

UK **AGRICULTURAL EXPERIMENT STATION**
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE

*The Kentucky
Agricultural Experiment Station*

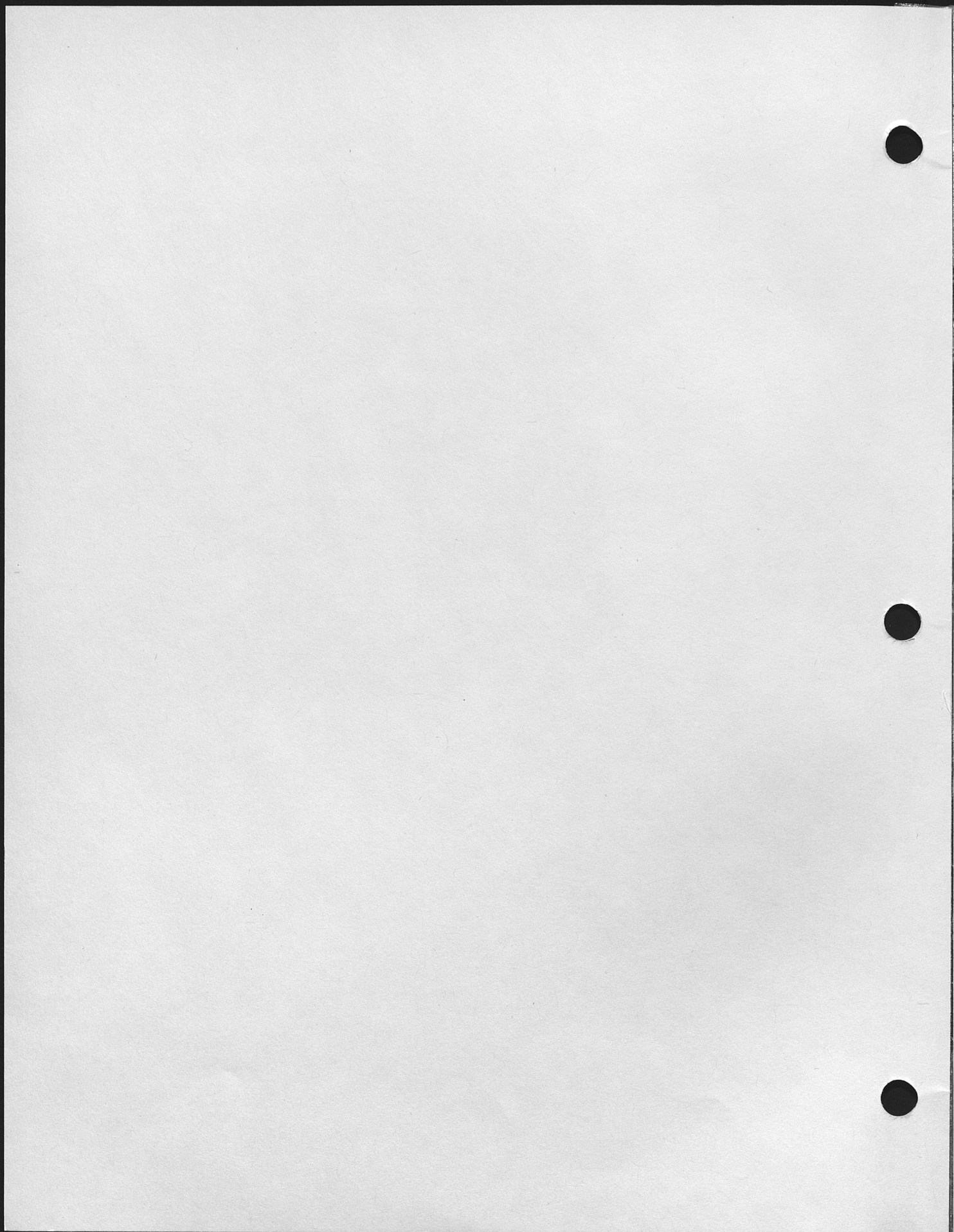
117th

**Annual Report
2004**

UK

UNIVERSITY OF KENTUCKY
College of Agriculture

University of Kentucky • Lexington, Kentucky 40546



Contents

To His Excellency,
The Honorable Ernie Fletcher
Governor of Kentucky

I herewith submit the one hundred and seventeenth annual report of the Kentucky Agricultural Experiment Station for the period ending December 31, 2004. This is done in accordance with an act of Congress, approved March 2, 1887, titled, "An act to establish Agricultural Experiment Stations, in connection with the Agricultural Colleges established in the several states under the provisions of an act approved July 2, 1862, and under the acts supplementary thereto," and also the act of the Kentucky State Legislature, approved February 20, 1888, accepting the provisions of the act of Congress.

Very respectfully,

Nancy M. Cox

Nancy M. Cox, Associate Dean for Research
Director, Agricultural Experiment Station
Lexington, Kentucky
June 30, 2005

To His Excellency
The Honorable James Fletcher
Governor of Kentucky

I herewith submit the one hundred and seventeenth annual report of the Kentucky Agricultural Experiment Station for the period ending December 31, 1904. This is done in accordance with an act of Congress approved March 2, 1837, titled "An act to establish Agricultural Experiment Stations, in connection with the Agricultural Colleges established in the several States under the provisions of an act approved July 2, 1862, and under the act supplementary thereto," and also the act of the Kentucky State Legislature, approved February 20, 1888, regarding the provisions of the act of Congress.

Very respectfully,

James M. Cox

James M. Cox, Associate Dean for Research
Director, Agricultural Experiment Station
Lexington, Kentucky
June 20, 1905

Purpose of the Kentucky Agricultural Experiment Station

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Experiment Station Affiliated Departments and Centers

- Agricultural Economics
- Animal and Food Sciences
- Biosystems and Agricultural Engineering
- Community and Leadership Development
- Entomology
- Forestry
- Horticulture
- Kentucky Tobacco Research and Development Center
- Landscape Architecture
- Livestock Disease Diagnostic Center
- Nutrition and Food Science
- Plant and Soil Sciences (*formerly Agronomy*)
- Plant Pathology
- Regulatory Services
- Robinson Station
- Tracy Farmer Center for the Environment
- USDA-ARS-FAPRU
- Veterinary Science
- West Kentucky Substation



As a land-grant institution, the University of Kentucky is responsible for serving the people of the Commonwealth of Kentucky. The College of Agriculture, with its teaching and extension programs, provides the most direct link between the University and the people of the Commonwealth. The Kentucky Agricultural Experiment Station has been providing research results to farmers and rural communities for more than a century. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology.

Research activities in the Department of Agricultural Economics include the study of farm income, farm costs, and farm taxes. The Department of Agricultural Economics also conducts research in the areas of farm labor, farm credit, and farm insurance. The Department of Agricultural Economics also conducts research in the areas of farm labor, farm credit, and farm insurance.

Efforts are constantly being made to improve the lives of farmers and other rural people. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology.

Map Position 1: Located in Lexington, Kentucky, the Research and Extension Center includes the West Kentucky Substation. This substation is devoted to research on grain crops, beef cattle, swine, fruits and vegetables, forestry, and tobacco.

Although much Experiment Station research was directed toward the application to agricultural and natural resource-related problems, the Station's research is also involved in basic research, general teaching, and extension programs. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology.

Map Position 2: At the University of Kentucky, the Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology.

Map Position 3: At the University of Kentucky, the Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology.

Map Position 4: At the University of Kentucky, the Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology. The Station's research is conducted in 16 major areas of agricultural science and technology.

Purpose of the Kentucky Agricultural Experiment Station

As a land-grant institution, the University of Kentucky is responsible for serving the people of the Commonwealth of Kentucky. The College of Agriculture, with its research, teaching, and extension activities, has developed a structure and organization to provide the mandated land-grant services in agriculture and related areas.

The Kentucky Agricultural Experiment Station has been providing research results to farmers and rural residents for more than 100 years. The continued advancement of Kentucky agriculture attests to the benefits of applying new knowledge and technology. Much of the research leading to increased quantity and improved quality of Kentucky's agricultural output was performed by the Experiment Station. College researchers also have successfully addressed problems of agribusiness, consumers, international trade, food processing, nutrition, community development, soil and water resources, and the environment.

Although much Experiment Station research has immediate application to agricultural and natural resource-related problems, scientists are also involved in basic research, generating new information to help solve present and potential problems. The ability of Kentucky producers to be competitive in domestic and world markets requires an expanded base of knowledge in emerging areas of research applicable to agriculture, food, and natural resources.

This Annual Report lists Experiment Station research projects and publications completed during 2004. A personnel list is also provided.

The research programs of the Kentucky Agricultural Experiment Station have benefited Kentucky's agriculture over the past century, and the results of present and future research will continue to serve Kentucky's primary industry.

Statewide Research

Research activities of the Kentucky Agricultural Experiment Station were conducted at Lexington, Princeton, Quicksand, and Owenton and in counties throughout the state in 2004.

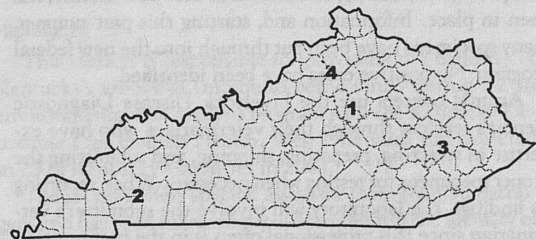
Efforts are constantly made to ensure that the research studies have application to the problems of all Kentucky farmers and other clientele groups. Locations of the experimental facilities provide conditions representative of most sections of the state.

Map Position 1

- **Campus**—Laboratories and specialized equipment for all research program areas.
- **Coldstream-Maine Chance-Spindletop Farms**—Beef and dairy cattle, poultry, horses, sheep and swine; forages and grain crops, tobacco, and turf.
- **South Farm**—Fruits and vegetables, ornamentals.
- **UK Animal Research Center (Woodford County)**—This farm was purchased in late 1991 as a location for development of state-of-the-art food animal research programs. The farm is in Phase I of development as a research facility.

Map Position 2

- At Princeton (*Caldwell County*), the **Research and Education Center** facilities and the **West Kentucky Substation Farm** are devoted to research on grain crops, beef cattle, swine, fruits and vegetables, forages, and tobacco.



Map Position 3

- At Quicksand (*Breathitt County*) the **Robinson Station** is the location of research on fruits and vegetables, ornamentals, forages, grain crops, tobacco, and wood utilization. Quicksand is also the headquarters of **Robinson Forest**, which spreads over parts of Breathitt, Perry, and Knott counties and is the site of forestry and watershed management research.

Map Position 4

- At the **Eden Shale Farm**, located in Owen County near Owenton, experimental and demonstration studies are conducted on forage crops, tobacco, fruits and vegetables, and beef management.

Livestock Disease Diagnostic Center

The Livestock Disease Diagnostic Center (LDDC) is charged with the diagnoses of animal diseases and performance of tests that safeguard the health of the animal population in Kentucky. The Livestock Disease Diagnostic Center helps identify infectious diseases, identifies chemical and toxic contaminants that may harm animals or humans, diagnoses nutritional diseases, identifies regulatory diseases, provides the means to meet export sales requirements, and provides an early warning system for impending epidemics.

The objective of the program is to provide veterinary diagnostic laboratory-based assistance to veterinary practitioners, farmers and agribusinesses, companion animal owners, wildlife specialists and public programs. Also, laboratory support is provided to the animal disease control and eradication programs of the Animal Health Programs, Kentucky Department of Agriculture. An outcome of handling complex and difficult cases is consultation and continuing education for veterinarians in veterinary diagnostic medicine.

The program provides surveillance for emerging and endemic diseases such as West Nile virus (WNV) infection and for possible threats to Kentucky agribusiness such as foot and mouth disease. Also, for more than 17 years prior to the introduction of the USDA's National Surveillance Program, a stringent program to monitor for bovine spongiform encephalopathy (BSE), also known as mad cow disease, has been in place. Information and, starting this past summer, many specimens have been put through into the new federal program. No positive cases have been identified.

Animal owners use the Livestock Disease Diagnostic Center's services through their veterinarians who have expertise in selecting, preparing, shipping, and submitting the proper specimens for testing when necessary. When reporting its findings, the laboratory will involve the submitter's veterinarian since this professional often is in the best position to recommend and administer treatment and preventative measures.

Professional and technical staff are specialists in essential scientific disciplines directly related to animal health. Disease diagnostic efforts are coordinated and handled by specialists in the appropriate disciplines. The Livestock Disease Diagnostic Center is organized into sections so that specialized workload/activities can be handled efficiently.

Highlights:

The scheduled periodic five-year review for American Association of Veterinary Laboratory Diagnosticians accreditation was done during 2004. The Livestock Disease Diagnostic Center received one-year provisional accreditation and not the conventional five-year accreditation. The accreditation committee identified major facility deficiencies. Efforts to achieve full five-year accreditation are in place. Plans call for a new necropsy laboratory and enhanced special proce-

dures facilities. Faculty and staff continue to participate in the Mare Reproductive Loss Syndrome (MRLS) diagnostic and investigational efforts. The number of equine abortion accessions of all breeds are posted on a weekly basis for the winter and spring on the College of Agriculture, Department of Veterinary Science Web site. This weekly posting of abortion accessions was done to help the equine industry manage concerns about the perceived long-term impact of MRLS. Identifying the cause(s) of equine abortion was a major challenge throughout 2003. Starting in the summer of 2001 and in cooperation with Kentucky Department of Public Health and Kentucky Department of Agriculture, the Livestock Disease Diagnostic Center conducted assays for statewide surveillance and diagnosis of West Nile virus (WNV) in birds, horses, and mosquito pools. The Livestock Disease Diagnostic Center provides laboratory support for the Kentucky Department of Agriculture and the Kentucky Department of Fish and Wildlife Resources for surveillance of chronic wasting disease in the wild and farmed cervid population.

Quality Assurance Program

L. L. Brown

At the recommendation of our accrediting agency, the American Association of Veterinary Laboratory Diagnosticians, a Quality Manager was hired July 1, 2004, to organize and implement a laboratory quality assurance program. Embarkation of this systematic method of identifying and eliminating all forms of waste in work processes while improving performance and service delivery is a new program for the Livestock Disease Diagnostic Center. The Livestock Disease Diagnostic Center's Quality Program goal is based on the University mission of improving service delivery while achieving excellent human relations, sound leadership, and effective communications. The program is being designed to focus primarily on standardization of work procedures that allow improvement of the quality of service to our internal and external customers. It is a never-ending, long-term development that is evolutionary in implementation yet revolutionary in vision, scope, and impact.

Integral to this process will be the participation of all Livestock Disease Diagnostic Center laboratory sections in quality assurance activities such as participation in intra-laboratory proficiency testing, standardization and documentation of test procedures, strong adherence to Good Laboratory Practices, better documentation of testing, tracking customer complaints, and improved training and competency assessment of employees. The overall program goal is to continually improve service delivery.

Public Services

Pathology

L. R. Harrison

The Livestock Disease Diagnostic Center provides services in necropsy, histopathology, and surgical biopsy. Pathologists evaluate changes found at necropsy and correlate lesions with other laboratory test results, including light microscopic examination of tissues. A comprehensive report is prepared for every case requiring the services provided by the veterinary pathologists.

Necropsy: A postmortem examination is conducted to identify any injury or change in an organ that has resulted in impairment or loss of function.

| Total Necropsy Cases | 4,677 |
|---|-------|
| Avian..... | 98 |
| Canine and feline..... | 458 |
| Caprine and ovine..... | 448 |
| Bovine..... | 1,182 |
| Equine..... | 2,369 |
| Porcine..... | 29 |
| Other species (exotic—zoo, wildlife)..... | 93 |

Histopathology: Tissues are prepared for light microscopic examination to reveal changes in body tissues due to disease. Tissues of 6,469 cases were processed and examined. In addition to hematoxylin and eosin (H&E) stained tissue section, special and immunochemical stains were done on 1,064 tissue preparations for the purpose of identifying microscopic organisms/agents that cause diseases or tissue antigens that define cell structures.

Biopsy: Small tissue specimens are prepared for light microscopic examination for evidence of neoplasia or other diseases. Tissue samples representing 5,039 cases were processed and examined. A report was generated for each case.

Cytology: Preparations of cells denuded from tumors or other type lesions, recovered from secretions and exudates for microscopic examination. Cytopathologic examinations were done and a report generated for 626 cases.

Bacteriology/Mycology

J. M. Donahue

The primary mission of the Bacteriology/Mycology Section is to detect or isolate and identify pathogenic bacteria or fungi present in animals. The section also determines the antibiotics that might be used for the treatment of specific bacterial infections. The section is also responsible for culture of bacteria for two federal/state regulatory programs: contagious equine metritis (CEM) in equine and brucellosis in bovine.

Highlights:

- 16,879 aerobic cultures were performed on samples submitted to the Livestock Disease Diagnostic Center; significant bacterial pathogens were found in more than 50% of the samples.
- 2,469 milk samples from dairy cows were tested for microorganisms that cause mastitis; more than 50% were positive for pathogenic microorganisms.

- 3,622 different bacterial isolates were tested to determine the antibiotics that could be used for their treatment in exposed animals.
- 7,094 samples from horses were cultured for contagious equine metritis organism (CEMO). All horses tested were negative for the bacterium, demonstrating that the disease no longer exists in horses in Kentucky.
- More than 4,500 samples from horses were tested for the presence of leptospire, and tissues from 37 fetuses were positive. These results indicated that leptospirosis was one of the most common causes of equine abortions in 2004.
- Through work with other departments in the College of Agriculture, the section provided data to prove that the bacteria responsible for the death of fetuses in experimentally reproduced Mare Reproductive Loss Syndrome are identical to the bacteria causing the death of fetuses in field cases.

Molecular Diagnostics

S. Sells

The Molecular Diagnostics Section uses assays designed to detect and identify the specific nucleic acids (DNA and RNA) of pathogenic bacteria and viruses. This application takes advantage of technologies in molecular science that have been developed during the last decade. Nucleic acid based tests are now used so that unknown organisms can be identified, closely related organisms can be differentiated, and small numbers of pathogens can be detected in complex samples.

Highlights:

This section is responsible for providing the majority of Kentucky's arbovirus (mosquito-borne virus) testing for an environmental risk analysis program with the Kentucky Department for Human Health. West Nile virus was detected in 23 of Kentucky's counties in 2004.

The section offers specific assays for more than 30 pathogens and has been increasingly used to confirm the identity of isolates cultured in the Bacteriology and Virology sections of the Livestock Disease Diagnostic Center and area veterinary clinics. The numbers of the most requested assays include:

| | |
|---------------------------------------|-------|
| <i>Streptococcus equi</i> | 73 |
| Equine herpesvirus..... | 97 |
| <i>Moraxella bovis</i> | 19 |
| <i>Mycoplasma bovis</i> | 57 |
| <i>Lawsonia intracellularis</i> | 30 |
| <i>Clostridium perfringens</i> | 75 |
| Equine nocardiform placentitis..... | 4,925 |
| <i>Neorickettsia risticii</i> | 68 |

Serology

B. J. Smith

The Serology Section provides accurate and timely results for both diagnostic and regulatory testing. This provides veterinarians and regulatory personnel with data upon which to base their decisions. These tests also enable Kentucky to export animals internationally. Testing for 30 animal diseases

was available utilizing various testing techniques. A total of 184,252 tests were performed.

Highlights:

| | |
|---------------------------------------|--------|
| Anaplasmosis..... | 162 |
| Avian influenza..... | 9,476 |
| Bovine leukemia virus..... | 884 |
| Brucellosis..... | 11,748 |
| Contagious equine metritis..... | 1,302 |
| Equine infectious anemia..... | 54,840 |
| Johne's disease..... | 2,429 |
| Leptospirosis..... | 4,236 |
| <i>Mycoplasma gallisepticum</i> | 41,119 |
| <i>Mycoplasma synoviae</i> | 41,042 |
| <i>Neospora caninum</i> | 335 |
| Salmonella pullorum-typhoid..... | 14,586 |

Virology

M. L. Vickers

The Virology Section of the Livestock Disease Diagnostic Center provides diagnostic virology support to the laboratory pathologists, veterinarians, regulatory officials, and the State and Federal Veterinarians.

Highlights:

This section provides 48 different tests, including 32 fluorescent antibody tests to detect antigens of viruses in tissues, 13 serology tests to detect antibodies of viruses, virus isolation for cattle, horses, sheep, pigs, goats, cats, dogs, birds, reptiles, etc., as well as electron microscopy and various tests for detection of viral antigens. In addition, this section maintains 10 tissue culture cell lines that are used routinely.

The section performed 25,855 tests during this year. Of this total, 13,194 were virus neutralization serology tests done to meet regulatory requirements.

This is the fifth year of funding from the Kentucky Department of Public Health by the Centers for Disease Control for West Nile virus (WNV) testing. The purpose of this grant is for surveillance/monitoring of WNV in wild birds, horses, and mosquitoes. West Nile virus is transmitted by mosquitoes. Mosquito trapping was carried out, and the pools of these insects were submitted to the laboratory for identification and testing for this virus. Birds are the most important sentinel species to provide information on the earliest activity of the virus in a given locality. The public was encouraged to report dead birds and to submit them to the local health department for shipment to the laboratory. Testing of birds and mosquitoes for WNV was done as a cooperative effort of this section and Molecular Diagnostics. WNV was first detected in the Commonwealth of Kentucky in the fall of 2001.

Toxicology

A. F. Lehner

A variety of assays are done routinely that identify poisonous substances in tissues taken at necropsy such as metals, certain elements, pesticides, plant toxins, and a variety of other toxins. Also, blood, serum, and urine from live animals are assayed for mineral/element deficiencies and toxins. These assays are done when a potential toxicological problem exists

and when a pathologist identifies changes in tissues/organs that are consistent with specific toxic agents.

Highlights:

The numbers refer to the number of cases, not the number of animals involved. On some premises numerous animals were involved.

| | |
|--|----|
| Acidosis..... | 11 |
| Acorn poisoning..... | 1 |
| Aldrin poisoning..... | 1 |
| Amylobarbitone poisoning..... | 1 |
| Antifreeze poisoning..... | 8 |
| Arsenic poisoning..... | 4 |
| Black locust poisoning..... | 1 |
| Brodifacoum toxicosis..... | 1 |
| Buckeye poisoning..... | 1 |
| Carbofuran poisoning..... | 5 |
| Deficient copper levels..... | 20 |
| Diazinon poisoning..... | 1 |
| DDT poisoning..... | 1 |
| Elevated copper levels..... | 11 |
| Endosulfan..... | 1 |
| Exposure to pharmacological agents..... | 3 |
| Elevated mercury..... | 1 |
| Elevated molybdenum levels..... | 3 |
| <i>(molybdenum is a copper antagonist)</i> | |
| Endosulfan poisoning..... | 3 |
| Horse nettle (<i>Solanum carolinense</i>) toxicosis..... | 1 |
| Iron toxicity, equine..... | 10 |
| Lead poisoning..... | 3 |
| Nitrate at dangerous levels..... | 14 |
| Taxus poisoning..... | 7 |
| Tumex (8-quinolinol) toxicosis (this compound is a fungicide)..... | 1 |
| Elevated vomitoxin levels..... | 10 |

Veterinary Epidemiology

Craig N. Carter

A contemporary veterinary epidemiology program located at the Livestock Disease Diagnostic Center is in the early stages of development. The primary goal of this new service is to provide animal disease surveillance and to assist veterinarians in the investigation of serious and unusual disease problems. The epidemiology program will be driven by state-of-the-art electronic data-gathering systems that will allow for near-real time analysis and dissemination of diagnostic case information that will be useful to practitioners in treatment, prevention, and management of animal disease problems.

Highlights:

- This faculty member is chairing the LDDC Laboratory Information Management System (LIMS) Steering Committee. This committee is charged with evaluating, selecting, and implementing a new LIMS to support the laboratory and the new epidemiology program.
- Meets regularly with staff at the State Veterinarian's office to help in planning and coordinating the flow of animal health information from the diagnostic laboratory.
- This professional is serving on the newly formed College of Agriculture Equine Planning Committee, which is charged to identify targeted areas of opportunity and needs across teaching, research, and extension missions regarding the equine industry of Kentucky.

Regulatory Services

Mission

Regulatory Services is committed to service and consumer protection of Kentucky citizens, businesses, and industries. Our programs monitor and analyze feed, fertilizer, milk, seed, and soil and are administered using a cooperative, science-based approach.

The Division of Regulatory Services is charged with administering four state laws pertaining to the manufacturing, processing, labeling, and marketing of commercial feed, fertilizer, seed, and raw milk. The Division's primary objectives are to protect producers and other consumers from poor quality, mislabeled, or misrepresented products and to protect agricultural and other businesses from unfair competition.

Feed, fertilizer, and seed are monitored through manufacturing and retail channels for compliance with state laws. Label review, product, and facility inspections as well as product sampling and analysis are important parts of this process. Raw milk is monitored during marketing to ensure an accurate and equitable exchange between dairy producers and processors and to ensure the integrity of milk from farm to processor.

Eleven regulatory inspectors and one auditor cover the state collecting samples, inspecting facilities, and auditing records. Two specialty product inspectors are dedicated to monitoring and sampling small-package and specialty pet food, fertilizer, and seed products throughout the state. This reflects the Division's commitment to provide consumer protection to the purchaser of nonagricultural products such as lawn seed, fertilizer, and dog, cat, and other pet food. One inspector is dedicated to the milk regulatory program: auditing records and monitoring activities of sampler-weighers, handlers, testers, and laboratory facilities.

In addition to regulatory programs of the Division, service testing is provided through the seed, soil, and milk laboratories. These and other activities in the Division are performed by a dedicated and professional staff who perform laboratory analyses, provide computer support, and process and compile reports in addition to performing various duties necessary to carry out and administer effective programs.

Auditing Program

H. S. Spencer

Audits of sales and fee payments were made on 158 of 415 feed, fertilizer, seed, and milk firms in Kentucky to verify inspection fees. Fees are assessed to help defray costs of inspecting, sampling, and analyzing commodities in accordance with state laws. Fees are indicated below. Cash receivables were substantiated on 1,080 fertilizer reports, 3,008 feed reports, 764 seed reports, and 74 milk reports. Reports were checked for accuracy and compared to field audits of the submitting firms.

The 2004 inspection fees for industries regulated by the Division of Regulatory Services are as follows:

| Industry | Fee Assessed per Unit |
|------------------------------------|-----------------------|
| Feed..... | 35 cents/ton |
| Fertilizer..... | 50 cents/ton |
| Milk (handlers and producers)..... | 0.5 cents/100 lb. |
| Seed Tags..... | 4-24 cents/unit |

The Division of Regulatory Services 2004 income from fees, licenses and testing services was as follows:

| Industry | 2004 Income |
|---|--------------------|
| Feed..... | \$943,760 |
| Fertilizer..... | \$589,581 |
| Milk..... | \$189,585 |
| Seed tags, licenses, and service testing..... | \$420,344 |
| Soil service testing..... | \$100,475 |
| Total..... | \$2,243,745 |

Feed Regulatory Program

S. Traylor

The feed regulatory program provides consumer protection for purchasers of livestock feed and pet food products as well as monitoring a marketplace environment that promotes fair and equitable competition. The Kentucky Commercial Feed Law outlines standards of quality, safety, and efficacy of commercial livestock feed and pet food industries through specific labeling requirements. Labels should identify the purpose, a guaranteed composition, ingredient list and directions, as well as warning or caution statements required for proper use. A statewide inspection, sampling, and testing program monitors feed products for accurate labeling.

The feed program is also involved in ensuring safety and suitability of animal feed products fed to livestock and poultry producing meat, milk, and eggs for human consumption. This includes participation in a nationwide effort by state and federal agencies to ensure food safety and to promote consumer confidence in the food supply. The feed program and the FDA cooperatively work together to inspect facilities for compliance with the ruminant-to-ruminant feeding ban, which was promulgated to prevent establishment and amplification of bovine spongiform encephalopathy (BSE or "mad cow disease").

2004 highlights:

- Administered actions on 3,529 official and 156 unofficial samples of commercial feed involving 24,250 tests to monitor about 3 million tons of commercial mixed feed and feed ingredients distributed in Kentucky.

- Administered a cooperative program with the FDA to inspect 14 feed mills that mix restricted drugs in feed and to inspect these mills for compliance with FDA's national BSE Rule. An additional 105 BSE inspections were contracted with FDA for mills not required to be licensed with FDA.
- Conducted 7,500 label reviews and maintained product registration for about 15,000 products from more than 950 companies.

Fertilizer Regulatory Program

D. L. Terry

The Kentucky Fertilizer Law ensures that fertilizers sold in Kentucky are clearly and accurately labeled so that consumers can make informed purchases of fertilizer and be assured of its quality. The law also protects the legitimate fertilizer industry from unfair competition. In 2004, the program:

- Administered actions on 3,175 official and 282 unofficial samples of fertilizer involving 10,380 chemical tests. The samples represented about 60,000 tons out of the approximately 920,000 tons of fertilizer distributed in Kentucky.
- Reviewed labels and registered 3,851 products from 529 firms, including 205 who manufactured custom blends of fertilizers.

Feed and Fertilizer Analytical Laboratory

M. Bryant

The laboratory provided analytical support for the feed, fertilizer, and soil programs. Accurate and timely analyses of these materials were provided for the fertilizer and feed regulatory programs and for the support of agriculture in Kentucky. In 2004, the laboratory analyzed 3,460 fertilizer samples and 3,685 feed samples. In addition, 40,000 agriculture-related samples were analyzed in the spectroscopy laboratory, i.e., soil, manure, litter, and research samples. The laboratory analyzed many materials from check sample programs and special sample requests.

Check sample materials were analyzed from regional, national, and international programs: AOCS, AAFCO, Magruder®, mycotoxins, UAN, AFPC phosphate rock, mineral, and other sample types. We started participation in mycotoxin and microscopy check sample programs. The laboratory routinely provides program support using approximately 75 different analytical methods. Samples are also submitted to and analyzed by commercial and other regulatory programs to provide additional analytical method support and to ensure the quality of laboratory results. The laboratory participates in a monthly aflatoxin share sample program.

Software program upgrades in the relevant data systems are under way to allow all data to be transferred to and from the laboratory electronically. A new thermal analyzer was added to the laboratory for nitrogen and protein analysis. The laboratory potash methodology improved by adding automatic titration equipment to improve precision and accuracy. The

gas chromatograph data system was improved for soil atrazine and simazine analysis. A special study was conducted on the analysis of Se in mineral feed premix materials to develop a new ICPOES method. Studies were conducted to improve the analysis of slow-release fertilizers.

Inspection Program

S. McMurry

The inspection program strives to promote industry compliance with consumer protection laws administered by the Division. Inspectors strategically located throughout the state carry out this responsibility in respective assigned areas. Their primary duty is to visit manufacturing plants, processing facilities, storage warehouses, and retail sites to collect official samples of feed, pet food, fertilizer, milk, and seed. While visiting these firms, inspectors also review records and offer assistance in improving operations to achieve compliance with the laws.

2004 highlights:

- 11 inspectors completed more than 5,400 feed, fertilizer, and seed inspections of processing, manufacturing, and marketing firms in the state.
- Emphasis in the feed area included feed mill inspections for compliance with FDA's BSE regulations.
- Two inspectors visited and sampled small package specialty feed, fertilizer, and seed products in urban markets.
- Two inspectors made 272 visits to determine compliance with Kentucky's Farm Milk Handler Law.
- Inspectors collected the following official samples for laboratory verification of appropriate constituents and quality:

| | |
|-----------------|-------|
| Feed..... | 3,529 |
| Fertilizer..... | 3,175 |
| Seed..... | 2,567 |
| Milk..... | 5,785 |

Milk Regulatory Program

C. D. Thompson

The mission of the milk regulatory program is to ensure raw farm milk produced and marketed in Kentucky is bought and sold using accurate weights and tests. The program's primary function is to monitor milk handling systems from the time a producer's milk is sampled and weighed, through delivery and laboratory testing, until producer payments are calculated. The program provides support to the producers and processors of Kentucky's \$200 million/year dairy industry. Industry participants are trained, licensed, and subsequently monitored to maintain compliance with the law.

In addition to regulatory functions, the milk program cooperates with other agencies in educational projects to provide a variety of services to Kentucky dairy producers and processors. The milk program also operates a laboratory that is available for Kentucky producer, processor, and handler service testing.

2004 highlights:

- Reviewed and issued licenses to five transfer stations, 21 milk handlers, 21 laboratories, 73 testers, and 347 sampler-weighers.
- Analyzed and administered action on 5,556 official samples.
- Administered a monthly milk laboratory quality control check sample program through the distribution of 3,024 check samples to the 21 licensed laboratories to ensure accurate component testing procedures.
- Conducted 16 pay-record and 18 raw milk receiving manifest audits.
- Conducted 37 milk laboratory inspections.
- Collaborated with Kentucky Cabinet for Health Services Milk Safety Branch to train sampler-weighers.
- Trained and examined 47 new sampler-weighers and three new testers.
- Conducted 20 inspections of raw milk transfer stations.
- Conducted 617 sampler-weigher inspections.

Seed Regulatory Program

D. T. Buckingham

The seed regulatory program ensures Kentucky farmers and urban consumers of quality seed while promoting fair and equitable competition among seed dealers and seedsmen through inspection and analysis of products found in the marketplace. The Division, which administers and implements the Kentucky Seed Law, promotes compliance through facility inspections, sampling, and analysis of seed offered for sale. The law requires proper labeling of seed which includes kind, variety and lot designation, purity percentages, noxious weeds, origin, test date, and a germination guarantee. The Division is also responsible for maintaining registration of seed labelers and dealers in the state.

2004 highlights:

- Performed inspections and sampled agricultural, lawn, turf, and garden seeds at more than 600 wholesale and retail locations.
- Collected and tested 2,567 official seed samples.
- Issued stop-sale orders on 380 official seed samples and 709 violative seed lots at seed dealer and seed processor locations.
- Cooperated with the USDA-Seed Branch regarding shipments of seed into the state that were in violation of the Federal Seed Act.
- Reviewed and issued 200 agricultural permits and 42 vegetable and flower permits to label seed.
- Registered 390 seed dealers and 25 non-certified custom conditioners.
- Provided training to firms on labeling requirements, mixing procedures, and batching records.

Seed Testing Laboratory

C. Finneseth

The Division maintains the only seed testing facility in Kentucky. This laboratory conducts all official testing in the state and provides service testing for producers, dealers, retailers, researchers, and homeowners. Laboratory capabilities include purity testing, weed and crop seed identification, seed counts, accelerated aging, test weight, fluorescence testing for ryegrass, moisture content, tetrazolium, herbicide tolerance, endophyte, and germination as well as many other tests. Laboratory analysts participated in regional and national referee testing through the Association of Official Seed Analysts to ensure inter-laboratory and intra-laboratory quality of test results. More than 20,000 different tests were performed by laboratory personnel in 2004.

2004 Highlights:

| Sample Type | 2004 Completed Samples |
|----------------------------|------------------------|
| Official samples | 2,567 |
| Service samples | 6,127 |
| Tobacco | 1,379 |
| Other certified crops..... | 390 |
| Total Samples..... | 8,694 |

Soil Testing Laboratory

*F. J. Sikora and D. Reid (Lexington)
Paula Howe (UK Research and Education Center, Princeton)*

Soil testing provides farmers, homeowners, greenhouse operators, and others with scientific information about the fertility status of their soils. In partnership with the Cooperative Extension Service, it also provides them with lime and fertilizer recommendations based on soil test results. We also offer analyses of animal wastes, water, and research soil tests.

The soil test Web site contains information on our services and calculators for determining fertilizer, lime, and manure application rates. The site is at soils.rs.uky.edu.

The number of samples analyzed in 2004 were:

| Type | Number | % Increase |
|---------------------------------|---------------|------------|
| Agriculture..... | 31,657 | 4 |
| Home lawn and garden | 6,337 | 8 |
| Strip-mine reclamation | 0 | |
| Commercial horticulture | 662 | 10 |
| Greenhouse..... | 70 | 30 |
| Research | 9,712 | 44 |
| Atrazine residue in soil | 19 | -5 |
| Animal waste | 217 | -34 |
| Nutrient solution | 26 | -7 |
| Special research solutions..... | 884 | 34 |
| Total | 49,584 | 11 |

Kentucky Agricultural Experiment Station Projects

Hatch, McIntire-Stennis, and Animal Health Projects

Hatch, McIntire-Stennis, and Animal Health projects for calendar year 2004, as reported in the USDA Current Research Information System (CRIS) database, follow.

Agricultural Economics

- Analyzing the Industrial Organization and Financial Economic Performance of the Global Agribusiness Sector—*Vickner, S.S.*
- Benefits and Cost of Natural Resources Policies Affecting Public and Private Lands—*Fleming, R.A.*
- Effects of Policy and Product Changes on the International Demand for U.S. Agricultural Products—*Reed, M.R.*
- Ex-Post Evaluations of Environmental Projects That Affect Kentucky Agriculture and Rural Communities—*Pagoulatos, A., Fleming, R.A.*
- Impacts of Trade and Domestic Policies on the Competitiveness and Performance of Southern Agriculture—*Marchant, M.A.*
- Risk Management and Profit Potential of Alternative Production Practices, Enterprises, and Technologies—*Dillon, C.*
- Rural Labor Markets: Workers, Firms, and Communities in Transition—*Freshwater, D.*
- Technological Progress in Agriculture, Farmers, and Rural Communities—*Debertin, D.L.*
- U.S. Consumer Demand for Dairy Products: Needs-Driven Methods and Analysis—*Maynard, L.J.*

Animal and Food Sciences

- Animal Manure and Waste Utilization, Treatment and Nuisance Avoidance for a Sustainable Agriculture—*Cromwell, G.L.*
- Assessment and Implications of Carbohydrate Utilization in the Small Intestine of Beef Cattle—*Harmon, D.L., McLeod, K.R.*
- Assessment and Regulation of Sexual Behavior in Beef Bulls—*Schillo, K.K., Silvia, W.*
- Calcium and Phosphorus Nutrition of Pregnant and Lactating Mares—*Lawrence, L.M.*
- Detection of Estrus in Gilts and Sows—*Edgerton, L.A.*
- Development of a Swine Model to Evaluate the Reduction of Antibiotic-Resistant Enteric Bacteria in Domestic Livestock—*Newman, M.C.*
- Dietary Regulation of Cationic Amino Acid Transporter Protein Expression in Cattle—*Mathews, J.C., Harmon, D.L.*
- Interpreting Cattle Genomic Data: Biology, Applications, and Outreach—*Mathews, J.C.*
- Enhancing Food Safety through Control of Food-Borne Disease Agents—*Newman, M.C.*
- Genetic (CO) Variance of Parasite Resistance Temperament and Production Traits of Traditional and Non-*Bos indicus* Tropically Adapted Breeds—*Thrift, F.A.*
- Genetic Selection and Crossbreeding to Enhance Reproduction and Survival of Dairy Cattle—*Franklin, S.T., McAllister, A.J.*
- Inhibition of Lipid and Myoglobin Oxidation in Fresh and Value-Added Meat Products through Natural Antioxidants—*Alderton, A.L.*
- Interaction of Structurally Modified Food Proteins in Processed Meat Systems—*Xiong, Y.L.*
- Management Systems to Improve the Economic and Environmental Sustainability of Dairy Enterprises—*Amaral-Phillips, D., Franklin, S.*
- Metabolic Relationships in Supply of Nutrients for Lactating Cows—*McLeod, K.R.*
- Methods to Increase Reproductive Efficiency in Cattle—*Silvia, W.J.*
- Modifying Milk Fat Composition for Improved Manufacturing Qualities and Consumer Acceptability—*Franklin, S.T.*
- Nutrition and Health of Dairy Calves—*Franklin, S.T., Jackson, J., Harmon, R., Amaral-Phillips, D.*
- Nutritional Modulation of the Vascular Endothelium—*Hennig, B., Toborek, M.*

- Nutritional Systems for Swine to Increase Reproductive Efficiency—*Lindemann, M.D., Aaron, D.K., Fleming, R.A.*
- Post-Harvest Biochemistry and Methods of Minimizing Methanethiol and Dimethyl Trisulfide in Soy Protein Products—*Boarright, W.L.*
- Proteomic Analysis of Anaerobic Bacterial Metabolism—*Strobel, H.J.*
- Regulation of Estrous Behavior in Dairy Cows—*Silvia, W.J., Schillo, K.K.*
- Water Quality Issues in Poultry Production and Processing—*Cantor, A.H., Pescatore, A.J., Ford, M.J.*

Biosystems and Agricultural Engineering

- Characterization of Laboratory and Pilot Scale Foam Fractionation of Industrial Enzymes—*Crofcheck, C.L.*
- Demand-Controlled Ventilation (DCV) for Residential Indoor Air Quality Control—*Colliver, D.G.*
- Developing and Integrating Components for Commercial Greenhouse Production Systems—*Norikane, J.H., Gates, R.S., Duncan, G., Anderson, R.G., Geneve, R., Buxton, J.*
- Management of Grain Quality and Security for World Markets—*Montrass, M.D., McNeill, S.G.*
- NCR-101: Controlled Environment Technology and Use—*Norikane, J.H.*
- Optical Sensor Measurement of Food Composition Based on Light Scattering Distribution—*Payne, F.A., Crofcheck, C., Menguc, P.*
- Stress Factors of Farm Animals and Their Effects on Performance—*Gates, R.S., Bridges, T.C., Overhults, D.G., Vanzant, E.*
- Systems for Controlling Air Pollutant Emissions and Indoor Environments of Poultry, Swine, and Dairy Facilities—*Gates, R.S., Overhults, D.G., Turner, L., Cantor, A.H., Pescatore, A.J.*
- The Science and Engineering for a Biobased Industry and Economy—*Nokes, S.E., Crofcheck, C., Strobel, H.*
- Water and Solute Transport in Subsurface Environments—*Workman, S.R.*

Community and Leadership Development

- Assessing Impacts of Welfare Reform on Individual, Family, and Community Well-Being in the Rural South—*Zimmerman, J.N.*
- How Do Structured Out-of-School Experiences Contribute to Positive Youth Development?—*Dyk, P.H., Hansen, G.*
- Rural Low-Income Families: Tracking Their Well-Being and Function in an Era of Welfare Reform—*Dyk, P.H.*

Entomology

- Biological Control of Arthropod Pests and Weeds—*Yeagan, K.V.*
- Biology and Management of Insects Attacking Turf and Woody Landscape Plants—*Potter, D.A.*
- Consequences of Variation in Host Plant Resistance for the Evolution of Offspring Size in a Seed-Feeding Beetle—*Fox, C.W.*
- Development of Pest Management Strategies for Forage Alfalfa Persistence—*Witt, W., Vincelli, P., Lacefield, G.*
- Development, Evaluation, and Safety of Entomopathogens for Control of Arthropod Pests—*Brown, G.C.*
- Dynamic Soybean Pest Management for Evolving Agricultural Technologies and Cropping Systems—*Yeagan, K.V.*
- Ecology and Management of European Corn Borer and Other Stalk-Boring Lepidoptera—*Brown, G.C.*
- Field Evaluation and Implementation of Economic Injury Levels Incorporating Biological Control Agent—*Brown, G.C.*
- Functional Implications of Polydnavirus Genome Organization—*Webb, B.A.*
- Herbivory in Deciduous Forests: Implications for Forest Regeneration and Restoration—*Rieske-Kinney, L.K.*
- Impacts of Interactions among Generalist Arthropod Predators in Two Complex Food Webs: Vegetable-Crop Gardens and Forest-Floor—*Wise, D.H.*
- Molecular Analysis of Pest Development and Resistance to Insecticides—*Palli, S.R.*

Potential for Evolution of Resistance to Synthetic Pheromone—Haynes, K.F.

Sources, Dispersal, and Management of Stable Flies on Grazing Beef and Dairy Cattle—Dobson, S.L.

Systematics and Biodiversity of Biological Control Agents with Special Reference to the Braconidae—Sharkey, M.J.

Forestry

Computer Simulation and Numerical Methods for Financial Optimization of Central Hardwood Forest Management—Pelkki, M.H., Ringe, J.M.

Controls on Litter Decay and N Transformations: Effects of Tree Species, Microclimate, and Soil Mesofauna in Oak and Mixed Hardwood Stands—Arthur, M.A., Muller, R.

Effects of Disturbance Corridors (Roads and Hiking Trails) on Invertebrate Macrofauna of Forest Soils on the Cumberland Plateau of Kentucky—Kalisz, P.

Restoration of the American Peregrine Falcon (*Falco peregrinus anatum*) to Cliff Habitats in Kentucky—Lacki, M.J.

Horticulture

Botrytis cinerea Development and Natural Volatile Compounds from Strawberry Fruit—Kemp, T.R.

Evaluation of Growth and Phenolic Content of Echinacea Species under Greenhouse Conditions—Anderson, R.G., Geneve, R.

Evaluation of Natural Products for Mediating Plant Resistance to Arthropods and for Use in Protecting Horticultural Crops from Insect Damage—Snyder, J.C.

Mechanism and Significance of Post-Translational Modifications in the Large (LS) and Small (SS) Subunits of Rubisco—Houtz, R.L.

Molecular Characterization of the Role of Raffinose in the Model Plants Corn and Arabidopsis—Downie, A.

Optimizing the Water and Air Relationship and Nutrient Concentration in a Controlled Water Table Irrigated Container Growing Medium—Buxton, J.W.

Peptide Deformylase: A Novel Herbicide Target Amenable to Genetically Engineered Tolerance—Williams, M.

Regulation of Sorbitol Dehydrogenase Activity during Apple Fruit Development: Genotypic Differences and the Impact of Cultural Practices—Archbold, D.D.

The Role of Ethylene and Polyamine Interaction in the Time to Radicle Protrusion during Seed Germination—Geneve, R.L.

Rootstock and Interstem Effects on Pome- and Stone-Fruit Trees—Masabni, J.G.

Technical and Economical Efficiencies of Producing Marketing and Managing Environmental Plants—McNiel, R.E.

Landscape Architecture

A Planning Model for Assessment of Agricultural Potential in Appalachia Using Information Technology Tools—Nieman, T.J.

Nutrition and Food Science

Dietary Antioxidants, NF- κ B, and Carcinogenesis—Glauert, H.P.

Mechanisms of Anti-Inflammatory Action of Eicosapentaenoic Acid (EPA)—Chen, L.

Plant and Soil Sciences (Agronomy)

Breeding and Genetics of Forage Crops to Improve Productivity, Quality, and Industrial Uses—Phillips, T.D.

Breeding for Fusarium Head Blight Resistance in Wheat for Kentucky—Van Sanford, D.A.

Environmental and Genetic Determinants of Seed Quality and Performance—TeKrony, D.M., Egli, D.B., Baskin, C.C., Baskin, J.M., Perry, S.E., Geneve, R.L., Downie, A.B.

Fragipan Influence on Hillslope Hydrology and Soil Water Quality—Thom, W.

Identification and Characterization of Genes Regulated by AGL15, an Embryo-Expressed MADS-Box Gene—Perry, S.E.

Mineral Controls on P Retention and Release in Soils and Soil Amendments—Karathanasis, A.D.

National Agricultural Program to Clear Pest Control Agents for Minor Uses—Nesmith, W.C.

Potential Impact of Global Warming on Seed Germination Ecology of Summer Annual and Winter Annual Weeds—Baskin, C.C.

Regulation of Isoprenoid Metabolism in Plant-Pathogen Interactions—Chappell, J.

Turfgrass Management Practices in Kentucky—Williams, D.W., Powell, A.J.

Plant Pathology

Biochemistry and Genetics of Plant-Fungal Interactions—Vaillancourt, L.

Biological Control of Soilborne Plant Pathogens for Sustainable Agriculture—Hendrix, J.W.

Characterization of R-Gene-Mediated Signaling and Cross Talk between Defense Signaling Pathways—Kachroo, P.

Epidemiology, Genetic Diversity, and Strategies to Control Bean Pod Mottle Virus—Ghabrial, S.A.

Genetics and Biochemistry of Alkaloid Production by Endophytes—Scharld, C.L.

Genomic Studies of the Model Phytopathogenic Fungus *Magnaporthe grisea*—Farman, M.

Genomics, Molecular Biology, and Cell Biology of Sonchus Yellow Net Virus, a Plant Rhabdovirus—Goodin, M.M.

Molecular Genetics of the Interaction between Corn and Corn Stalk Rot Fungi (*Colletotrichum graminicola* and *Fusarium graminea*)—Vaillancourt, L.J.

Role of Promoter and Enhancer Elements in the Replication of Defective Interfering Tombusvirus RNA—Nagy, P.D.

Veterinary Science

Effect of Aging on the Immune Response of Horses—Horohov, D.W., Chambers, T.

Identification and Characterization of Immunodominant Antigens from the Coccidian Parasite *Sarcocystis neurona*—Howe, D.K.

Induced Protectively Immunogenic Outer Envelope Proteins of *Leptospira kennewicki*—Timoney, J.F.

Investigation of the Role of Thyroxine in the Control of Seasonal Reproductive Activity in the Mare—Fitzgerald, B.P.

Molecular Mechanisms, Ecology, and Control of Natural Infections of Equids and Ruminants by Drug-Resistant Internal Parasites—Lyons, E.T.

NAGRP Species Coordinator for the Horse—Bailey, E.F.

National Animal Genome Research Program—Bailey, E.F., Lear, T., MacLeod, J., Cothran, E.G., Graves, K., Webb, B.

New Therapeutic Approaches for Equine Protozoal Myelitis—Tobin, T.

Pathogenesis of Equine Infectious Anemia—Issel, C.J., Cook, R.F.

Pregnancy Maintenance in Mares—McDowell, K.J.

Reactivation and Transmission of Latent Equine Herpesvirus-1 in Pregnant Mares: Role as Risk Factors for Equine Herpesvirus Abortion—Allen, G.P.

West Nile Virus Immunity in Horse Foals—Chambers, T.

Collegewide Extramural Funding

This information, generated from the Office of Sponsored Projects Administration database, includes any award with a start date within the reporting period (January 1, 2004-December 31, 2004) and any budgetary addition or reduction to existing projects processed within the reporting period.

Agriculture Communications

Total—\$30,000

HorseQuest.info Equine Knowledge Modules, American Distance Education Consortium, \$30,000—Wood, C., Griffin, A.

Agricultural Economics

Total—\$342,724

Economic Burden of Obesity among Uninsured Individuals in the Rural South: A Case Study of Southeastern Kentucky, Mississippi State Univ., \$27,973—Scorsone, E., Tietjen, J.

Entrepreneurship Center, Jackson County Development Assoc., \$15,000—Scorsone, E.

Kentucky Center for Cooperative Development Phase 2, Kentucky Center for Cooperative Development, \$20,000—Woods, T., Williamson, L.

Policy Designs for Sharing Agricultural Risk, GlobalAgRisk Inc., \$100,482—Skees, J.

Production Costs and Techniques of Blueberry Establishment in Eastern Kentucky, Univ. of Georgia, \$3,764—Woods, T., Ernst, M.

Strategies for Developing Agricultural Opportunities in the Greater Lexington Area, Fayette County Farm Bureau, \$18,000—Woods, T., Williamson, L.

Supporting and Enhancing the Role of SARE in Extension and Other Land-Grant University Programs in the South, Univ. of Georgia, \$90,305—Meyer, A.

Value-Added Targeted Marketing of Feeder Cattle, Kentucky Beef Network, \$67,200—Meyer, A., Johns, J.

Agriculture Extension Programs

Total—\$149,719

Contract for Services between SRRMEC and UK, Texas A&M Univ., \$4,000—Henning, J.

Salt River Basin Coordinator, Kentucky Department of Environmental Protection, \$92,000—Henning, J.

SARE Professional Development Program (PDP) Plan of Work, Univ. of Georgia, \$10,000—Deaton, P.

University of Kentucky Cooperative Extension Service Liaison, Kentucky Natural Resources Environmental Protection Cabinet, \$43,719—Henning, J.

Animal and Food Sciences

Total—\$3,095,083

American Beef Safety Symposium, Food Safety and Inspection Service, \$13,000—Mikel, W.

Commercialization Fund: Development of a Value-Added Food Processing Incubator, Kentucky Science and Technology Corporation Inc., \$75,000—Mikel, W., Newman, M.

Development of a Small Plant Mini-Audit Guide for Food Safety, Food Safety and Inspection Service, \$25,000—Mikel, W.

Effect of Diet on Horses with Cushing's Disease, Cooperative Research Farms, \$44,928—Lawrence, L.

Ethanol Production via Consolidated Bioprocessing, Advanced Bio-conversion Technologies, \$23,219—Strobel, H.

Food Safety Consortium, Food Safety and Inspection Service, \$185,000—Mikel, W., Newman, M.

HACCP Training for Meat Processors, Food Safety and Inspection Service, \$12,000—Mikel, W., Newman, M.

Identification of Pawpaw Genotypes with High Fruit Antioxidant Activity, Kentucky State Univ., \$53,086—Xiong, Y.

Joint Program in Extension Goat Production, Kentucky State Univ., \$15,245—Harmon, R.

Kentucky Cowpokes: A Youth Master Cattleman Program, Friends of Kentucky 4-H Inc., \$10,000—Burris, W., Anderson, L.

Master Cattleman Program, Kentucky Cattleman's Assoc., \$233,080—Burris, W., Anderson, L., Henning, J.

Mechanism of Oxidation-induced Functionality Changes of Myofibrillar Protein, Cooperative State Research Education and Extension, \$223,000—Xiong, Y., Alderton, A.

National Beef Cattle Evaluation Consortium, Cornell Univ., \$30,000—Bullock, K.

Proteomic Analysis of Ethanol Sensitivity and Tolerance of Thermophilic Anaerobic Bacteria, Department of Agriculture, \$330,000—Strobel, H.

Quality Attribute Characterization of Beef Long-Term Muscles, National Cattleman's Beef Assoc., \$50,109—Alderton, A., Mikel, W., Xiong, Y.

Sensory Properties and Microbiological Stability of Red Claw, Kentucky State Univ., \$80,671—Xiong, Y., Alderton, A.

Shared Faculty Position with CSREES/USDA, Cooperative State Research Education and Extension, \$40,000—Cromwell, G.

Small Plant Pilot Testing of a Unique HACCP System, Food Safety and Inspection Service, \$25,000—Mikel, W.

Superfund NIEHS, National Institute of Environmental Health Sciences, \$1,626,745—Hennig, B., Bastin, S., Gaetke, L., D'Angelo, E.

Arboretum

Total—\$15,000

Arboretum Educational Brochures and Interpretative Signage, Kentucky Natural Resources Environmental Protection Cabinet, \$15,000—Farris, M.

Associate Dean/Director

Total—\$932,895

Forage-Animal Production Research, Department of Agriculture, \$4,140—Cox, N., Boling, J., Harmon, R., Lawrence, L., Matthews, J., McLeod, K., Vanzant, E., Potter, D., Rieske-Kinney, L., Webb, B., Harrison, L., Collins, M., Witt, W., McDowell, K.

Forage-Animal Production Research, Department of Agriculture, \$10,000—Cox, N., Boling, J., Harmon, R., Lawrence, L., Matthews, J., McLeod, K., Vanzant, E., Potter, D., Rieske-Kinney, L., Harrison, L., Collins, M., Witt, W., McDowell, K.

Forage-Animal Production Research, Department of Agriculture, \$898,755—Cox, N., Boling, J., Harmon, R., Lawrence, L., Matthews, J., McLeod, K., Vanzant, E., Potter, D., Rieske-Kinney, L., Webb, B., Harrison, L., Collins, M., Witt, W., McDowell, K.

State Matching Funds for NSF Partnership Grant 4-66395, Kentucky Economic Development Cabinet, \$20,000—Cox, N.

Biosystems and Agricultural Engineering

Total—\$1,824,108

Biosystems and Agriculture Engineering Training-Educational Consortium for Sustainable Plant and Animal Production Systems, Department of Education, \$52,233—Gates, R., Montross, M.

CAN-Based Precision Seed Placement and Tracking of Genetically Modified Grain Crops, Kentucky Science and Technology Corporation Inc., \$14,986—Shearer, S., Montross, M., Stombaugh, T.

Cooperative Extension Program for Kentucky's Building Systems Energy Needs, Kentucky Department of Environmental Protection, \$63,066—Fehr, R., Gates, R.

Cooperative Extension Radon and Indoor Air Quality Education, Kentucky Department for Public Health, \$92,000—Piercy, L., Hash, G.

- Demonstration of a Performance-Based System of Storm Water and Erosion Controls in Georgia, Chattahoochee Flint Regional Development Center, \$27,886—*Warner, R., Agouridis, C.*
- Demonstration of Enhanced Technologies for Land Application of Animal Nutrient Sources in Sensitive Watersheds, Natural Resources Conservation Service, \$354,572—*Higgins, S., Coffey, R., C., Coyne, M., Dillon, C., Shearer, S.*
- Developing a Low-Cost Portable Vision Device for Inspecting Agricultural Products for Safety, Agricultural Research Service, \$130,960—*Gates, R.*
- Development of Robust, Automatic Calibration Algorithms for Online Detection of Diseased and Defective Poultry Carcasses, Agricultural Research Service, \$70,085—*Gates, R.*
- Effect of Enzyme Inhibitors on Ammonia Emissions in Broiler Houses, North Carolina State Univ., \$18,000—*Gates, R., Casey, K., Pescatore, A., Singh, A.*
- EnergyStar Energy Efficient State Fair Exhibit, Kentucky Natural Resources Environmental Protection Cabinet, \$1,434—*Fehr, R.*
- EnergyStar Energy Efficient State Fair Exhibit, Kentucky Natural Resources Environmental Protection Cabinet, \$22,700—*Fehr, R., Gates, R., Hash, G.*
- HP Technology for Teaching Grant Initiative—2004, Hewlett Packard Inc., \$7,500—*Warner, R., Agouridis, C., Dowdy, T., Fehr, R., Workman, S.*
- Kentucky Lead Education and Outreach Project, Univ. of Georgia, \$13,333—*Piercy, L., Henken, K.*
- Kentucky Lead Education and Outreach Project, Univ. of Georgia, \$11,905—*Piercy, L., Henken, K.*
- KSEF Emerging Ideas: Utilization of Nickel Nanoparticles to Facilitate the Recovery of Histidine Tagged Proteins, Kentucky Science and Technology Corporation Inc., \$15,000—*Crofcheck, C.*
- KSEF: Developing a System to Reconstruct Severely Disturbed Soil, Kentucky Science and Technology Corporation Inc., \$36,651—*Wells, L.*
- Mechanical Fractionation of Corn and Wheat Plant Residues for Increased Sugar, Idaho National Energy and Environment, \$58,103—*Shearer, S., Montross, M.*
- Mud, Horses, and Clean Water—A BMP Demonstration Project for Suburban Horse Owners, Kentucky Natural Resources Environmental Protection Cabinet, \$185,600—*Workman, S., Coleman, R.*
- Precision Agriculture: Precision Resource Management, Cooperative State Research Education and Extension, \$615,682—*Shearer, S., Dillon, C., Fleming, R., Grove, J., Kew, B., Lee, C., Mueller, T., Schwab, G., Stombaugh, T.*
- Tours of Ethanol and Biodiesel Production Facilities and Users Across Kentucky, Southern States Energy Board, \$24,412—*Crofcheck, C., McNeill, S., Montross, M., Nokes, S.*
- White Paper on Air Quality and Emissions from Livestock and Poultry Production Systems—Update, North Carolina State Univ., \$8,000—*Gates, R., Casey, K.*

Community and Leadership Development

Total—\$663,217

- Enhancing Alternative Niche Market and Retail Opportunities in Agriculture, Univ. of Georgia, \$47,127—*King, B.*
- Leadership Program to Stimulate the Entrepreneurial Culture in Tobacco-Dependent Counties of Northeast Kentucky, Kentucky Governor's Office of Agricultural Policy, \$516,220—*Hustedde, R., Scorsone, E., Jones, L.*
- Rebuilding Trust in Beef: The New Science-Based Food Safety Regime in Japan, National Science Foundation, \$74,870—*Tanaka, K., Schillo, K.*
- University of Kentucky Appalachian IDEAS Network: A Regional, Collegiate, Social Entrepreneurship Initiative, Appalachian Regional Commission, \$25,000—*Fink III, J., Maurer, R., Wilmoth, G.*

Dean's Office

Total—\$250,000

- The Kentucky Natural Products Alliance, Kentucky Economic Development Cabinet, \$250,000—*Smith, M., Cox, N., Davies, H.*

Entomology

Total—\$1,505,205

- 20 Hydroxycyclohexane Suppression of Juvenile Hormone Response, National Science Foundation, \$110,573—*Palli, S.*
- Characterization of EcR-Based Gene Switch, RheoGene, \$195,840—*Palli, S.*
- Cooperative Agricultural Pest Survey, Department of Agriculture, \$219,317—*Obrycki, J., Dillon, P.*
- Cooperative Agricultural Pest Survey, Department of Agriculture, \$10,000—*Obrycki, J., Dillon, P.*
- Cooperative Agricultural Pest Survey, Department of Agriculture, \$11,250—*Obrycki, J., Dillon, P.*
- Early Warning Systems to Detect and Suppress Eastern Tent Caterpillar on Horse Farms, Insect Pest Management Development, \$22,446—*Haynes, K.*
- Integrating IPM Strategies in On-Farm Wheat in Tennessee and Kentucky, Univ. of Tennessee, \$15,603—*Johnson, D., McNeill, S., Montross, M.*
- Interactions between the Oriental Chestnut Gall Wasp Chestnut Foliar Chemistry and Subsequent Herbivore Susceptibility, American Chestnut Foundation, \$4,000—*Rieske-Kinney, L.*
- KSEF R&D Excellence: A Quantitative Evaluation of the Bioaccumulation of Bt-Toxins within Predators in Kentucky Using Diagnostic Immunological Techniques, Kentucky Science and Technology Corporation Inc., \$10,495—*Obrycki, J., Harwood, J.*
- Molecular Analysis of Juvenile Hormone Action in *Heliothis virescens*, Department of Agriculture, \$260,033—*Palli, S.*
- Monitor Gypsy Moth Populations for Slow the Spread Program, Slow the Spread Foundation, \$50,000—*Obrycki, J., Harper, C.*
- Pesticide Applicator Training—Private Applicator Database, Kentucky Department of Agriculture, \$11,477—*Townsend Jr., L.*
- Pesticide Applicator Training—Private Applicator Database, Kentucky Department of Agriculture, \$55,000—*Townsend Jr., L.*
- Pesticide Management Strategic Plan for Beef Cattle in Tennessee and Kentucky, Univ. of Tennessee, \$4,760—*Sandell, L.*
- Progressive Investigation of Mare Reproduction Loss Syndrome, Kentucky Thoroughbred Owners and Breeders, \$273,415—*Webb, B., Donahue, J., Horohov, D., McDowell, K., Williams, N.*
- Recovery of Wood Vegetation Following Overstory Mortality from the Southern Pine Beetle—Phase I, Forest Service, \$43,000—*Rieske-Kinney, L.*
- Revegetation and Forest Succession of Southern Pine-Beetle Killed Shortleaf Stands in the Southern Appalachian/Cumberland Plateau Region, Forest Service, \$100,000—*Rieske-Kinney, L.*
- The Evolutionary Genetics of Sexual Size Dimorphism in a Seed-Feeding Beetle, National Science Foundation, \$12,000—*Fox, C.*
- Wolbachia Research Coordination Network, National Science Foundation, \$95,996—*Dobson, S.*

Family and Consumer Sciences

Total—\$1,629,495

- Cooperative Agreement with USDA/CSREES, Cooperative State Research Education and Extension, \$34,000—*Kurzynske, J.*
- Cooperative Agreement with USDA/CSREES-CYFAR Technical Assistant Liaison, Cooperative State Research Education and Extension, \$34,000—*Kurzynske, J.*
- Creating Mercury Safe Homes, Schools and Communities in the Southeast, Cooperative State Research Education and Extension, \$9,995—*Henken, K.*
- CYFERnet-Program, Cooperative State Research Education and Extension, \$155,200—*Kurzynske, J., Stivers, W.*
- CYFERnet-Program, Cooperative State Research Education and Extension, \$112,483—*Kurzynske, J., Stivers, W.*
- Health Education through Extension Leadership (HEEL), Department of Agriculture, \$968,241—*Tanner, B.*
- Healthy Weight Consensus Document, Kentucky Health Services Cabinet, \$10,000—*Tietyen, J.*
- Kentucky Food Stamp Nutrition Program, Kentucky Families and Children Cabinet, \$142,339—*Sigler, P., Tanner, B.*
- Nutrition Education Program, Kentucky Health Services Cabinet, \$53,709—*Tanner, B., Sigler, P.*

Providing Healthy Homes for Kentucky Families and Children, Georgia Cooperative Extension, \$15,300—*Henken, K.*
The Value-Added Microprocessor Project, Univ. of Georgia, \$94,228—*Bastin, S.*

Family Studies

Total—\$199,916

A Partnership to Promote Linkages among Assessment, Curriculum, and Outcomes in Order to Enhance School Success in Head Start Programs, Administration for Children and Families, \$199,916—*Hallam, R., Grisham-Brown, J.*

Forestry

Total—\$2,428,411

Biotic Control of Calcium Supply: Distinguishing Sources to Regrowing Forests, State Univ. of New York, \$37,247—*Arthur, M.*

Carbon Sequestration on Surface Mined Lands, Department of Energy, \$510,815—*Graves, D., Warner, R.*

Cerulean Warbler and Golden Wing Warbler Status and Distribution in Kentucky, Kentucky Department of Fish and Wildlife, \$3,000—*Maehr, D.*

Cerulean Warbler and Golden Winged Warbler Status and Distribution in Kentucky, Kentucky Department of Fish and Wildlife, \$50,000—*Maehr, D.*

Diet and Prey Abundance of the Ozark Big-Eared Bat in Northwest Arkansas, Arkansas Game and Fish Commission, \$24,000—*Lacki, M.*
Effects of an Exotic Pest and Geological Substrate on the Carbon and Nitrogen Dynamics in Northern Hardwood Forests, Institute of Ecosystems Studies, \$29,305—*Arthur, M.*

Establishing Baselines for Nitrogen Cycling in Mammoth Cave National Park Forests, National Park Service, \$19,975—*Arthur, M.*

Fire in the Southern Appalachians Fuel Stand Structure and Oaks, Forest Service, \$341,773—*Arthur, M.*

Forest Land Enhancement Program: Public Awareness, Publicity, and Training, Kentucky Natural Resources Environmental Protection Cabinet, \$40,000—*Stringer, J.*

Forest Land Enhancement Program: Public Awareness, Publicity, and Training, Kentucky Natural Resources Environmental Protection Cabinet, \$20,000—*Stringer, J.*

Forestry Stewardship Public Awareness, Publicity and Training, Kentucky Natural Resources Environmental Protection Cabinet, \$10,000—*Stringer, J.*

Habitat Use, Demography, and Landscape Ecology of the Black Bear in South Central Florida, Florida Fish and Wildlife Conservation, \$10,000—*Maehr, D.*

Hyporheic Zone Development and Water Quality Improvement in a Restored Riparian Area, Forest Service, \$7,000—*Barton, C.*

Implementing Strategies for Drying and Pressing Wood without Emissions Controls, Georgia Institute of Technology, \$73,296—*Conners, T.*
Influence of Riparian Management Prescriptions on the Use of Upland and Riparian Habitats by Bats in Forests of the Pacific Northwest, Northwest Bat Cooperative, \$86,000—*Lacki, M.*

Post-Mining Reforestation Demonstration Project IV, Forest Service, \$971,000—*Graves, D., Warner, R.*

Restoration of Elk and Colonization of Black Bear in Kentucky, Kentucky Department of Fish and Wildlife, \$125,000—*Maehr, D.*

Species Accounts for AWAKE Project, Kentucky Department of Fish and Wildlife, \$20,000—*Maehr, D.*

Status Distribution and Reproductive Characteristics of River Otters in Kentucky, Kentucky Department of Fish and Wildlife, \$25,000—*Lacki, M.*

Survey of Forest Bats in Managed Coniferous Forests of North-Central Idaho, Idaho State Department of Fish and Game, \$10,000—*Baker, M., Lacki, M.*

Water Quality and BMPs National Web-Based Learning Center, Univ. of Tennessee, \$15,000—*Stringer, J.*

4-H Central Operations

Total—\$256,725

Army Volunteer Coordinator Handbook, Cornell University, \$114,225—*Culp III, K.*

Positive Youth Development State and Local Collaboration Demonstration Project, Administration for Children and Families, \$120,000—*Delahanty, T., Kurth, J.*

Rural Youth's Participation in Leadership Activities, National FFA Organization, \$22,500—*Peiter, R., Nall, M., Rennekamp, R.*

Horticulture

Total—\$616,682

New Crop Opportunities Phase V, Department of Agriculture, \$615,682—*Ingram, D. Archbold, D., Geneve, R., Williams, M., Anderson, R., Dunwell, W., Rowell, A., Dillon, C., Fleming, R., Norikane, J., McNeill, S., Bitzer, M., Grabau, L., Mullen, M., Pearce, W., Pfeiffer, W., Van Sanford, D.*

Seed Vigor in Small-Seeded Flowers Using Computer-Aided Analysis, Fred C. Gloeckner Foundation, \$1,000—*Geneve, R.*

International Programs

Total—\$6,546

Scholarships for Thai Ministry of Agriculture Officials, Thai Ministry of Agriculture and Cooperatives, \$6,546—*Reed, M.*

Kentucky Tobacco Research and Development Center

Total—\$614,886

Development of Screens for Drugs in Alcohol Dependence, National Institute on Alcohol Abuse and Alcoholism, \$614,886—*Littleton, J.*

Livestock Disease Diagnostic Center

Total—\$472,700

Bovine Spongiform Encephalopathy Testing, Kentucky Department of Agriculture, \$20,000—*Harrison, L.*

Comprehensive Study of Equine Placentas in Health and Disease, Kentucky Thoroughbred Owners and Breeders, \$20,700—*Williams, N., Donahue, J., Vickers, M.*

Diagnostic Laboratory Services for Farmers and Agribusinesses, Kentucky Department of Agriculture, \$370,000—*Harrison, L.*

West Nile Surveillance of Horses and Birds, Kentucky Department for Public Health, \$62,000—*Harrison, L., Vickers, M.*

Merchandising, Apparel, and Textiles

Total—\$49,882

Preferences, Patronage Motives, and Choice of Retail Format: Implications for Tenant Mix Strategies, International Council of Shopping Centers, \$13,564—*Carpenter, J.*

Quality Control Laboratory For NAILM, National Assoc of Institutional Linen Management, \$36,318—*Easter, E.*

Plant and Soil Sciences (Agronomy)

Total—\$3,292,356

Accelerating the Development of FHB-Resistant Soft Red Winter Wheat Varieties, Department of Agriculture, \$50,566—*Van Sanford, D.*

Animal Health and Grazing Systems, Cooperative State Research Education and Extension, \$360,310—*Bush, L., Aaron, D., Dougherty, D., Ely, E., Harrison, L., Taylor, N., Vanzant, E.*

Assessment of the Current Status of Heavy Metals in Kentucky Soil Routinely Used for Tobacco, Philip Morris Inc., \$115,233—*Pearce, R., Matocha, C.*

Benefits of the Roundup Ready Alfalfa Weed Control System, Monsanto Co., \$3,000—*Slack, C.*

Burley Tobacco Breeding and Genetics, Philip Morris Inc., \$1,020,000—*Miller, R.*

Comparing Corn Fertility Practices on Rented and Owned Soils, Kentucky Corn Growers Assoc., \$4,000—*Lee, C., Riggins, S., Schwab, G.*

Cultivation of Running Buffalo Clover, Kentucky Natural Resources Environmental Protection Cabinet, \$750—*Taylor, N.*

Development of Soybeans as a Commercial Source of Epoxy Fatty Acids, United Soybean Board, \$29,031—*Hildebrand, D.*

Engineering Yeast for Terpene Production, R&D Voucher Award/Allylix-UK, Allylix, Inc., \$100,000—Chappell, J.

Improving Wheat Nitrogen Management on Wet Soils, Kentucky Small Grain Growers Assoc., \$4,000—Schwab, G., Grove, J., Murdock Jr., L.

Indirect Benefit of No-Till Wheat: Enhanced Yield of Rotational No-Till Corn and Soybean, Kentucky Small Grain Growers Assoc., \$8,000—Murdock Jr., L., Grove, J.

Indirect Benefit of No-Till Wheat: Enhanced Yield of Rotational No-Till Corn and Soybean, Kentucky Soybean Promotion Board, \$4,000—Murdock Jr., L., Grove, J.

Isolation and Characterization of Candidate Genes Involved in Normicotine Biosynthesis, North Carolina State Univ., \$49,980—Siminszky, B.

KSEF R&D Excellence: Selective Accumulation of Fatty Acids in Plant Oils, Kentucky Science and Technology Corporation Inc., \$34,956—Hildebrand, D.

Matching Soybean Cultivars to Soils, Kentucky Soybean Promotion Board, \$2,000—Lee, C., Egli, D., Grove, J.

Molecular Regulation and Transport of Sterols in Plants, National Science Foundation, \$112,751—Chappell, J.

Monitoring and Recommendations for the Prevention of MRLS, Kentucky Thoroughbred Owners and Breeders, \$190,000—Henning, J., Burton, H., Bush, L.

National Seed Science Distance Education Program, Colorado State Univ., \$16,003—Tekrony, D.

Owensboro Biotechnology Alliance, Industry Inc., \$30,000—Chappell, J.

Physiological Basis for Yield Reduction in No-Till Wheat, Kentucky Small Grain Promotion Council, \$5,000—Van Doren, S., Grabau, L.

Profitable Forage/Livestock Systems for Northeastern Kentucky, Kentucky Forage & Grasslands Council, \$355,602—Barrett, M., Ditsch, D., Henning, J.

Reduction of Cadmium Contents of Tobacco Leaves, Philip Morris Inc., \$166,258—Wagner, G.

Reduction of Cadmium Contents of Tobacco Leaves, Philip Morris Inc., \$309,517—Wagner, G.

Reduction of Saturated Fatty Acid Content of Soybean Oil, United Soybean Board, \$50,000—Hildebrand, D.

Reduction of Saturated Fatty Acid Content of Soybean Oil, United Soybean Board, \$52,000—Hildebrand, D.

Shifting Costs and Benefits of Systemic Endophyte Interactions with Native Grass Hosts, Arizona State Univ., \$20,395—Bush, L.

Soft Red Winter Wheat Breeding and Variety Development for Kentucky, Kentucky Small Grain Promotion Council, \$25,000—Van Sanford, D.

Soil Morphology Training Course, Kentucky Department for Public Health, \$45,000—Karathanasis, A.

Soybean Genetic Engineering for Increased Disease Resistance, Kentucky Soybean Promotion Board, \$16,000—Collins, G.

Soybean Management Verification Program, Kentucky Soybean Promotion Board, \$8,000—Lee, C., Herbek, J.

Soybean Tissue Culture and Genetic Engineering Center, Univ. of Georgia, \$89,534—Collins, G.

Watershed Education Professional Educators and Youth, Univ. of Georgia, \$15,470—Thom, W.

Plant Pathology

Total—\$1,164,771

Advanced Genetic Technologies, Department of Agriculture, \$560,895—Scharl, C., Hartman, J., Hunt, S., Sharkey, M.

CRUI: A Multidisciplinary Test of Mutualistic Benefits Fungal Endophytes Provide Their Host Plants, Hope College, \$69,000—Scharl, C.

Development of Management Strategies to Control Major Soybean Virus Diseases in the North Central States, Iowa State Univ., \$28,366—Ghabrial, S.

Dissecting the Mechanism of Viral RNA Recombination, National Institute of Allergy and Infectious Diseases, \$68,000—Nagy, P.

Fatty Acid Signaling Pathway and Its Role in Plant Defense, National Science Foundation, \$120,380—Kachroo, P., Kachroo, A.

Glycerolipid Metabolism and Its Role in Plant Defense, Department of Agriculture, \$50,000—Kachroo, P.

Incidence and Epidemiology of Major Virus Diseases in Soybean in Kentucky, Kentucky Soybean Promotion Board, \$10,000—Ghabrial, S., Hershman, D.

KSEF R&D Excellence: Genome-Wide Search of Oleate-Responsive Genes in Arabidopsis, Kentucky Science and Technology Corporation Inc., \$14,960—Kachroo, P., Kachroo, A.

KSEF: Characterization of Signaling Pathway(s) Required for Resistance to Viral and Oomycete Pathogens, Kentucky Science and Technology Corporation Inc., \$14,960—Kachroo, P.

Molecular Biology and Biosynthesis of Lolines by Grass Endophytes, National Science Foundation, \$135,000—Scharl, C.

Southern Region Plant Diagnostic Laboratory Network Kentucky Co-operating National Plant, Univ. of Florida, \$1,500—Nesmith, W.

Studies on Quadris Fungicide and Warrior Insecticide Use on Soybean in Kentucky, Kentucky Soybean Promotion Board, \$10,000—Hershman, D., Herbek, J., Johnson, D.

Whole Genome Analysis of Pathogen-Host Recognition and Subsequent Responses in the Rice Blast Patho-System, North Carolina State Univ., \$81,710—Farman, M.

Regulatory Services

Total—\$29,792

Medicated Feed Mill and BSE Rule Inspections, Food and Drug Administration, \$29,792—Traylor, S., Miller, C.

Tracy Farmer Center for the Environment

Total—\$12,500

All Wild about Kentucky's Environment (AWAKE): Virtual Outdoor Encyclopedia, Kentucky Department of Fish and Wildlife, \$12,500—Hanley, C.

Veterinary Science

Total—\$693,707

EIA Vaccine Trial, Univ. of Pittsburgh, \$45,000—Issel, C.

ELAV Envelope Variation and Vaccine Efficacy, Univ. of Pittsburgh, \$224,322—Issel, C.

Exploration of a Single Nucleotide Polymorphism in the GALK1 Gene as a Potential Marker for Juvenile Cataracts in the Boston Terrier, AKC Canine Health Foundation, \$5,397—Graves, K.

Functional Genomics for Horses, Morris Animal Foundation, \$100,000—Bailey, E.

Genetic Determinants of Equine Herpesvirus-1 Neurological Disease, Grayson Jockey Club Research Foundation Inc., \$30,000—Allen, G.

Production of Antibodies to Selected Equine Cytokines, Grayson Jockey Club Research Foundation Inc., \$36,800—Horohov, D.

Quality Assurance/Blind Sample Testing and New Analytical Methods/Metabolite Synthesis/Standardized Testing Research, Kentucky State Racing Commission, \$50,000—Tobin, T.

Respiratory Immune Response of Young Foals, Grayson Jockey Club Research Foundation Inc., \$72,250—Horohov, D.

Systemically Immunogenic Surface and Secreted Proteins of *S. equi*, Grayson Jockey Club Research Foundation Inc., \$42,450—Timoney, J., Artiushin, S.

Testing of a Pfizer Equine Influenza Vaccine 2004, Pfizer Inc., \$42,458—Chambers, T.

The Effect of Age on Immune Responses to Equine Herpesvirus-1, Pfizer Inc., \$45,030—Horohov, D.

Multi-Disciplinary Grants Led by Other Colleges

(College of Agriculture co-investigators are listed.)

Total—\$1,674,863

Brain Endothelial Cell TNF and Tat-Induced Cell Injury, National Institute of Mental Health, \$253,400—Hennig, B.

Development of a Novel Optical Radiation Depolarization Technique for On-Line Measurements of Particle and Bubble Sizes, Virginia Polytechnic Institute and State University, \$77,745—Croscheck, C.

Ethanol, Tat and Dysfunction of Brain Endothelium, National Institute on Alcohol Abuse and Alcoholism, \$147,000—Hennig, B.

Evaluation of SSARE-Funded Research, University of Georgia, \$50,000—Tanaka, K.

Southeast Center for Agricultural Health and Injury Prevention, Center for Disease Control and Prevention, \$800,794—Isaacs, S., Jouridine, L.

State Water Resources Research Institute Grant, United States Geological Survey, \$92,524—Coyne, M., Matocha, C.

Tat-Mediated Brain Endothelial Cell Dysfunction, National Institute of Neurological Disorders and Stroke, \$253,400—Hennig, B.

Intellectual Property

Patents Issued

Animal and Food Sciences

J.C. Matthews, co-inventor with G.M. Davenport (The IAMS Company) received a patent for "Compositions and Methods for Increasing Amino Acid Absorption in Mammals." Patent No. 6803186. Issued October 12.

Horticulture

Robert Houtz and co-inventors L. Dirk and M. Williams received a patent for "Inhibitors of plant peptide deformylase for use as broad-spectrum herbicides." Patent No. 6,730,634. Issued May 4.

Plant Pathology

Mark L. Farman, co-inventor with Sally A. Leong (University of Wisconsin) received a patent for "Cultivar specificity gene from the rice pathogen *Magnaporthe grisea*, and methods of use." Patent No. 6,794,176B1. Issued Sept. 21.

Plant and Soil Sciences (Agronomy)

George Wagner and co-inventors G.S. Gan, E. Wang, and R. Wang received a patent for "Plant trichome gland specific promoter sequence." Patent No. 6,730,826. Issued May 4.

Genbank Register

Entomology

Harwood, J.D. *Bathyphantes pallida* Cytochrome oxidase (subunit I) mtDNA. ACCESSION AY944732.

Harwood, J.D. *Grammonota inornata* Cytochrome oxidase (subunit I) mtDNA. ACCESSION AY944733.

Harwood, J.D. *Acyrtosiphon pisum* Cytochrome oxidase (subunit I) mtDNA. ACCESSION AY944734.

Plant Pathology

Farman, M.L. *Magnaporthe grisea* isolate GG3H 5-1 cytochrome b (cytb) gene ACCESSION AY245427.

Farman, M.L. *Magnaporthe grisea* isolate LpMD01-1 cytochrome b (cytb) gene ACCESSION AY245426.

Farman, M.L. *Magnaporthe grisea* isolate CHW cytochrome b (cytb) gene ACCESSION AY245425.

Farman, M.L. *Magnaporthe grisea* isolate Guy11 cytochrome b (cytb) gene ACCESSION AY 245424.

Schardl, C. L. Evolution of Epichloe and Neotyphodium species, fungal symbionts of grasses. ACCESSIONS AF457466-AF457545, AF532922-AF532924, AY137610-AY163835, AY166645-AY166649, AY723749, AY723750, AY724686.

Zhang, C., and S.A. Ghabrial. Characterization of an intermolecular recombinant RNA1 from a partial diploid strain of Bean pod mottle virus. Genomic RNA1 (subgroup I), RNA1 (subgroup II) and RNA2 (subgroup I), complete cds. ACCESSIONS AY44931, AY44932, AY44933, respectively.

Plant and Soil Sciences (Agronomy)

Addepalli, B., and A.G. Hunt. Rice gene encoding poly(A) polymerase, chromosome 6. Definition: *Oryza sativa* (indica cultivar-group) clone OS6811505 putative polynucleotide adenyltransferase mRNA, complete cds. ACCESSION No. AY785762.

Addepalli, B., and A. G. Hunt. Rice gene encoding poly(A) polymerase, chromosome 6, Definition: *Oryza sativa* (indica cultivar-group) clone OS6b4213643 putative polynucleotide adenyltransferase mRNA, complete cds. ACCESSION No. AY785763.

Addepalli, B., and A.G. Hunt. Rice gene encoding poly(A) polymerase, chromosome 3. Definition: *Oryza sativa* (indica cultivar-group) clone OS13346 putative polynucleotide adenyltransferase mRNA, partial cds. ACCESSION No. AY785764.

Addepalli, B., and A. G. Hunt. Rice gene encoding poly(A) polymerase, chromosome 2. Definition: *Oryza sativa* (indica cultivar-group) clone OS374212643 putative polynucleotide adenyltransferase mRNA, complete cds. ACCESSION No. AY785765.

Fukushige, H., and Hildebrand, D. Definition: *Citrullus lanatus* 13-hydroperoxide lyase mRNA, complete cds. ACCESSION No. AY703450.

Shepherd, R.W., W.T. Bass, R.L. Houtz, and G. Wagner. Phylloplanin cDNA sequence. Definition: *Nicotiana tabacum* phylloplanin gene, phylloplanin precursor, gene, complete cds. ACCESSION No. AY705384.

Wang, E., and G. Wagner. CBToI cyclase genomic. Definition: *Nicotiana tabacum* cultivar T.I. 1068 cyclase gene, complete cds. ACCESSION No. AY495694.

Veterinary Science

Howe, D.K. Sarcocystis EST Sequencing Project. 6,900 EST (express sequence tags) submitted. CO729986-CO730740, CO746907-CO749246, CO905556-CO905796, CV089638-CV090193, CV191779-CV194581, CV467807-CV468011.

Publications

All publication dates in this section are 2004 unless otherwise noted.

Annual Report

One Hundred and Sixteenth Annual Report of the Kentucky Agricultural Experiment Station for 2003. College of Agriculture, University of Kentucky, M. Scott Smith, Director. June.

Books and Book Chapters

Agricultural Economics

Dasgupta, Sid, Forrest Wynne (both of Kentucky State University), Angela Caporelli (Kentucky Department of Agriculture), and Lee Meyer. Processing and marketing aquaculture products on a small scale (a 95-page workbook developed under a USDA/RMA grant). Kentucky State University, Frankfort.

Freshwater, David. Delusions of grandeur: the search for a vibrant rural America. pp. 29-50. IN: G. Halseth and R. Halseth, eds. *Building for Success: Exploration of Rural Community and Rural Development*. Rural Development Institute, Brandon University: Brandon, MB.

Infanger, Craig. Technical assistance to Armenian agribusiness: promising but still determinate. Chapter 8. IN: David A.J. Macey et al., eds. *Building Market Institutions in Post-Communist Agriculture: Land, Credit, and Assistance*. Lexington Books, New York.

Skees, Jerry R., and Jason Hartell. New instruments for risk management: index contracts variability. *The Management of Risk in Agriculture: Instruments and Policies*. Forum Internazionale Dell' Agricoltura e Dell' Alimentazione (in Italian).

Animal and Food Sciences

Alderton, A.L. Proteomics. IN: Jensen, W., C. Devine, and M. Dikeman, eds. *Encyclopedia of Meat Science*. Elsevier Ltd., Oxford, UK.

Cromwell, G.L. Nutrition: Pigs. IN: *The Merck Vet Manual*. Merial Publication Service, Duluth, Ga.

Cromwell, G.L. Iron toxicity in newborn pigs. IN: *The Merck Vet Manual*. Merial Publication Service, Duluth, Ga.

Cromwell, G.L. Feed supplements: antibiotics. IN: W.G. Pond and A.W. Bell, ed. *Encyclopedia of Animal Science*. Marcel Dekker, New York.

Matthews, J.C. Expression and function of non-organelle glutamate transporters to support peripheral tissue function. Chapter 1, pp. 1-30. IN: S. Gill and O. Pulido, eds. *Glutamate Receptors in Peripheral Tissues: Excitatory Transmission Outside the Central Nervous System*. Kluwer Academic/Plenum Press, New York.

Xiong, Y.L. Chemical and physical characteristics of meat: protein functionality. pp. 218-225. IN: Jensen, W.K., C. Devine, and M. Dikeman, eds. *Encyclopedia of Meat Sciences*. Elsevier, Oxford, UK.

Xiong, Y.L. Muscle proteins. Chapter 5, pp. 100-122. IN: Yada, R., ed., *Proteins in Food Processing*. Woodhead Publishing, Cambridge, UK.

Xiong, Y.L. Functional foods from meat animals. Chapter 11, pp. 289-302. IN: Shi, J., Ho, C.T., and Shahidi, F., ed. *Asian Functional Foods*. Marcel Dekker Inc., New York.

Xiong, Y.L., L. Wang, E.A. Pena-Ramos, and C. Wang. Antioxidant activity of hydrolyzed whey, soy, and yeast proteins. pp. 315-322. IN: Lyons, T.P., and Jacques, K.A., ed., *Nutritional Biotechnology in the Feed and Food Industries*. Nottingham University Press, Nottingham, UK.

Biosystems and Agricultural Engineering

Warner, R.C., and C.T. Agouridis. Stream channel construction. IN: *Handbook of Western Reclamation Techniques*, Section II: Hydrology. U.S. Department of Interior, Office of Surface Mining. 62 pp.

Entomology

Carde, R.T., and K.F. Haynes. Structure of pheromone communication in moths. pp. 283-332. IN: J. Millar and R. Carde, eds. *Advances in Chemical Ecology*. Cambridge University Press, Cambridge, UK.

Haynes, K.F. Chemical mimicry. IN: J. Hardege, ed. *Chemical Ecology: EOLSS-UNESCO*. (www.eolss.net).

Held, D.W., and D.A. Potter. June beetles (Phyllophaga spp.). pp. 1225-1228. IN: J. Capinera, ed. *Encyclopedia of Entomology*. Kluwer Publ., Dordrecht, The Netherlands.

Potter, D.A. Japanese beetle. pp. 1215-1217. IN: J. Capinera, ed. *Encyclopedia of Entomology*. Kluwer Publ., Dordrecht, The Netherlands.

Rogers, M.E., and D.A. Potter. Tiphidae parasitic on white grubs. pp. 2269-2271. IN: J. Capinera, ed. *Encyclopedia of Entomology*. Kluwer Publ., Dordrecht, The Netherlands.

Webb, B.A., N.E. Beckage, Y. Hayakawa, P.J. Krell, B. Lanzrein, M.R. Strand, D.B. Stoltz, and M.D. Summers. Polydnviridae. pp. 253-259. IN: C. Fauquet et al., ed. *Virus Taxonomy*. Academic Press, New York.

Family Studies

Not available at the time of publication.

Forestry

Hector, T.S., M.H. Carr, P.D. Zwick, and D.S. Maehr. The Florida Statewide Greenways Project: its realisation and political context. pp. 222-250. IN: R. Jongman and G. Pungetti, ed. *Ecological Networks and Greenways: Concept, Design, Implementation*. Cambridge University Press, Cambridge, UK.

Koo, B.J., D.C. Adriano, N.S. Bolan and C.D. Barton. Plant root exudates. pp. 421-428. IN: *Encyclopedia of Soils in the Environment*. Academic Press.

Maehr, D.S. Dispersal and colonization in the Florida panther: over-coming landscape barriers—real and perceived. pp. 179-196. IN: N. Fascione, A. Delach, and M.E. Smith, ed. *People and Predators: From Conflict to Coexistence*. Island Press, Washington, D.C.

Horticulture

Geneve, R.L. Vigor testing in flower seeds. pp. 311-332. IN: M.B. McDonald and F. Kwong, ed. *Flower Seeds, Biology, and Technology*. CAB International, London.

Merchandising, Apparel, and Textiles

Michelman, S.O. Religious clothing in the West. IN: Lindsay Jones, ed. *Encyclopedia of Religion*. 2nd ed. MacMillan, New York.

Michelman, S.O., and K.A. Miller-Spillman. Gender dress and fashion. IN: V. Steele, ed. *Encyclopedia of Clothing and Fashion*. Scribners, New York.

Plant and Soil Sciences (Agronomy)

Baskin, C.C., and J.M. Baskin. Determining dormancy-breaking and germination requirements from the fewest seeds. pp. 162-179. IN: E. Guerrant, K. Havens, and M. Maunder, ed. *Strategies for Survival*. Island Press, Washington.

Coyne, M.S., and W.W. Frye. Nitrogen in soils: cycle. pp. 13-20. IN: D. Hillel, ed. *Encyclopedia of Soils in the Environment*. Vol. III. Elsevier Ltd., New York.

Hildebrand, D., K. Yu, C. McCracken, and S. Rao. Fatty acid changes. Chapter 3. IN: Denis J. Murphy, ed. *Plant Lipids: Biology, Utilization and Manipulation*. Blackwell Publishing, Oxford, UK.

Plant Pathology

Ghabrial, S.A., and K.W. Buck. Rhizidiovirus. pp. 229-230. IN: C.M. Fauquet, M.A. Mayo, J. Maniloff, U. Desselberger, and L.A. Ball, ed. *Virus Taxonomy*. 8th Report of the ICTV. Elsevier/Academic Press, London.

Ghabrial, S.A., K.W. Buck, B.I. Hillman, and R.G. Milne. Partitiviridae. pp. 581-590. IN: C.M. Fauquet, M.A. Mayo, J. Maniloff, U. Desselberger, and L.A. Ball, ed. *Virus Taxonomy*. 8th Report of the ICTV. Elsevier/Academic Press, London.

- Ghabrial, S.A., D. Jiang, and J.R. Caston. Chrysoviridae. pp. 591-595. IN: C.M. Fauquet, M.A. Mayo, J. Maniloff, U. Desselberger, and L.A. Ball, ed. *Virus Taxonomy*. 8th Report of the ICTV. Elsevier/Academic Press, London.
- Schardl, C.L., J.D. Blankenship, M.J. Spiering, and C. Machado. Loline and ergot alkaloids in grass endophytes. pp. 427-448. IN: Z. An, ed. *Handbook of Industrial Mycology*. Marcel-Dekker Inc., New York and Basel.
- Schardl, C.L., A. Leuchtmann, and M.J. Spiering. Symbioses of grasses with seedborne fungal endophytes. pp. 315-340. IN: D.P. Delmer and S. Merchant, ed. *Annual Review of Plant Biology*. Volume 55. Annual Reviews, Palo Alto.

Veterinary Science

- Allen, G.P. Equine rhinopneumonitis. Chapter 2.5.7, pp. 707-716. IN: *OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*. 5th ed. OIE Press, Paris.
- Allen, G.P., J.H. Kydd, J.D. Slater, and K.C. Smith. Equid herpesvirus 1 (EHV-1) and equid herpesvirus 4 (EHV-4) infections. Chapter 102. IN: J.A.W. Coetzer, G.R. Thomson, and R.C. Tustin, ed. *Infectious Diseases of Livestock*. Oxford Press, Capetown.
- Allen, G.P. and M.J. Murray. Equid herpesvirus 2 (EHV-2) and equid herpesvirus 5 (EHV-5) infections. Chapter 104. IN: J.A.W. Coetzer, G.R. Thomson, and R.C. Tustin, ed., *Infectious Diseases of Livestock*. Oxford Press, Capetown.
- Allen, G.P., and N.W. Umphenour. Equine coital exanthema. Chapter 103. IN: J.A.W. Coetzer, G.R. Thomson, and R.C. Tustin, ed., *Infectious Diseases of Livestock*. Oxford Press, Capetown.
- Timoney, J.F. Strangles. IN: J.A.W. Coetzer, G.R. Thomson, and R.C. Tustin, ed., *Infectious Diseases of Livestock*. Oxford Press, Capetown.
- Timoney, J.F. Streptococcus. pp. 23-42. IN: C.L. Gyles, J.F. Prescott, J.G. Songer, and C.O. Thoen, ed., *Pathogenesis of Bacteria Infections in Animals*. 3rd ed. Blackwell Publishing, Ames, Iowa.
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Family Studies

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- In addition, members of the department published 13 abstracts.
- Horticulture**
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- A.B. Downie contributed to one publication with the primary author in the Department of Plant and Soil Sciences (Agronomy).
- In addition, members of the department published 33 abstracts.
- Livestock Disease Diagnostic Center**
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K. Addo contributed to one publication with the primary author in *Animal and Food Sciences*.

In addition, members of the department published 23 abstracts.

Plant and Soil Sciences (Agronomy)

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Mark Coyne contributed to two publications with the primary author in the Department of Biosystems and Agricultural Engineering and to one publication with the primary author in the Department of Horticulture.

Randy Dinkins contributed to one publication with the primary author in the Department of Horticulture.

David Hildebrand contributed to one publication with the primary author in the Department of Plant Pathology.

Arthur Hunt contributed to one publication with the primary author in the Kentucky Tobacco Research and Development Center.

In addition members of the department published 110 abstracts.

Plant Pathology

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In addition, members of the department published 24 abstracts.

Veterinary Science

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- Karen McDowell contributed to one publication with the primary author in the Department of Entomology.
- In addition, members of the department published 20 abstracts.

Other Research Publications

Agricultural Economics

- Burdine, Kenneth H., Leigh J. Maynard, and A. Lee Meyer. Understanding the market for Holstein steers. AEC Staff Paper No. 447. August.
- Burdine, K.H., J.T. Johns, A.L. Meyer, P. Scharko, P. Deaton, and J. Akers, 2003 summary of the five state beef initiative in Kentucky. 2003 Research and Extension Beef Report, UK Ag. Experiment Station, SR-2004.
- Debertin, David L., and Stephan J Goetz. A social capital and economic growth: a new model for rural communities. Proceedings, Southern Community Development Educators' Conference: New Beginnings, New Horizons, Tampa, Fla., May 19-21.
- Dillon, C., J. Salim, and M. Kanakasabai. The impact of farmer risk preference on optimal nutrient management zone delineation. 7th International Conference on Precision Agriculture, Minneapolis, Minn., July 25-28.
- Fleming, Ronald A. An econometric analysis of the environmental benefits provided by the conservation reserve program. Invited paper. Southern Agricultural Economics Association Annual Meeting. Tulsa, Okla., Feb. 14-18.
- Fleming, Ronald A., and Michael H. Thomas. New regulations governing concentrated animal feeding operations require new solutions: discussion, Invited paper. Southern Agricultural Economics Association Annual Meeting. Tulsa, Okla., Feb. 14-18.
- Freshwater, David. Local development and the roles of community. Contract report for Agriculture and Agri-Food Canada. May.
- Freshwater, David. Rural development trends. Plenary session, putting the pieces together. 2nd Mississippi Rural Development Conference, Hattiesburg, Miss. Invited paper. April. (Published on a CD).
- Gandonou, J., and C.R. Dillon. The potential of precision agriculture in a developing country: cotton in Benin. 7th International Conference on Precision Agriculture. Minneapolis, Minn., July 25-28. (Published on a CD)
- Infanger, Craig. U.S. and Kentucky economic outlook, Fall 2004. *ESM-30*. October.
- Isaacs, Steve, Stephanie Goode, Richard Trimble, Lee Meyer, Kenny Burdine, and Terry Hutchens. Livestock enterprise budgets for Kentucky, Department of Agricultural Economics, University of Kentucky. July.
- Isaacs, Steve, Stephanie Goode, and Richard Trimble. Field crop enterprise budgets for Kentucky, ver. 4.1, Department of Agricultural Economics, University of Kentucky, July.
- Kumar, Sanjeev, and Mary A. Marchant. Demand determinants for U.S. processed food exports to emerging/low- and middle-income countries. Department of Agricultural Economics Staff Paper #453, University of Kentucky, August. Paper selected for presentation at the American Agricultural Economics Association (AAEA) annual meeting, Denver, Colo. August. Paper also available on AgEcon Search at URL: <http://agecon.lib.umn.edu>.
- Marchant, Mary A., Courtney P. Murrell, and Jun Zhuang. Investment analysis of replacing endophyte-infected with endophyte-free tall fescue pastures. Department of Agricultural Economics Staff Paper #446, University of Kentucky, February. Paper selected for presentation at the SAEA annual meeting, Tulsa, Okla. February.
- Maynard, L.J., and R. Heifner. The milk pricing system, milk price variability, and hedging milk price risk. Dairy Options Pilot Program and Risk Management in Dairy, Report to the Risk Management Agency, USDA. July.
- Miriri, Kimathi, and Eric Scorsone. Prospects for agricultural entrepreneurship among resource-limited farmers in the central Appalachian tobacco belt. UK Center for Poverty Research discussion paper 2004-02.
- Novak, James L., Larry Sanders, and Lee Meyer. How to maintain the middle of the road when studying controversial issues. Part 1, Farm Foundation Issue Report. Fall.

- Pagoulatos, A., Risk and uncertainty in environmental and natural resource economics. Book review. *American Journal of Agricultural Economics*. December.
- Peng, Xuehua, Mary A. Marchant, and Michael R. Reed. Identifying monetary impacts on food prices in China: a VEC model approach. Department of Agricultural Economics Staff Paper #449, University of Kentucky. August. Paper selected for presentation at the AAEA annual meeting, Denver, Colo. August.
- Peng, Xuehua, Mary A. Marchant, and Yuewei Yu. Price linkages across agricultural products in China: A Zhejiang province case study in China's agricultural sector: markets, myths, and mavens. pp. 126-146. T. Wahl and B. Sternquist, ed. *Proceedings, Assessing China as a Market and Competitor WCC-101 Research Project*. East Lansing, Mich., April 19-20. Conference proceedings available at URL: <http://www.china.wsu.edu/>.
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- Skees, Jerry R. A policy proposal for livestock insurance in Mongolia. Working Paper to Policy Makers in Mongolia Used for Video Conference, Jan. 19.
- Skees, Jerry. Innovation in agricultural insurance: linkages to microfinance. Invited paper. *Proceedings, Innovaciones en las Microfinanzas*, Santa Cruz de la Sierra, Bolivia, May 10-11.
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- Zhuang, Jun, Mary A. Marchant, Sue Nokes, and Herbert Strobel. Economic analysis of cellulase production by *Clostridium thermocellum* in solid state and submerged fermentation Department of Agricultural Economics Staff Paper #450, University of Kentucky. August. Paper selected for presentation at the AAEA annual meeting, Denver, Colo. August. Paper also available on AgEcon Search at URL: <http://agecon.lib.umn.edu>.

Animal and Food Sciences

- Cromwell, G.L., and G.F. Hartnell. Animal nutrition studies on biotechnology-derived foods/crops. *Proceedings, 11th Animal Science Congress. Asian-Australian Association of Animal Production Societies*, Kuala Lumpur, Malaysia, Sept. 5-9.
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- Hanson, K.C., K.R. McLeod, and D.L. Harmon. Effect of supplemental energy source on performance of growing beef heifers fed drought-damaged corn silage. p. 8. 2004 Beef Research Report. Kentucky Agr. Report SR-2004-2.
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- Lindemann, M.D. A broader perspective of the benefits of using chromium in sow diets. *Proceedings, Prince Agra Products 24th Annual Feed Ingredient Conference*, Des Moines, Iowa. 10 p. on CD of proceedings.
- Lindemann, M.D., and J.H. Agudelo. An update of continuing research evaluating Stafac® in a variety of situations with finishing pigs. *Proceedings, Phibro Animal Health Symposium*, Des Moines, Iowa. 6 p. on CD of proceedings.
- Pescatore, A.J., K.D. Casey, R.S. Gates, M.J. Ford, E.F. Wheeler, and H. Xin. Ammonia emissions from broiler houses during three consecutive flocks. *Proceedings, 22nd World's Poultry Congress*, Istanbul, Turkey.
- Pescatore, A.J., and M.J. Ford. Variation in the capacity of ventilation fans in broiler houses as determined by fan analysis numeration system. *Proceedings, 22nd World's Poultry Congress*, Istanbul, Turkey.
- Rademacher, M., M. Lindemann, and S. Illan. Effectiveness of liquid MHA-FA compared with DL-methionine. 1 p. *Proceedings, 8th Conference on Pig and Poultry Nutrition*, Wittenberg, Germany.

Biosystems and Agricultural Engineering

- Agouridis, C.T., D.R. Edwards, S.R. Workman, J.R. Bicudo, J.L. Taraba, E.S. Vanzant, and R.S. Gates. Effects of cattle grazing and BMPs on stream water quality. Paper No. 04-2131, ASAE International Meeting, Ottawa, Ontario, Aug. 1-4.
- Agouridis, C.T., D.R. Edwards, S.R. Workman, J.R. Bicudo, J.L. Taraba, E.S. Vanzant, and R.S. Gates. Streambank erosion associated with grazing practices in central Kentucky. Paper No. 04-2227, ASAE International Meeting, Ottawa, Ontario, Aug. 1-4.
- Agouridis, C.T., D.R. Edwards, S.R. Workman, J.R. Bicudo, J.L. Taraba, E.S. Vanzant, and R.S. Gates. Influence of BMPs on cattle position preference. Paper No. 04-2182, ASAE International Meeting, Ottawa, Ontario, Aug. 1-4.
- Barnett, J.R., R.C. Warner, and D.R. Edwards. The effectiveness of a combination weep berm-grass filter control system for reducing fecal coliforms and nutrients from surface runoff. Paper No. 04-2181, ASAE International Meeting, Ottawa, Ontario, Aug. 1-4.
- Botts, S., and R. Warner. Incorporating Indigenous Technologies into an Enhanced Stormwater Erosion and Sediment Control System. 2004 SME Annual Meeting and Exhibit. Denver, Colo., Feb. 23-25.
- Bridges, T.C., L.G. Wells, W.O. Peterson, and M. Peters. Ongoing evaluation of labor requirements for conventional stripping of burley tobacco. 41st Tobacco Workers Conference, Nashville, Tenn., Jan. 20-23.
- Casey, K.D., R. S. Gates, E.F. Wheeler, H. Xin, J.S. Zajackowski, P.A. Topper, and Y. Liang. Ammonia emissions from Kentucky broiler houses during winter, spring, and summer. Paper #629, Air and Waste Management Association Conference, Indianapolis.
- Castillo, M., Payne, F.A., López, M.B., Ferrandini, E., and Laencina, J. Sensores ópticos para la monitorización y control de procesos en la elaboración de queso. III Congreso Español de Ingeniería de Alimentos, CESIA 2004. Pamplona, Spain, 15-17 Sept.
- Castillo, M., Payne, F.A., López, M.B., Ferrandini, M.B., and Laencina, J. Development of a fiber optic sensor to measure low fat concentration in goats' whey. 9th International Congress on Engineering and Food. Montpellier, France, 7-11 Mar.
- Castillo, M., Payne, F.A., López, M.B., Ferrandini, M.B., and Laencina, J. Kinetic of syneresis during goats' cheese manufacturing. 9th International Congress on Engineering and Food. Montpellier, France, 7-11 March.
- Castillo, M., Payne, F.A., and Lucey, J.A. Gelation time and curd setting predictions on cottage cheese by light backscatter. ASAE/CSAE Annual International Meeting, Ottawa, Ontario, Aug. 1-4.
- Castillo, M., Payne, F.A., and Mengüç, M.P. Syneresis sensor technology development for curd moisture content control. 2nd Annual Kentucky Innovation and Enterprise Conference, Lexington, Ky., 3 March.
- Castillo, M., Payne, F.A., and Mengüç, M.P. Large field of view light backscatter sensor for monitoring whey syneresis and control curd moisture content. 2nd International Scholar Poster Session, Lexington, Ky., 14 April.
- Castillo, M., Lucey, J.A., Wang, T., and Payne, F.A. Gel microstructure, permeability, and syneresis kinetics of cottage cheese-type gels made under different gelation rates. ADSA Annual Meeting, St. Louis, Mo., 25-29 July.
- Castillo, M., Lucey, J.A., and Payne, F.A. Rheological and light scattering properties of cottage cheese-type gels made under different gelation rates. ADSA Annual Meeting, St. Louis, Mo., 25-29 July.
- Chinn, M.S., S.E. Nokes, and H.J. Strobel. Saccharification of avicel and paper pulp using cellulolytic enzymes produced by *Clostridium thermocellum* in solid substrate cultivation. Paper No. 04-5067. ASAE Annual International Meeting, Ottawa, Ontario, Aug. 1-4.
- Cole, J.T., T.S. Stombaugh, and S.A. Shearer. Development of a test track for evaluation of GPS receiver dynamic performance. Paper No. 04-1060. ASAE Annual International Meeting, Ottawa, Ontario, Aug. 1-4.
- Colliver, D.G. Advanced energy design guide: small office buildings. ASHRAE SP-120. National Building Energy Codes Workshop, Philadelphia, Pa., Oct. 13. http://www.energycodes.gov/news/2004_workshop/presentations/building-science/ashrae_sp-102.pdf.
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- Crofcheck, C.L. Utilizing foam fractionation to recover a wide range of proteins: from wastes to pharmaceuticals. Paper No. 04-7012. ASAE Annual International Meeting, Ottawa, Ontario, Aug. 1-4.
- Crofcheck, C., J. Wade, M. Jay, P.M. Brummer, I. Maiti, and S. Patta-naik. Improved recovery of engineering pharmaceutical proteins from tobacco extract. 2nd Annual Innovation and Enterprise Conference, Louisville, Ky.
- Darr, M.J., T.S. Stombaugh, and S.A. Shearer. Development of CAN based distributed control system for autonomous vehicle guidance. ASAE Paper No. 04-1155, St. Joseph, Mich.
- Davis, J.D., J.L. Purswell, J.R. Bicudo, E.S. Vanzant, and R.S. Gates. Methods of remote, continuous temperature detection in beef cattle. Paper No. MC04-202, Mid-Central Section of the ASAE, St. Joseph Mich., 25-26 March.
- Duncan, G.A., Calvert J., Smith D., and Middleton D.C. Further studies of fertility levels and barn and chamber curing environments of TSNA formation in burley tobacco. Abstract Program and Abstracts, 2004 CORESTA Congress, Kyoto International Conference Hall, Kyoto, Japan, Oct. 3-7.
- Fulton, J.P., and L.G. Wells. A mechanism for reconstruction of surface-mined lands. Proceedings, 4th Ohio Department of Minerals Resource Management Applied Research Conference, Ohio University, Athens, Ohio, Dec. 8-9.
- Fulton, J.P., and L.G. Wells. Soil reconstruction on surface-mined land using a prototype mechanical system. Proceedings, 2004 National Meeting of the American Society of Mining and Reclamation and 25th West Virginia Surface Mine Drainage Task Force, Morgantown, W.Va., April 18-24.
- Fulton, J.P., S.A. Shearer, T.S. Stombaugh, E.L. Hutchins, S.F. Higgins, D.W. Hancock, and M.J. Darr. Comparison of VRT granular applicators. ASAE Paper No. 04-1113, St. Joseph, Mich.
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- Bale, Katie H. Development of the *Junonia coena* densovirus derived viral vector system to functionally characterized *Campoletis sonorensis* ichnovirus gene function.
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- Fulkerson, J. Matthew. Assessing the impact of modified atmosphere storage on eastern thornless blackberry quality and antioxidant capacity.

Merchandising, Apparel, and Textiles

- Rahn, N. Evaluating instrumental measurement and visual assessment of textiles with and without optical brighteners.
- Crawford, Cassandre. Retail internationalization: the influence of culture on product development issues.

Plant and Soil Sciences (Agronomy)

- Alvarado, Soraya Patricia. Basic nutrient cation chemistry of two Ecuadorian andisols.
- Bourne, Jo Anna. Effects of poultry litter applications on the yield and quality of burley and dark tobacco.
- Gandhapudi, Siva Kumar. Managing fecal bacteria and nutrient contamination in poultry manure-amended sod by mowing and alum addition.
- Ingram, Claude W. The effects of merit and diazinon on microbial urealytic activity.
- Robinson, Jason E. Geochemical and mineralogical gradients in an abandoned constructed wetland treating acid mine drainage.
- Verges, Virginia L. Breeding for fusarium head blight resistance in soft red winter wheat.

Veterinary Science

- Godman, Robert L. Heatstroke in racing thoroughbreds: Comparison of venous blood clinical biomarkers.
- Kennedy, Erin. Simulation of the stress response by infusion of cortisol: Effects on the reproductive cycle of the mare.
- Mains, Christine. Comparative mapping: homology within the order Perisodactyla of four genes located on *Equus caballus* chromosome 20.

Graduate Degrees and Enrollment

Note: Graduate student enrollment and graduation figures are reported by graduate program in an academic year, not a calendar year. These figures are from the Graduate School's Annual Statistical Reports, <http://www.rgs.uky.edu/greports.html>.

| | 2002-2003 | 2003-2004 | Net | 2002-2003 Degrees Awarded | | | 2003-2004 Degrees Awarded | | | Net |
|---|------------|------------|------------|---------------------------|-----------|-----------|---------------------------|-----------|------------|-----------|
| | Enrollment | Enrollment | | Change | Master's | Doctoral | Total | Master's | Doctoral | |
| Agricultural Economics | 59 | 54 | -5 | 9 | 1 | 10 | 5 | 3 | 8 | -2 |
| Animal and Food Sciences | 69 | 67 | -2 | 9 | 2 | 11 | 11 | 11 | 22 | 11 |
| Biosystems and Agricultural Engineering | 27 | 33 | 6 | 1 | 2 | 3 | 9 | 2 | 11 | 8 |
| Crop Science | 14 | 14 | 0 | 0 | 3 | 3 | 0 | 1 | 1 | -2 |
| Entomology | 42 | 34 | -8 | 5 | 2 | 7 | 3 | 3 | 6 | -1 |
| Family Studies | 59 | 70 | 11 | 9 | 0 | 9 | 13 | 1 | 14 | 5 |
| Forestry | 18 | 17 | -1 | 7 | * | 7 | 3 | * | 3 | -4 |
| Hospitality and Dietetic Administration | 18 | 15 | -3 | 1 | * | 1 | 2 | * | 2 | 1 |
| Interior Design, Merchandising and Textiles** | 10 | 9 | -1 | 3 | * | 3 | 1 | * | 1 | -2 |
| Plant Pathology | 17 | 22 | 5 | 1 | 1 | 2 | 0 | 5 | 5 | 3 |
| Plant Physiology | 21 | 18 | -3 | * | 3 | 3 | * | 3 | 3 | 0 |
| Plant and Soil Science | 34 | 36 | 2 | 10 | * | 10 | 4 | * | 4 | -6 |
| Rural Sociology/ Vocational Education | 71 | 49 | -22 | 21 | 2 | 23 | 19 | 0 | 19 | -4 |
| Soil Science | 8 | 11 | 3 | * | 2 | 2 | * | 1 | 1 | -1 |
| Veterinary Science | 26 | 29 | 3 | 1 | 0 | 1 | 2 | 3 | 5 | 4 |
| Total | 493 | 478 | -15 | 77 | 18 | 95 | 72 | 33 | 105 | 10 |

* Degree type not offered.

** Includes graduate student numbers in the joint School of Design Interior Design, Merchandising, and Textiles program.

Financial Statement

Statement of Current General Fund Income and Expenditures Fiscal Year 2004

INCOME

| Federal Funds | |
|--------------------------|---------------------|
| Hatch..... | \$3,896,961 |
| Hatch Multistate..... | 850,060 |
| McIntire-Stennis..... | 454,918 |
| Animal Health..... | 52,935 |
| Total Federal Funds..... | 5,254,874 |
| State Funds..... | 27,111,873 |
| Total Funds..... | \$32,366,747 |

EXPENDITURES

| | Federal | State | Total |
|--------------------------------|--------------------|---------------------|---------------------|
| Personal Services..... | \$4,289,651 | \$16,197,815 | \$20,487,466 |
| Travel..... | 85,627 | 244,981 | 330,608 |
| Equipment..... | 234,651 | 432,814 | 667,465 |
| Other Operating Expenses..... | 644,945 | 10,236,263 | 10,881,208 |
| Total Expenditures..... | \$5,254,874 | \$27,111,873 | \$32,366,747 |

Staff

University of Kentucky Board of Trustees 2004

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Stephen P. Branscum

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C. Frank Shoop

Alice Stevens Sparks

Myra Leigh Tobin

Jo Etta Y. Wickliffe

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Elaine A. Wilson

Barbara Smith Young

Faculty Members: Roy L. Moore and Michael Kennedy

Staff Member: Russ Williams

Student Member: Rachel Lee Watts

Agricultural Experiment Station

January 1, 2004-December 31, 2004

Administration

Lee T. Todd Jr., President

Michael T. Nietzel, Provost

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Nancy M. Cox, Associate Dean for Research & Director

Linus R. Walton, Associate Dean for Administration

Lisa Collins, Assistant Director

J. D. Lawson, Assistant Director for Legal & Fiscal Affairs

W. O. Peterson, Director of Management Operations

Departments

Following are Experiment Station personnel lists for calendar year 2004 as reported by departments. (R) denotes Experiment Station appointment.

Agricultural Communications

Miller, T.H., Interim Director
Wood, C.H., CALE Laboratory Director
and Professor

Agricultural Economics

Robbins, L.W., Chair and Professor (R)
Debertin, D.L., Professor (R)
Dillon, C., Associate Professor (R)
Fleming, R., Associate Professor (R)
Freshwater, D., Professor (R)
Infanger, C.I., Extension Professor
Isaacs, S., Extension Professor
Jones, L.D., Extension Professor (R)
Marchant, M.A., Professor (R)
Maynard, L., Associate Professor (R)
Meyer, A.L., Extension Professor
Pagoulatos, A., Professor (R)
Pushkarskaya, H.N., Assistant Professor (R)
Reed, M.R., Professor (R)
Riggins, S.K., Extension Professor
Scorsone, E., Assistant Extension Professor
Skees, J.R., Professor (R)
Snell, W.M., Extension Professor
Trimble, R.L., Extension Professor
Vickner, S., Associate Professor (R)
Williamson, L., Extension Professor
Woods, T., Associate Extension Professor

Animal and Food Sciences

Harmon, R.J., Chair and Professor
Aaron, D.K., Professor (R)
Alderton, A.L., Assistant Professor (R)
Amaral-Phillips, D.M., Associate Extension
Professor
Anderson, L.H., Associate Extension
Professor
Boatright, W.L., Associate Professor (R)
Boling, J.A., Professor (R)
Bullock, K.D., Associate Extension
Professor
Burris, R., Extension Professor
Cantor, A.H., Associate Professor (R)
Coffey, R.D., Associate Extension
Professor
Coleman, R.J., Associate Extension
Professor
Cromwell, G.L., Professor (R)
Dawson, K.A., Adjunct Professor
Edgerton, L.A., Associate Professor (R)
Ely, D.G., Professor (R)
Franklin, S.T., Assistant Professor (R)
Harmon, D.L., Professor (R)
Heersche, Jr., G., Extension Professor
Hennig, B., Professor (R)
Hicks, C.L., Professor (R)
Jackson Jr., J.A., Associate Professor (R)
Johns, J.T., Extension Professor
Lawrence, L.M., Professor (R)
Lindemann, M.D., Professor (R)
Matthews, J.C., Associate Professor (R)
McAllister, A.J., Extension Professor

McLeod, K.R., Assistant Professor (R)
Mikel, W.B., Extension Professor
Newman, M.C., Associate Professor (R)
O'Leary, J., Associate Extension Professor
Parker, G.R., Extension Professor
Pescatore, A.J., Extension Professor
Schillo, K.K., Associate Professor (R)
Silvia, W.J., Professor (R)
Strobel, H.J., Associate Professor (R)
Thrift, F.A., Professor (R)
Tidwell, J., Adjunct Assistant Professor
Vanzant, E.S., Associate Professor (R)
Wang, C., Adjunct Assistant Professor
Webster, Carl, Adjunct Assistant Professor
Xiong, Y., Professor (R)

Biosystems and Agricultural Engineering

Gates, R.S., Chair and Professor (R)
Byers, M., Assistant Professor (R)
Carey, D., Assistant Professor (R)
Castillo, M., Assistant Professor (R)
Colliver, D., Associate Professor (R)
Crofcheck, C., Assistant Professor (R)
Duncan, G.A., Extension Professor (R)
Edwards, D.R., Professor (R)
Fehr, R., Professor (R)
McNeill, S.G., Associate Extension
Professor (R)
Montross, M.D., Assistant Professor (R)
Nokes, S.E., Associate Professor (R)
Norikane, J., Assistant Professor (R)
Overhults, D.G., Associate Extension
Professor (R)
Payne, F.A., Professor (R)
Rohlf, R., Assistant Professor (R)
Shearer, S.A., Professor (R)
Stombaugh, T.D., Assistant Extension
Professor (R)
Taraba, J., Extension Professor (R)
Warner, R.C., Extension Professor (R)
Wells, L.G., Professor (R)
Wheeler, E., Assistant Professor
Workman, S., Associate Professor (R)

Community and Leadership Development

Hansen, G., Chair and Extension Professor
Burmeister, L., Associate Professor (R)
Dyk, P., Associate Professor (R)
Garkovich, L., Professor
Greider, T., Associate Professor
Harris, R., Associate Professor (R)
Hustedde, R., Extension Professor
Knight, D., Lecturer
Maurer, R., Extension Professor
Nall, M., Extension Professor
Peiter, R., Assistant Professor (R)
Rennekamp, R., Extension Professor
Swanson, M., Assistant Research
Professor (R)
Tanaka, K., Assistant Professor (R)

Tulloch, R., Associate Professor
Warner, P., Extension Professor
Weckman, R., Associate Professor
Witham, D., Professor
Zimmerman, J., Associate Extension
Professor

Entomology

Obyrcka, J. J., Chair and Professor
Barney, R. J., Assistant Adjunct Professor
Bessin, R. T., Extension Professor
Brown, G. C., Professor (R)
Dobson, S. L., Associate Professor (R)
Fox, C. W., Associate Professor (R)
Haynes, K. F., Professor (R)
Johnson, D. W., Extension Professor
Palli, S. R., Assistant Professor (R)
Potter, D. A., Professor (R)
Potter, M. F., Extension Professor
Rieske-Kinney, L. K., Associate Professor (R)
Sedlacek, J. D., Assistant Adjunct Professor
Sharkey, M. J., Professor (R)
Townsand, L. H., Extension Professor
Webb, B. A., Professor (R)
Webster, T. C., Assistant Adjunct Professor
Wise, D. H., Professor (R)
Yeagan, K. V., Professor (R)

Family Studies

Bradford, K., Assistant Professor
Brock, G., Professor
Flashman, R., Extension Professor
Forgue, R., Associate Professor
Grisham-Brown, J., Associate Professor
Hans, J., Assistant Professor
Heath, C., Professor
Hildreth, G., Professor
Kim, H., Assistant Professor
Simmons-Wescott, L., Assistant Professor
Smith, D., Associate Professor
Townley, K., Associate Professor
Walker, R., Professor
Whiting, J., Assistant Professor

Forestry

Bullard, S., Chair and Professor
Arthur, M.A., Associate Professor (R)
Barnes, T.G., Extension Professor
Barton, C., Assistant Professor (R)
Connors, T., Associate Extension Professor
Graves, D.H., Extension Professor
Hill, D.B., Extension Professor
Kalisz, P.J., Associate Professor (R)
Lacki, M.J., Associate Professor (R)
Maehr, D.S., Associate Professor (R)
Ringe, J.M., Professor (R)
Stringer, J.W., Associate Professor (R)
Wagner, D.B., Associate Professor

Horticulture

Ingram, D.L., Chair and Extension Professor (R)
Anderson, R.G., Extension Professor (R)
Archbold, D.D., Professor (R)
Buxton, J.W., Associate Professor (R)
Downie, A.B., Assistant Professor (R)
Dirk, L.M.A., Research Specialist
Dunwell, W.C., Extension Professor
Durham, R.E., Assistant Extension Professor
Fountain, W.M., Extension Professor
Geneve, R.L., Professor (R)
Houtz, R.L., Professor (R)
Jones, R.T., Extension Professor
Kemp, T.R., Professor (R)
Masabni, J.G., Assistant Extension Professor (R)
McNiel, R.E., Extension Professor (R)
Rowell, A.B., Associate Extension Professor (R)
Snyder, J.C., Associate Professor (R)
Strang, J.G., Extension Professor
Williams, M.A., Assistant Professor (R)
Wolfe, D.E., Research Specialist

Landscape Architecture

Schach, H., Chair and Professor
Crankshaw, N., Associate Professor
Kew, B., Assistant Professor
Lee, B., Assistant Professor
Nieman, T., Professor

Livestock Disease Diagnostic Center

Harrison, L.R., Director and Professor
Bolin, D.C., Associate Professor
Donahue, J.M., Professor
Giles, R.C., Professor
Hong, C.B., Professor
Jackson, C.B., Associate Professor
Poonacha, K.B., Professor
Scharko, P.B., Associate Professor
Vickers, M.L., Associate Professor
Williams, N.M., Associate Professor

Merchandising, Apparel, and Textiles

Michelman, S., Chair and Associate Professor (R)
Carpenter, J., Assistant Professor (R)
Easter, E., Professor (R)
Jackson, V., Associate Professor (R)
Miller-Spillman, K., Associate Professor (R)

Nutrition and Food Science

Forsythe, H.W., Chair and Associate Professor (R)
Addo, K., Associate Professor (R)
Brown, D.O., Associate Professor (R)
Chen, L., Professor (R)
Chow, C.K., Professor (R)
Cook-Newell, M., Lecturer
Gaetke, L., Associate Professor (R)
Ham, S., Assistant Professor (R)
Roseman, M.G., Assistant Professor (R)
Stephenson, T.J., Temporary Faculty
Wesley, M., Associate Professor

Plant and Soil Sciences (Agronomy)

Barrett, M., Chair and Professor
Aiken, Glen E., Associate Adjunct Professor
Bailey, W.A., Assistant Extension Professor
Barnhisel, R.I., Professor (R)
Baskin, C., Professor* (R)
Bitzer, M.J., Professor (R)
Blair, M., Research Specialist
Burton, H.R., Associate Professor (R)
Bush, L.P., Professor (R)
Calvert, J., Research Specialist
Chappell, J., Professor (R)
Collins, G.B., Professor (R)
Cornelius, P.L., Professor (R)
Coyne, M., Associate Professor (R)
D'Angelo, E.M., Assistant Professor (R)
Davies, M., Professor and Director, KTRDC
Dinkins, R., Assistant Adjunct Professor
Ditsch, D., Associate Extension Professor
Dougherty, C.T., Professor (R)
Egli, D.B., Professor (R)
Grabau, L.J., Professor (R)
Green, J.D., Extension Professor
Grove, J.H., Associate Professor (R)
Herbek, J.H., Extension Professor
Hildebrand, D.F., Professor (R)
Hill, R., Research Specialist
Hunt, A.G., Professor (R)
Jack, A.M., Research Specialist
Karathanasis, A. D., Professor (R)
Kennedy, B.S., Research Specialist
Kumudini, S., Assistant Professor (R)
Lacefield, E., Research Specialist
Lacefield, G.D., Extension Professor
Lee, C.D., Assistant Extension Professor
Marshall, M., Research Specialist
Martin, J.R., Extension Professor
Matocha, C.J., Assistant Professor (R)
Miller, R.D., Professor (R)
Mueller, T.G., Assistant Professor (R)
Murdock, L.W., Extension Professor
Olsen, Gene, Research Specialist
Palmer, G.K., Associate Extension Professor
Pearce, R.C., Associate Extension Professor
Pearce, W.L., Research Specialist
Perry, S.E., Associate Professor (R)
Pfeiffer, T.W., Professor (R)
Phillips, T.D., Associate Professor (R)
Powell, A.J., Professor (R)
Rasnake, M., Associate Extension Professor
Ritchey, E., Research Specialist
Schwab, G.J., Assistant Extension Professor
Siminszky, B., Assistant Professor (R)
Slack, C.H., Research Specialist
Smalle, J., Assistant Professor (R)
Smith, R. S., Associate Extension Professor
Stefaniak, T., Research Specialist
Stewart, A.J., Research Specialist
TeKrony, D.M., Professor (R)
Thom, W.O., Extension Professor
Tomes, L., Research Specialist
Van Sanford, D.A., Professor (R)
Wagner, G.J., Professor (R)

Wendroth, O., Associate Professor (R)
Williams, D.W., Associate Professor (R)
Witt, W.W., Professor (R)
Xu, Dongmei, Assistant Adjunct Professor (R)
Yuan, L., Assistant Professor (R)
Zhu, Hongyan, Assistant Professor (R)
* Joint Biological Sciences

Plant Pathology

Smith, D.A., Chair and Professor
Bachi, P.R., Ag. Research Specialist
Beale, J.W., Ag. Research Specialist
Farman, M.L., Associate Professor (R)
Ghabrial, S.A., Professor (R)
Goodin, M.M., Assistant Professor (R)
Hartman, J.R., Extension Professor
Hendrix, J.W., Professor (R)
Hershman, D.E., Extension Professor
Kachroo, P.R., Assistant Professor (R)
Kachroo, A.P., Ag. Research Specialist
Nagy, P.D., Associate Professor (R)
Nesmith, W.C., Extension Professor
Nuckles, E.M., Ag. Research Specialist
Pogany, J., Ag. Research Specialist
Scharl, C.L., Professor (R)
Thornbury, D.W., Scientist II
Vaillancourt, L.J., Associate Professor (R)
Vincelli, P., Extension Professor
Wang, R., Ag. Research Specialist

Regulatory Services

Miller, Eli, Director
Barrow, M.C., Inspector
Bryant, M., Feed/Fertilizer Laboratory Coordinator
Buckingham, D.T., Seed Regulatory Coordinator
Burden, Tracy, Inspector
Coffey, D.S., Inspector
Finneseth, C.H., Seed Testing Coordinator
Flood, J.S., Inspector
Hickerson, R.R., Inspector
Johnston, C.B., Inspector
Johnston, N.T., Inspector
Mason, D.W., Inspector
McMurry, S.W., Inspection Coordinator
Prather, T.G., Inspector
Sikora, F.J., Soil Testing Coordinator and Professor
Singleton, P.G., Inspector
Spencer, H.S., Auditor
Terry, D.L., Fertilizer Coordinator and Assistant Director
Thompson, C.D., Milk Coordinator
Traylor, S.L., Feed Coordinator
Whitehouse, W.J., Inspector

Robinson Station

Ditsch, D., Acting Superintendent

Veterinary Science

- Timoney, P.J.*, Chair and Professor (R)
- Allen, G.P.*, Professor (R)
- Artiushin, S.C.*, Assistant Professor (R)
- Bailey, E.F.*, Professor (R)
- Chambers, T.M.*, Associate Professor (R)
- Cook, R.F.*, Assistant Professor (R)
- Cothran, E.G.*, Professor (R)
- Dwyer, R.M.*, Associate Professor (R)
- Fitzgerald, B.P.*, Associate Professor (R)
- Graves, K.T.*, Assistant Professor (R)
- Horohov, D.W.*, Professor (R)
- Howe, D.K.*, Assistant Professor (R)
- Issel, C.J.*, Professor (R)
- Lear, T.L.*, Assistant Professor (R)
- Lehner, A.F.*, Ag. Research Specialist (R)
- Lyons, E.T.*, Professor (R)
- MacLeod, J.N.*, Professor (R)
- McCollum, W.H.*, Professor (R)
- McDowell, K.J.*, Associate Professor (R)
- Powell, D.G.*, Professor
- Swerczek, T.W.*, Professor (R)
- Timoney, J.F.*, Professor (R)
- Tobin, T.*, Professor (R)

West Kentucky Substation

- Davis, D.*, Superintendent

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