation to fund work.	• NCDA&CS Agronomists work cooperatively with NCSU Extension Specialists to monitor, evaluate and revise fertilizer and lime recommendations for specific crops. Revisions are based on reviews of trends in soil test summaries, data from diagnostic or problem samples, limited field calibration studies and published literature. There is no specific funding for soil test correlation and little formal research on soil fertility. The work is accomplished within, or in addition to, normal duties.

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Are there soil fertility/nutrient management course(s) and/or a degree program targeting soil chemistry/nutrient management? Is it integrated into watershed training/degree programs?	• MSU Plant and Soil Science curriculum offers Soil Fertility at the junior level and Advanced Soil Fertility at the senior/graduate level. In recent years, Junior/Senior level Soil Conservation has had modules on Nutrient Management Planning.	• Yes. • Soil Plant Relationships, Soil Management and Fertility, Soil Chemistry; however, the soils program is more of an environmental science curriculum.	• Yes, we have both undergraduate and graduate soil fertility, a graduate level soil chemistry. Nutrient management is a subset of these courses. • Many of our graduate students are conducting water quality. Few graduate students are conducing soil fertility research.
Nutrient Management Regulations			
Are there state-level nutrient management regulations?	• Yes	• Yes. NM Environment Department Permits address N loading.	• Yes
If yes, do the regulations pertain to commercial fertilizer, animal waste and/or biosolids?	• Animal wastes and biosolids.	• Commercial and organic fertilizer regulations apply to permitted facilities.	• Commercial fertilizer • Animal waste • Biosolids
If yes, when did the regulations occur and what nutrient sources did they affect?	• Biosolid regulations followed national 503 guidelines a number of years ago. Animal sources were first regulated, for wet systems, in 1979. Dry poultry were added in 1994. Currently revisions are being done for animal sources (late 2003 to current). Permits have historically been based on NRCS standards.	• 1967 Water Quality Act • 1973 – WQA amended to allow permits • 1977 – Water Quality Control Commission (WQCC) adopts comprehensive groundwater quality protection program for all aquifers with <10,000 mg/L TDS. • Nitrogen (only nutrient) but limits chloride, TDS, and TKN.	• 1993 nutrient management (NRCS standard) required for liquid animal waste systems, 100 cows, 250 pigs, 30,000 birds (N only). • 1995 more extensive regulations of liquid systems, including operator training (10 hours & continuing education) and 2 site visits per year. • 1998 nutrient management for *dry poultry*, less rigorous than liquid systems (N only). • 1998 Neuse River Basin – all written nutrient management plans have to meet NRCS standard (both animal waste and commercial fertilizer). • 2001 Tar-Pamlico River Basin – all

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			written nutrient management plans have to meet NRCS standard (both animal waste and commercial fertilizer).
What are your state nutrient management regulations by source?	• Required permits and waste utilization plans since 1979 for wet systems; dry poultry were added in 1994. Mississippi installed a new general permit for poultry confined animal feeding operations in January 2004 that followed the new national guidelines and superceded previous actions. Revised dairy and swine general permits are 'in development'. Since 1994, swine facilities have been through individual NPDEQ permits.	• NMED Ground Water: Solid and Liquid TKN and synthetic fertilizer applications to cropland must not exceed 125% of what is reasonably expected to be removed by the harvested plant material on a permitted facility. Total N loss below root zone must not exceed 200 lb/A per year. NMED Surface Water: CAFOs must have a PPP. The plan is based on NRCS Nutrient Management 590 practice standard, or agronomic rates.	• Neuse and Tar-Pamlico River Basins: anyone fertilizing 50 acres or more in a given year needs certified nutrient management plans (meets NRCS standards) for all nutrient sources or they must attend nutrient management training. • Liquid animal waste: producers need certified nutrient management plans (meets NRCS standards), site visited 2-times per year, applicators certified to apply waste. • Non-liquid poultry waste: N-based plans that are not certified.
Which state agencies are involved in state regulations?	• Mississippi Department of Environmental Quality	• NMED-Surface Water Quality Bureau • NMED-Ground Water Quality Bureau	• Department of Environment and Natural Resources • Division of Soil and Water Conservation • Division of Water Quality (regulatory)
Do you have state agency committee for nutrient management and if so, which agencies participate on the committee?	• There is not a formal committee; however, there is extensive networking among staff responsible for nutrient management in each agency.	• Yes. • NMED – GWQB, SWQB • NRCS • NMSU • DPNM – non government/state	• Yes (2 committees) • 1217 – works on rules and implications for liquid systems (NCDENR – Division of Soil and Water & Division of Water Quality, NC Department of Agriculture and Consumer Services, NC State University (CES)). Nutrient management questions are passed on to the State Interagency Nutrient Management Committee. • State Interagency Nutrient Management Committee – technical aspects of nutrient management planning, such as establishing realistic yield expectations, soil management groups (NCDENR – Division of Soil and Water, NC Department of Agriculture, Consumer Services, NC State University, and

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			USDA-NRCS).
Nutrient Management Plans			
Who can write nutrient management plans? Who reviews the plans?	• Natural Resources Conservation Service planners, at the moment. • Review of NRCS plans is internal. Plans going into AFO/CAFO permits are reviewed by MDEQ.	• NRCS certified individuals. Plans reviewed by NRCS. For CNMP, must attend 4-day workshop and pass exam (70%), as well as complete USDA NRCS Water Quality Module and 9-step process Conservation Planning. For nutrient management planner, must take the NEDS Nutrient Mgt Course online and attend a 1-day facilitated session.	• Certified nutrient management plans are written by certified nutrient management planners. Technical specialists have met specific course and work requirements and are designated by the Division of Soil and Water as a Technical Specialist.
Are nutrient management plans part of a permit?	• Yes, for all CAFO facilities, and most AFOs for all animal types. CAFOs are NPDES, and AFOs are state permits.	• Yes	• Liquid systems are permitted under state non-discharge permits. • Dry litter are NOT permitted. • Commercial fertilizer plans are not permitted.
Are nutrient management plans available to the public?	• Yes, as part of the permit process.	• No	• Liquid plans are available. • Dry litter plans are not available. • Most commercial fertilizer plans are not available.
Is there software or other tools for plans?	• Yes	• Yes • NMSU Soil Test Interpretation (Excel spreadsheet) workbook	• Yes, NC has developed a software program for both animal waste and commercial fertilizer plans. The software meets NC NRCS guidelines.
How many nutrient management plans have been written?	• Each farm with more than 9,000 birds and that has had a operational change since 1994 should have a permit that includes a plan. This is estimated to be about 2,000.	• We estimate that about 50 nutrient management practices have been completed since we have had the training. We have written about 13 CNMPs using the new style training.	• 238,183 acres commercial fertilizer plans Neuse Basin • ?? acres commercial fertilizer plans Tar-Pam Basin • 2,300 liquid waste plans • ~3,200 dry litter plans
Educational Resources			
What is (are) the major website(s) for nutrient management in your state?	• Mississippi State University Extension Service • Natural Resources Conservation Service – Mississippi	• NRCS : http://www.nm.nrcs.usda.gov/	• http://www.soil.ncsu.edu/nmp/ncnmwq

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	• Mississippi Department of Environmental Quality		
What educational programs are available to producers?	• Extension Service Environmental and Nutrient Management Program Priority Group efforts • Soil and Water Conservation Districts outreach • NRCS county outreach	• 4-day workshop on CNMP and 1-day workshop for straight nutrient management • Farm-A-Syst	• Neuse and Tar-Pam River Basins: a 6-hour nutrient management training course delivered by county CES (anyone fertilizing 50 acres or more either has to have this training or a certified nutrient management plan). • Animal waste operators: must have a 10-hour certification class and 6-hours recertification every 3 years (http://www.soil.ncsu.edu/certification/).
What educational programs are available to planners?	• In-Service offerings from MSU-ES • NRCS – MS training • NEDC on-line courses	• 4- day workshop (same as producers) on CNMP and 1-day workshop for straight nutrient management.	• 3-day nutrient management class – must pass test at 70% (http://www.soil.ncsu.edu/swetc/nutrient/3day.htm). • 2-day RUSLE/PLAT – must pass test at 70% (http://www.soil.ncsu.edu/swetc/plat/plat1htm.htm). • NC Nutrient Management Software
What educational programs are available to reviewers?	• Same as above	• 4-day workshop (same as producers and planners) on CNMP and 1-day workshop for straight nutrient management.	• Reviewers take the same classes as planners.
Animal Waste			
AFO numbers?	• More than 2,000	• About 250 all types of livestock, mostly dairies.	• 1,100 liquid swine, ?? dairy, ?? liquid layer, 2,850 dry litter
CAFO numbers?	• Currently estimated to be 700 to 900 poultry operations, 56 swine, and less than 25 dairy	• About 210	• 1,100 liquid swine, 20 liquid dairy, 5 liquid layer, ~350 dry litter
What will your state need to do to meet CAFO standards?	• General permit for poultry is in place, swine and dairy are in progress. There are no other species with AFO/CAFO concentrations currently identified in the state. However, again, CAFO have individual NPDES permits.	• We are waiting for Region VI EPA to issue a new permit. The USEPA Region VI CAFO permit for New Mexico expired in 1998 but remains effective until the permit is reissued. This currently requires a Pollution Prevention Plan to address some nutrient management issues. The new re-issued permit will require a Nutrient	• NCDWQ is working with USEPA. NCDWQ already did old CAFOs through 2002 permits and DWQ has delegation authority to write permits for all USEPA permit programs. P planning will be phased in over five years for larger animal operations.

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		Management Plan according to the revised CAFO regulations effective April 14, 2003. Depending on the status of the facility, there are different deadlines for preparing and implementing the NMP per the revised regulations.	
What are state requirements for farms with excessive nutrients?	• Operating plans require a plan for all manure nutrients estimated to be produced during the life of the permit.	• NMED Ground Water requires deep soil testing when the 3 ft of their annual TKN samples test high. It is not clear what is high. Then application of TKN will be something less than the 125% of uptake N is required.	• If PLAT rating is high (P removal only); if PLAT rating is very high (no additional P).
Are manure brokers or individuals that purchase animal waste subject to nutrient management planning regulations? If yes, what are the regulations?	• No.	• No, the only requirement for offsite application from the AFO is that the AFO maintain records.	• If animal waste is from a permitted operation, then the regulations are the same as for the permitted operation. • If animal waste is dry litter, then the same level of record-keeping is expected and litter rate is based on N rates.
Phosphorus Risk Assessment			
Is there a P risk index (or assessment tool) for your state? What is the web address if it is available on the internet?	• Yes • http://www.cnmpwatch.com/pdf/ms.doc	• Yes • The Technical Note is: http://www.nm.nrcs.usda.gov/technical/tech-notes/agro/ag59.doc • The actual worksheet is: http://www.nm.nrcs.usda.gov/technical/tech-notes/agro/ag59.xls	• Yes • http://www.soil.ncsu.edu/nmp/ncnmwq/
When was the P risk assessment required in your state?	• Spring 2000	• March 2001. It was part of the NRCS Nutrient Mgt Standard.	• November 2003
What are the major inputs to your P risk assessment?	• Site-specific landscape and soils factors, soil test results, manure analysis	• There are 11 factors: Soil Test P Level, Phosphorus (P2O5) Application Rate, Organic Phosphorus Source Application Method, Phosphorus Fertilizer Application	• User id; County; soil mapping unit; most erosive crop; tillage (sometimes); STP (agronomic depth); STP sometimes (30" depth); soil weight_volume (optional);

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		Method, Proximity of Nearest Field Edge to Named Arroyo, Stream, or Lake, Soil Erosion (wind & water), Runoff Class (Runoff Class), Irrigation Erosion, Grazing Management, and Vegetative Buffer	drainage information; soil loss; receiving slope distance; type amount, application type of P; drainage information
Is there a maximum soil test P level where animal waste is not allowed to apply?	• No	• No; however, when the index is greater than 47, manure application is no longer allowed.	• No
Are there tools or educational programs available on the P risk assessment?	• MSU-ES Educational Programs	• Yes, It is taught in the CNMP course (4 day) and the NRCS Nutrient Mgt Course (1 day).	• Yes, NC Phosphorus Loss Assessment Tool (NCPLAT – http://www.soil.ncsu.edu/nmp/ncnmwq/) • PLAT training (1/2 day course – see website above)
Are there any field studies/surveys that were conducted to assess the accuracy of P risk assessment related to water quality?	• Not currently	• No, the NMED has been testing for P in surface waters and has not found enough to justify a study. We have modified our P index from the national index and added two factors for NM.	• We made assessments of the leaching potential of soils. • We made assessments of the numbers and types of farmers the tool would affect.
Summary			
General nutrient management needs	• Better coordination, although we have a pretty good situation.	• We very much need a study to compare nutrient loading rates using the 125% of uptake N that the NMED Ground Water uses versus the NMSU/NRCS agronomic rate requirement that CNMP uses.	• Concern about organic carry-over and the lack of credit for mineralization after year one. • Though there is limited formal research on soil fertility, there are ongoing needs to develop soil test interpretations and fertilizer/lime recommendations for new, niche or specialty crops. There are also some concerns about the impact of accumulating micronutrients at certain field sites.

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What are your state's greatest needs related to nutrient management plan development or implementation?	• We have been relatively 'calm' following the publication and utilization of our PI in 2000, and the training and adoption of a local nutrient management planning software program. What we probably need most is for other states to get to our level of implementation.	• Education on the value of manure as a fertilizer. • TSP requirements from national NRCS that allows states to require their own training courses to work in that state. • Training of consultants on the process of soil testing and fertilizer recommendation based on NMSU's testing method. • Settle the disagreement between NMED Ground Water and NMSU/NRCS on what constitutes over-application rates.	• Continued funding for basic agronomic studies. • Further verification of the state realistic yield expectation database, especially for cotton and new crop commodities. • Validation of NCPLAT (Phosphorus Loss Assessment Tool).
Additional comments			

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General Information on Nutrient Management			
How many, where and what are your state nutrient TMDLs?	• Yes, 1	• http://www.scdhec.net/water/html/tmdlsc.html • 70 stations on 33 water bodies throughout the state, 52 fecal coliform, 17 dissolved oxygen, 1 phosphorus and pH. 2 established but not posted. 120-130 TMDLs in development.	• Currently, Tennessee does not have any nutrient TMDLs approved by EPA. There are two draft nutrient TMDLs that will soon go out on public notice.
Is there a state-managed soil testing program? If yes, who runs it and how is it funded?	• Yes, Oklahoma Cooperative Extension Services. • Charges for soil, plant and water testing at state lab are similar to commercial labs; state has little support for this program. • Waste analysis is not available.	• Yes. Clemson University. Funded from State appropriations and user fees. • Soil sample – pH, buffer pH, lime requirement, Mehlich I P, K, Ca, Mg, Zn, Mn, Cu, B, Na ($5), O.M. ($5), NO3-N ($3) • Manure – moisture, organic-N, NH4-N, P, K, Ca, Mg, S, Zn, Cu, Mn, Na ($20 in-state/$28 out-of-state), soluble-P ($5/$10), NO3-N ($10/$20), As ($20/$20), calcium carbonate equiv. ($10/$20), pH ($3/$6) • http://virtual.clemson.edu/groups/agsrvlb/#Home	• Yes. It is overseen by the University of Tennessee Agricultural Extension Service. It provides testing of soils and forages, but currently does not conduct manure analyses. It is funded by the University of Tennessee and the fees that are charged for testing.

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		• http://www.clemson.edu/agsrvlb/myweb10/index.htm	
Does your state have rules that regulated fertilizer and/or lime regulations?	• Yes • Fertilizer Law: http://www.oda.state.ok.us/forms/law/faar.htm • Lime Law: http://www.oda.state.ok.us/forms/law/aglime.htm	• Yes, from the standpoint of guaranteed analysis. • http://fscs.clemson.edu/FSCS_index.htm.	• Quality regulations for lime and fertilizer and soil conditioners. • Registration required.
How many faculty are conducting nutrient management research at your institution and what are there areas?	• 2: 1 research and teaching faculty, 1 extension faculty	• Two. Nutrient efficiency from fertilizers and animal manures. Soil scientist and agricultural and biological engineer.	• 5 (with part-time research involvement): 2 = manure management, 1 = soil fertility, 2 = precision ag.
Is there an active process to conduct updated soil test correlation/calibration research? How is it funded?	• Numerous long-term soil fertility plots are maintained; new trials are initiated as needed; more emphasis is on precision nutrient management research and extension lately. • Fertilizer check-off fund and external grants.	• No. No one is actually assigned to soil fertility/nutrient management in teaching, research or Extension.	• No active process (due to lack of funding).
Are there soil fertility/nutrient management course(s) and/or a degree program targeting soil chemistry/nutrient management? Is it integrated into watershed training/degree programs?	• Yes, we have undergraduate soil science degree, and graduate soil fertility, soil chemistry program. Both undergraduate and graduate-level soil fertility soil chemistry classes are offered. • Half and half graduate students are conducting soil fertility research or environmental quality studies.	• No. Unfortunately, a degree program that integrated soils science and watershed management was eliminated several years ago. In fact we no longer have an undergraduate degree program in soils, agronomy, crop science, plant pathology or entomology.	• B.S. Degree in Environmental and Soil Sciences at University of Tennessee Knoxville. Four-year curriculum includes three study options: Environmental Science, Soil Science, or Agricultural Systems Technology. Other four-year BS degree programs offered from University of Tennessee – Martin, Middle Tennessee State, and Tennessee Tech University. • Three-day CNMP element writer's certification program for agency personnel and private consultants has been run three times (2001, 2002, and twice in 2003) by the Extension Service. • No specific watershed training programs. Several MS graduate students at the

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			University of Tennessee Knoxville in Departments of Biosystems Engineering & Environmental Science, Geology and Geography are involved in watershed research programs. Similar projects are being undertaken by students at Middle Tennessee State, Tennessee State, Tennessee Tech and Vanderbilt universities.
Nutrient Management Regulations			
Are there state-level nutrient management regulations?	• Yes	• Yes, incorporated into land application regulations of various nutrient sources, but not fertilizers unless as a component of an animal manure management plan.	• Yes, for Concentrated Animal Feeding Operations (CAFOs). There are also state regulations regulating the application of biosolids/sludge.
If yes, do the regulations pertain to commercial fertilizer, animal waste and/or biosolids?	• Animal waste • Biosolids	• Animal manures – http://www.scdhec.net/eqc/water/regs/r61-43.pdf • Solid waste – http://www.scdhec.gov/lwm/regs/R61-107_15.pdf • Biosolids – R.61.9-503, R.61.9-504, R.61.9-505. Available through http://www.scdhec.net/eqc/water/html/gwqual.html.	• Different regulations for animal waste (P index based) and biosolids (N based). • No regulations on nutrient management of commercial fertilizer rates.
If yes, when did the regulations occur and what nutrient sources did they affect?	• 1998 – state passed both poultry bill and swine bill regulating manure application based N and P. • Nutrient management plans are required for all poultry operations, CAFOs of other livestock.	• Animal manures – revised 2002. Initial regulation 1998. • Solid Waste – revised 1996. Most industrial waste products except biosolids. • Biosolids – revised 1996.	• Manures and other sources of nutrients (biosolids and commercial fertilizers) applied from CAFOs.
What are your state nutrient management regulations by source?	• Nine hours initial and 3 hours annual thereafter education required. • Nutrient management plans required. • Commercial applicator certification required. • More restricted rules in nutrient impaired watersheds.	• See websites above.	• Large (Class I) CAFOs must apply for an individual NPDES permit. • Medium-sized (Class II) CAFOs on impaired streams and rivers must apply for a general permit.

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Which state agencies are involved in state regulations?	• Water Quality Division, Department of Agriculture, Food and Forestry	• Department of Health and Environmental Control • Natural Resources Conservation Service • Clemson University • University of South Carolina	• Tennessee Department of Environment and Conservation • Tennessee Department of Agriculture
Do you have state agency committee for nutrient management and if so, which agencies participate on the committee?	• No committee specifically for nutrient management, but there are several committees for overall waste management.	• There are no standing committees on nutrient management.	• No
Nutrient Management Plans			
Who can write nutrient management plans? Who reviews the plans?	• Most nutrient management plans are written by certified nutrient management planners (NRCS personnel or other technical specialists). Plans are reviewed by ODAFF Specialist.	• Comprehensive Nutrient Management Plans will be NRCS-approved Technical Service Providers without any State requirements. Currently contracting with up to 5 firms for writing plans. • Nutrient management portions of permits can be written by NRCS employees, a PE registered in SC, or an individual that is qualified in nutrient management (CCA, agronomist, soil scientist, Extension agent, etc.)	• A Comprehensive Nutrient Management Plan must be written by a "certified" planner. A Nutrient Management Plan can be written by anyone, although most producers get help from their local extension or NRCS office. Each type of plan is reviewed by the Tennessee Department of Agriculture and must be approved before a CAFO permit is issued.
Are nutrient management plans part of a permit?	• CAFOs are under EPA NEPDES permit rules. • Dry litter are registered with state and required plans. • Commercial fertilizer plans are not regulated.	• Yes.	• Yes, a NMP (or CNMP, depending of the size of operation) must be written and approved before a permit will be issued, and failure to comply with the NMP constitutes a violation of the permit.
Are nutrient management plans available to the public?	• ?	• Yes, by request.	• They are available only by request.
Is there software or other tools for plans?	• Yes, OK NRCS has a Word doc file. More comprehensive tools are under development with other agencies.	• Yes, AFOProTM developed by NRCS and University of South Carolina.	• There is no state-developed software available to the public. NRCS in Tennessee has developed some spreadsheets that

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		• http://www.esri.sc.edu/Projects/usda/application_development/afopro.asp.	simplify some of the calculations, but it is only distributed within NRCS and to select others involved in nutrient management (specifically, CAFOs).
How many nutrient management plans have been written?	• All 323 CAFOs (230 swine, 16 dairy, 65 cattle, and 12 poultry) • Most of 893 poultry facilities have plans.	• Forty comprehensive nutrient management plans (CNMP) comprising 48,817 acres were written in 2003. Over the past 25 years, waste management plans have been written for every confined animal facility as a condition of their permit. In excess of 1,100 facilities remain in operation.	• There have been 133 CAFO permits issued in Tennessee, each accompanied by a NMP. There are other plans out there for CAFOs that are in the process of getting permitted.
Educational Resources			
What is (are) the major website(s) for nutrient management in your state?	• http://www.animalwaste.okstate.edu • http://www.soiltesting.okstate.edu	• None.	• http://www.state.tn.us/agriculture/nps/afofaq.html • http://www.state.tn.us/environment/permits/cafo.php • http://bioengr.ag.utk.edu/extension/ExtProg/WasteMgmt/ • http://www.state.tn.us/environment/wpc/tmdl/index.php
What educational programs are available to producers?	• Nine-hour initial training for poultry waste operators is on DVD. • Nine-hour initial training for swine waste operators is on video tapes. • Three-hour annual course is offered as needed.	• Confined Animal Manure Management Certification Program • www.clemson.edu/camm	• Field days, demonstrations, and other events organized by UT Extension, USDA-NRCS, and soil conservation districts.
What educational programs are available to planners?	• Three-day Nutrient Management Planners Certification Program is also available. • A four-day CNMP certification program has been offered once, and will be offered soon.	• Planners can participate in the same training program. No programs have been scheduled for CNMP planners.	• UT has a nationally recognized program for the certification of CNMP element writers. It is coordinated by Dr. Robert Burns. More information is available at http://bioengr.ag.utk.edu/extension/ExtProg/WasteMgmt/
What educational programs are available to reviewers?	• Reviewers take the same classes as planners.	• Not yet discussed.	• None, other than those events mentioned in the two questions above.

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Animal Waste			
AFO numbers?	• About 900 poultry, no data for other species.	• About 1,100 including CAFOs.	• No statewide assessment of AFO numbers has been done.
CAFO numbers?	• 230 liquid swine, 16 liquid dairy, 65 cattle, 12 poultry	• 153 large CAFOs and 566 medium CAFOs.	• No statewide assessment of CAFOs has been done either. Approximately 160 CAFOs have applied for a permit. 133 CAFO permits have been issued: 12 swine, 13 dairy, and 108 poultry.
What will your state need to do to meet CAFO standards?	• OK DOAFF is working with EPA Region 6 for CAFO rule implementation.	• General NPDES permit for CAFOs on public comment currently.	• The Tennessee Department of Environment and Conservation has already written new CAFO rules to comply with the new federal regulations. These new rules were passed by the Tennessee Water Quality Control Board in November 2003. The will become effective sometime in the summer of 2004. The new rules can be found here: http://www.state.tn.us/environment/wpc/publications/1200-4-%20official%20draft.pdf
What are state requirements for farms with excessive nutrients?	• Sale or give away excess if no land is available for application according to their NMPs.	• Farms must have land area or contractual agreement for land area suitable for land application of nutrients from manures, biosolids, and industrial wastes. Most plans are based on N. For land application of animal manure, risk of P contamination of surface waters is addressed by the P Index and management options ranging from N-based application rates when risk is low, P-based applications at moderate risk levels, and no P application when risk is very high.	• They must adhere to application rates in their NMP. If more land is needed to adequately absorb excess nutrient produced by the farm, then offsite transport of manure may be required or alternative application methods such as injection may need to be investigated.
Are manure brokers or individuals that purchase animal waste subject to nutrient management planning regulations? If yes, what are the regulations?	• Commercial poultry waste applicators (land apply >10 tons per year) are required to obtain a certificate and go through all trainings as producers.	• Yes. Must take a certification class and adhere to land application regulations. Details at: http://www.scdhec.net/eqc/water/regs/r61-43.pdf	• No, manure haulers/brokers are not subject to CAFO regulation. In addition, there is no registry maintained of these individuals, nor is there any certification/training provided.

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Phosphorus Risk Assessment			
Is there a P risk index (or assessment tool) for your state? What is the web address if it is available on the internet?	• Yes • http://www.animalwaste.okstate.edu/OK_P_Index_Worksheet.xlt	• Yes • http://www.esri.sc.edu/Projects/usda/CNMPLiterature/NRCS_SC_Suppl/SC_Ag_Waste_Sup2.pdf	• Yes • http://bioengr.ag.utk.edu/extension/ExtProg/WasteMgmt/P%20Index.pdf
When was the P risk assessment required in your state?	• 1998	• The P Index was included in the 2002 animal manure regulations as a potential requirement for nutrient management planning. It is not required of everyone with animals and not applied currently to non-animal nutrient fertilization.	• It was only required recently as a part of the state's new CAFO rules. They were approved by the Tennessee Water Quality Control Board in November 2003.
What are the major inputs to your P risk assessment?	• Locate in a nutrient impaired watershed or not, STP (Mehlich 3, 6" depth), soil depth, slope, etc.	• Soil test P, application rate and method, erosion, runoff, and drainage class, buffer/setback distance and runoff class.	• Soils information (soil P, hydrologic group), topography (slope), P rates, P type, timing and method of application
Is there a maximum soil test P level where animal waste is not allowed to apply?	• Yes, 150 mg/kg Mehlich 3 P in nutrient impaired watershed. • Crop removal only, 200 mg/kg Mehlich 3 P in non-nutrient impaired watershed.	• Not currently, however many waste management plans prior to the 1998 regulations had a maximum soil test P level of 400-500 lb/acre (Mehlich I). Many biosolids application fields also are limited by soil test P levels of 400-500 lb/acre.	• No. Fields where manure is to be applied need to be soil tested. On fields where the soil test report recommends additional P manure can be applied at an N rate. The P index has to be used for fields where the recommendation does not call for additional P.
Are there tools or educational programs available on the P risk assessment?	• Yes, OK Phosphorus Risk Assessment Tool (http://www.animalwaste.okstate.edu/OK_P_Index_Worksheet.xlt)	• Yes. Program linked to AFOPro™.	• http://bioengr.ag.utk.edu/extension/ExtProg/WasteMgmt/P%20Index.pdf
Are there any field studies/surveys that were conducted to assess the accuracy of P risk assessment related to water quality?	• No, based on best judgment of a group of people.	• No	• No

	OKLAHOMA	SOUTH CAROLINA	TENNESSEE
Summary			
General nutrient management needs	• Quantitative assessment of nutrient loss is lacking. • Effectiveness of various BMPs is poorly documented. • Alternative use of manure needs to be explored.	• Personnel to implement a research and Extension program in nutrient management.	• Standardization of soil testing procedures to meet UT lab's standards (we have had trouble with out-of-state, private labs). • Capability to perform manure analysis at UT's state lab. • Licensure/certification program for third-party manure haulers that requires some level of training and sets practice standards that can be enforced.
What are your state's greatest needs related to nutrient management plan development or implementation?	• Continued funding for basic agronomic and water quality studies. • Develop a rational P risk index to replace the current assessment tool. • Develop a computerized tool to generate CNMP.	• Training and oversight of planners.	• Better organized training/educational opportunities for CAFO operators (this was part of early, draft versions of our new CAFO rules, but opposition from Farm Bureau and producers themselves convinced TDEC to remove them from the final version). • Additional staff for CAFO inspections to ensure adherence to NMP.
Additional comments			

	TEXAS
General Information on Nutrient Management	
How many, where and what are your state nutrient TMDLs?	• Two – from north of Stephenville to Waco; Upper North Bosque and North Bosque River Waterbody Segments.
Is there a state-managed soil testing program? If yes, who runs it and how is it funded?	• Yes – Dr. Tony Provin; partially state funded, mainly funded through payments for analyses.

	TEXAS
Does your state have rules that regulated fertilizer and/or lime regulations?	• Yes for fertilizer, no for limestone.
How many faculty are conducting nutrient management research at your institution and what are there areas?	• Todd Baughman – Ca on peanuts and N, P on wheat. Brent Bean – P in wheat forage, start fertilizer with corn, N on lodging of forage sorghum. Randall Boman – N on cotton. Kevin Bronson – N, P, K, S, Zn, and Fe on cotton, wheat, sorghum and peanut. Twain Butler – composted dairy manure on corn silage, bermudagrass, and wheatgrass and P, B, limestone on alfalfa. Dave Chalmers – N on bermudagrass and St. Augustine. Monty Dozier – poultry litter on crop and hay. Gerald Evers – clovers and clover/grass mixtures, poultry litter. Sam Feagley – forages and row crops, animal manures, effluent, biosolids; cotton and corn, N, P, Zn, S. Vincent Haby – Hybride and common bermudagrasses: N, P, K, Mg, S, B, Cl, poultry litter, limestone; ryegrass, alfalfa and clovers: N, P, Mg, S, B, Zn, limestone; sweet potatoes: N, P, limestone; petunia: poultry litter; roses: N, P, K; blueberry: N, P; onion: N, S; cauliflower and broccoli: N, B; tomato: N. Frank Hons – corn, N, P, K; grain sorghum, N, P; cotton, N, K; wheat, N, P; N on forage sorghum, soybean, bermudagrass, switchgrass, kleingrass, rice. Steve Livingston – sorghum, Fe; bermudagrass, N; corn, Zn. Richard Loeppert – sorghum, wheat, corn, soybean, cowpea, Fe, P. Jim McAfee – turfgrass, N, P, K, dairy compost. Mark McFarland – cotton, corn, bermudagrass, sorghum, vegetables N, P, K, Zn, animal manures and composts. Jim Muir – dairy manure and compost on corn, sorghum, sorghum-sudan, millet, bluegrass, phasey bean, cowpea, lablab, soybean, tall fescue, Illinois bundleflower, crabgrass, partridge pea; clovers, P. Tony Provin – forages, N, P, K; corn and sorghum, P. Monte Rouquette – forage stoking rates, N. John Sij – wheat, N, P. John Sloan – turf and horticultural crops, compost, manures, biosolids, and inorganic N, P, K, Fe, Zn. Charles Stickler – corn, sorghum and cotton, N, P. Calvin Trostle – peanuts, N, P, K; sorghum, sunflower, soybean, N; guar, N. Fred Turner – rice and ryegrass, N, P, K, poultry litter, biosolids. Don Vietor – turfgrass and annual and perennial grassland, manure, wastewater, composted animal manure and biosolids. Billy Warrick – cotton, drip irrigation and P. Rick Weaver – clover, starter N. Bob Wiedenfeld – sugarcane, citrus, corn, sorghum, cotton, vegetables, ornamentals, N, P, Ca, Fe, slow release fertilizers, humic acid, zeolite, snake oils.
Is there an active process to conduct updated soil test correlation/ calibration research? How is it funded?	• Yes and no. Most of it is being done through the soil testing lab. No formal funding. A lot of the work is being done in conjunction with other funding.
Are there soil fertility/nutrient management course(s) and/or a degree program targeting soil chemistry/nutrient management? Is it integrated into watershed	• There are several courses. Undergraduate, AGRO 422, Soil Fertility and Fertilizers, 3 hr; AGRO 432, Soil Chemistry and Fertility Laboratory, 4 hr; AGRO 489, Special topics in Soil, Water and Environmental Issues, 3 hr (this will be a 200 or 300 level course when approved as a course). Graduate, AGRO 609, Integrated Farming Systems, 3 hr; AGRO 615 and 616, Reclamation of Drastically Altered Lands and Land Disposal of Wastes have been combined into one course, 3 hr; AGRO 627, Soil Fertility Relationships, 3 hr. • Undergraduate degree program, Plant and Environmental Soil Science – Environmental Soil Science Emphasis, has soil chemistry and nutrient management, elective courses have watershed training. Graduate degree program, all are available, depends on the major professor, graduate student and project.

	TEXAS
training/degree programs?	
Nutrient Management Regulations	
Are there state-level nutrient management regulations?	• Only for CAFOs. There are guidances through NRCS and Texas State Soil and Water Conservation Board if nutrients are being cost-shared.
If yes, do the regulations pertain to commercial fertilizer, animal waste and/or biosolids?	• There are regulations related to CAFOs and Class B biosolids, both have to have nutrient management plans as part of the permit. Commercial fertilizer is not regulated.
If yes, when did the regulations occur and what nutrient sources did they affect?	• CAFOs, all nutrients, mainly N and P, 1995; Class B biosolids, all nutrients, mainly N and P, 2003.
What are your state nutrient management regulations by source?	• CAFOs, Texas Commission on Environmental Quality, Chapter 321, Subchapter B, individual and general permits; Class B biosolids, Texas Commission on Environmental Quality, Chapter 312.
Which state agencies are involved in state regulations?	• Texas Commission on Environmental Quality – point source. • Texas State Soil and Water Conservation Board – non-point agriculture and silviculture, this is more guidance than regulatory.
Do you have state agency committee for nutrient management and if so, which agencies participate on the committee?	• Kind of a loose committee, consists of NRCS Zone Agronomists and State Soil Environmental Specialist with Texas Cooperative Extension for the Nutrient Management Plan, through NRCS; CAFO Stakeholder Committee for all CAFO issues through Texas Commission on Environmental Quality, representation from all animal industries, Texas State Soil and Water Conservation Board, Texas Agricultural Experiment Station, Texas Cooperative Extension, Texas Farm Bureau, Texas Department of Agriculture, consultants, City of Waco.
Nutrient Management Plans	
Who can write nutrient management plans?	• For NRCS NMP, anyone can write the plan, only Certified Texas Nutrient Management Specialists can approve the plan, and NRCS will review 10% of plans. For Texas Commission on Environmental Quality Nutrient Utilization Plan (NUP, a NMP that meets regulatory criteria), those that can develop the plan are Certified Texas Nutrient Management Specialists, employees of NRCS, Texas State Soil and Water

	TEXAS
Who reviews the plans?	Conservation Board, Texas Cooperative Extension, an accredited University in the State of Texas and Texas Commission on environmental Quality reviews/approves the plan.
Are nutrient management plans part of a permit?	• They have not been. Under the new rule, all must have a NMP. The only ones required to have one before were the application fields that had >200 mg/kg P and were required to have a NUP in order to apply any additional manure to field.
Are nutrient management plans available to the public?	• No
Is there software or other tools for plans?	• Yes, software
How many nutrient management plans have been written?	• Estimate 30 NUPs from Texas Commission on Environmental Quality and 400 through NRCS and Texas State Soil and Water Conservation Board.
Educational Resources	
What is (are) the major website(s) for nutrient management in your state?	• http://nmp.tamu.edu • http://tammi.tamu.edu
What educational programs are available to producers?	• Programs through Texas Cooperative Extension County Agents (usually free), Nutrient Management Certification Short Course ($400 fee) for inorganics and organics, NRCS CEU opportunities through Zone Agronomists and web.
What educational programs are available to planners?	• Same as above
What educational programs are available to reviewers?	• Same as above
Animal Waste	
AFO numbers?	• Unknown
CAFO numbers?	• 2,000 including new CAFOs such as dry poultry.

	TEXAS
What will your state need to do to meet CAFO standards?	• When new rule in place, will know better. This is supposed to be completed and published by July 27, 2004. There will be about 1,800 to 1,900 new CAFOs due to changes in regulations and the addition of poultry to CAFOs for Texas. All must have NMPs as part of their permit by December 31, 2006. Many of the poultry producers currently have a Water Quality Management Plan that includes a NMP. Many of the new producers had to have NMPs before they were given loans through the banks. So, I estimate that about 0.3 to 0.5 of the new CAFOs already have plans that will just need to be updated.
What are state requirements for farms with excessive nutrients?	• No requirements if not part of a permit for CAFOs or Class B biosolids. For CAFOs, currently a NUP, with new rule will be NMP. For biosolids, NMP. These will limit application with N and/or P rates. Nutrient impaired waterbody segments have stricter requirements.
Are manure brokers or individuals that purchase animal waste subject to nutrient management planning regulations? If yes, what are the regulations?	• No
Phosphorus Risk Assessment	
Is there a P risk index (or assessment tool) for your state? What is the web address if it is available on the internet?	• Yes, found on NRCS website under practice standards for Texas.
When was the P risk assessment required in your state?	• March 2000
What are the major inputs to your P risk assessment?	• Soil test P, Fertilizer P Application Rate, Organic P Application Rate, P Fertilizer Application Method and Timing, Organic P Source Application Method and Timing, Proximity of Nearest Field Edge to Named Stream or Lake, Runoff Class, Soil Erosion

	TEXAS
Is there a maximum soil test P level where animal waste is not allowed to apply?	• No, there are soil test P levels where it is recommended that no additional manure be applied, will probably have this in the future.
Are there tools or educational programs available on the P risk assessment?	• Yes, the Nutrient Management Certification Short Course, software available on website http://nmp.tamu.edu.
Are there any field studies/surveys that were conducted to assess the accuracy of P risk assessment related to water quality?	• Yes, a 3,500-acre microwatershed was used to revise the original PI. There is research underway to validate/revise the PI now in the feedyard and dairy areas of the state and in the poultry areas of the state starting the end of this year.
Summary	
General nutrient management needs	• Funding for research to test BMPs nutrient load reduction potentials at edge of field. Surveys to determine implementation of BMPs and land coverage within watersheds and interpretation/summary of the surveys. Development of online course so more people have access to training when they want it, rather than the 20 hour course now offered two to three times per year. Grant funds have been obtained for this. Funds will need to be obtained to maintain the course and information for certified nutrient management specialists.
What are your state's greatest needs related to nutrient management plan development or implementation?	• Increased number of people trained to develop NMPs. Cost-share funding to install, implement and maintain BMPs. Reviewers to check compliance of producer/operator in implementation and maintenance of BMPs.
Additional comments	• There needs to be state and/or federal legislation and funding for nutrient management training supporting the trainers and BMP development/implementation/maintenance for producers/operators in each state. There is no course that will cover the differences of each state. Each state's NRCS Nutrient Management Practice Standard, PI, and CAFO regulations are different, thus each state must have information that meets their needs, not a generic course(s).