

University Farm

Squire Valleevue and Valley Ridge Farms

Annual Report 2009



RESEARCH



EDUCATION



CONSERVATION



PRESERVATION





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The Case Western Reserve University Farm, located on Fairmount Boulevard in The Village of Hunting Valley, is a 389-acre property that includes forests, ravines, waterfalls, meadows, ponds, a self-contained natural watershed, seven residences, many other structures and several miles of roads and trails. The farm came to the university as the result of four gifts. The late Andrew Squire gave 277 acres (Squire Valleevue Farm) in the late 1930s; in 1977, the heirs of Jephtha Wade II gave Case Western Reserve 104 adjoining acres (Valley Ridge Farm); in 1984, John and Elizabeth Hollister deeded five acres to the university; and in 1995, the Hollisters donated another five acres.

In his will, Mr. Squire stated “Valleevue Farm should be held in perpetuity for the use and benefit of the teachers and students of the women’s college of the Western Reserve University... I desire it cultivated and preserved

as a farm for educational purposes, and to be a place where the practical duties of life may be taught; where the teachers and students can come in close contact with Mother Earth.”

The Wade gift was made with the intent that “the premises ... be preserved in an open and undeveloped state subject to reasonable provisions for access ... and the premises may be used for investigation, research and teaching in all fields relating to the natural sciences and the ecology of natural systems, including man’s use of said systems through agriculture, aquaculture and otherwise.” As a condition of this gift, the university officers report annually to the Board of Trustees of the university and to the trustees of the Cleveland Museum of Natural History.

The farm is a magnificent asset for Case Western Reserve and serves the total university community in a variety of educational, research, community service and recreational formats.

OPERATIONS AND FINANCES



The Farm Management Committee Chair is Glenn Nicholls, vice president for Student Affairs. He reports to the provost regarding the overall management of the farm. The Farm Management Committee meets on a regular basis and provides policy and long-range planning advice and guidance.

A portion of the income from the Andrew Squire Endowment supports the operation of the farm. The operating budget allocation for the 2009-2010 academic year is \$366,941 and the major maintenance budget is \$136,417. A farm capital reserve, funded from gifts and savings from the annual operating budget, is maintained for investments in major farm maintenance projects, capital improvements, vehicle replacements and initiation of new programs.

The Farm Management Committee's focus continues to be identifying improvements that can be implemented at the farm within the constraints of the available budget and personnel that will maximize its positive impact on the university's strategic priorities.

The administration of the farm is under Ana Locci, farm director and adjunct assistant professor in the Department of Biology. Locci manages the farm operations, staff and finances. She provides leadership in cooperation with the Farm Management Committee to expand the utilization of the farm's resources in accordance with the strategic plans of the university. Among her essential functions are:

- Develop and maintain liaisons with the academic, athletic and student leadership of the university to maximize benefits of the farm's unique resources relative to the university's mission

- Facilitate the development of education and research programs by working with appropriate faculty, department chairs and deans to catalyze expanded academic use of the farm
- Prepare a five-year operating and capital financial plan, plus the annual budgets; assure that income and expenses are monitored to achieve balanced budgets
- In concert with the Farm Management Committee and appropriate university officers, seek out sources to acquire new funding for the farm in the form of gifts and grants, and prepare necessary grant applications and presentations
- Supervise the farm foreman and a full-time staff of five
- Prepare an annual report on farm operations, plans and finances for the Farm Management Committee and the trustees of the university
- Manage liaisons with neighbors and The Village of Hunting Valley officials to maintain constructive and mutually beneficial relationships

Ana Locci reports to Glenn Nicholls and the Farm Management Committee. Mark McGee, farm foreman, is responsible for the daily on-site supervision of the farm and reports directly to Locci. Patty Gregory is the department assistant and Manor House program administrator.



ACADEMIC AND RESEARCH PROGRAMS



Academic and research programs at the university farm greatly expanded during the last three years. In 2009, 15 courses for undergraduate and graduate levels used the indoor and outdoor facilities. Among the Case Western Reserve programs include courses in the fields of ecology, geology, engineering and visual arts, as well as training courses for nurses and language immersion programs. More than 1,600 students and faculty visit the farm annually to take classes. The approved fund for transportation for all students and faculty taking credit courses has been key to expanding academic activities. The greatest increase being with on-site research projects. There was an increase from 10 to 40 faculty and students who are actively doing research at the farm in the areas of ecology, environmental studies, engineering, conservation and carbon sequestration. Projects included undergraduate research, senior projects and graduate research.

UNDERGRADUATE AND GRADUATE COURSES

Under the supervision of **Deborah Vallance**, lab coordinator, 12 lab sections enrolled in the class Genes and Evolution (BIOL 214) came to the farm for their biodiversity lab during the month of April. With more than 300 students, each section of 24 students came for a two-week period, collecting insects from the fields and analyzing the diversity and richness of species in various microhabitats within the maple-beech forest.

Sheryl Petersen offered Principles of Ecology Lab (BIOL 351L/451L) during the fall semester, with 16 undergraduate students enrolled. The course explored spatial and temporal relationships involving organisms and the environment at individual and community levels. An underlying theme was Darwinian evolution through natural selection with an emphasis on organism adaptations to biotic and abiotic environments. Case Western Reserve studies and models illustrated ecological principles on their applicability to ecosystem conservation. The laboratory portion of the class complemented the lecture material and involved hypotheses-driven investigations in field and greenhouse settings at the farm. **Joe Keiper**, research entomologist from the Cleveland Museum of Natural History, led two lab sessions on aquatic macroinvertebrates.

During the summer, 17 students enrolled in Genes and Evolution (BIOL 214) made three field trips to the farm with instructor **James Bader**, professor of biology and director of the university's Center for Science and Mathematics Education. During their visits, they studied the farm aquatic and terrestrial ecosystem.

During the fall semester, Professor Bader also

taught the Aquatic Ecology Lab (BIOL 339) to 16 undergraduate biology majors. The course investigated the physical, chemical and biological limnology of freshwater ecosystems. Emphasis was placed on identifying the organisms inhabiting these systems and their ecological interactions. This course combined both field and laboratory analyses to characterize and compare the major components of the research ponds at the farm.

Gerry Maditsoft, Department of Geological Sciences chair and professor, offered a Hydrogeology (GEOL 321/421) class during the fall semester. Students learned basic and applied concepts pertaining to the occurrence and movement of groundwater, studying definitions, basic equations, wells and applications to a variety of geologic settings. The 15 students visited the farm's research water wells during a field trip in October to make field measurements and collect and analyze data.

Steve Hauck, Department of Geological Sciences associate professor, came to the farm three weekends in September and October with eight students enrolled in Geophysical Field Methods and Laboratory (GEOL 330/430), using the field between the ponds and the pumping wells and nearby walking/running paths to do class experiments.

Mark Willis, Department of Biology associate professor, offered Introductory Entomology (BIOL 318L) during the fall semester. The class of 16 students came five times to the farm for their insect collection during the months of August and September. Class meetings alternated with some structured lectures and laboratory exercises. Students were required to make a small but comprehensive insect collection.

For two weeks in June, nine Case Western

Reserve students took a course in Raku Ceramics. Two students from ARTS 399 and seven students from ARTS 497 enrolled in the Graduate Art Education program with instructor **Tim Shuckerow**, Art Education and Art Studio director. The classes used the ceramic studio at Valley Ridge Farm.

The Art Studio Program offered Introduction to Photography Studio I (ARTS 220) with instructor **Alexander Aitken**. The nine students in the class spent a day on the farm taking photographs for their assigned projects. During the course assignment, students worked on transfiguration of common space, personification and multiple figure-ground relationships.

In spring and fall, **Martha Lois**, Art Studio/Art Education lecturer, held one-day Raku Ceramic sessions for 47 students in her ceramics courses (ARTS 214/314) at Valley Ridge Farm. The sessions focused on hands-on building techniques and the development of sensitivity to

design and form. Farm transportation funds were used to provide student transportation.

The National Flight Nursing Academy

at Case Western Reserve University held its seventh annual Summer Camp 2009 for acute care nurse practitioners, flight nurses and emergency service personnel in emergency response. The camp—the only one of its kind in the country—took place August 9-14 at the farm and Mt. Sinai Skills and Simulation Center in Cleveland. This year's mass casualty response drill included more than 100 volunteers and staff. Students were able to use their advanced clinical decision-making skills as they attended to the "victims" of a massive simulated explosion at a remote area (picnic area and creek ravines). Open to nurses, physicians, pilots, firefighters and paramedics, the camp provided training exercises to prepare teams for treating critical patients in unstructured environments, such as those following natural disasters. The students came from Colorado, California, Texas, Arizona, New York, Florida, Wisconsin and as far away as Japan. The week-long, 40-hour, hands-on training course included mass casualty scene response; pediatric trauma and obstetric emergencies; advanced airway and extrication; chest tube and central line placement and suturing labs using high-tech simulated patients; hazardous materials response; flight safety; preparing landing zones and helicopter simulation.

As an integral part of studying foreign languages at Case Western Reserve, a weekend immersion



National Flight Nursing Academy participants.
August 2009 Photo provided by Ivan Locci.

is a required element and takes place at the Pink Pig. Students hike trails, cook, converse, and play sports and games, all in the target language they study. Participating this year were 143 students enrolled in German, Spanish, Russian, French and Japanese classes.

CONTINUING EDUCATION

Summer in the Country, a program sponsored by the College of Arts and Sciences Office of Continuing Education, offered 11 courses: painting in the outdoors, writing poetry, journal writing, university farm history, writing nonfiction, walking through nature, and birds and breakfast. Each class had between 10 and 22 participants, resulting in 675 visits to the farm from May to July. The majority of the classes met twice a week at the Pink Pig or Kutina Classroom facilities. The outdoor painting class met at the Sheep Barn and used both Squire Valleevue and Valley Ridge Farms for their sessions.

One fall class was offered by the Continuing Education Office. The Autumn in the Country program offered non-fiction writing. Thirty-eight participants took the courses, with 266 visits to the farm.

RESEARCH

During early spring, **Michael Benard**, Department of Biology assistant professor, research assistant **Katherine Krynak** and two summer interns, **John Vanek** and **Tina Barbash**, investigated how frog species adapt to changing environments. In a protected area at the farm, Benard and his colleagues set up 100 artificial ponds, each of which held up to 300 gallons of water. These artificial ponds allowed Benard and his colleagues to experimentally manipulate specific characteristics of natural ponds like the genetic diversity within wood frog populations or the presence or absence of predatory insects, while holding other environmental characteristics constant.



Dr. Michael Benard summer interns, John Vanek and Tina Barbash, investigate how frog species adapt to changing environments. *Spring 2009*

The data gathered from these experiments were incorporated into population models to predict how changes in environmental conditions like reduced genetic diversity and increased predation risk affect overall population extinction risk. The laboratory facilities at the farm provide an important place for Benard and his colleagues to sort, measure and preserve samples taken from the artificial ponds. The farm also provides another benefit to Benard's research: the wooded areas and vernal pond on the property are home to a population of wood frogs. By taking data on the number of wood frogs living on site and comparing it to similar population-size estimates from other sites in Ohio, Benard is able to test the predictions generated by his artificial pond and modeling studies.



Aaron Jennings and **Robert Mullen** from the university's Department of Civil Engineering continued their research project in the Debra Ann November Research Greenhouse, studying the potential for development of carbon-negative biofuels. The goal of this project is to study the impact of the addition of biomass-derived charcoal on the growth of the African oil palm *Elaeis guineensis Jacq.* and soybean *Glycine L. max*, because they are the source of more than half of the world's vegetable oil production. Both species are being grown in the farm greenhouse in a variety of soils with and without biomass-derived charcoal amendments. Plant growth is being measured over a one- or two-year period, and the impact of the charcoal soil amendment will be quantified.



Christopher Cullis, Department of Biology professor and chair; graduate students **Cory Johnson**, **Tiffanie Moss**, **Cong Liu**,

Christina Cajigas; and **Andrea Fischione**, an undergraduate student doing independent research, are working at the Debra Ann November Research Greenhouse growing flax plants to study the mechanisms by which DNA within the cell can change rapidly, particularly in response to external stimuli. The plant-based model systems that are the basis for these investigations are the heritable mutations in flax in response to the external environment and the appearance of somaclonal mutations after plants have been taken through a cycle of tissue culture and regeneration. Flax has been shown to be especially prone to genomic destabilization by the external growing environment. Cullis and his students are interested in developing a flax genome project to elucidate these global genomic changes.



Joseph Koonce, Department of Biology professor, is upgrading the existing weather stations as part of a planned effort to install a high-resolution environmental monitoring network at the farm. The goal is to improve understanding of the interaction of environment and populations of animal and plant species at the scale of the individual organism for research and teaching. Ultimately, advancing understanding will require high-resolution (spatial and temporal) monitoring of key environmental drivers (temperature, relative humidity, light, etc.) and ability to track animal movements in the environment.

There are substantial technical challenges in creating a high-resolution monitoring network, and upgrading the existing weather stations was the first step. With funding from the Oglebay Trust, Koonce purchased replacement data loggers and precipitation and wind speed/



Dr. Joseph Koonce is upgrading farm weather stations. *Fall 2009*

direction sensors, and added new soil moisture sensors. He also purchased four water level data loggers. Solar radiation, temperature, precipitation and soil moisture are important environmental variables for plants and animals. Individuals respond to these variables and their local gradients in a variety of ways.

The existing weather stations are located in an open field near the permanent plot in the primary forest in the north woodlot. These two locations represent the extremes in level of direct solar radiation to flat topography at the farm. These weather stations now have remote data loggers, which report conditions via GSM phone to a web server. Every 12 hours, data are uploaded and archived for interactive use by researchers or students.

Probes monitoring incident solar radiation, temperature, relative humidity, precipitation, wind speed and direction, and soil moisture are in the open field. In the forest site, probes currently monitor temperature, relative humidity, soil moisture and wind speed. In addition to the remote data loggers, a stand-alone data logger for temperature and relative humidity in other

forests and open-field areas was deployed. The next step will be to deploy water level stand-alone data loggers in Squire Pond, the vernal pool constructed for amphibian habitat in the north woodlot and the small creek draining the sub-watershed containing the weather stations.

In the next phase of expansion of the monitoring network, a remote sensor network will replace the GSM remote data loggers and stand-alone data loggers. This network will consist of a radio base station receiver in the Biology Field Station and a set of radio repeater antennas arrayed over the entire farm. Any number of radio equipped (IEEE 802.15.4, 2.4 GHz ISM band) sensors can be added to this network. The network would also be able to track movement of radio-tagged animals.



David Burke and **Kurt Smemo**, assistant scientists at the Holden Arboretum and adjunct assistant professors of the Department of Biology, are studying phosphorus limitation and soil microbial community composition in hardwood forests of the farm. They have established 72 experimental plots throughout northern and southern Ohio, divided into six blocks consisting of 12 plots each. Two blocks (24 plots) were established at the farm property within the mature oak-maple forest along Cedar Road. They are applying granular limestone to six of the plots to raise soil pH from about



Kristal Hans, working on her forensic entomology research. *Summer 2009*
Photo provided by Kristal Hans.

3.5 to 5.0. Plots were set in September with additional application of limestone and triple super phosphate next year to achieve target pH and phosphorous levels. One and two years after treatment application, they will be sampling soil for analysis of soil microbial communities, soil chemistry and enzyme activity. Cores will measure 10 cm in diameter and will be collected to a depth of 5 cm.

They also will sample tree leaf tissue for analysis of foliar nutrient content. It is their expectation that sampling will have few affects on the forest stand, but could result in increased nutrient gain by the trees. The study will run from September 2009 until December 2013. This research is a collaborative project between Ohio University and Case Western Reserve University. **Jared DeForest**, assistant professor in the Department of Environmental and Plant Biology at Ohio University, is another principal investigator on the project and will be involved

in site set-up and sampling. The study is being funded by a National Science Foundation grant.



Joseph Keiper, curator of invertebrate zoology at the Cleveland Museum of Natural History and adjunct assistant professor of the Department of Biology, and his Cleveland State University graduate student, **Kristal Hans**, used the farm as a study site for their forensic entomology research. They selected a location near the farm research ponds to study nine small mammal carcasses. Each mammal carcass was placed in cages on the ground and students checked them weekly to record the insect colonization. The study took place over a two-month period.



Ronald Oldfield, Department of Biology lecturer, currently uses the farm for two primary areas of research on the biology of fish: (1) as

a base of operations for a study on habitat use in native Ohio brook trout; and (2) for a laboratory study of growth and development. The brook trout research aims to study stream characteristics that allow brook trout to establish new populations. In 2008, his research team mapped three trout streams to identify sections of riffles, runs and pools.

Bob Szatkowski, undergraduate student, is studying how brook trout are using these different microhabitats. This information helps the research team better understand why some seemingly appropriate streams have failed to support brook trout, and helps in the design of additional streams that may be restored in the future. The farm provides an ideal base of operation for this research due to its location on the Chagrin River drainage. The farm also maintains various ecological equipment, such as waders, measuring tapes, flow meters and fishnets, used to conduct the research.

Oldfield's second area of research is studying the response of fish growth and development to social behavior in Midas Cichlids. In lab conditions, fish were raised either alone or in pairs, and were sampled regularly over a two-month period. Primarily, they are interested in finding out if a self-induced growth reduction is the mechanism responsible for growth inhibition in non-group-living fish, as it is in group-living fishes. **Laura Gibbons**, undergraduate student, and **Karen Hoang**, research assistant, are currently using the histology laboratory in the Main Barn to analyze the gonads of the fish used in the experiment to identify the sex and assess the stage of reproductive development of each.



Ana Locci and **Josh Losth**, farm summer student supported by the SURES program, analyzed carbon footprints at the farm facilities

and programs, and explored the installation of renewable energy projects to reduce CO₂ emissions. The analysis included a detailed auditing of several energy sources, including electric, gas, and fuel and diesel consumption during the last 10 years. A goal of the study is CO₂ emissions reduction.



Cleveland Botanical Garden research manager **Sandra Albro** used the ecology research lab equipment to collect a set of data points for a greenhouse plant experiment. Albro calculated dry weight (biomass) for four species—tomato, pepper, marigold and basil—that were grown in either a test greenhouse or a standard (control) greenhouse at Cleveland Botanical Garden. The test greenhouse is constructed with liquid crystal panels that are able to vary the amount of light that they transmit based on ambient conditions.



Hardwood forest tallest trees at the research site. Summer 2009



Junco eggs. May 2009

In comparison, the control greenhouse is constructed with regular glass, covered in 47 percent shade cloth. They hypothesize that plants grown in the liquid crystal greenhouse will grow better than in the standard greenhouse, due to having more favorable light and temperature conditions. The botanical garden is partnering with the Liquid Crystal Institute of Kent State University on this project. The long-term goal of this series of experiments is to develop a “smart” greenhouse using liquid crystal panels that optimizes plant production and energy efficiency.



Andy Jones, Cleveland Museum of Natural History curator, and his masters student, **Dee Bolen**, continued their study on the importance of UV reflectance in host recognition of Brown-headed Cowbird eggs during the early summer 2009.

Surveys of wildlife populations continue to take place at the farm. One group was led by **Lisa Rainsong**, who surveyed bird-nesting activity at the property for Ohio Breeding Bird Atlas II. This atlas is a grid-based survey used to document the status and distribution of all bird species that breed within a given country, state or county. The Ohio Breeding Bird Atlas II is a joint project of The Ohio State University School of Environment and Natural Resources and the Ohio Department of Natural Resources—Division of Wildlife.



Darhl Foreman, professor emeritus of Biology, is currently working on publishing a paper on the role of photoperiod and animal reproductive systems.



In her third year, **Mary-Scott Cebul** continues her valuable volunteer work at the farm as a consultant for several projects at the Valley Ridge

Farm including research on the historical gardens and the planning of the Silo Theater.



Kenneth Kutina, vice president emeritus for Institutional Planning, uses one of the main barn faculty offices. Kutina was the Farm Management Committee chair for 11 years and continues providing support and advice to the farm administration, including grant writing and assistance with several development initiatives. Kutina has been key in the development of green farm campus initiatives including the feasibility study and the permit process to install a small wind turbine and solar panel array.



More than 100 tobacco and Ditura plants are being supplied by the farm greenhouse for **Mark Willis'** lab, which studies the flight patterns of moths. The plants are used for female moths to lay their eggs in and to

maintain their colony. **Alan Aldridge**, farm staff, oversees the plant production.



Fertilized egg production for research laboratories continues to be a very important activity at the farm. In 2008-2009, 35,652 eggs were produced. Fertilized eggs were delivered to five Case Western Reserve researchers at two Cleveland Clinic labs, two School of Medicine labs and one Department of Biology teaching lab. Areas of research include neurobiology, oncology, molecular cardiology, molecular biology and hematology. Lab experiments range from determining where derma tissue develops to the formation of neural circuits in vertebrates. The farm also provided fertilized eggs to several local schools. The B300 chickens used for the farm's egg production are supplied by ISA Breeders in Ithaca, New York. Egg production and delivery is overseen by staff member, **John Schwartz**.



Entomology course student searching for aquatic insects. *Fall 2009*

CONSERVATION PROGRAMS AND GREEN INITIATIVES



The conservation programs continue to expand at the farm. Projects are aimed at enhancing the farm's natural resources while providing great opportunities for research and teaching for students and farm visitors. Since 2000, several programs have been established, including a bluebird trail of 48 houses, a 4-acre prairie restoration, enhancement of ponds using renewable energy and creation of a salamander lagoon.

The bluebird trail, in its eighth season, includes 48 Peterson houses located around the research ponds and nearby fields. (Six new boxes were added this year.) Alumnus **Bill Jirousek** and university staff member **Betsy Banks**, both farm volunteers, checked the houses regularly during the breeding season (April to August), recorded data and banded hatchlings. Many of the farm bluebirds wintered over, and the first bluebird egg was laid on April 18. The last bluebird fledged on August 2. A total of 167 birds fledged (as compared with 141 in 2008)—44 Eastern bluebirds (34 in 2008), 32 tree swallows (11) and 91 house wrens (96). Three adult birds were caught and banded—one bluebird and two tree swallows. Another tree swallow was caught that had been banded as an adult in 2008. An adult house wren was also caught that had been banded as a hatchling in 2006. Trail data, recorded and analyzed at the

farm as part of a long-term study, continues to be included in the Holden Arboretum's and Cornell University's national database totals.



During the last week of April, 10 acres were burned in the prairie restoration area, with assistance from the Geauga Park District staff. A permit for open burn was obtained from the Ohio EPA office by the Geauga Park District field biologist **John Oros**. A certified prescribed fire manager through ODNR, Division of Forestry, Oros supervised the burning. He has overseen prescribed burns on the park properties since 2001. The typical burning window in Northeast Ohio begins the last week of March and ends the third week of April. On April 17, 2009, the weather conditions were right for a prescribed fire. These conditions included a sunny day with 1.5 days since rain, winds of 5 mph, and



John Oros, Geauga Park district field biologist and certified prescribed fire manager, during a prescribed burning of the prairie restoration area. *April 2009*



Big Bluestem grasses dominating the prairie area. September 2009

midflame winds of 2.4 mph. The burning took place from 1:30 to 3 p.m. There was a 24-hour advance notice for the burning. Farm staff rototilled the area surrounding the prairie to create a firebreak. Three farm staff and three park staff assisted during the burning.

During spring and summer 2009, 17 wildflowers and grasses were observed in the prairie restoration area. Species observed include *Bouteloua curtipendula* (Side-oats Grama), *Elymus canadensis* (Nodding Wild Rye), *Sorghastrum nutans* (Indian Grass), *Andropogon gerardii* (Big Bluestem), *Echinacea purpurea* (Purple Coneflower), *Heliopsis helianthoides* (Ox Eye Sunflower), *Ratibida pinnata* (Grey-Headed Coneflower), *Aster novae-angliae* (New England Aster), *Coreopsis tripteris* (Tall Coreopsis), *Monarda fistulosa* (Wild Bergamot), *Silphium trifoliatum* (Whorled Rosinweed), *Verbena hastata* (Blue Vervain), *Helianthus*

grosseserratus (Sawtooth Sunflower), *Lespedeza capitata* (Roundheaded Bushclover), *Rudbeckia subtomentosa* (Sweet Black-eyed Susan), *Rudbeckia triloba* (Brown-eyed Susan), *Rudbeckia hirta* (Black-eyed Susan), and *Lobelia siphilitica* (Great Lobelia).

One of the most noticeable vegetation changes after the burning was observed during the month of September, with a high density of Big Bluestem grasses dominating the prairie area. The project is being done in collaboration with the Cleveland Museum of Natural History and the Ohio Prairie Nursery Ltd. The program aims to restore 4 acres of old pasture area into a native prairie containing several Ohio indigenous grasses and 20 forbs species. The prairie restoration is enhancing the farm's rich wildlife, and becoming another teaching and research tool to complement our expanding academic programs. The prairie site also serves as a great

educational tool for farm visitors. The project was supported with funds provided by **Brian** and **Cindy Murphy**.



With a \$15,000 fund from the Case Western Reserve campus sustainability fund, a feasibility study was carried out by EPS Company to explore the possibility of installing a 50kW wind turbine to produce 90 percent of the electricity consumed at the farm. The installation of a wind turbine will be a pioneering effort and will serve as a showcase for this environmentally friendly technology.

During March 2009, a construction permit to erect the wind turbine was obtained from the Village of Hunting Valley for a 130-foot

tower located by the farm research areas.

The feasibility study results recommended the installation of a 50kW wind turbine and a 24.4 kW solar panel array to produce up to 80 percent of the total electricity consumed by the farm teaching and research facilities. These two sources of renewable energy will be used as demonstration projects and operation for Case Western Reserve students and for the hundreds of grade-school children and teachers who come to the farm each year for environmental programs. In addition, we will feature the facility on the farm website and invite interested private and commercial owners to come for regularly scheduled tours and information sessions about this state-of-the-art clean energy source.



Example of proposed wind turbine to be installed near the farm research area.

STUDENT LIFE



Student life at the farm includes academic, community service and recreation. Among the diverse groups are Greek Life, varsity teams, religious organizations and language immersion.

Student-initiated, scheduled use of the farm facilities has increased greatly. Sixty student groups reserved the facilities in 2009. The student reservations included groups using the Pink Pig, Sheep Barn, Manor House, Kutina Classroom and picnic areas. Among the student groups using the facilities were:

Aikido Club
Alpha Phi Omega Sorority
Alpha Kappa Psi
ASHA Indian Students Association
American Medical Student Association
Beta Nu of Theta Chi
Biology graduate students
Bioethics graduate students
Case Baja SAE
Case Alliance Dental Association (CADA)
Case Campus Girl Scouts
Catalyst Social Interest Group
Case Western Reserve Fellowship of Christian Athletes
Case Western Reserve Film Society
Case Western Reserve Go Club
Case Western Reserve School of Medicine Student Groups
Case Western Reserve Women's Soccer Team
Case Western Reserve Archery Club
Case Western Reserve Cross Country teams
Case Western Reserve Track team
Case Western Reserve Cycling Club
Chi Alpha Christian Fellowship
College Scholars Program
Delta Sigma Theta
Delta Upsilon Fraternity

Dental Si Omega
Electrochemical Society/CWRU Student Chapter
Engineers Without Borders Group
French Students Immersion
German Students Immersion
Institute of Electrical and Electronic Engineers Case Student Chapter
Inter-Society Council Group
Inter-Varsity Christian Fellowship
Inter-Varsity Graduate Christian Fellowship
Japanese Students Immersion
Korean Graduate Students Association
Lambda Chi Alpha Fraternity
Mather Dance Center
Material Science Graduate Students
Muslim Students Association
Newman Catholic Students Association
Phi Kappa Tau
Phi Gamma Delta
Phi Sigma Rho
Psi Omega Dental Honorary Society
Residence Hall Association
Russian Students Immersion
Second Year Institute
Sigma Phi Epsilon Fraternity
Sigma Psi Sorority
Solstice Women's A Cappella
Spanish Student Immersion
Student Turning Point Society (WSOM)
Tau Beta Pi
Theta Chi Fraternity
Turkish Student Association
Undergraduate Student Government
UPCaM
Zeta Beta Tau Fraternity

Students members from Engineers Without Borders, Case Western Reserve University Chapter installing an irrigation system. *Spring 2009*
Photo provided by Mark McGee.

Orientations for the School of Medicine, School of Dentistry and Case Western Reserve new faculty took place at the farm.

During 2009, several student groups used the farm for special projects as part of their extra curricular activities. The farm provides unique space and opportunities for outdoor projects.



The Case Society of Automobile Engineers Mini Baja team used the farm to test its off-road vehicle in preparation for international competitions. The team consists of undergraduate and graduate students working together to raise funds, attract new students, manage the design, and build and test processes over two semesters. The team consists of approximately 21 core members who are a mix of undergraduate students from several different majors. Their team's advisor is **Jim Drake** of the Bingham Shop. The team came during the month of May to test their vehicle for the Baja SAE Wisconsin June 11-14, 2009, in Burlington, Wisconsin. They used the gravel parking lot around the picnic areas after hours and during the weekends.



Since spring 2009, the university's Engineers Without Borders chapter has been conducting a water project at the farm both to act as a test bed for current and future international projects and to improve the farm community gardens' irrigation system. The group is a humanitarian student organization committed to partnering with developing communities in order to improve quality of life. This partnership involves the implementation of sustainable engineering projects by internationally responsible engineering students partnering with professional engineers.

The partnership consists of Case Western Reserve undergraduate students, faculty and professional advisors. The faculty project advisors are **Andrew M. Rollins** and **Warren E. Rupp** from the departments of Biomedical Engineering and Medicine. Project co-chairs are students **Steven Burns** and **Matthew McPheeters**.

The rainwater collection system is designed to use the roof of the chicken coop in order to supply the nearby garden plots with water. Construction of the collection system involves modification of the drainage gutters and offshoots. The project consists of the design and construction of two ferrocement water tanks and the installation of a small vertical windmill to pump the water. The irrigation system will offer gardeners the option of a drip irrigation system. Both water holding tanks are designed and constructed of appropriate size for their use and will have drainage systems for excess water to prevent erosion and damage to the tanks and surrounding structures in the event of extreme rainfall or periods of non-use. This project has been promoted as a sustainable approach to water sourcing in both the local and the university communities.



Eight members of the Case Alumni Association came to the farm on October 4 to test a trebuchet built by engineering alumni. The trebuchet launch was one of the many alumni activities during the alumni weekend celebration. The testing took place in the large open field by the farm picnic areas. The actual launch happened at the baseball diamond at the village.

The Case Alumni Association (CCA) and farm director **Ana Locci** hosted A Day at the Farm, a picnic open house, on August 15, which brought

200 alumni and their families to the farm. The event included hiking along the beautiful wooded trails; a walk through the Debra Ann November Research Greenhouse; guided tours of the energy-efficient projects, which included viewing the future site of the wind turbine; tours of farm historical buildings and teaching facilities; and games and activities for the whole family. CCA and farm administration hope to make this an annual event.

ATHLETICS AND RECREATION

Three Case Western Reserve cross country meets took place in September and October at the farm. Ten colleges participated in the Sudeck Classic Invitational September 5, with about 400 visitors and 300 athletes and coaches. The alumni race took place on September 12 and brought more

than 60 visitors to the farm. On October 31, the university hosted the UAA Championships, which brought 600 visitors to farm.

For the second year, the farm hosted the North Coast League HS meet, held this year on October 17, 2009. Ten schools participated, bringing more than 600 runners and guests to the farm.

The Case Western Reserve Archery Club hosted its annual conference May 3 at the farm. Ten students participated in the one-day event.

The Community Garden program had another busy season. University staff, faculty members, emeriti faculty and students reserved 21 garden plots from May to October 2009. The farm administration provided water, hoses, a garden shed for tool storage and a compost pile.



Community Gardens. *Summer 2009.*

FACILITIES USAGE



All of the facilities continue to be a popular destination for Case Western Reserve classes, university department events and meetings, student group meetings and retreats, and outreach programs. Events using the various facilities range from international conferences and training programs to small weekend retreats. The historic facilities are not only excellent for retreats, but hold many memories for university alumni. Many of the facilities are known by name: The Sheep Barn; Pink Pig, our “rustic cottage,” several picnic areas; the Main Barn and Kutina Classroom; and Squire’s own country estate, the Manor House. Patty Gregory oversees the reservation process for all farm facilities.

During the year, 135 groups booked the various picnic areas, generating 8,247 person-visits. Of these specific groups, 14 percent were student events, 33 percent were university departments, 40 percent were university-affiliated private events, and 14 percent were not-for-profit groups.

The Sheep Barn hosted 87 groups, generating 7,273 person-visits. Groups using the Sheep Barn consisted of 26 percent student events, 61 percent university academic meetings and retreats, 20 percent university social events, and 8 percent not-for-profit groups.

The Pink Pig accommodated 101 groups, generating 1,733 person-visits. Groups using the Pink Pig consisted of 40 percent student events, 26 percent Case Western Reserve continuing education classes, 24 percent other university academic and social meetings and retreats, and 11 percent not-for-profit organizations.

The Kutina Classroom provided space for 96 groups, generating 1,644 person-visits. The classroom hosted 88 percent academic meetings and retreats, and 12 percent not-for-profit group meetings. The classroom is equipped with audio/visual equipment and can accommodate up to 25 users per visit comfortably.

The Manor House provides a special venue for meetings and reached a wide audience this year. The facility hosted 41 events: 28 for Case Western Reserve departments, three for student groups, two for not-for-profit groups, and eight for other university-affiliated private events.

Among the university academic events hosted at the Manor House were the Department of Biology graduate students and faculty retreat and the Cardiovascular Research Institute retreat. University staff retreats held at the house included the Office of Inclusion, Diversity and Equal Opportunity, the FES Center, Instructional Technology and Academic Computing, and the Office of Customer Service and Support. Several Case Western Reserve departments use the Manor House yearly for their social events. Among them were the Frances Payne Bolton School of Nursing Thanksgiving Brunch in honor of their donors and the Law School LL.M. Graduation Dinner. In December, the Manor House hosted the Department of Family Medicine's holiday party. The Manor House also serves the Cleveland community's non-profit and corporate groups by hosting board meetings and training programs. The number of student groups using the Manor House continues to increase.

COMMUNITY SERVICE



Another very important farm contribution is community service.

The administration, as part of its strategic plan for the university, is committed to encouraging other organizations to use the farm. Area museums, academic institutions, local schools and community service groups are encouraged to use the farm's facilities, property and research areas for academic purposes.

The School Visitation Program is a hands-on program designed to reinforce concepts and field methods in the areas of environmental science and ecology for local middle and high school students. During the academic year 2008-2009, the farm hosted a total of 13 school visits: 526 students, 28 teachers and 38 chaperones visited the farm. The schools participating were Shaker Middle School, Warrensville Heights High School, Caledonia and Mayfair elementary schools, Entrepreneurship Preparatory School, Padua Franciscan High School, Saint Christopher, Charles F. Brush and Hathaway Brown.

During the school visits, **Kathy Nolan**, University of Michigan student and farm summer volunteer, assisted with the programs. Nolan volunteered at the farm six weeks in the month of July and August, during which she designed brochures to describe the facilities and programs at the farm buildings, updated a database and designed surveys for the farm administration to evaluate the farm programs and facilities usage.



Hathaway Brown School and Case Western Reserve continued their collaboration and usage of the farm facilities. During the academic year 2008-2009, the usage of farm facilities exceeded 600 students and staff. Their use of the farm facilities including the Sheep Barn, Pink Pig, Manor House and picnic areas. Visits included environmental programs for second, fourth and fifth graders, Spanish immersion programs, middle school aquatic education, several faculty and staff professional meetings, and several social events.



The Cleveland Museum of Natural History offered several programs at the farm. In December 2008, four museum staff and two members conducted the Christmas Bird Count. The Future Scientists, one of the museum's longest running programs, offers high-school-aged students an extraordinary opportunity to learn about a variety of topics in natural history through field experiences, contact with researchers and hands-on activities. The Future Scientists visited the farm three times in 2009. The program exposes motivated high school students to topics and activities in the natural sciences. During one of the visits led by **Jeff Day**, Cleveland Museum of Natural History instructor, five students learned how to use a compass and had an orienteering course around the farm property.

During their second visit, Mike Benard led five students through the farm's research ponds. Future Scientists had the opportunity to catch and study dragonfly larvae as well as examine salamanders with an expert herpetologist. In previous years, the Future Scientists have studied the bluebird trail surrounding habitat. In fall 2009, they studied the farm woodlot permanent research plots.

Beside these programs, the museum's curators and researchers are actively teaching undergraduate and graduate courses at the farm in collaboration with the Case Western Reserve Department of Biology.



The Audubon Society continues to use the farm facilities for their meetings. The group meets in the Kutina Classroom five times a year.

GRANTS AND GIFTS



Grants and generous gifts from numerous donors and foundations have allowed us to develop new academic programs and update our teaching and research facilities.

During spring 2009, the farm received an annuity gift from **Mort** and **Iris November** to convert the main room of the Dairy Barn (Silo room) into an assembly area. The renovation consists of repairs in the staging room, opening of the front entrance, hard surface on the courtyard area, restoration of back doors and a new egress access to the main room. The new space remodeling started in June 2009, and after getting the final permits from the State of Ohio the renovations resumed in October 2009. The new room will be a venue for academic programs sponsored by the Case Western Reserve music, English and biology departments. This three-season space will be home for programs such as nature classes, chamber music concerts, poetry readings and creative writing summer workshops. The site is expected to be ready by spring 2010.

The University Farm Endowment fund, established in 2007 to help maintain the property with more than 20 structures, including historic barns, conference and classroom facilities, a research greenhouse, private homes, garages

and acres of green space, received several gifts during 2009. The fund started with \$10,000 and has grown to \$17,850 within two years.

A Farm Annual Fund to raise funds to support new farm initiatives and programs was initiated in 2005. By means of this fund, individuals can now contribute directly to the farm during the university's annual fund drive. To date, \$17,800 has been raised thanks to the generosity of farm friends and neighbors. This fund is already being used for new initiatives such as trails brochures, green initiatives and supporting the Farm Visitation Program.

The Farm Bench Program received four bench donations in 2009 for \$2,000 each. Families of university alumni donated the benches in honor of family members. This fund supports the expansion and updates of the teaching facilities at the Valley Ridge Farm facilities. Several of the updates included repairs of the octagonal building exterior and new doors, which is used by the Art Studio Department's ceramic courses.



MAJOR IMPROVEMENTS AND REPAIRS



The farm property facilities continue undergoing extensive improvements and major repairs. The farm administration is committed to increasing the sustainability of the farm operations by reducing energy consumption. Purchases, improvements and repairs are aimed at reducing utility bills and saving on fuel consumption while lowering maintenance time and costs. Construction and repair projects are under the direct supervision of Mark McGee, on-site farm foreman since 2000.

From May to August, two Case Western Reserve students were hired to assist farm staff with general farm maintenance: **Mark Mahler**, a junior in the nursing program, and **Ryan Franz**, a masters student in the Department of Civil Engineering. Their hard work and dedication made it possible to complete several of the painting and landscape jobs scheduled during spring and summer. Among the several large painting jobs completed by farm staff and students during the spring, summer and fall, including the painting of the boat shed, Pink Pig window frames, Valley Ridge Farm small structures, and community gardens shed.



Several roofing jobs completed this past year consisted of the community gardens shed, the boat shed and the historical Gazebo by the Wade's Lake at Valley Ridge Farm.



The Sheep Barn front driveway area was repaired and paved during the month of October.



The Manor House main entrance sidewalk and front stone patio underwent extensive repair, which including replacement of 70 percent of the stone and all of the grounding. The Manor House landscape has ongoing improvements, including the addition of ground covers. **Chris Bond**, new staff member and horticulturist by training is redesigning several garden sites using various plants to add color and texture to the farm landscape



Fourteen energy-efficient windows were installed in the Pink Pig facility. These new windows will lower the heating consumption as well as greatly improve the comfort of farm visitors during winter months.



The farm's six private residences continue getting updates including indoor and outdoor painting, new high-energy efficient appliances, new tile floors and carpets.



Garden gazebo, Valley Ridge Farm. September 2009. Photo provided by Mark McGee.

THANKS FOR YOUR GENEROUS SUPPORT



Your generous support has allowed us to develop new academic programs and to update our teaching and research facilities. Thanks again for your generosity.

Your philanthropy for the farm can be expressed in several ways, including:

Farm Annual Fund Gifts in any amount provide unrestricted income to develop new academic and conservation initiatives as well as small facilities improvements.

Farm Bench Dedication Program A \$2,000 bench donation helps to update our art teaching facilities and to improve our outdoor areas at the farm. Learn more at studentaffairs.case.edu/farm/support/bench.html

University Farm Endowment This fund was established in 2007 to help improve and maintain the property, which includes more than 20 structures and 389 acres of green space. Many of the university farm buildings are more than 100 years old and require extensive upkeep to preserve their rich history.

Planned Giving A planned gift to the farm would provide a benefit to you and your family by bringing immediate and deferred tax advantages to both you and your heirs.



If you would like to contribute to any of these funds, please contact us at 216.368.0274 or visit studentaffairs.case.edu/farm/support.

STATISTICS



Table 1. Farm Usage by Facilities from November 1, 2008 to October 31, 2009

Facilities	# Groups	# Visits
Picnic Areas	135	8,247
Sheep Barn	87	7,273
Pink Pig	101	1,713
Manor House	41	2,378
Main Barn Kutina Classroom	96	1,644
Main Barn Training Classroom	3	101
Mather Teaching Lab	28	690
Main Barn Faculty Offices	7	582
Greenhouse Lab	18	1,093
Debra Ann November Greenhouse	22	932
Ceramic Studio	5	170
Cross Country Trail	62	2,598
Community Garden Plots	20	400
Total Farm Users by Facilities	625	27,821
Estimated Casual Visitors		5,250

Table 2. Farm Usage by Program from November 1, 2008 to October 31, 2009

Programs and Events	# Groups	# Visits
<i>UNDERGRADUATE AND GRADUATE COURSES</i>		
Genes and Evolution (BIOL 214) (Spring)	12	360
Genes and Evolution (BIOL 214) (Summer)	1	75
Aquatic Lab (BIOL 339)	1	192
Principles of Ecology Lab (BIOL 351L/451L)	1	228
Introduction to Entomology (BIOL 318)	1	100
Hydrogeology (GEOL 321/421)	1	16
Geophysical Field Methods and Lab (GEOL 330/430)	3	27
ACNP Flight Nursing Summer Course	1	300
Raku Ceramics (ARTS 399)	1	14
Raku Ceramics (ARTS 497)	1	77
Raku Ceramics (ARTS 214, 314, and 365g)	1	32
Photography Studio I (ARTS 220)	1	10
Ceramic (ARTS 330) Spring	1	14
Ceramic (ARTS 330) Fall	1	33
Modern Languages and Literature Immersion Programs	5	195
<i>CONTINUING EDUCATION</i>		
Summer in the Country	9	675
Non-fiction Fall - Winter course	2	252
Autum in the Country	2	266
<i>ON-SITE RESEARCH</i>		
CWRU Undergraduate Research	9	182
CWRU Graduate Research	5	280
Holdem Arboretum	2	70
Cleveland Museum of Natural History/Cleveland State	1	15
John Carroll University Research	2	50
Cleveland Botanical Gardens	1	20
Cleveland Metroparks	2	10
<i>STUDENT LIFE</i>		
Society of Automobile Engineers (SAE) Mini Baja Club	1	15
Engineers Without Borders	1	60
CWRU Cross Country Meets		
Case Alumni	1	60
Case Sudeck Invitational	15	700
UAA CC Championships	12	600

Programs and Events	# Groups	# Visits
<i>ORIENTATIONS</i>		
New Faculty	1	90
School of Medicine	1	120
School of Dentistry	1	300
Archery Conference	1	10
Fraternities/Sororities	18	648
Student Trebuchet Testing	1	12
Case Alumni Association Open House	1	200
<i>COMMUNITY SERVICES</i>		
Local Schools, Grades K-12	13	596
North Coast League Cross Country Meet	12	600
Cleveland Audubon Society	1	105
Cleveland Museum of Natural History (CMNH)	3	32
CMNH Future Scientist	4	48
Other Non-profit Organizations	27	1309
Hawthway Brown School	16	643
Science in the Circle Program	2	44
John Carroll University Biology Courses	5	106
Cleveland Herb Society	1	40
Garden Clubs lectures	2	85
Total Farm Users by Programs	207	9,916



Farm Management Committee

DAVID M. HUTTER, Professor, Physical Education and Athletics

KENNETH L. KUTINA, Vice President Emeritus for Institutional Planning

ANA B. LOCCI, University Farm Director and Adjunct Assistant Professor,
Department of Biology

HEIDI MARTIN, Assistant Professor, Department of Chemical Engineering

DAVID MCCOY, Associate Professor, Environmental Health Sciences,
School of Medicine

GLENN NICHOLLS, Vice President for Student Affairs,

Chair, Farm Management Committee

BEVERLY SAYLOR, Associate Professor, Department of Geological Sciences

JERROLD SCOTT, Associate Professor, Department of Theater Arts

DAVID BELL, Vice President, Government and Community Relations

Farm Staff

ANA B. LOCCI, Director

MARK B. MCGEE, Foreman

JOHN SCHWARTZ, Group Leader

ALAN ALLDRIDGE, Utility Worker

CHRISTOPHER BOND, Utility Worker

PATTY GREGORY, Department Assistant

KIMBERLY DEININGER, Manor House Events Coordinator

Report submitted by:

GLENN NICHOLLS

Chair of the Farm Management Committee

ANA B. LOCCI

Director of University Farm

December 2009

Photography by Ana Locci



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