

South Campus Farms

Campus farms have served the educational, outreach and research functions of Michigan State University since the university's founding more than 150 years ago.

Research Farms

Current research farms include:

- Beef Cattle Research & Teaching Center
- Crop and Soil Sciences Teaching & Research Field Facility (Agronomy Farm)
- Dairy Cattle Research & Teaching Center
- Entomology Research Farm
- Experimental Fur Farm
- Hancock Turf Grass Research Center
- Horse Teaching and Research Center
- Horticulture Teaching & Research Center
- MSU Sheep Farm
- MSU Swine Farm
- MSU Tree Research Center
- Plant Pathology Research Farm
- Poultry Science Research & Teaching Center

- Purebred Beef Cow-Calf Teaching & Research Center
- Veterinary Research Farm

Additional facilities:

- MSU Feed Mill
- Pavilion for Agriculture and Livestock Education
- University Farms
- University Research Containment Facility
- South Campus Compost Facility



University Farms

The purpose of University Farms is to provide a centralized service and facilities for departments within the Colleges of Agriculture and Natural Resources and Veterinary Medicine, as well as the Michigan Agricultural Experiment Station and MSU Extension, to alleviate those units of the economic burden and time-consuming activities of maintenance and general farm operations. The departments may then place their emphasis on the more important aspects of education and research. University Farms works with 16 departments of MSU that operate field and animal units south of Mt. Hope Road.

- The University Farms is responsible for all of the unassigned land south of Mt. Hope Rd. including the personnel and equipment to maintain this land for the production of livestock feed.
- University Farms includes 760 acres that consist of corn (500 acres), alfalfa (200 acres), wheat (60 acres) and 100 acres of pasture land harvested for hay.
- University Farms maintains blacksmith fabrication capabilities.
- The farms produce 3.2 million gallons of liquid + 9,500 tons of solid manure (totaling 3,474 loads/year), and operates a composting facility that handles 80% of the total solid manure produced /year.

Composting Facility

The composting facility developed as a tool within the South Campus nutrient management plan, works to reduce the nutrients applied to agricultural land, improve manure handling and provide Grounds Maintenance with a soil amendment to improve the soil quality and lessen the burden of fertilizer costs.

- The facility takes in 12,000 yds.² (7,700 tons) of solid manure—80% of total produced on campus/yr.
- It also incorporates leaf material from North Campus.
- Last year, the composting facility produced 10,000 cubic yards of finished compost.
- This year it is on track to produce 12,000 cubic yards of finished compost.



South Campus Farms Housing Animals

- The animals in these facilities are used for teaching, intensive research and extension/outreach activities.
- During the 2004 academic year, there were at least 1500 students involved in activities that utilize farm animals bringing in tuition of more than \$20M per year.
- The total farm budget is just over \$3 million. University funding (GF, MAES, MSUE) for the farms contributes approximately 30% of the operating budget. The rest of the funding for the farms is generated by selling commodities (meat, milk, or livestock) and through per diems that are charged to the scientist for their research projects.
- There has been at least \$10 returned to the University in research funding awarded for every \$1 invested.

Purebred Beef Cow-Calf Teaching & Research Center

The purebred Angus and Hereford herds were established in 1909, and have served as a source of improved beef cattle genetics for the world. The center has a full time manager and all other labor is supplied by students working part time.

- **TEACHING:** More than 700 students (primarily CANR and CVM) use these animals and those in the Beef Cattle Research & Teaching Center in their classes each year.
- **EXTENSION/OUTREACH:** Since 2000, MSU student employees have exhibited 5 Grand or Reserve Grand Champion Polled Hereford cattle at the National Polled Hereford Show in Denver, Colorado. This visibility has helped recruit students to MSU.
- Recently the Michigan Cattlemen's Association established an endowed fund at MSU to help support the teaching activities at both campus beef cattle units.



MSU Swine Farm

The MSU Swine Farm facility and animals are used by more than 14 classes, across three departments and two colleges.

TEACHING: Undergraduate student employees learn modern swine production techniques and practices first-hand.

RESEARCH: Scientists across 3 colleges utilize this facility within their research programs.

- Animals from the Swine Farm are used in biomedical research both at MSU and across the state.
- A innovative solid-liquid separation system, one of the first of its kind within the United States, improves air quality and has led to multiple research collaborations across the U.S. and Canada.

EXTENSION/OUTREACH:

- As part of our outreach mission, the farm participates in 14 youth events annually.
- Swine Farm sows are a major attraction at the College of Veterinary Medicine's "Miracle of Life" display at the Michigan State Fair.

Beef Cattle Research & Teaching Center

This facility is a feedlot in which cattle are grown to be marketed. It is used for teaching feedlot management and for research addressing environmental and welfare issues that are important to Michigan farmers.

Examples of current research:

- Identification of genes that affect marbling and tenderness in cattle.
- Feeding direct-fed microbial products to reduce acidosis and increase feed efficiency in feedlot cattle.
- Feeding diets that reduce phosphorous (P) excretion from feedlot cattle. Phosphorous is considered an environmental contaminant when too much is applied to land through manure.
- Comparison of two methods of estimating P excretion from beef and sheep farms.
- Comparison of three weaning strategies to improve the welfare of the weaned calf.



Poultry Science Research and Teaching Center



- **TEACHING:** The Poultry Science Research & Teaching Center is used to teach students within the Department of Animal Science and the College of Veterinary Medicine.
- **RESEARCH:** The research facilities are used by faculty in the Departments of Animal Science, Food Science and Human Nutrition, and Microbiology and Molecular Genetics and the National Food Safety and Toxicology Center.
 - Research focuses on applied research benefiting the poultry industry, transgenics, and vitamin deficiencies affecting human development.
 - The Center provides fertile eggs for biomedical research at MSU and other institution throughout the country.

MSU Sheep Farm

The MSU Sheep Farm maintains a high quality, purebred sheep flock that is recognized nationally for its impact on students and industry.

TEACHING, RESEARCH & EXTENSION/OUTREACH: The farm offers experiential learning for undergraduate and graduate students, including:

- Graduate research projects primarily in ruminant nutrition.
- Undergraduate research projects with results having immediate industry applications.
- Entrepreneurial experience with sheep and wool products.

The farm also provide access to sheep and sheep products to facilitate teaching, research and extension efforts by faculty in numerous departments and colleges throughout MSU.

Horse Teaching and Research Center

- **TEACHING:** A total of 14 undergraduate courses are conducted, at least in part, at the Horse Teaching and Research Center—accounting for 9,941 student contact hours per year. Outreach courses are also taught at the facility every semester.
- Every horse at the HTRC must have at least two jobs—a primary responsibility for at least two educational or research activities in a given year. For example: some mares will be used in horsemanship teaching all fall semester, then have a foal in the spring and participating in reproduction and genetics courses at the same time.
- **RESEARCH:** 5-10 research projects are conducted at the facility each year, ranging from behavior and welfare to nutrition and exercise physiology.
- **EXTENSION/OUTREACH:** More than 25,000 visitors enjoy the farm each year. From mid-April until late-September the HTRC receives an average of more than 100 visitors per day—ranging from daycare picnics to busloads on inner city children getting their first experience on a farm. Special functions, such as Small Animal Day, can bring over 10,000 people to the HTRC in a single day.



Dairy Cattle Research & Teaching Center

RESEARCH: The primary use of the dairy farm is for basic and applied research funded by industries in Michigan and nationally, as well as the USDA.

Current studies include:

- Determining what controls feed intake of a dairy cow and what type of forage is best for cows.
- Investigating how fat and protein affect mammary growth and lactation.
- Investigating how to alter the period of time that cows are not lactating.

TEACHING: The dairy farm is also used for teaching students in the Colleges of Agriculture and Natural Resources and Veterinary Medicine about dairy cattle management.

EXTENSION/OUTREACH: Extension and outreach activities take place daily. Children from throughout Michigan arrive on buses to watch cows being milked, see baby calves and learn about animal agriculture. Organizations such as the USDA Natural Resources Conservation Service (NRCS) hold workshops and model industry practices at the dairy farm.

Experimental Fur Farm

The Experimental Fur Farm is only university experimental fur farm in the United States and one of a small number of facilities in the world conducting toxicology research with fur animals.

- **RESEARCH:** The majority of research relates to environmental toxicology with data being used for state, federal and international regulatory agencies for environmental risk assessments. Some research is funded by and benefits the mink industry.

Veterinary Research Farm

The Veterinary Research Farm consists of 86 acres of pastures divided into 25 fields ranging in size from ¼ to 10 acres. There are generally 35 to 45 horses and from 7 to 40 cattle housed on the farm.



TEACHING & RESEARCH:

- Animals are used for teaching classes to College of Veterinary Medicine students and for research

conducted by CVM, Department of Animal Science and Michigan Agricultural Experiment Station faculty.

MSU Feed Mill

The Feed Mill's mission is to provide safe, nutritious and palatable feed for livestock.

- The Feed Mill was renovated in 2000-01 to include two 26,000-bushel corn bins, two 24-ton soybean meal bins, a high-speed leg, new grain dump, a 1.5-ton mixer, roller mill and four 1,000 bushel bins.
- Between 1,500 - 1,700 tons of complete feed are manufactured at the MSU Feed Mill each year.
- The mill serves the animal farms and research units at MSU by acquiring, receiving, storing, milling, mixing and delivering feed as needed.

Pavilion for Agriculture and Livestock Education

- **EXTENSION/OUTREACH:** The MSU Pavilion includes an arena that seats 2,000 people, an auditorium with amphitheater-style seating for 364, an exhibit area with over 77,000 sq ft of space and several conference rooms. The Pavilion hosts numerous livestock and commercial exhibitions, auctions, events and meetings annually.
- The MSU Pavilion is one of the most visited facilities on campus, hosting more than 100 events and operating 50 weekends out of each calendar year. It has a high economic impact on Lansing's tourism economy (hotels, restaurants, etc.)
- **TEACHING:** Animal Science labs in the Pavilion's classrooms and arena provide students with direct contact with animals in a modern livestock facility.



University Research Containment Facility

The University Research Containment Facility is located on the Veterinary Research Farm, but operates as a separate unit from the farm.

- Aquatic areas house fish and frogs for research on environment, fish diseases and fish development using lamprey as an evolutionary model.
- Terra areas house traditional lab animals (rodents, dogs, etc) as well as farm animals and occasionally wild-caught species (opossums, starlings) for research on animal and human diseases.
- Some studies use rodents as a human model for toxicology studies and are coordinated with the use of Air-CARE1, a mobile toxicology lab that is housed on the veterinary research farm as its "home base."

Entomology Research Farm

RESEARCH: The Entomology Research Farm is used for a diverse list of entomology & nematology research projects, including: pest management in field crops, vegetables, fruit, turf, ornamentals, Christmas trees, and forestry; biological control and invasive species; native plants to enhance pest control; apiculture/ pollination; aquatic systems; forensic entomology; as well as biology, ecology, and systematics.

TEACHING: Students use the farm as a field trip/ collection site in several classes, including Fundamental of Entomology, Field Crops Entomology, Turf Pest Management, Forest Entomology, and ENT 812 Bugs and Bodies.

EXTENSION/OUTREACH: Program examples include the MSU Diagnostic Field Day, the Native Plant Field Day and forensic entomology training for MSU and State Police.

Horticulture Teaching and Research Center

The Horticulture Teaching and Research Center, established in 1966, comprises 180 acres, five buildings, and greenhouses.

TEACHING: Ten courses use the facilities extensively for lab sections. In addition, more than 100 students participate in landscape and nursery class activities conducted at the HTRC each year.



EXTENSION/OUTREACH & RESEARCH:

The Student Organic Farm is a student-run organic farm and research/outreach organic horticulture methods for Michigan and the Midwest. The farm is partially funded by Community Supported Agriculture program of produce sales to subscribers. Tours and educational programs bring numerous visitors to the SOF throughout the year.

Examples of current research:

- The HTRC is the primary location for landscape and nursery research conducted at MSU. Projects include nursery water conservation and phytoremediation, green roof systems, emerald ash borer management, and plant evaluation.
- Breeding and genetics activities include the development of new cultivars of horticultural crops, primarily strawberries and blueberries.
- Weed management programs include research using herbicides and cultural practices for horticultural crops. The Inter-regional 4 project for registration of minor use pesticides. Determining the suitability of herbicides for registration and use on horticultural crops.
- Viticulture and enology program evaluates wine grape cultivars and production systems for Michigan and the Midwest.



The viticulture and enology program also engages in Extension programs focused on wine production and quality.

Crop and Soil Sciences Teaching & Research Field Facility

The Agronomy Farm is comprised of 470 acres of small plot research—including more than 450 experiments annually, plant processing and germplasm storage, equipment modification and maintenance (safety).

TEACHING & EXTENSION: The farm provides classroom and hands-on laboratory for students, farmers and citizens, and an excellent venue for diagnostic courses and field days.

RESEARCH: Research supports Michigan's \$60 billion agriculture and bio-science industries. CSS conducts research on 14 of Michigan's top 20 commodities in cash receipts. Field research programs are run by faculty, staff and graduate and undergraduate students. In 2006, they have established over 450 experiments across Michigan. In addition to those conducted on-site, many are conducted on farmer/cooperator's fields when specific environmental conditions, soil types, pest or disease pressure is needed for the experiment.

Hancock Turf Grass Research Center

The Hancock Turf Grass Research Center works in partnership with the turfgrass industry to provide ongoing programs in research, education and extension in the area of professional turfgrass management.

- Built in 1980, originally 10 acres, now consists of 56 completely irrigated acres.
- Research is conducted by four different MSU departments.
- Supplied sod to Spartan Stadium, Oldsmobile Park (Lansing Lugnuts), MSU baseball and softball fields.
- More than \$520,000 in equipment and supplies were donated to the center to assist operations in 2005.



MSU Tree Research Center

The original MSU forest tree nursery was established on campus in 1903, where Spartan Stadium now stands. The Tree Research Center, established in 1963, includes 30 acres on campus, plus 100 acres at Sandhill Rd. (south of I-96), two greenhouses, a 2-acre irrigated tree nursery, 55 acres of tree plantations, plus acreage in forest, field crops or fallow.

Examples of current research:

- Emerald ash borer—investigate biology and control systems for this invasive insect.
- Biomass production—species evaluation, culture and genetic improvement of trees for fuel and pulp production.
- Christmas trees—ongoing research to enhance commercial Christmas tree production through improved cultural techniques, genetic quality, and pest control.
- Forest genetics program—more than 60-year history of forest genetics research to improve commercial timber and pulp production through approximately 300 genetics plantations located throughout Michigan.
- Forest ecology studies—basic research in forest ecology to better understand Michigan woodlands and facilitate improved ecosystem management. Objectives include sustainable forest management for health, productivity and diversity.

Plant Pathology Research Farm

The Plant Pathology Research Farm consists of 85 acres of land used for research of plant diseases caused by fungi, bacteria, viruses, nematodes and abiotic factors in large and small fruits, turf, vegetables, floriculture, woody ornamentals, trees, and field crops.

The main building is used to store, design, fabricate, and maintain research equipment used on campus, at the Rogers Reserve, outlying research stations, and for projects engaging grower/cooperators throughout the state. It also is used for field days and training courses.

The pesticide building is a state of the art storage facility that also provides safety for handlers. It is scheduled to increase in size to accommodate the Department of Entomology.



Examples of current research:

- New chemical and biological control materials are tested for efficacy in disease management. Diseases currently under study include fire blight and scab diseases of apple, wilt disease of oak and wheat scab.
- Strategies to avoid and manage pathogen resistance to fungicides and antibiotics in crops such as apple.
- Screening of cucumber, sugar beet, turfgrass, and chestnut germplasm for resistance to economically important diseases.

MSU Land Management Office

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