

ANNUAL REPORT
2006

MICHIGAN AGRICULTURAL
EXPERIMENT STATION

Michigan State University



2006 Annual Report

This annual report not only highlights the research activities supported by the Michigan Agricultural Experiment Station, it recognizes the people making that research happen.

MICHIGAN
AGRICULTURAL
EXPERIMENT STATION

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Report prepared under the direction of Steven G. Pueppke, director of the Michigan Agricultural Experiment Station.

Design by Christine Altese; editing and production by Gwen Skinner, public relations manager.

All photos by Harley Seeley and Kurt Stepnitz, MSU photographers, unless otherwise noted.

2006: MAES Research for Michigan and the Global Economy



Steven G. Pueppke

Mid-Michigan is all dressed up in leafy, late summer finery. The campus, a tidy polygon, is hard up against Grand River Avenue, squeezed in between Harrison and Hagadorn roads and bisected by the Red Cedar River. In no time at all, I am adept at looking purposeful as I blend in with the pedestrian flow and dodge bicyclists.

Straight sidewalks? There aren't any of them connecting places that I need to go, particularly north of the river. So I learn to take pleasure in winding up where I don't intend to be — late for class and having no idea where Wells Hall has hidden itself this time. The year is 1968, John Hannah is the president and not a statue, and I am a new freshman at MSU.

These are some of the memories that washed over me when I returned to MSU this past January — almost 38 years after I first arrived — to become the new director of the Michigan Agricultural Experiment Station. Like the rest of us, the campus has put on a few pounds and now sags down around the middle toward Mt. Hope Road. But the children and grandchildren of my classmates still navigate their bikes much too fast, and the campus planners still haven't taken the curves out of the sidewalks.

Some things have changed, though, including me. There are wisps of gray now over the ears — all honestly earned. The North Dakota grain farm of my 1950s childhood seems far away, as I look back over challenging yet rewarding decades as a university professor in Florida, Missouri and Illinois — and as an escapee to Switzerland and Germany for sabbatical leaves. My drive to be the world's expert in my own little area of research — a species of bacterium that fixes nitrogen in soybean roots — has given way to the middle-ager's desire to understand as much as he can about broad science issues that didn't interest him at all when he was younger. And Michigan has become, not a station on the way to somewhere else, but my home.

The world of our stakeholder community has changed, too. In the 1960s, we didn't imagine that differential labor costs would combine with efficient global transportation networks to bring us consistent supplies of inexpensive food products from far away — and at costs that often challenge our local producers. Agricultural biotechnology, vertically integrated supply systems, identity preserved market

channels, big box retailers and serious interest in organic foods were unknown.

We knew about Rachel Carson; indeed, many of my generation were motivated by her concerns for the environment. But our collective sense of the fragility of our natural resource base was poorly developed. We weren't very concerned about water quality or urban sprawl, and I don't remember hearing much about energy security or global climate change. We weren't yet thinking much about systems.

Universities such as Michigan State have changed, too. My predecessors in the role of MAES director couldn't have imagined the degree to which we are now expected to leverage scarce research funds with outside grants (no more allowance, as I sometimes say to new faculty members). Agricultural experiment stations of the 1960s didn't much concern themselves with indirect cost returns on research grants, and they were rarely called upon to negotiate intellectual property deals. The notion of a fourth leg to the tripartite land grant mission — that of technology transfer — was still years off.

Today, we're coming to terms with the globalized world of the 21st century, our role as part of the modern research university, and our complex and interrelated food, agricultural and natural resources system. We have built a powerful basic research engine and focused it on problems that need solving. We have come to a heightened sense of the importance of consumers and rural communities. And we have discovered expertise all around the campus and used MAES resources to apply it to key Michigan issues.

I don't expect this pace of change to abate. How many of us were thinking of the bioeconomy even two years ago? Not many, and yet now we are talking seriously about the potential to turn Michigan into a major producer, processor and consumer of biomass for renewable energy, biomaterials and other substances. This offers immense opportunities, not just for Michigan producers but for entrepreneurs interested in processing, logistics and manufacturing.

We have the natural resource base and the human assets to make it happen here, and President Simon has committed MSU to be a leader in generating new bio-based technologies and transferring them to the private sector. I'm involved, too, as director of the new university Office of Bio-based Technologies. This keeps me busy, but it makes perfect sense to link our bio-economy efforts closely to the MAES.

Michigan Agricultural Experiment Station Mission and Areas of Emphasis

The Michigan Agricultural Experiment Station generates knowledge through strategic research to enhance agriculture, natural resources, and families and communities in Michigan.

This mission, effectively executed by more than 300 scientists in five colleges at Michigan State University, has enabled the MAES to be one of the most successful agricultural experiment stations in the country. This success is due to our outstanding researchers; close ties with MSU Extension, state agencies and commodity groups and other stakeholders and exceptional legislative support.

The challenges facing Michigan agriculture and natural resources are increasingly complex and diverse. MAES research programs are continually evaluated for relevance and progress. A strategic visioning process, linked to those of MAES-affiliated colleges at MSU (Agriculture and Natural Resources, Veterinary Medicine, Social Science, Natural Science and Engineering) and MSU Extension, has identified five areas of emphasis that are driving the MAES research agenda over the next decade.

The MAES areas of emphasis address the research priorities of Michigan agriculture and natural resources industries and family and community needs but are also linked to national goals and new initiatives.

MAES Areas of Research Emphasis:

- **Food and Health.** Microbial and chemical food safety, nutritional enhancement of foods (functional foods), nutritional immunology, consumer choice and diet, food security, general nutrition and epidemiology.
- **Environmental Stewardship and Natural Resources Policy and Management.** Land use policy and management, air quality, soil conservation, waste management and use of waste products, landscape ecology, ecosystem management and water research (quality, watershed management, and water use for agriculture and natural resources businesses).
- **Enhancing Profitability in Agriculture and Natural Resources.** Basic research in the plant and animal sciences to reduce dependency on chemicals and enhance resistance to diseases, insects and environmental stresses, integrated crop management, and the identification and development of value-added agriculture opportunities for Michigan.
- **Secure Food and Fiber System.** Basic and applied research on new, emerging and reemerging infectious diseases, invasive species (insects, plants, pathogens and aquatic animals) and agrosecurity.
- **Families and Community Vitality.** Community and economic development, recreation/tourism, youth, aging, family dynamics, demographics, and rural and urban community security.

This research will result in profitable Michigan agriculture and natural resources industries, enhanced rural and urban community development, and strong and healthy families. As programs develop, the MAES strives to maintain a balance between applied and basic research.

McKinsey, a major international consulting firm, recently took a careful look at the American labor market and identified three kinds of jobs for the 21st century. One type of work will be transformational — extracting raw materials and turning them into finished products. A second will be transactional and involve repetitive operations that can be easily automated. The third kind of jobs will rely on tacit knowledge and keen judgment to negotiate a world of complex interactions.

The consultants zeroed in on this last group of jobs, which now makes up 40 percent of the U. S. labor market, as the area with greatest growth potential. I believe that we should be paying attention. Ours was a world of transformational jobs back when

Hannah was the president. Today, though, we're seeing the importance of judgment and tacit knowledge as we negotiate the intricacies of 21st century agriculture, the community systems that support it and the natural resources that sustain it. The MAES intends to be a leader as we work through these complexities, and I'm looking forward to being part of the process.



Steven G. Pueppke
Director

Michigan Agricultural Experiment Station

As of 10-1-2006

Steven G. Pueppke, Director & Assistant Vice President, Research & Graduate Studies

John C. Baker, Associate Director

Douglas D. Buhler, Associate Director & Associate Dean, Agriculture & Natural Resources

Bev Riedinger, Business and Finance Manager

Jamie DePolo, Editor

Jackie DeSander, Administrative Assistant

Candace Ebbinghaus, Administrative Assistant

Jawed Faruqi, IT Manager

Linda Haubert, Projects Administrator

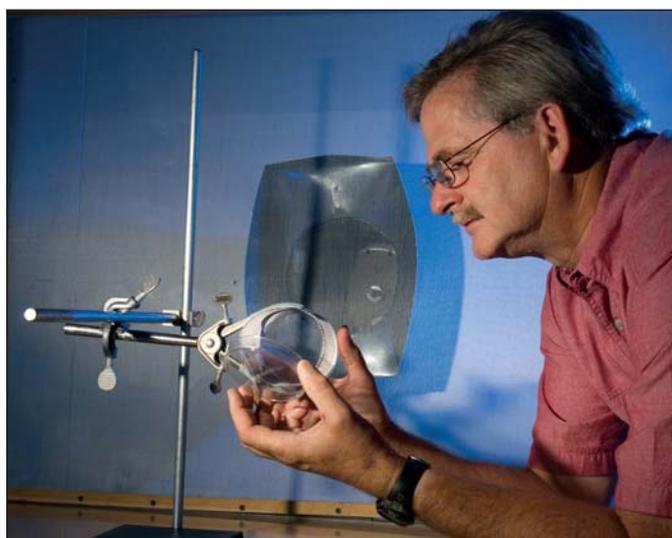
Debbie McCaffrey, Administrative Assistant

Gwendolyn Skinner, Public Relations Manager



PHOTO COURTESY OF GETTY IMAGES

MAES and MSU scientists have identified the genetic mutation that reduces grain shattering during rice domestication — research that will improve production of the crop that feeds more than half the world's population.



MAES entomologist Jim Miller studies how to apply pheromones in the most efficient, cost-effective way possible. Here, he prepares to release a codling moth in a wind tunnel to study its behavior as it moves toward a pheromone plug.

MAES Affiliated Deans

As of 10-1-2006

Jeffrey D. Armstrong, Dean
College of Agriculture & Natural Resources

Satish Udpa, Dean
College of Engineering

George E. Leroi, Dean
College of Natural Science

Marietta L. Baba, Dean
College of Social Science

Christopher Brown, Dean
College of Veterinary Medicine

MAES Unit Administrators

(Units receiving funding)

As of 10-1-2006

Steven D. Hanson, Chairperson
Agricultural Economics

Karen Plaut, Chairperson
Animal Science

Shelagh Ferguson-Miller, Chairperson
Biochemistry & Molecular Biology

Ajit K. Srivastava, Chairperson
Biosystems & Agricultural Engineering

Martin C. Hawley, Chairperson
Chemical Engineering & Material Science

Scott G. Witter, Chairperson
Community, Agriculture, Recreation & Resource Studies

James J. Kells, Acting Chairperson
Crop & Soil Sciences

Richard W. Merritt, Chairperson
Entomology

Deborah Johnson, Acting Chairperson
Family & Child Ecology

William W. Taylor, Chairperson
Fisheries & Wildlife

Gale M. Strasburg, Chairperson
Food Science & Human Nutrition

Daniel E. Keathley, Chairperson
Forestry

Richard E. Groop, Chairperson
Geography

Ronald L. Perry, Chairperson
Horticulture

Katherine L. Gross, Director
Kellogg Biological Station

Charles J. Reid, Director
Land Management

Thomas H. Herdt, Chairperson
Large Animal Clinical Sciences

Walter J. Esselman, Chairperson
Microbiology & Molecular Genetics

Scott Winterstein, Acting Director
National Food Safety & Toxicology Center

Sara J. Risch, Director
School of Packaging

Willie M. Reed, Chairperson
Pathobiology & Diagnostic Investigation

William S. Spielman, Chairperson
Physiology

Richard E. Triemer, Chairperson
Plant Biology

Raymond Hammerschmidt, Chairperson
Plant Pathology

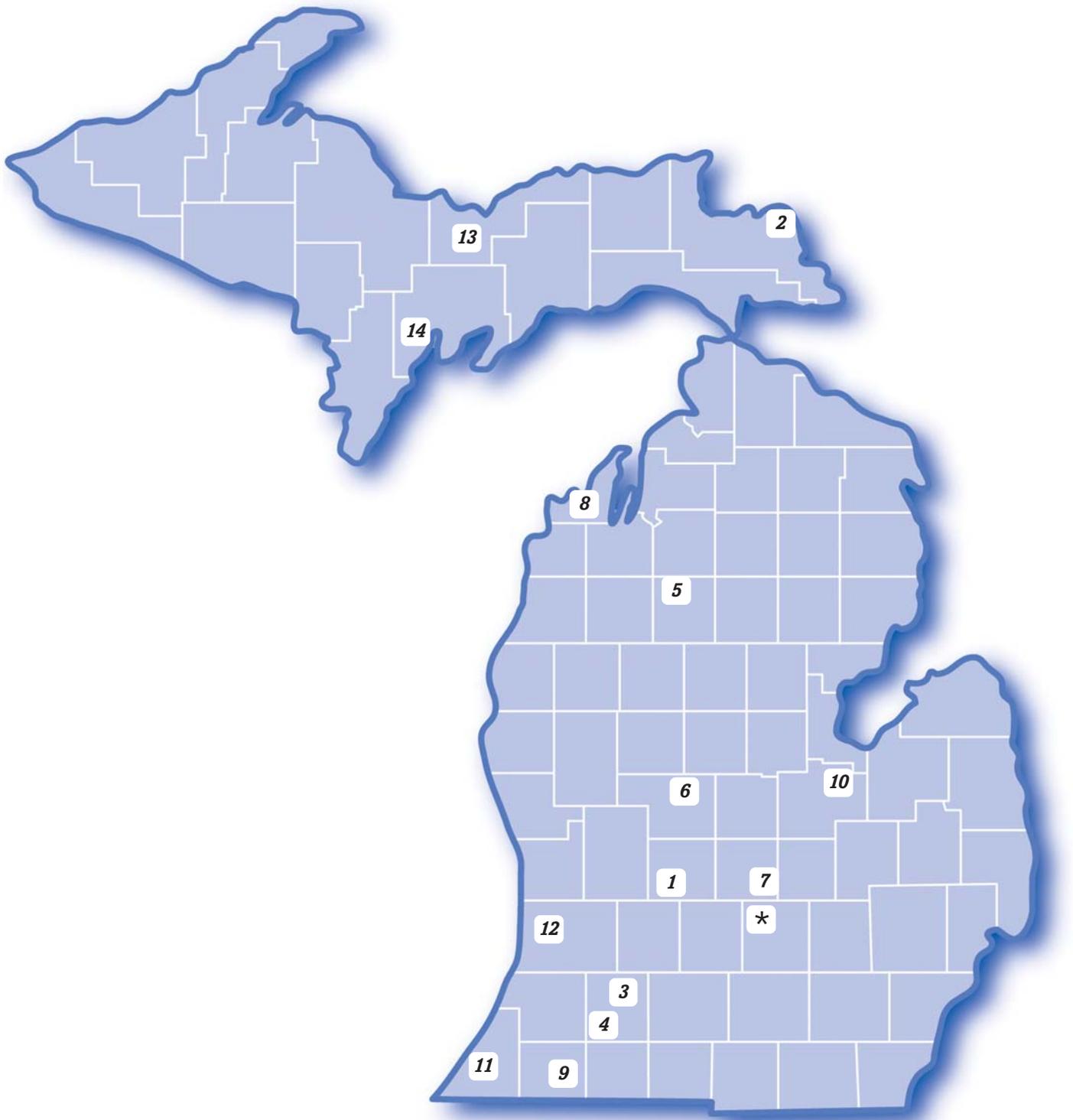
Kenneth Keegstra, Director
Plant Research Laboratory (MSU-DOE)

Gary R. Anderson, Director
School of Social Work

Janet K. Bokemeier, Chairperson
Sociology

Jon F. Bartholic, Director
Institute of Water Research

Michigan Agricultural Experiment Station Outlying Stations — 10-1-2006



1. CLARKSVILLE HORTICULTURAL EXPERIMENT STATION

Established 1974
 9302 Portland Road
 Clarksville, MI 48815
 Phone: 616-693-2193
 FAX: 616-693-2317
 Gerald Skeltis
Farm Manager
 Phil Schwallier
Coordinator

2. DUNBAR FOREST EXPERIMENT STATION

Established 1925
 12839 S. Scenic Drive
 Rt. 1, Box 179
 Sault Ste. Marie, MI 49783
 Phone: 906-632-3932 or
 906-786-1575
 Ray Miller
Nonresident Forester

3. W. K. KELLOGG BIOLOGICAL STATION

Established 1928
 3700 E. Gull Lake Drive
 Hickory Corners, MI 49060
 FAX: 269-671-2351
 Kay Gross: 269-671-2341
Director

4. W. K. KELLOGG EXPERIMENTAL FOREST

Established 1932
 7060 N. 42nd Street
 Augusta, MI 49012
 Phone: 269-731-4597
 FAX: 269-731-4597
 Greg Kowalewski
Resident Forester

5. LAKE CITY EXPERIMENT STATION

Established 1928
 5401 W. Jennings Road
 Lake City, MI 49651
 Phone: 231-839-4608
 FAX: 231-839-8663
 Doug Nielsen
Farm Manager

6. MONTCALM RESEARCH FARM

Established 1966
 4747 McBride Road
 Lakeview, MI 48850
 Phone: 989-365-3473
 FAX: 989-365-3473
 Richard Crawford
Research Technician

7. MUCK SOILS RESEARCH FARM

Established 1941
 Rt. 3
 9370 E. Herbison Road
 Laingsburg, MI 48848
 Phone: 517-641-4062
 Ron Gnagey
Farm Manager

8. NORTHWEST MICHIGAN HORTICULTURAL RESEARCH STATION

Established 1979
 6686 S. Center Highway
 Traverse City, MI 49684
 Phone: 231-946-1510
 FAX: 231-946-1404
 Bill Klein
Farm Manager
 James Nugent
Coordinator

9. FRED RUSS FOREST EXPERIMENT STATION

Established 1942
 20673 Marcellus Highway
 Decatur, MI 49045
 Phone: 269-782-5652 or
 269-731-4597
 Greg Kowalewski
Nonresident Forester

10. SAGINAW VALLEY BEAN AND BEET RESEARCH FARM

Established 1971
 3066 S. Thomas Road
 Saginaw, MI 48609
 Phone: 989-781-1160
 FAX: 989-781-0260
 Paul Horny
Farm Manager

11. SOUTHWEST MICHIGAN RESEARCH AND EXTENSION CENTER

Established 1987
 1791 Hillandale Road
 Benton Harbor, MI 49022
 Phone: 269-944-1477
 FAX: 269-944-3106
 Dave Francis
Farm Manager
 Thomas Zabadal
Coordinator

12. TREVOR NICHOLS RESEARCH COMPLEX

Established 1967
 6237 124th Avenue
 Fennville, MI 49408
 Phone: 269-561-5040
 FAX: 269-561-5314
 Matthew Daly
Farm Manager
 John Wise
Coordinator

13. UPPER PENINSULA EXPERIMENT STATION

Established 1899
 P.O. Box 168
 E3774 University Drive
 Chatham, MI 49816
 Phone: 906-439-5114
 FAX: 906-439-5698
 Paul Naasz
Operations Supervisor

14. UPPER PENINSULA TREE IMPROVEMENT CENTER

Established 1986
 6005 J Road
 Escanaba, MI 49829
 Phone: 906-786-1575
 FAX: 906-786-9370
 Ray Miller
Resident Forester

★ EAST LANSING FIELD RESEARCH FACILITIES

Established 1888
 109 Agriculture Hall
 East Lansing, MI 48824-1039
 Phone: 517-355-3272
 FAX: 517-353-5406
 Charles J. Reid
Director, Land Management

Alphabetical List of MAES Scientists

As of 10-1-2006

Faculty members with dual MAES appointments are listed in both of the departments in which they serve.

NAME	UNIT
Adams, Gerard C.	Plant Biology
Adams, Gerard C.	Plant Pathology
Alaimo, Katherine	Food Science & Human Nutrition
Allen, Michael S.	Animal Science
Allison, Richard F.	Plant Biology
Allison, Richard F.	Plant Pathology
Alocilja, Evangelyn C.	Biosystems & Agricultural Engineering
Ayers, George S.	Entomology
Bagdasarian, Michael	Microbiology & Molecular Genetics
Balander, Richard J.	Animal Science
Bates, Ronald O.	Animal Science
Batie, Sandra S. ¹	Agricultural Economics
Beaudry, Randolph M.	Horticulture
Beede, David K. ⁵	Animal Science
Behe, Bridget K.	Horticulture
Bence, James R. ⁶	Fisheries & Wildlife
Benning, Christoph	Biochemistry & Molecular Biology
Bennink, Maurice R.	Food Science & Human Nutrition
Benson, Margaret E.	Animal Science
Berglund, Kris A.	Chemical Engineering & Materials Science
Bickert, William G	Biosystems & Agricultural Engineering
Biernbaum, John A.	Horticulture
Bingen, R. James	Community, Agriculture, Recreation & Resource Studies
Bitsch, Vera	Agricultural Economics
Bix, Laura	Packaging (School of)
Black, J. Roy	Agricultural Economics
Bolin, Carole A.	Pathobiology & Diagnostic Investigation
Bolin, Steven R.	Pathobiology & Diagnostic Investigation
Booren, Alden M.	Food Science & Human Nutrition
Booren, Alden M.	Animal Science
Bourquin, Leslie D.	Food Science & Human Nutrition
Boyd, Stephen A.	Crop & Soil Sciences
Bremigan, Mary T. ⁶	Fisheries & Wildlife
Brewer, Michael J.	Entomology
Breznak, John A.	Microbiology & Molecular Genetics
Britton, Robert A.	Microbiology & Molecular Genetics

NAME	UNIT
Bughrara, Suleiman S.	Crop & Soil Sciences
Bursian, Steven J.	Animal Science
Burton, Jeanne L.	Animal Science
Burton, Zachary F.	Biochemistry & Molecular Biology
Busch, Lawrence M.	Sociology
Buskirk, Daniel D.	Animal Science
Cameron, Arthur C.	Horticulture
Campa, Henry III	Fisheries & Wildlife
Champness, Wendy C.	Microbiology & Molecular Genetics
Chou, Karen	Animal Science
Cibelli, Jose B.	Animal Science
Ciche, Todd A.	Microbiology & Molecular Genetics
Clarke, Robert H.	Packaging (School of)
Claycombe, Kate	Food Science & Human Nutrition
Coe, Paul H.	Animal Science
Cognato, Anthony L.	Entomology
Coussens, Paul M.	Animal Science
Crawford, Eric W.	Agricultural Economics
Cregg, Bert M.	Horticulture
Crum, James L.	Crop & Soil Sciences
Dale, Bruce	Chemical Engineering & Materials Science
Day, Robert Bradley	Plant Pathology
Dazzo, Frank B.	Microbiology & Molecular Genetics
Dazzo, Frank B.	Crop & Soil Sciences
Della Penna, Dean	Biochemistry & Molecular Biology
Derksen, Frederik J.	Large Animal Clinical Sciences
DiFonzo, Christina D.	Entomology
Dodgson, Jerry	Microbiology & Molecular Genetics
Dolan, Kirk D.	Food Science & Human Nutrition
Dolan, Kirk D.	Biosystems & Agricultural Engineering
Dong, Ke	Entomology
Douches, David S.	Crop & Soil Sciences
Doumit, Matthew E.	Food Science & Human Nutrition
Doumit, Matthew E.	Animal Science
Epperson, Bryan K.	Forestry
Ernst, Catherine W.	Animal Science
Erskine, Ronald J.	Large Animal Clinical Sciences
Fernandez, R. Tom	Horticulture
Ferris, Theodore A.	Animal Science

NAME	UNIT
Flore, James A.	Horticulture
Fraker, Pamela J.	Food Science & Human Nutrition
Fraker, Pamela J.	Biochemistry & Molecular Biology
Frank, Kevin W.	Crop & Soil Sciences
Freed, Russell D.	Crop & Soil Sciences
Fulbright, Dennis W.	Plant Pathology
Gage, Stuart H.	Entomology
Gangur, Venugopal	Food Science & Human Nutrition
Garling, Donald L.	Fisheries & Wildlife
Gehl, Ronald J.	Crop & Soil Sciences
Giesy, John P.	National Food Safety & Toxicology Center
Grooms, Daniel L.	Large Animal Clinical Sciences
Grumet, Rebecca	Horticulture
Güt, Larry	Entomology
Guyer, Daniel E.	Biosystems & Agricultural Engineering
Hamm, Michael W. ²	Food Science & Human Nutrition
Hamm, Michael W. ²	Community, Agriculture, Recreation & Resource Studies
Hamm, Michael W. ²	Crop & Soil Sciences
Han, Kyung-Hwan	Forestry
Hancock, James F.	Horticulture
Hanson, Eric J.	Horticulture
Hao, Jianjun	Plant Pathology
Harkema, Jack	Pathobiology & Diagnostic Investigation
Harris, Craig K.	Sociology
Harsh, Stephen B.	Agricultural Economics
Hausbeck, Mary K.	Plant Pathology
Hausinger, Robert P.	Microbiology & Molecular Genetics
Hausinger, Robert P.	Biochemistry & Molecular Biology
Hayes, Daniel B. ⁶	Fisheries & Wildlife
He, Sheng Yang	Plant Research Lab (MSU-DOE)
Hill, Gretchen M.	Animal Science
Hoehn, John P.	Agricultural Economics
Hoerr, Sharon M.	Food Science & Human Nutrition
Holecek, Donald F.	Community, Agriculture, Recreation & Resource Studies
Hollingsworth, Rawle I.	Biochemistry & Molecular Biology
Hollingworth, Robert M.	Entomology
Horan, Richard D.	Agricultural Economics
Hord, Norman G.	Food Science & Human Nutrition
Howard, Philip	Community, Agriculture, Recreation & Resource Studies
Howe, Gregg A.	Plant Research Lab (MSU-DOE)
Huang, Zachary Y.	Entomology

NAME	UNIT
Iezzoni, Amy F.	Horticulture
Imig, David R.	Family & Child Ecology
Ireland, James J.	Animal Science
Isaacs, Rufus	Entomology
Jacobs, Lee W.	Crop & Soil Sciences
Jaffee, Daniel S.	Sociology
Jarosz, Andrew M.	Plant Pathology
Jiang, Ning	Horticulture
Johnson, Nan E.	Sociology
Jones, Arthur Daniel	Biochemistry & Molecular Biology
Jones, Michael L. ⁶	Fisheries & Wildlife
Jump, Donald B.	Physiology
Kaguni, Jon M.	Biochemistry & Molecular Biology
Kakela, Peter J.	Community, Agriculture, Recreation & Resource Studies
Kamdem, Donatien-Pascal	Forestry
Kaneene, John B.	Large Animal Clinical Sciences
Kaplowitz, Michael C.	Community, Agriculture, Recreation & Resource Studies
Kelly, James D.	Crop & Soil Sciences
Kirk, William W.	Plant Pathology
Kirkwood, Roy N.	Large Animal Clinical Sciences
Kobe, Richard K.	Forestry
Kravchenko, Alexandra N.	Crop & Soil Sciences
Kroos, Lee R.	Biochemistry & Molecular Biology
La Pres, John J.	Biochemistry & Molecular Biology
Landis, Douglas A.	Entomology
Lang, Gregory A.	Horticulture
Lang, Nancy Suzanne	Horticulture
Last, Robert L.	Plant Biology
Leefers, Larry A.	Forestry
Leep, Richard H.	Crop & Soil Sciences
Lenski, Richard E. ³	Crop & Soil Sciences
Li, Hui	Crop & Soil Sciences
Li, Weiming ⁶	Fisheries & Wildlife
Linz, John E.	Food Science & Human Nutrition
Lira, Carl T.	Chemical Engineering & Materials Science
Liu, Jianguo ⁹	Fisheries & Wildlife
Lloyd, James W.	Agricultural Economics
Loescher, Wayne H.	Horticulture
Loveridge, Scott T.	Agricultural Economics
Lownds, Norman K.	Horticulture
Lupi, Frank ⁶	Fisheries & Wildlife
Lupi, Frank ⁶	Agricultural Economics
Luster, Thomas J.	Family & Child Ecology
MacFarlane, David	Forestry

NAME	UNIT
Mahoney, Edward M.	Community, Agriculture, Recreation & Resource Studies
Malmström, Carolyn	Plant Biology
Mansfield, Linda S.	Large Animal Clinical Sciences
Marks, Bradley P.	Biosystems & Agricultural Engineering
Matuana, Laurent M.	Forestry
Maurer, Brian A.	Fisheries & Wildlife
McCullough, Deborah G.	Entomology
McDonough, Maureen H.	Forestry
Meek, Katheryn	Pathobiology & Diagnostic Investigation
Melakeberhan, Haddish	College of Agriculture & Natural Resources
Millenbah, Kelly F.	Fisheries & Wildlife
Miller, Dennis J.	Chemical Engineering & Materials Science
Miller, James R.	Entomology
Mohanty, Amar K.	Packaging (School of)
Mokma, Delbert L.	Crop & Soil Sciences
Montgomery, Alesia F.	Sociology
Myers, Robert S.	Agricultural Economics
Nair, Muraleedharan G.	Horticulture
Ng, Perry K. W.	Food Science & Human Nutrition
Ngouajio, Mathieu	Horticulture
Nicholls, Sarah C.	Community, Agriculture, Recreation & Resource Studies
Nielsen, Brian D.	Animal Science
Norris, Patricia E.	Agricultural Economics
Norris, Patricia E.	Community, Agriculture, Recreation & Resource Studies
Northcott, William J.	Biosystems & Agricultural Engineering
Oehmke, James F.	Agricultural Economics
Ofoli, Robert Y.	Food Science & Human Nutrition
Ohlrogge, John B.	Plant Biology
Olsen, Larry G.	Entomology
Olson, Beth	Food Science & Human Nutrition
Orth, Michael W.	Animal Science
Osteryoung, Katherine W.	Plant Biology
Patterson, Jon S.	Pathobiology & Diagnostic Investigation
Peacor, Scott D.	Fisheries & Wildlife
Penner, Donald	Crop & Soil Sciences
Pestka, James J.	Food Science & Human Nutrition
Peterson, H. Christopher ⁷	Agricultural Economics
Peyton, R. Benny ⁶	Fisheries & Wildlife
Poff, Kenneth L.	Horticulture

NAME	UNIT
Potter-Witter, Karen L.	Forestry
Prather, L. Alan	Plant Biology
Preiss, Jack	Biochemistry & Molecular Biology
Propst, Dennis B.	Forestry
Pursley, James R.	Animal Science
Reddy, C. Adinarayana	Microbiology & Molecular Genetics
Reguera, Gemma	Crop & Soil Sciences
Reguera, Gemma	Microbiology & Molecular Genetics
Renner, Karen A.	Crop & Soil Sciences
Riebschleger, Joanne	Social Work (School of)
Riley, Shawn J. ⁶	Fisheries & Wildlife
Rivera, Jennifer	Community, Agriculture, Recreation & Resource Studies
Robertson, G. Philip	Crop & Soil Sciences
Robinson, Norman E. ¹⁰	Large Animal Clinical Sciences
Robison, Lindon J.	Agricultural Economics
Rogers, John N. III	Crop & Soil Sciences
Rosenbaum, Rene P.	Community, Agriculture, Recreation & Resource Studies
Rothstein, David E.	Forestry
Rowe, D. Bradley	Horticulture
Rubino, Maria	Packaging (School of)
Runkle, Erik S.	Horticulture
Rust, Steven R.	Animal Science
Ryser, Elliott T.	Food Science & Human Nutrition
Ryser, Elliott T.	Animal Science
Safferman, Steven I.	Biosystems & Agricultural Engineering
Safir, Gene R.	Plant Pathology
Sang, Tao	Plant Biology
Schemske, Douglas W. ³	Horticulture
Schilder, Annemiek C.	Plant Pathology
Schmidt, Thomas M.	Microbiology & Molecular Genetics
Schultink, Gerhardus	Community, Agriculture, Recreation & Resource Studies
Schweikhardt, David B.	Agricultural Economics
Scriber, J. Mark	Entomology
Scribner, Kim T. ⁶	Fisheries & Wildlife
Sears, Barbara B.	Plant Biology
Sears, Phillip M.	Large Animal Clinical Sciences
Seita, John R.	Social Work (School of)
Singh, Sher Paul	Packaging (School of)
Sink, Kenneth C	Horticulture
Skole, David	Forestry
Smith, George W.	Animal Science
Smitley, David R.	Entomology
Smucker, A.J.M.	Crop & Soil Sciences

NAME	UNIT
Snapp, Sieglinde S.	Crop & Soil Sciences
Soranno, Patricia A.	Fisheries & Wildlife
Sordillo, Lorraine M. ⁸	Large Animal Clinical Sciences
Sprague, Christy L.	Crop & Soil Sciences
Staatz, John M.	Agricultural Economics
Steffe, James F.	Biosystems & Agricultural Engineering
Steffe, James F.	Food Science & Human Nutrition
Straw, Barbara E. ¹¹	Large Animal Clinical Sciences
Sundin, George W.	Plant Pathology
Surbrook, Truman C.	Biosystems & Agricultural Engineering
Swinton, Scott M.	Agricultural Economics
Tempelman, Robert J.	Animal Science
Ten Eyck, Tobias A.	Sociology
Teppen, Brian J.	Crop & Soil Sciences
Thelen, Kurt D.	Crop & Soil Sciences
Thiem, Suzanne M.	Entomology
Thomashow, Michael F.	Crop & Soil Sciences
Thomashow, Michael F.	Microbiology & Molecular Genetics
Thornsbury, Suzanne D.	Agricultural Economics
Tiedje, James M.	Microbiology & Molecular Genetics
Tiedje, James M.	Crop & Soil Sciences
Tonsor, Glyndall T.	Agricultural Economics
Trail, Frances	Plant Pathology
Triezenberg, Steven J.	Biochemistry & Molecular Biology
Trottier, Nathalie L.	Animal Science
Turetsky, Merritt R.	Fisheries & Wildlife
Turetsky, Merritt R.	Plant Biology
Uebersax, Mark A.	Food Science & Human Nutrition
Ustunol, Zeynep	Food Science & Human Nutrition
Van Ee, Gary R.	Biosystems & Agricultural Engineering
VandeHaar, Michael J.	Animal Science
Vander Stoep, Gail A.	Community, Agriculture, Recreation & Resource Studies
Van Nocker, Steven R.	Horticulture
Vargas, Joseph M. Jr.	Plant Pathology
Vogt, Christine A.	Community, Agriculture, Recreation & Resource Studies
Wagner, C. Michael	Fisheries & Wildlife
Walker, Edward D.	Entomology
Walker, Edward D.	Microbiology & Molecular Genetics
Walker, Kevin D.	Biochemistry & Molecular Biology
Walters, Michael B. ⁶	Forestry
Walton, Jonathan D.	Plant Research Lab (MSU-DOE)
Wang, Dechun	Crop & Soil Sciences

NAME	UNIT
Wang, John L.	Biochemistry & Molecular Biology
Warncke, Darryl D.	Crop & Soil Sciences
Warner, Ryan M.	Horticulture
Weatherspoon, Dave D.	Agricultural Economics
Weber, Michael T.	Agricultural Economics
Weber-Nielsen, Miriam S.	Animal Science
Whalon, Mark E.	Entomology
Whittam, Thomas S. ³	Food Science & Human Nutrition
Whittam, Thomas S. ³	Microbiology & Molecular Genetics
Widders, Irvin E.	Horticulture
Williams, Kurt	Pathobiology & Diagnostic Investigation
Winterstein, Scott R.	Fisheries & Wildlife
Wolf, Christopher A.	Agricultural Economics
Worden, Robert M.	Chemical Engineering & Materials Science
Yin, Runsheng	Forestry
Yokoyama, Melvin T.	Animal Science
York, Ian Arthur	Microbiology & Molecular Genetics
Zabadal, Thomas J.	Horticulture
Zacharewski, Timothy	Biochemistry & Molecular Biology
Zandstra, Bernard H.	Horticulture
Zhong, Shiyuan	Geography
Zile, Maija H.	Food Science & Human Nutrition

Other Faculty Affiliated with MAES

FACULTY	RANK	INTEREST
Adelaja, Adesoji	12	Land Use
Andresen, Jeffrey	12	Global Change & Earth Observations
Kalof, Linda	12	Environmental Values & Ethics/Animals & Society
Pysarchik, Dawn	12	Merchandising Management
Rook, Joseph	12	Perinatal Lamb Mortality and Production Issues
Rose, Joan	12	Water Research
Sternquist, Brenda J.	12	Merchandising Management

¹ Elton R. Smith Professor in Food and Agricultural Policy

² C.S. Mott Distinguished Professor of Sustainable Agriculture

³ John A. Hannah Distinguished Professor

⁴ Homer Nowlin Chair of Water in Agricultural and Natural Resources Systems

⁵ Clinton E. Meadows Endowed Chair

⁶ Partnerships for Ecosystem Research and Management (PERM) positions with salary funded by the Michigan Department of Natural Resources

⁷ Homer Nowlin Chair of Consumer Responsive Agriculture

⁸ Meadow Brook Chair in Farm Animal Health and Well-being

⁹ Rachel Carson Chair in Ecological Sustainability

¹⁰ Matilda Wilson Chair

¹¹ David J. Ellis Swine Professorship

MAES Scientists and Projects by Department

The names listed here represent faculty members who have an MAES appointment and are in the tenure stream as of 10-1-2006. Faculty members with dual MAES appointments are listed in both of the departments in which they serve.

SCIENTISTS	PROJECTS
MAES = Michigan Agricultural Experiment Station MSUE = Michigan State University Extension Joint = Joint appointment in an MAES-affiliated College or Department 12 = Professor 13 = Associate Professor 14 = Assistant Professor	Projects listed are as of 10-1-2006. *Signifies Multistate Project

Advertising

Phone: 355-2314

PROJECTS

MICL01775	Processed Food Industries in India: Market Evolution	Pysarchik, D.
MICL01833	Food Retailer's Buyer-Supplier Relationships in Emerging Markets	Sternquist, B.
MICL08316	Market Development of Processed Food in India: Opportunities for U.S. Food Processors and Marketers	Pysarchik, D.

Agriculture & Natural Resources (College of)

Phone 355-0232

FACULTY					
	RANK	MAES	MSUE	JOINT	INTEREST
Melakeberhan, Haddish	13	0.20	0.00	0.80	Physiology of Plant Nematode Interactions/Genetic Diversity
TOTALS:		0.20	0.00	0.80	

PROJECTS

MICL01792	Physiological Basis for Integrated Approach Towards Sustainable Management of Plant-Parasitic Nematodes	Melakeberhan, H.
MICL02080*	Genetic Variability in the Cyst and Root-Knot Nematodes	Melakeberhan, H.

Agricultural Economics

Phone: 355-4563



Steven D. Hanson, Chair

FACULTY					
	RANK	MAES	MSUE	JOINT	INTEREST
Batie, Sandra S. ¹	12	0.60	0.20	0.20	Food & Agriculture Policy
Bitsch, Vera	13	0.30	0.55	0.15	Human Resources & Farm Management
Black, J. Roy	12	0.60	0.20	0.20	Farm Management
Crawford, Eric W.	12	0.40	0.35	0.25	International Development
Harsh, Stephen B.	12	0.20	0.50	0.30	Farm Management
Hoehn, John P.	12	0.85	0.00	0.15	Natural Resource & Environmental Economics
Horan, Richard D.	13	0.80	0.00	0.20	Natural Resource & Environmental Economics
Lloyd, James W.	12	0.19	0.00	0.81	Livestock Production/Health Management/Food Safety
Loveridge, Scott T.	12	0.10	0.70	0.20	Regional Economics

Agricultural Economics (continued)

FACULTY

Lupi, Frank ⁶	13	0.15	0.42	0.43	Fisheries & Wildlife Economics
Myers, Robert S.	12	0.80	0.00	0.20	International Trade/Price Analysis
Norris, Patricia E.	12	0.12	0.30	0.58	Land Use Management/Public Resource Economics
Oehmke, James F.	12	0.75	0.00	0.25	Price Analysis/Research Policy
Peterson, H. Christopher ⁷	12	0.50	0.35	0.15	Food and Agribusiness Management
Robison, Lindon J.	12	0.65	0.00	0.35	Social Capital Theory
Schweikhardt, David B.	12	0.25	0.40	0.35	Food, Agricultural & Trade Policy
Staatz, John M.	12	0.25	0.00	0.75	International Development
Swinton, Scott M.	12	0.70	0.00	0.30	Production Economics
Thornsbury, Suzanne D.	14	0.40	0.50	0.10	Food System Marketing
Tonsor, Glyndall T.	14	0.50	0.50	0.00	Livestock Economics
Weatherspoon, Dave D.	13	0.40	0.00	0.60	Food & Agribusiness Management
Weber, Michael T.	12	0.80	0.00	0.20	International Development
Wolf, Christopher A.	13	0.50	0.50	0.00	Dairy Farm Management Economics
TOTALS:		10.81	5.47	6.72	

PROJECTS

MICL01625	Financial Decision Making and Investment in Agriculture	Hanson, S.
MICL01732	Analysis of the Economics and Political Economy of National and International Agricultural Policies and Decision Processes	Schweikhardt, D.
MICL01770	Economic Analysis of Public Policies Affecting the Performance of Michigan Agriculture	Batie, S.
MICL01788	Economic Analysis of Tactical and Operational Decisions on Michigan Farms and the Design/Development of Information Systems to Support These Decisions	Harsh, S.
MICL01790	Structural Adjustments in Michigan's Beef and Crop Sectors with Risk Management Considerations	Black, J.
MICL01815	The Political Economy of Agribusiness Structure, Agricultural Research, and the Biotechnology Industry	Oehmke, J.
MICL01844	Risk Analysis and Management in U.S. Agriculture	Myers, R.
MICL01850	Incentives for and Impacts of Land Use Change	Norris, P.
MICL01905	Agricultural Production Economics and Environmental Risk Management	Swinton, S.
MICL01949	Global Agribusiness Trade and Marketing Research	Weatherspoon, D.
MICL01960	Structural Change, Competition, and Marketing Challenges in Agricultural and Livestock Industries	Raper, K.
MICL01963	Economics of Fishery and Wildlife Management	Lupi, F.
MICL01989	Managing Jointly-Determined Economic and Ecological Systems	Horan, R.
MICL02006*	Impact Analysis and Decision Strategies for Agricultural Research	Oehmke, J.
MICL02014	Human Resources Management in Agriculture	Bitsch, V.
MICL02045*	Rural Communities, Rural Labor Markets and Public Policy	Bitsch, V.
MICL02049*	Benefits and Costs of Natural Resources Policies Affecting Public and Private Lands	Hoehn, J.
MICL02070	Produce Markets and Global Competitiveness	Thornsbury, S.
MICL02076*	Rural Development, Work and Poverty in the North Central Region	Loveridge, S.
MICL02092*	Agricultural and Rural Finance Markets in Transition	Hanson, S.
MICL02100	Improving Non-Technical Skills, Knowledge, Aptitudes, and Attitudes in the Veterinary Profession	Lloyd, J.
MICL02101*	Fruit and Vegetable Marketing Innovations and Demand Assessment	Thornsbury, S.
MICL02103	Innovation, Entrepreneurship and New Ventures in Agriculture and Natural Resources	Peterson, H.
MICL03384	Assessing the Economic Structure, Performance, Viability and Competitiveness of the Michigan Dairy Industry	Wolf, C.

Agricultural Economics (continued)

PROJECTS

MICL03387	Agricultural Economics Research on International Agricultural Development and the Environment	Weber, M.
MICL03408	Strengthening Community Vitality Research in Michigan	Loveridge, S.
MICL03410	Capacity Building in Land Policy at Michigan State University	Adelaja, A.
MICL03424	Heterogeneous Consumers and Impacts on Livestock Industries	Tonsor, G.
MICL08358	Rural Household Adjustment Mechanisms and Attitudes Towards Public Investments in the United States	Loveridge, S.
MICL08384	Enhancing Agricultural-Based Economic Development in Rural Communities: A Partnership to Internationalize Teaching, Research and Extension	Loveridge, S.
MICL08393	Bioeconomics of Managing Pathogens in Multi-Host, Livestock-Wildlife Systems	Horan, R.

Animal Science

Phone: 355-8383



Karen Plaut, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Allen, Michael S.	12	0.50	0.50	0.00	Forage Nutrition
Balander, Richard J.	13	0.40	0.00	0.60	Avian Physiology/Reproduction
Bates, Ronald O.	13	0.35	0.65	0.00	Swine Genetics
Beede, David K. ⁵	12	0.50	0.50	0.00	Dairy Nutrition/Dairy Management
Benson, Margaret E.	12	0.35	0.00	0.65	Ruminant Nutrition/Sheep
Booren, Alden M.	12	0.10	0.10	0.80	Meat/Poultry/Fish
Bursian, Steven J.	12	0.85	0.00	0.15	Physiology/Toxicology
Burton, Jeanne L.	13	0.90	0.00	0.10	Immunology/Dairy Cattle
Buskirk, Daniel D.	13	0.50	0.50	0.00	Ruminant Nutrition/Beef
Chou, Karen	13	0.80	0.00	0.20	Toxicology
Cibelli, Jose B.	12	0.50	0.00	0.50	Animal Biotechnology
Coe, Paul H.	13	0.20	0.00	0.80	Animal Health
Coussens, Paul M.	12	0.90	0.00	0.10	Molecular Biology
Doumit, Matthew E.	13	0.25	0.00	0.75	Meat Science/Muscle Biology
Ernst, Catherine W.	13	0.80	0.00	0.20	Molecular Genetics
Ferris, Theodore A.	12	0.20	0.80	0.00	Dairy Genetics
Hill, Gretchen M.	12	0.40	0.00	0.60	Swine Nutrition
Ireland, James J.	12	0.95	0.00	0.05	Reproductive Physiology
Nielsen, Brian D.	13	0.60	0.00	0.40	Equine Exercise Physiology
Orth, Michael W.	13	0.80	0.00	0.20	Growth/Skeletal Biology
Pursley, James R.	13	0.20	0.80	0.00	Reproductive Management
Rust, Steven R.	12	0.50	0.50	0.00	Beef Feedlot Nutrition
Ryser, Elliott T.	13	0.17	0.00	0.83	Dairy Manufacturing/Microbiology
Smith, George W.	13	0.85	0.00	0.15	Reproductive Physiology
Tempelman, Robert J.	13	0.50	0.00	0.50	Statistics/Biometry/Statistical Genetics
Trottier, Nathalie L.	13	0.75	0.00	0.25	Swine Nutrition/Management
VandeHaar, Michael J.	12	0.65	0.00	0.35	Dairy Nutrition
Weber-Nielsen, Miriam S.	13	0.30	0.00	0.70	Dairy Management
Yokoyama, Melvin T.	12	0.70	0.00	0.30	Animal Nutrition/Microbiology
TOTALS:		15.47	4.35	9.18	

PROJECTS

MICL01573	Regulation of Folliculogenesis in Cattle	Ireland, J.
MICL01604	Increasing the Efficiency of Protein Production in Dairy Cattle	VandeHaar, M.

PROJECTS

MICL01622	Developmental and Reproductive Toxicity of Environmental Contaminants	Chou, K.
MICL01643	Microbial Ecology of Rumen, Gastrointestinal Tract, Ensiled Feeds, Probiotics, and Livestock Waste	Yokoyama, M.
MICL01727	The Fate and Biological Effects of Xenobiotics in Animals	Bursian, S.
MICL01760	Nutrient Management and Well-Being of the Sow	Hill, G.
MICL01800	Investigating Ways to Improve Utilization, and Reduce and Predict the Excretion of Phosphorus by Dairy Cattle	Beede, D.
MICL01802	Optimizing the Nutritional Utilization of Forages by Dairy Cattle	Allen, M.
MICL01803	Nutritional Management and Other Applied Studies Using Poultry and Other Avian Species	Balander, R.
MICL01822	Development and Application of Hierarchical Statistical Models to Inferential Problems in Animal Science	Tempelman, R.
MICL01823	Methods to Enhance Decision Making by Dairy Producers	Ferris, T.
MICL01836	Genetic and Physiological Factors Regulating the Neutrophil System in Parturient Dairy Cows	Burton, J.
MICL01852	Improving Skeletal Health in Livestock and Companion Animals	Orth, M.
MICL01854	Optimizing Protein and Amino Acid Utilization	Trottier, N.
MICL01861	Management of Athletic Horses to Reduce Musculoskeletal Injuries and Improve Performance	Nielsen, B.
MICL01877	Discovery and Evaluation of Genetic Factors That Influence Growth, Carcass Merit and Meat Quality of the Pig	Bates, R.
MICL01880	Regulation of Skeletal Muscle Growth and Meat Quality	Doumit, M.
MICL01890	Mechanisms of Ovulation in Dairy Cattle	Smith, G.
MICL01928*	Reproductive Performance in Domestic Ruminants	Smith, G.
MICL01929	Identification and Evaluation of Genes Controlling Economically Important Traits in Pigs and Cattle	Ernst, C.
MICL01952	Increasing Efficiency of Milk Production in Dairy Cattle	Weber-Nielsen, M.
MICL01961	An Integrated Approach to Improve Embryonic Survival in Lactating Dairy Cows	Pursley, J.
MICL02033*	Management Systems to Improve the Economic and Environmental Sustainability of Dairy Enterprises	Beede, D.
MICL02034*	Metabolic Relationships in Supply of Nutrients for Lactating Cows.	VandeHaar, M.
MICL02035*	Interpreting Cattle Genomic Data: Biology, Applications and Outreach	Burton, J.
MICL02038*	Methods to Increase Reproductive Efficiency in Cattle	Pursley, J.
MICL02043*	Genetic and Functional Genomic Approaches to Improve Production and Quality of Pork	Ernst, C.
MICL02104*	Molecular Mechanisms Regulating Skeletal Muscle Growth and Differentiation	Doumit, M.
MICL02116*	Whole Farm Dairy and Beef Systems for Environmental Quality.	Allen, M.
MICL02127	Increasing the Efficiency of Somatic Cell Nuclear Transfer (SCNT) Cloning in Bovine	Cibelli, J.
MICL02129	Nutritional Strategies to Enhance the Sustainability of Farm Flock Sheep Production	Benson, M.
MICL03360	Nutrition and Management Regimes for Efficient Feed Utilization by Beef Cattle	Buskirk, D.
MICL03374	Maximum Utilization of Michigan Grown Feedstuffs for Growing-Finishing Cattle	Rust, S.
MICL03402	Immune Modulation and Gene Expression Signatures Associated with Infection of Cattle with <i>M. partuberculosis</i>	Coussens, P.
MICL03422	Role of Environmental or Growth Factors in Mammary Development and Lactation	Plaut, K.
MICL04003*	Applied Animal Behavior and Welfare	Siegford, J.
MICL04006*	Reproductive Performance in Domestic Ruminants	Smith, G.
MICL06912	Pain and Behavior Development	Burton, J.
MICL08266	Functional Genomics of Well-Being and Milk Quality in Cattle	Coussens, P.
MICL08274	Enhancing Management and Profitability on Small and Mid-Sized Dairy Farms	Pursley, J.
MICL08290	Intrafollicular Signaling Pathways That Control Follicle Rupture in Dairy Cattle	Smith, G.
MICL08320	Propionate Regulation of Feed Intake	Allen, M.

Animal Science (continued)

PROJECTS

MICL08324	Integration of Transcriptional Profiles with Genetic Marker Data for Identifying Genes Controlling Economically Important Traits in Pigs	Ernst, C.
MICL08331	Significance of Numbers of Antral Follicles in Ovarian Follicular Waves in Cattle	Ireland, J.
MICL08348	A Novel Dairy Management Learning Experience for Undergraduates: The Dairy Challenge	Weber-Nielsen, M.
MICL08356	Local Role of CART in Regulation of Follicular Estradiol Production	Smith, G.
MICL08369	Immune Modulation in Bovine Paratuberculosis: Macrophage T Cell Interactions	Coussens, P.
MICL08373	Modeling Ruminant Passage	Allen, M.
MICL08377	2nd International Symposium on Animal Functional Genomics	Burton, J.
MICL08378	Improving Livestock Production in Mali: Partnership to Strengthen International Collaborations in Research and Education	Yokoyama, M.
MICL08379	The Stromal Effect: Remodeling and the Effect of Transforming Growth Factor-Beta (TGFB) on the Mammary Gland During the Dry Period in the Dairy Cow	Plaut, K.
MICL08389	Neutrophil Apoptosis Delay at Parturition: Mechanisms and Inflammatory Consequences During Interaction with Mastitis-Causing Coliforms	Burton, J.

ANR Communications

Phone 432-1555

PROJECTS

MICL03421	Development of a Michigan Farm Marketing and Agri-Tourism Association	Heinze, K.
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The Michigan State University dairy herd is maintained for teaching, outreach, and research purposes. Research projects are conducted in the areas of nutrition, mammary and reproductive physiology, animal breeding and selection, and dairy management.



PHOTO COURTESY OF SARA LONG

Biochemistry & Molecular Biology

Phone: 355-1600



Shelagh Ferguson-Miller,
Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Benning, Christoph	14	0.67	0.00	0.33	Plant Biochemistry
Burton, Zachary F.	12	0.20	0.00	0.80	Molecular Biology
Della Penna, Dean	12	0.25	0.00	0.75	Nutritional Genomics
Fraker, Pamela J.	12	0.30	0.00	0.70	Immunology
Hausinger, Robert P.	12	0.25	0.00	0.75	Enzymology
Hollingsworth, Rawle I.	12	0.25	0.00	0.75	Renewable Resource Chemistry
Jones, Arthur Daniel	12	0.25	0.00	0.75	Director of Mass Spectrometry Facility
Kaguni, Jon M.	12	0.43	0.00	0.57	Molecular Biology
Kroos, Lee R.	12	0.50	0.00	0.50	Molecular Biology

Biochemistry & Molecular Biology (continued)

FACULTY

La Pres, John J.	14	0.25	0.00	0.75	Functional Genomics
Preiss, Jack	12	0.25	0.00	0.75	Starch Biochemistry
Triezenberg, Steven J.	12	0.20	0.00	0.80	Molecular Biology
Walker, Kevin D.	14	0.20	0.00	0.80	Bio-organic Chemistry
Wang, John L.	12	0.20	0.00	0.80	Cell Biology
Zacharewski, Timothy	14	0.20	0.00	0.80	Biochemical Toxicology
TOTALS:		4.40	0.00	10.60	

PROJECTS

MICL01598	Gene Regulation During Development of Soil Bacteria	Kroos, L.
MICL01601	DNA Replication and its Regulation in <i>Escherichia coli</i>	Kaguni, J.
MICL01608	Activation of Gene Expression by a Herpes Simplex Virion Protein	Triezenberg, S.
MICL01610	Elongation by Human RNA Polymerase II	Burton, Z.
MICL01754	Influence of Disulfide Bond Formation on Local Structure of Peptides/Proteins as Assessed by Hydrogen/Deuterium Exchange and Mass Spectrometry	Watson, J.
MICL01906	Comprehensive Assessment of Estrogenic Endocrine Disruptors and Their Mixtures	Zacharewski, T.
MICL01924	Dietary Zinc: Its Effects on the Immune Response	Fraker, P.
MICL01940	Regulation of Metabolism in Developing Seeds of <i>Arabidopsis</i>	Benning, C.
MICL01973	Identification and Cloning of Quantitative Trait Loci Affecting Seed Tocopherol Levels	Della Penna, D.
MICL01997	The SMN Complex in Spinal Muscular Atrophy	Wang, J.
MICL02037*	Regulation of Photosynthetic Processes	Benning, C.
MICL02099	Recovery of Sugars and Pectic Polysaccharides from Plant Materials	Hollingsworth, R.
MICL02107	Evaluation of the Specificity and the Structure/Function of Taxol Biosynthesis Acyltransferases Isolated from Taxus Plant Cultures	Walker, K.
MICL03415	Chloroplast 2010	Last, R.
MICL03432	Biological Energy Transformation by Cytochrome C Oxidase	Ferguson-Miller, S.
MICL08364	Molecular Design of Oxidoreductases for the Biosynthesis of Carbohydrate-Based Industrial Polyols	Zeikus, J.
MICL08390	17th International Symposium on Plant Lipids	Benning, C.

Biosystems & Agricultural Engineering

Phone: 355-4720



Ajit K. Srivastava, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Alocilja, Evangelyn C.	13	0.40	0.00	0.60	Biosensors/Environmental Quality/ Food Safety
Bickert, William G.	12	0.20	0.80	0.00	Livestock Facilities/Environment/ Manure Management
Dolan, Kirk D.	13	0.25	0.00	0.75	Food Engineering/Value Added Processing/Plant Products
Guyer, Daniel E.	12	0.25	0.50	0.25	Fruit/Vegetable Storage/Handling
Marks, Bradley P.	12	0.50	0.00	0.50	Food Safety
Northcott, William J.	14	0.40	0.00	0.60	Watershed Hydrology/Water Quality/ GIS Applications
Safferman, Steven I.	13	0.50	0.20	0.30	Nutrient Management

Biosystems & Agricultural Engineering (continued)

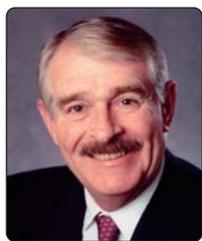
FACULTY					
Steffe, James F.	12	0.25	0.00	0.75	Food Engineering/Rheology
Surbrook, Truman C.	12	0.25	0.00	0.75	Electrical Technology/Stray Voltage
Van Ee, Gary R.	12	0.25	0.00	0.75	Chemical Application/Power & Machinery
TOTALS:		3.25	1.50	5.25	

PROJECTS

MICL01581	Postharvest Technology for Fruit, Vegetable, and Chestnuts	Guyer, D.
MICL01799	Integrating Alternative Manure Treatments into Conventional Animal Manure Handling and Storage Systems	Bickert, W.
MICL01862	Bio-Energy Based Electrical Systems and Their Safe, Efficient Applications	Surbrook, T.
MICL01967	Engineering Methods to Improve the Safety, Yield, and Quality of Value-Added Protein Foods	Marks, B.
MICL01972	Methods for Improving Water Quality in Agricultural Watersheds	Northcott, W.
MICL02007	Development of Lab-On-Chip Biosensor for Food and Environmental Safety and Biosecurity	Alocilja, E.
MICL02041*	Assuring Fruit and Vegetable Product Quality and Safety Through the Handling and Marketing Chain	Guyer, D.
MICL02102*	Improvement of Thermal and Alternative Processes for Foods	Steffe, J.
MICL02130*	Nanotechnology and Biosensors	Alocilja, E.
MICL03433	Biobased Energy Information	Srivastava, A.
MICL08313	Optimizing the Design and Operation of Commercial Cooking Systems for Ready-To-Eat Meat and Poultry Products	Marks, B.
MICL08314	Improving Cooking Yield of Ready-To-Eat Meat and Poultry Products via Mechanistic Models for Fat and Moisture Transport	Marks, B.
MICL08315	Modeling Pathogen Migration and Thermal Resistance in Marinated Whole-Muscle Meat and Poultry Products	Marks, B.

Chemical Engineering & Materials Science

Phone: 355-5135

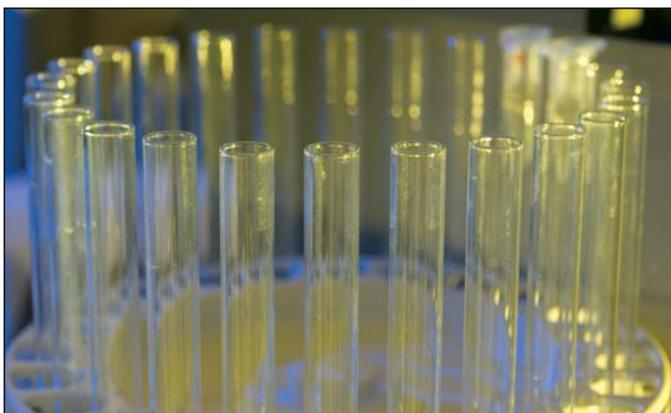


Martin Hawley, Chair

FACULTY					
	RANK	MAES	MSUE	JOINT	INTEREST
Berglund, Kris A.	12	0.49	0.00	0.51	Bioprocess/Biotechnology
Dale, Bruce	12	0.50	0.00	0.50	Bio-based Fuels & Chemicals
Lira, Carl T.	13	0.30	0.00	0.70	Bio-based Fuels & Chemicals
Miller, Dennis J.	12	0.20	0.00	0.80	Bio-based Fuels & Chemicals
Worden, Robert M.	12	0.20	0.00	0.80	Bio-based Fuels & Chemicals
TOTALS:		1.69	0.00	3.31	

PROJECTS

MICL02047*	Science and Engineering for a Biobased Industry and Economy	Worden, R.
MICL03414	Enabling Biorefineries	Dale, B.
MICL07695	Bioprocessing for Utilization of Agricultural Raw Materials	Dale, B.
MICL07709	Bioprocessing for Utilization of Agricultural Raw Materials	Dale, B.
MICL08298	Novel High-Value Products from Biomass-Derived Organic Acids	Miller, D.
MICL08391	A Novel Process for Improved Biodiesel Production	Miller, D.



In Bruce Dale's lab, much work is done on the ammonia fiber expansion (AFEX) process, to pretreat biomass with ammonia. The AFEX process, for which MSU has received a patent, makes the breakdown of cellulose and hemicellulose more efficient.

Community, Agriculture, Recreation & Resource Studies

Phone: 355-5190



Scott G. Witter, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Bingen, R. James	12	0.40	0.00	0.60	International Development
Hamm, Michael W. ²	12	0.20	0.05	0.75	Sustainable Agriculture
Holecek, Donald F.	12	0.70	0.20	0.10	Resource Economics/Tourism
Howard, Philip	14	0.40	0.00	0.60	Community, Food & Agriculture
Kakela, Peter J.	12	0.70	0.00	0.30	Natural Resources Management
Kaplowitz, Michael C.	13	0.50	0.00	0.50	Land Use Law
Mahoney, Edward M.	12	0.20	0.50	0.30	Tourism
Nicholls, Sarah C.	14	0.25	0.00	0.75	Tourism
Norris, Patricia E.	12	0.08	0.20	0.72	Land Use
Rivera, Jennifer	14	0.25	0.00	0.75	Agricultural Science Education
Rosenbaum, Rene P.	13	0.40	0.40	0.20	Community Economic Development
Schultink, Gerhardus	12	0.50	0.00	0.50	Natural Resources Management
Vander Stoep, Gail A.	13	0.25	0.25	0.50	Communications/Human Dimensions
Vogt, Christine A.	13	0.50	0.00	0.50	Tourism/Marketing/Communications
TOTALS:		5.33	1.60	7.07	

PROJECTS

MICL01536	Comparative Indicators for Urban and Rural Development, Environmental Planning and Public Policy Formulation.	Schultink, G.
MICL01817	Water Security in Our Rural and Urban Communities	Witter, S.
MICL01859	Organic Agriculture and Rural Development Policy	Bingen, J.
MICL01979	The Role of Economics and Law on Environmental Management	Kaplowitz, M.
MICL01994	Integrating Interpretation, Heritage and Community with Tourism Development and Resource Management: Maritime/Coastal Focus	Vander Stoep, G.
MICL02060*	Sustaining Local Food Systems in a Globalizing Environment: Forces, Responses, Impacts	Bingen, J.
MICL02062	Consumer Decision Making Behavior in Selected Tourism and Recreation Contexts	Vogt, C.
MICL02124	Assessing the Distribution and Benefits of Parks and Open Spaces	Nicholls, S.
MICL03280	Travel, Tourism and Recreation Resource Center	Holecek, D.
MICL03352	Mineral Lands Development, Energy Requirements, and Environmental Impacts	Kakela, P.
MICL03358	Michigan Seasonal Agriculture Labor Markets	Rosenbaum, R.
MICL03409	Community-Based, Sustainable Food Systems for Michigan and Beyond: Developing a Coherent Strategy	Hamm, M.
MICL03417	Improving Decision Making Processes for Environmental, Resource, and Risk Management	Arvai, J.
MICL03425	Water Security in Our Rural and Urban Communities	Witter, S.

Community, Agriculture, Recreation & Resource Studies (continued)

PROJECTS

MICL03428	Agri-Food Systems and Community Health	Howard, P.
MICL07706	Sustainable Agriculture 2006: Developing Sustainable Agriculture and Food Systems	Hamm, M.
MICL08382	Enhancing Small and Medium Farm Viability Through Season Extension Technologies: Economic and Environmental Implications	Conner, D.

Crop & Soil Sciences

Phone: 355-0271



James J. Kells, Acting
Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Boyd, Stephen A.	12	0.79	0.00	0.21	Environmental Soil Chemistry
Bughrara, Suleiman S.	14	0.75	0.25	0.00	Turfgrass Breeding & Genetics
Crum, James L.	12	0.15	0.00	0.85	Soil Class/Genesis/Turfgrass
Dazzo, Frank B.	12	0.10	0.00	0.90	Microbial Ecology
Douches, David S.	12	0.90	0.00	0.10	Potato Breeding/Genetics
Frank, Kevin W.	13	0.30	0.70	0.00	Turfgrass Physiology/Management
Freed, Russell D.	12	0.34	0.00	0.66	International Agronomy/Plant Breeding
Gehl, Ronald J.	14	0.40	0.60	0.00	Soil Fertility & Nutrient Management
Hamm, Michael W. ²	12	0.15	0.10	0.75	Sustainable Agriculture
Jacobs, Lee W.	12	0.39	0.50	0.11	Environmental Waste Management
Kelly, James D.	12	0.85	0.00	0.15	Dry Bean Breeding
Kravchenko, Alexandra N.	14	0.50	0.00	0.50	Spatial Variability in Agroecosystems
Leep, Richard H.	12	0.35	0.50	0.15	Soil Fertility/Forage Management
Lenski, Richard E. ³	12	0.40	0.00	0.60	Microbial Ecology & Evolutionary Biology
Li, Hui	14	0.75	0.00	0.25	Soil Chemistry & Nutrient Management
Mokma, Delbert L.	12	0.50	0.15	0.35	Soil Classification/Genesis
Penner, Donald	12	0.85	0.00	0.15	Crop/Weed/Physiology
Reguera, Gemma	14	0.25	0.00	0.75	Soil Microbiology
Renner, Karen A.	12	0.25	0.00	0.75	Weed Seed Decay/Predation/ Emergence
Robertson, G. Philip	12	0.38	0.00	0.62	Ecosystem Ecology
Rogers, John N. III	12	0.25	0.00	0.75	Turfgrass Management
Smucker, A.J.M.	12	0.75	0.00	0.25	Soil Biophysics
Snapp, Sieglinde S.	13	0.30	0.15	0.55	Integrated Production & Management of Vegetable Crops
Sprague, Christy L.	14	0.50	0.50	0.00	Weed Science
Teppen, Brian J.	13	0.70	0.00	0.30	Surface Soil Chemistry
Thelen, Kurt D.	13	0.40	0.60	0.00	Cropping Systems Agronomist
Thomashow, Michael F.	12	0.76	0.00	0.24	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.60	0.00	0.40	Soil Microbiology/Microbial Ecology
Wang, Dechun	14	0.75	0.00	0.25	Soybean Breeding & Genetics
Warncke, Darryl D.	12	0.50	0.50	0.00	Greenhouse/Vegetable Soil Fertility
TOTALS:		14.86	4.55	10.59	

PROJECTS

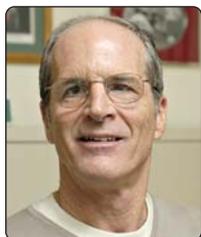
MICL00319	Classification, Genesis and Evaluation of Michigan Soils	Mokma, D.
MICL00569	Breeding and Testing Oats, Barley and Canola for Michigan	Freed, R.
MICL00908	Fundamental Factors in Cultural and Chemical Weed Control, Weed Competition, and Weed Life Cycles	Renner, K.

PROJECTS

MICL01568	Plant Biotechnology: Molecular Approaches to Improve Environmental Stress Tolerance	Thomashow, M.
MICL01574	Movement and Degradation of Organic Contaminants and Pesticides in Soils and Sediments	Boyd, S.
MICL01654	Genetic Improvement of Bean (<i>Phaseolus vulgaris</i> L.) For Yield, Pest Resistance and Food Value	Kelly, J.
MICL01761	Weed Management as a Component of Field Crop Production Systems	Kells, J.
MICL01779	The Physiology and Biochemistry of Herbicide Action, Selectivity, and Degradation	Penner, D.
MICL01780	Impact Absorption, Traction, and Wear Tolerance Investigation on Turf and Soil Surfaces	Rogers, J.
MICL01782	Application of Organic and Other Waste Residuals to Agricultural Soils as a Waste Management Option	Jacobs, L.
MICL01806	Breeding and Genetics for the Improvement of Potato (<i>Solanum tuberosum</i> L.) For Yield, Quality and Pest Resistance	Douches, D.
MICL01807	Properties of High Sand Content Soils for Turfgrass Uses	Crum, J.
MICL01821	Microbial Ecology of Soil and Biodegradation	Tiedje, J.
MICL01830	Wheat Breeding and Genetics	Ward, R.
MICL01855	The Role of Mutation in Bacterial Evolution	Lenski, R.
MICL01872	Greenhouse Gas Mitigation and Carbon Sequestration in Row-Crop Agriculture	Robertson, G.
MICL01884	Soil Aggregate Porosity Contributions to Carbon Sequestration	Smucker, A.
MICL01953	Fundamental Interactions of Soil Colloids with Environmental Chemicals	Teppen, B.
MICL01965	Corn and Soybean Cropping Systems	Thelen, K.
MICL01975	Genetic and Turfgrass Breeding	Bughrara, S.
MICL01990	Nitrogen Fate in Turfgrass	Frank, K.
MICL02013	Genetic Improvement of Soybean for Food Value, Yield and Pest Resistance.	Wang, D.
MICL02015	Development and Correlation of Soil Test Procedures with Crop Yields and Plant Nutrient Contents	Warncke, D.
MICL02051	Quantitative Methods for Analyzing Spatial Variability of Soil Properties and Crop Yields	Kravchenko, A.
MICL02081*	Environmental and Genetic Determination of Seed Quality and Performance	McGrath, J.
MICL02091*	The Chemical and Physical Nature of Particulate Matter Affecting Air, Water and Soil Quality	Smucker, A.
MICL02097*	Chemistry, Bioavailability, and Toxicity of Constituents in Residuals and Residual-Treated Soils	Jacobs, L.
MICL02098	Influence of Cultural and Chemical Factors on Weed Management	Sprague, C.
MICL02105*	Assessing Nitrogen Mineralization and Other Diagnostic Criteria to Refine Nitrogen Rates for Crops and Minimize Losses	Gehl, R.
MICL02117*	Evaluating the Physical and Biological Availability of Pesticides in Agricultural Contexts	Boyd, S.
MICL02119*	Characterize Weed Population Dynamics for Improved Long-Term Weed Management Decision Making	Sprague, C.
MICL02128	Integration of Laboratory and Field Studies on Environmental Occurrence, Transport and Fate of Organic Contaminants and Pharmaceuticals	Li, H.
MICL02132	Managing Coarse Soils for Nutrient Efficiency and Resilience Through Integration of Multifunction Cover Crops in Row Crop Systems	Snapp, S.
MICL03260	Evaluation of Forage Management Systems in Michigan	Leep, R.
MICL03324	Environmental Impacts on Crop Growth and Development	Foster, E.
MICL03405	Seed Biology of Annual Weed Species in Turf and Agronomic Crop Systems	Buhler, D.
MICL04000*	Characterizing Active Soil Organic Matter Pools Controlling Soil N Availability in Maize-Based Cropping Systems	Gehl, R.
MICL04004*	Weed Management Strategies for Sustainable Cropping Systems	Mutch, D.
MICL07689	Sustainable Agriculture 2004: Production and Food Ecology Systems	Buhler, D.
MICL07698	Improving the Sustainable Production of Specialty Crops	Kelly, J.
MICL07700	Sustainable Agriculture 2005: Sustainable Agriculture and Food Systems	Hamm, M.
MICL07703	Improving the Sustainable Production of Specialty Crops	Kelly, J.
MICL07713	Development of Multipurpose Potato Cultivars with Enhanced Quality, Disease and Pest Resistance	Douches, D.
MICL08344	Mechanisms and Forces Controlling Pesticide Retention by Soil Clay Minerals	Teppen, B.

Entomology

Phone: 355-4663



Richard W. Merritt, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Ayers, George S.	12	0.25	0.00	0.75	IPM/Apiculture & Pollination
Brewer, Michael J.	13	0.25	0.50	0.25	IPM Coordinator
Cognato, Anthony L.	14	0.40	0.00	0.60	Molecular Biosystematist
DiFonzo, Christina D.	13	0.20	0.65	0.15	Field Crop Entomology
Dong, Ke	13	0.25	0.00	0.75	Insect Toxicology & Neurobiology
Gage, Stuart H.	12	0.48	0.12	0.40	Computational Ecology/Bioinformatics
Güt, Larry	12	0.25	0.65	0.10	Tree Fruit Insects
Hollingworth, Robert M.	12	0.62	0.11	0.27	Pesticide Toxicology/Action, Insecticide Resistance/NRSP 4 Program
Huang, Zachary Y.	13	0.21	0.53	0.26	Apiculture
Isaacs, Rufus	13	0.45	0.45	0.10	Small Fruit Insect Management
Landis, Douglas A.	12	0.66	0.18	0.16	Insect Ecology/Biological Control
McCullough, Deborah G.	12	0.30	0.50	0.20	Forest Entomology
Miller, James R.	12	0.42	0.00	0.58	Insect Behavior/Physiology
Olsen, Larry G.	12	0.20	0.80	0.00	Agrimedecine/PIAP Program
Scriber, J. Mark	12	0.50	0.00	0.50	Insect Ecology
Smitley, David R.	12	0.25	0.60	0.15	Landscape/Turf/Greenhouse Insect Management
Thiem, Suzanne M.	13	0.40	0.00	0.60	Insect Molecular Biology/Pathology
Walker, Edward D.	12	0.29	0.00	0.71	Medical/Veterinary Entomology
Whalon, Mark E.	12	0.60	0.00	0.40	Fruit Insect Pest Management/ Insecticide Resistance Management
TOTALS:		6.98	5.09	6.93	

PROJECTS

MICL01606	Biological Control, Cultural Control, Host Resistance and Insecticides for Protection of Trees, Shrubs, Flowers and Turfgrass Against Exotic Insect Pests	Smitley, D.
MICL01640*	Ecology and Management of European Corn Borer and Other Lepidopteran Pests of Corn	DiFonzo, C.
MICL01644	Plant Chemical Defenses: Insect Detoxification and Ecological Factors Affecting Gene Flow and Host Selection in Generalist Lepidoptera	Scriber, J.
MICL01663	Biology and Management of Insect Pests of Vegetable Crops	Grafius, E.
MICL01700	Ecology and Management of Forest Insects in Michigan	McCullough, D.
MICL01730*	A National Agricultural Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
MICL01733	Baculovirus Biotechnology	Thiem, S.
MICL01783	Arthropod Biological Control	Landis, D.
MICL01814	Applied Behavioral Ecology of Insects	Miller, J.
MICL01826	Development of Bee Forage Systems	Ayers, G.
MICL01915	Assessment of Change in Natural and Managed Ecosystems	Gage, S.
MICL01936	Molecular Characterization of Knockdown Resistance to Pyrethroids in Agricultural Important Arthropod Pests	Dong, K.
MICL01951	Better Pest and Disease Management Through Studying Their Mode of Action and Effect on Honey Bees	Huang, Z.
MICL01971	Ecology and Management of Insects in Michigan's Small Fruit Industries	Isaacs, R.
MICL01986	Tree Fruit IPM/ICM Management and Measurement Systems and Pesticide Regulatory Policy in Michigan	Whalon, M.
MICL02052*	Dynamic Soybean Pest Management for Evolving Agricultural Technologies and Cropping Systems	DiFonzo, C.

PHOTO COURTESY OF ZACHARY HUANG



Honey bees around the world are under attack from a deadly parasite smaller than a grain of rice. MAES entomologist Zachary Huang has invented a chemical-free, inexpensive way to control deadly Varroa mites in bee colonies.

PROJECTS

MICL02094*	Impact of Climate and Soils on Crop Selection and Management	Gage, S.
MICL02095*	Alternative Management Systems for Plant-Parasitic Nematodes in Horticultural and Field Crops	Bird, G.
MICL02110*	Agrochemical Impacts on Human and Environmental Health.	Olsen, L.
MICL02135	IPM with Emphasis on Vegetation-Based Tactics and Information and Financial Support Systems	Brewer, M.
MICL03338	Emerging Vector-Borne Disease in Michigan: Landscape Ecology and Risk Analysis	Walker, E.
MICL03361	Monitoring the Effects of Human Perturbations on Aquatic Habitats Using Freshwater Invertebrates	Merritt, R.
MICL03365	Biology and Management of Insects, and Assessment of Pesticide Use/Exposure, in Michigan Field Crops	DiFonzo, C.
MICL03379	New Arthropod Pest Controls and Management Strategies for Michigan Tree Fruit Production Systems	Güt, L.
MICL03416	Holistic Insect Systematics	Cognato, A.
MICL07696	Mating Disruption, Host Resistance, and Insecticide Management Strategies for Tree Fruit Pests	Brewer, M.
MICL07704	Pest Phenology, Mating Disruption, and Leaf Damage Threshold Strategies for Tree Fruit Pests	Brewer, M.
MICL07707	NC Region IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.
MICL08306	Molecular Mechanism of High Level Resistance to Imidacloprid in the Colorado Potato Beetle	Hollingworth, R.
MICL08310	Research Evaluations of and Outreach for Methyl Bromide Alternatives in Conifer Seedlings and Herbaceous Perennials	Brown-Rytlewski, D.
MICL08319	Reduced Risk Pest Management Systems for U.S. Tart Cherry Production	Whalon, M.
MICL08326	Integrating Alternative Approaches to Control Key Pests in Eastern U.S. Vineyards	Isaacs, R.
MICL08327	Improved Bait-and-Kill for Fruit Fly Control in FQPA-Targeted Fruit Crops	Güt, L.
MICL08330	Does Intraguild Predation Limit Soybean Aphid Parasitoid Impacts?	Landis, D.
MICL08337	Soybean Aphid in the North Central U.S.: Implementing IPM at the Landscape Scale	Landis, D.
MICL08338	Development and Optimization of Pre- and Post-Harvest Pest Management Strategies in Cherries: A Multi-Tactic Approach	Wise, J.
MICL08345	Using Demographic Models to Assess Biocontrol of an Invasive Plant	Landis, D.
MICL08346	Pyrethroid Resistance Mechanism in Arachnids	Dong, K.
MICL08367	Development and Delivery of Alternative Insect Management Strategies for Eastern U.S. Vineyards	Isaacs, R.
MICL08374	Modeling U.S. Metropolitan Areas as Hubs of Human-Mediated Pathways of Invasive Species	Colunga-Garcia, M.

Extension Education

Phone: 355-2308

PROJECTS

MICL08380 Michigan Agrability Project

Ivan, D.

Family & Child Ecology

Phone: 355-7680



Deborah Johnson, Acting Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Imig, David R.	12	0.25	0.00	0.75	Family Ecology
Luster, Thomas J.	12	0.30	0.00	0.70	Child Development
TOTALS:		0.55	0.00	1.45	

PROJECTS

MICL02067* Rural Low-Income Families: Tracking Their Well-Being and Function in an Era of Welfare Reform

Imig, D.

MICL03411 Risk and Resilience

Luster, T.

Fisheries & Wildlife

Phone: 355-4478



William W. Taylor, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Bence, James R. ⁶	12	0.75	0.20	0.05	Fish Population Dynamics/Fish Ecology
Bremigan, Mary T. ⁶	13	0.60	0.00	0.40	Fish Management
Campa, Henry III	12	0.50	0.00	0.50	Wildlife Habitat Ecology
Garling, Donald L.	12	0.17	0.71	0.12	Aquaculture
Hayes, Daniel B. ⁶	13	0.75	0.20	0.05	Stream Fisheries Biology
Jones, Michael L. ⁶	12	0.75	0.20	0.05	Fisheries Stream Models
Li, Weiming ⁶	13	0.75	0.20	0.05	Fish Physiology
Liu, Jianguo ⁹	12	0.50	0.00	0.50	Wildlife Systems Models
Lupi, Frank ⁶	13	0.25	0.70	0.05	Natural Resource Economics
Maurer, Brian A.	13	0.41	0.00	0.59	Landscape Ecology
Millenbah, Kelly F.	13	0.37	0.00	0.63	Restoration Ecology
Peacor, Scott D.	14	0.25	0.00	0.75	Aquatic Ecological/Ecosystem Modeler
Peyton, R. Benny ⁶	12	0.65	0.17	0.18	Human Dimensions
Riley, Shawn J. ⁶	14	0.47	0.00	0.53	Wildlife Ecologist
Scribner, Kim T. ⁶	13	0.75	0.20	0.05	Molecular Ecology
Soranno, Patricia A.	13	0.50	0.00	0.50	Limnology
Turetsky, Merritt R.	14	0.20	0.00	0.80	Wetland Ecology/Biogeochemistry
Wagner, C. Michael	14	0.75	0.20	0.05	Fish Behavioral Ecology
Winterstein, Scott R.	12	0.50	0.00	0.50	Wildlife Biometry
TOTALS:		9.87	2.78	6.35	

PROJECTS

MICL01540 The Consequences of Globalization on Fisheries Resources in the Great Lakes and Other Shared Fisheries

Taylor, W.

MICL01646 Wildlife Responses to Habitat Management

Campa, H.

MICL01740 Development of Commercial Aquaculture Techniques

Garling, D.

Fisheries & Wildlife (continued)

PROJECTS

MICL01758	Relationship Between Habitat Characteristics and Fish Population Dynamics	Hayes, D.
MICL01759	Tools and Information for Improved Management of Great Lakes' Fisheries	Bence, J.
MICL01785	A Spatially Explicit Approach to Modeling Wildlife Habitats and Populations Across Heterogeneous Landscapes	Liu, J.
MICL01868	The Influence of Landscapes on Freshwater Ecosystems	Soranno, P.
MICL01893	Uncertainty and the Management of Great Lakes Fisheries	Jones, M.
MICL01894	Pheromone Communication in Fish	Li, W.
MICL01904	Developing Landscape-Based Classification Systems for Lake Management	Bremigan, M.
MICL01976	Understanding Spatial Patterns of Wildlife Habitat Use in Human-Modified Ecosystems at Different Scales	Maurer, B.
MICL02030	Modeling Great Lakes Food Webs to Understand Broad Effects of Disturbances	Peacor, S.
MICL02031	Adaptive Impact Management: Improving Decision-Making Capacity of Stakeholders in Fish and Wildlife Management	Riley, S.
MICL02044*	Landscape Ecology of White-Tailed Deer in Agro-Forest Ecosystems: A Cooperative Approach to Support Management	Campa, H.
MICL03378	Wildlife Response to Ecological Restoration	Millenbah, K.
MICL03380	Modeling Wildlife Population Dynamics	Winterstein, S.
MICL03383	Assessment of Anthropogenic Impacts to Genetic Diversity of Native and Introduced Fisheries in the Great Lakes	Scribner, K.
MICL03386	Improving the Effective Use of Public Involvement in Wildlife Management	Peyton, R.
MICL08381	Development of a Natural Resources Field Institute: Shaping Future Professionals Through Experiential Learning and Teaching	Kramer, D.
MICL08392	Integrating Ecology and Economics for Managed Forest Landscapes: A Systems Approach	Liu, J.
MICL10013	Regional Aquaculture Center	Batterson, T.
MICL10015	Regional Aquaculture Center - North Central Region	Batterson, T.
MICL10016	Regional Aquaculture Center - North Central Region	Batterson, T.
MICL10017	Regional Aquaculture Center - North Central Region	Batterson, T.
MICL10018	Regional Aquaculture Center - North Central Region	Batterson, T.
MICL10019	Regional Aquaculture Center - North Central Region	Batterson, T.

Food Science & Human Nutrition

Phone: 355-8474



Gale M. Strasburg,
Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Alaimo, Katherine	14	0.50	0.00	0.50	Community Nutrition
Bennink, Maurice R.	12	0.60	0.00	0.40	Nutritional Biochemistry
Booren, Alden M.	12	0.15	0.65	0.20	Meat/Poultry/Fish
Bourquin, Leslie D.	13	0.25	0.75	0.00	Food Safety
Claycombe, Kate	14	0.76	0.00	0.24	Nutritional Biochemistry
Dolan, Kirk D.	13	0.25	0.50	0.25	Plant & Food Engineering
Doumit, Matthew E.	13	0.25	0.00	0.75	Meat Quality
Fraker, Pamela J.	12	0.20	0.00	0.80	Cellular Immunology
Gangur, Venugopal	14	0.25	0.00	0.75	Food Allergy
Hamm, Michael W. ²	12	0.15	0.10	0.75	Sustainable Agriculture
Hoerr, Sharon M.	12	0.40	0.00	0.60	Community Nutrition
Hord, Norman G.	13	0.35	0.00	0.65	Nutritional Epidemiology
Linz, John E.	12	0.50	0.00	0.50	Food Microbiology
Ng, Perry K. W.	12	0.50	0.00	0.50	Cereal Science

Food Science & Human Nutrition (continued)

FACULTY

Ofoli, Robert Y.	13	0.49	0.00	0.51	Colloid/Interface Science
Olson, Beth	14	0.24	0.76	0.00	Community Nutrition
Pestka, James J.	12	0.60	0.00	0.40	Food Microbiology/Immunology
Ryser, Elliott T.	13	0.70	0.00	0.30	Dairy Foods/Microbiology
Steffe, James F.	12	0.25	0.00	0.75	Food Engineering/Rheology
Uebersax, Mark A.	12	0.60	0.00	0.40	Food Processing
Ustunol, Zeynep	12	0.70	0.00	0.30	Dairy Foods
Whittam, Thomas S. ³	12	0.08	0.00	0.92	Nutritional Genomics
Zile, Maija H.	12	1.00	0.00	0.00	Nutritional Biochemistry
TOTALS:		8.77	2.76	10.47	

PROJECTS

MICL01448	Microbial Food Borne Disease	Pestka, J.
MICL01599	Improving Quality and Safety of Muscle Food Products	Strasburg, G.
MICL01664	Enhancing the Value of Dairy and Dairy-Based Products	Ustunol, Z.
MICL01699	Molecular Structure of Soft Wheat Proteins in Relation to End-Use Quality	Ng, P.
MICL01706	Interactions of Biological Macromolecules at Fluid-Like Interfaces	Ofoli, R.
MICL01804*	Using Stage Based Interventions to Increase Fruit and Vegetable Intake in Young Adults	Hoerr, S.
MICL01856	Aflatoxin B1 Biosynthesis in <i>Aspergillus</i>	Linz, J.
MICL01878	Relation of Family Meals and Lifestyle Factors to Obesity and Diet Quality of Children and Youth	Hoerr, S.
MICL01920*	Management of Grain Quality and Security for World Markets	Ng, P.
MICL01932	Microbial Safety of Foods	Ryser, E.
MICL01937	Processing Treatments Influencing Functional Properties and Utilization of Muscle Foods	Booren, A.
MICL01964*	Enhancing Food Safety Through Control of Food-Borne Disease Agents	Ryser, E.
MICL01981	Enhancing Economic and Nutritional Value of Food Products Through Food Processing Technology	Dolan, K.
MICL02019	Evolution of Acid Resistance in Pathogenic <i>E. coli</i>	Whittam, T.
MICL02023	Assessment of Allergenic Potential of Food	Gangur, V.
MICL02053*	Beneficial and Adverse Effects of Natural Bioactive Dietary Chemicals on Human Health and Food Safety	Pestka, J.
MICL02064*	Parent and Household Influences on Calcium Intake Among Preadolescents	Olson, B.
MICL02096	The Effect of Environmental Influences on Health Behaviors Contributing to Overweight and Obesity Among Infants and Children	Olson, B.

MAES food scientists use nut allergies as a model for their work. Tree nuts and peanuts cause about 30,000 life-threatening reactions per year.



PROJECTS

MICL02112*	Exotic Germplasm Conversion and Breeding Common Bean (<i>Phaseolus vulgaris</i> L.) For Resistance to Abiotic and Biotic Stresses and to Enhance Nutrition	Uebersax, M.
MICL02126	Improved Quality of Fruit and Vegetable Products	Uebersax, M.
MICL02131*	Promoting Healthful Eating to Prevent Excessive Weight Gain in Young Adults	Hoerr, S.
MICL03363	Institute for Food Laws and Regulations	Hegarty, P.
MICL03429	Role of Genetics and Stress on Turkey Meat Quality	Strasburg, G.
MICL04008*	An Integrated Approach to Prevention of Obesity in High Risk Families	Olson, B.
MICL08311	Modeling Thermal and Mechanical Effects on Retention of Nutraceuticals in Extruded Foods	Dolan, K.
MICL08353	Identification, Differential Expression, and Mapping of Muscle Genes in Genetically Selected Turkeys	Strasburg, G.
MICL08363	Identification of Molecular Mechanisms of Stress-Resistance in Turkeys to Improve Meat Quality	Strasburg, G.
MICL08368	Natural Transformation of <i>Campylobacter jejuni</i> in Chickens: Impact on Food Safety	Linz, J.
MICL08375	Workplace Culture of Breastfeeding Support: Perception of New Mother Employees, and the Role of Company Policies and Manager Attitudes	Olson, B.

Forestry

Phone: 355-0091



Daniel E. Keathley,
Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Epperson, Bryan K.	12	0.70	0.00	0.30	Forest Genetics
Han, Kyung-Hwan	13	0.70	0.00	0.30	Genomics
Kamdem, Donatien-Pascal	12	0.70	0.00	0.30	Wood Science
Kobe, Richard K.	13	0.70	0.00	0.30	Forest Ecology
Leefers, Larry A.	13	0.50	0.00	0.50	Forest Economics
MacFarlane, David	14	0.60	0.00	0.40	Forest Measurements/Modeling
Matuana, Laurent M.	13	0.60	0.00	0.40	Wood Composites
McDonough, Maureen H.	12	0.15	0.50	0.35	Forest Sociology
Potter-Witter, Karen L.	13	0.20	0.65	0.15	Forest Economics
Propst, Dennis B.	12	0.50	0.00	0.50	Psychology/Policy/Economics
Rothstein, David E.	13	0.60	0.00	0.40	Forest Nutrient Dynamics
Skole, David	12	0.18	0.00	0.82	Global Environmental Change
Walters, Michael B. ⁶	13	0.75	0.20	0.05	Forest Ecology
Yin, Runsheng	13	0.70	0.00	0.30	Forest Economics
TOTALS:		7.58	1.35	5.07	

PROJECTS

MICL01693*	The National Atmospheric Deposition Program (NADP)	Kobe, R.
MICL01748	Economic Analysis of Forest Management Opportunities in Michigan	Potter-Witter, K.
MICL01774	Managing the Genetic Diversity of Michigan Pines	Epperson, B.
MICL01811	Sustaining Forest Resources: Public Institutions and Impacts	Leefers, L.
MICL01871	Mechanisms Underlying Tree Species Distribution Across Soil Resource Gradients	Kobe, R.
MICL01899	Citizen Expectations from Public Participation	McDonough, M.
MICL01983	Land Use and Cover Change Dynamics Using Geospatial Information	Skole, D.
MICL01993	Soil-Hydrology Research for Productive and Sustainable Michigan Forests and Woody Plant Crops	Hart, J.

Forestry (continued)

PROJECTS

MICL01996	A Study of Producer Performance and Products Markets of Michigan's Forest Products Industry	Yin, R.
MICL02008	Durability and Protection of Wood Products	Kamdern, D.
MICL02009	Forest Biogeochemistry in a Glaciated Landscape	Rothstein, D.
MICL02022	Integrating Ecology and Economics for Ecosystem Management of Forested Landscapes	Walters, M.
MICL02061	Molecular Biology of Wood Formation	Han, K.
MICL02072	Microcellular Foaming of Wood-Plastic Composite Lumber	Matuana, L.
MICL02073	Modeling Forest Growth and Productivity as a Function of Temporal-Spatial Variability in Environmental Resource Distribution	MacFarlane, D.
MICL02086	Constructing and Evaluating a Knowledge Management System in Resource-Based Recreation Management	Propst, D.
MICL07702	Advanced Technology Applications to Eastern Hardwood Utilization	Kamdern, D.
MICL07712	Advanced Technology Applications to Eastern Hardwood Utilization.	Kamdern, D.
MICL08295	Seed, Substrate and Resource Limits to Tree Regeneration in Red Pine Plantations	Walters, M.
MICL08394	Microcellular Foam Extrusion of Bio Composites from Polylactic Acid and Cellulosic Fibers	Matuana, L.
MICL09012	Corps of Engineers Recreation Program: Development of Analytical Tools and Transfer of Knowledge to Outdoor Recreation Managers and Planners	Propst, D.

Geography

Phone: 355-4651



Richard E. Groop, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Zhong, Shiyuan	13	0.50	0.00	0.50	Meteorology
TOTALS:		0.50	0.00	0.50	

PROJECTS

MICL03373	Impacts of Weather and Climate on Michigan Agriculture	Andresen, J.
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Horticulture

Phone: 355-5191



Ronald L. Perry, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Beaudry, Randolph M.	12	0.50	0.50	0.00	Postharvest Physiology
Behe, Bridget K.	12	0.40	0.20	0.40	Horticulture Marketing
Biernbaum, John A.	12	0.20	0.20	0.60	Plant Physiology/Sustainable Horticulture/Organics
Cameron, Arthur C.	12	0.70	0.00	0.30	Plant Physiology/Landscape Horticulture
Cregg, Bert M.	13	0.50	0.50	0.00	Plant Physiology/Woody Ornamentals
Fernandez, R. Tom	13	0.25	0.50	0.25	Integrated Crop Management for Nurseries
Flore, James A.	12	0.65	0.00	0.35	Plant Physiology/Pomology
Grumet, Rebecca	12	0.84	0.00	0.16	Vegetable Breeding/Genetics

FACULTY

Hancock, James F.	12	0.84	0.00	0.16	Small Fruit Breeding/Genetics
Hanson, Eric J.	12	0.35	0.42	0.23	Pomology Small Fruits
Iezzoni, Amy F.	12	0.80	0.00	0.20	Fruit Breeding/Genetics
Jiang, Ning	14	0.25	0.00	0.75	Genomics/Transposable Elements (TE's)
Lang, Gregory A.	12	0.75	0.25	0.00	Pomology/Growth & Development
Lang, Nancy Suzanne	13	0.46	0.00	0.54	Plant Physiology/Integrated Crop Management/Turfgrass
Loescher, Wayne H.	12	0.75	0.00	0.25	Plant Physiology
Lownds, Norman K.	13	0.25	0.00	0.75	Landscape Horticulture/Stress Physiology
Nair, Muraleedharan G.	12	0.90	0.00	0.10	Natural Products Chemistry
Ngouajio, Mathieu	14	0.40	0.50	0.10	Vegetable Crops
Poff, Kenneth L.	12	0.25	0.00	0.75	Plant Physiology
Rowe, D. Bradley	13	0.25	0.00	0.75	Landscape Horticulture
Runkle, Erik S.	14	0.50	0.50	0.00	Floriculture/Integrated Crop Management
Schemske, Douglas W. ³	12	0.10	0.00	0.90	Plant Adaptation & Evolution of Pollinations Systems
Sink, Kenneth C.	12	0.75	0.00	0.25	Genetics/Plant Breeding
Vannocker, Steven R.	13	0.75	0.00	0.25	Reproductive Development/Genetics
Warner, Ryan M.	14	0.75	0.00	0.25	Floriculture/Stress Physiology
Widders, Irvin E.	12	0.67	0.00	0.33	Vegetables/International Agriculture
Zabadal, Thomas J.	12	0.25	0.75	0.00	Viticulture/SWMREC Faculty Coordinator
Zandstra, Bernard H.	12	0.25	0.75	0.00	Vegetable Crops/Weed Science
TOTALS:		14.31	5.07	8.62	

PROJECTS

MICL01222*	Conservation, Management, Enhancement and Utilization of Plant Genetic Resources	Iezzoni, A.
MICL01272	Physiology of Carbon Balance in Fruit Crops: Abiotic and Biotic Thresholds	Flore, J.
MICL01305*	Rootstock and Interstem Effects on Pome- and Stone-Fruit Trees	Perry, R.
MICL01325	Alternative Weed Control Methods for Fruit, Vegetable, and Ornamental Crop Production	Zandstra, B.
MICL01680	Value-Added Products for Improving Human, Animal and Plant Health	Nair, M.
MICL01731	Genetic and Biotechnology Studies for Selected Horticultural Crops	Sink, K.
MICL01753	Application of Molecular Genetic Approaches to Vegetable Crop Improvement	Grumet, R.
MICL01810	Genetic Improvement of Strawberries and Blueberries	Hancock, J.
MICL01839	Efficient Use of Fertilizers in Fruit Production	Hanson, E.
MICL01848	Enhancement of Control over Quality Loss in Horticultural Commodities Following Harvest	Beaudry, R.
MICL01908	Species Selection and Stormwater Runoff Analysis from Green Roof Systems	Rowe, D.
MICL01933	Greenhouse Organic Crop Production for Small Farms	Biernbaum, J.
MICL01938	The Law of Reciprocity and the Interaction with Concept of Cross-Stimuli in Plants	Poff, K.
MICL01956*	Postharvest Quality and Safety in Fresh-Cut Vegetables and Fruits	Beaudry, R.
MICL01978	Water and Nutrient Management in Nursery and Landscape Systems	Cregg, B.
MICL01998	Site-Specific Management Using Remote Sensing for Detection of Abiotic/Biotic Stress in Horticultural Crops	Lang, N.
MICL02002	Integrated Tree Fruit Physiology, Genetics, and Management	Lang, G.
MICL02003	Polyol Metabolism, Compartmentation, and Transport	Loescher, W.

Horticulture (continued)

PROJECTS

MICL02010	Phytoremediation of Agricultural Chemicals Using Ornamental Plants	Fernandez, R.
MICL02011	Improving Vegetable Production and Ecology under Short Crop Rotation	Ngouajio, M.
MICL02021	Environmental and Cultural Strategies to Control Growth and Development of Floriculture Crops.	Runkle, E.
MICL02032	Genetic Improvement of Sour Cherry and Sweet Cherry Rootstocks	Iezzoni, A.
MICL02057	New Floriculture Crops: Selection and Development of Production Protocols	Cameron, A.
MICL02077*	Multi-State Evaluation of Winegrape Cultivars and Clones	Perry, R.
MICL02078*	Postharvest Biology of Fruit	Beaudry, R.
MICL02085	Consumer and Market Research of Hard Ciders, Fresh Premium Cherries, Processed Chestnuts, and New Flowering Potted Plants	Behe, B.
MICL02106*	Managing and Marketing Environmental Plants for Improved Production, Profitability, and Efficiency	Behe, B.
MICL02120	The Impact of Mules on Genome Evolution and the Mechanism Underlying Pack-Mule Formation	Jiang, N.
MICL02121	Improvement of Abiotic Stress Tolerance to Horticultural Crops	Warner, R.
MICL03218	Achieving Sustainable Grapevine Yields, Maximum Processed Quality, Resistance to Environmental Stresses	Howell, G.
MICL03305	Vineyard Mechanization in Michigan Vineyards	Zabadal, T.
MICL03375	Plant Science Education Outreach Through the MSU Horticultural Gardens	Lownds, N.
MICL03388	Molecular Biology of Plant Development Relating to the Needs of Michigan	Van Nocker, S.
MICL03406	Peach Germplasm Improvement	Shane, W.
MICL03430	Novel and Sustainable Approaches to Horticultural Production of Healthy Foods and Improved Quality of Life and the Environment	Perry, R.
MICL08325	Genetic and Molecular Characterization of Self-Incompatibility and Self-Compatibility in Tetraploid Sour Cherry	Iezzoni, A.
MICL08332	Reducing Use of the At-Risk Pesticides, Atrazine, Simazine, and Chlorothalonil in Christmas Trees	Zandstra, B.
MICL08335	An Integrated Program to Replace Methyl Bromide Fumigation for Black Root Rot Control in Strawberries	Hancock, J.
MICL08350	Genomic Resources to Improve Fruit Size and Quality in Cherry	Iezzoni, A.
MICL08351	Identifying the Genes Associated with Day-Neutrality in Strawberries Using a QTL Approach	Hancock, J.
MICL08370	Partnering to Cultivate Organic Agriculture in Michigan and the Midwest	Snapp, S.
MICL08371	Environmental Risk Assessment of Secondary Effects Associated with Engineered Abiotic Stress Tolerance Using Regulatory or Metabolic Genes	Grumet, R.
MICL08372	The Impact of Rice Mutator-Like Elements on Gene Expression and Gene Function	Jiang, N.

Kellogg Biological Station

Phone: (269) 671-2341

PROJECTS

MICL03418	Controls and Consequences of Plant Diversity in Grasslands	Gross, K.
MICL08317	Enhancing Phosphorus Reduction Strategies in the Kalamazoo River Basin	Solomon, D.
MICL08395	Pulsed Ecosystem Activity: Responses of Soil Microorganisms to Variable Water Supply	Lennon, J.



N. Edward Robinson, MAES large animal clinical sciences researcher, studies heaves, an asthma-like equine disease, which is chronic in older horses.

Large Animal Clinical Sciences

Phone: 355-9593



Thomas H. Herdt, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Derksen, Frederik J.	12	0.20	0.00	0.80	Equine Respiratory Diseases
Erskine, Ronald J.	12	0.25	0.33	0.42	Dairy Cattle Mastitis
Grooms, Daniel L.	13	0.50	0.50	0.00	Beef Disease Management
Kaneene, John B.	12	0.27	0.00	0.73	Epidemiology/Disease Impact
Kirkwood, Roy N.	13	0.36	0.00	0.64	Swine Reproduction
Mansfield, Linda S.	12	0.30	0.00	0.70	Food Safety/Campylobacter Pathogenesis
Robinson, Norman E. ¹⁰	12	0.25	0.00	0.75	Respiratory Physiology
Sears, Phillip M.	12	0.20	0.41	0.39	Dairy Disease Management
Sordillo, Lorraine M. ⁸	12	0.30	0.00	0.70	Bovine Immunology & Mastitis
Straw, Barbara E. ¹¹	12	0.20	0.60	0.20	Swine Veterinary Medicine
TOTALS:		2.83	1.84	5.33	

PROJECTS

MICL01417*	Evolving Pathogens, Targeted Sequences, and Strategies for Control of Bovine Respiratory Disease	Grooms, D.
MICL01708	Reducing Economic Losses and Food Safety Risks Related to Mastitis	Erskine, R.
MICL01801	Hemorrhagic Bowel Syndrome and Antimicrobial Resistance in Swine	Straw, B.
MICL01916	Diagnosis and Prevention of Bovine Viral Diarrhea Virus (BVDV)	Grooms, D.
MICL02016	Preharvest Food Safety: Reducing the Risk of Preharvest Pathogens, Antibiotic Residues and Antibiotic Resistance in Cows	Sears, P.
MICL02017	Improving the Reproductive Performance of Swine Herds	Kirkwood, R.
MICL02025	Elimination of <i>Campylobacter jejuni</i> from the Food Chain	Mansfield, L.
MICL02039*	Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety	Mansfield, L.
MICL02040*	Mastitis Resistance to Enhance Dairy Food Safety	Erskine, R.
MICL02082	Epidemiology and Antibiotic Resistance of <i>Campylobacter</i> and <i>Salmonella</i> Isolates from Food Animals, Milk, and Meat	Kaneene, J.
MICL02108	Enhanced Resistance to Mastitis in Dairy Cattle	Sordillo, L.
MICL02115*	Basic and Applied Aspects of Bacterial Source Tracking	Kaneene, J.
MICL03355	Perinatal Lamb Mortality and Production Issues Associated with Pasture Lambing Systems in Michigan	Rook, J.

Large Animal Clinical Sciences (continued)

PROJECTS

MICL04002*	An Integrated Approach to Control of Bovine Respiratory Disease	Grooms, D.
MICL06906	Natural Transformation Between Genetically Marked <i>Campylobacter jejuni</i> Strains in the Pig Intestine	Mansfield, L.
MICL06907	Development of a Biosensor for Rapid Detection of Viruses	Grooms, D.
MICL06910	Equine Chronic Airway Disease	Robinson, N.
MICL07681	Bovine Tuberculosis: Epidemiology, Diagnosis, and Pathogenesis	Kaneene, J.
MICL07691	Bovine Tuberculosis: Epidemiology, Diagnosis, and Pathogenesis	Kaneene, J.
MICL07692	Bovine Tuberculosis: Epidemiology, Diagnosis, and Pathogenesis	Kaneene, J.
MICL07708	Bovine Tuberculosis: Epidemiology, Diagnosis, and Pathogenesis	Kaneene, J.
MICL08294	Interventions For Controlling Antimicrobial Resistance of <i>Salmonella</i> and <i>Campylobacter</i> in Dairy Cattle	Kaneene, J.
MICL08355	Development of a Field-Based Biosensor to Enhance the Epidemiological Study, Diagnosis and Control of Bovine Viral Diarrhea Virus	Grooms, D.
MICL08359	Increased Susceptibility to Bovine Mastitis During Oxidant Stress	Sordillo, L.
MICL08383	Influence of Selenoproteins in Promoting Cardiovascular Health	Sordillo, L.
MICL08385	On-Line DVM-MS Degree Program in Food Safety	Bartlett, P.

Michigan Agricultural Experiment Station

Phone: 355-0123

PROJECTS

MICL03369	Families, Children and Their Communities: Promoting Behavioral and Social Science Approaches	Bokemeier, J.
MICL03431	MSU Bioeconomy Initiative	Pueppke, S.

The main focus of the Saginaw Valley Bean & Beet Research Farm has always been to introduce new technologies into current dry edible bean and sugar beet production systems that are profitable to the growers of these crops.



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Microbiology & Molecular Genetics

Phone: 355-6463



Walter J. Esselman, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Bagdasarian, Michael	12	0.39	0.00	0.61	Molecular Biology
Breznak, John A.	12	0.30	0.00	0.70	Microbial Ecology
Britton, Robert A.	14	0.40	0.00	0.60	Genomics/Microbial Genetics
Champness, Wendy C.	12	0.50	0.00	0.50	Microbial Genetics
Ciche, Todd A.	14	0.50	0.00	0.50	Host Pathogen/Microbe Interactions
Dazzo, Frank B.	12	0.15	0.00	0.85	Microbial Ecology

Microbiology & Molecular Genetics (continued)

FACULTY

Dodgson, Jerry	12	0.36	0.00	0.64	Molecular Genetics
Hausinger, Robert P.	12	0.40	0.00	0.60	Microbial Physiology
Reddy, C. Adinarayana	12	0.46	0.00	0.54	Microbial Physiology/Ecology
Reguera, Gemma	14	0.25	0.00	0.75	Soil Microbiology
Schmidt, Thomas M.	12	0.40	0.00	0.60	Microbial Ecology
Thomashow, Michael F.	12	0.14	0.00	0.86	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.15	0.00	0.85	Soil Microbiology
Walker, Edward D.	12	0.14	0.00	0.86	Medical/Veterinary Entomology
Whittam, Thomas S. ³	12	0.17	0.00	0.83	Nutritional Genomics
York, Ian Arthur	14	0.25	0.00	0.75	Virology
TOTALS:		4.96	0.00	11.04	

PROJECTS

MICL01314	Beneficial Plant-Microbe Interactions of Agricultural Importance	Dazzo, R.
MICL01629	Molecular Biology and Enzymology of Lignin Degradation by Basidiomycete Fungi	Reddy, C.
MICL01728*	The National Animal Genome Research Project	Dodgson, J.
MICL01757	Understanding the Distribution of Microbial Populations in Soils	Schmidt, T.
MICL01857	Physiology and Phylogenetic Diversity of Termite Gut Symbionts	Breznak, J.
MICL01918	Enzymology of Alpha-Ketoglutarate-Dependent Dioxygenases	Hausinger, R.
MICL02020	Pathogenicity Factors of <i>Vibrio</i> and <i>E. coli</i> O157: Secretion of Toxins and Dissemination of Genes	Bagdasarian, M.
MICL02068*	Advanced Technologies for the Genetic Improvement of Poultry	Dodgson, J.
MICL03427	Prediction of Immunodominant Epitopes for Vaccine Design	York, I.
MICL06902	Requirement for Branched-Chain Amino Acid Biosynthesis in <i>Actinobacillus pleuropneumoniae</i> Disease	Mulks, M.
MICL08265	Bridging Genome Sequence to the Prevention of Marek's Disease in Poultry	Dodgson, J.
MICL08281	<i>In vivo</i> Expressed Genes of <i>Actinobacillus pleuropneumoniae</i>	Mulks, M.
MICL08333	Use of RNAi to Block Viral Infections in Poultry	Dodgson, J.
MICL08339	Impact of Changing Land Use on Microbial Community Genetic Diversity in Soil: A Novel Application of Suppressive Subtractive Hybridization	Antonopoulos, D.
MICL08352	A Physical and Comparative Map of Turkey Genome	Dodgson, J.

National Food Safety & Toxicology Center

Phone: 432-3100



Scott Winterstein, Director

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Giesy, John P.	12	0.25	0.00	0.75	Aquatic Toxicology
TOTALS:		0.25	0.00	0.75	

PROJECTS

MICL01919	Fates and Effects of Potential Endocrine Modulating Compounds in the Environment	Giesy, J.
MICL01995	A Toxicogenomic Approach to Understanding Environmental Pollutants	La Pres, J.
MICL05001	Controlling Listeria: Working Towards International Harmonization	Todd, E.
MICL07697	NC Region IR-4 Leader Lab Program to Clear Pest Control Agents for Minor Uses	Hollingworth, R.

National Food Safety & Toxicology Center (continued)

PROJECTS

MICL08362	A Risk-Based Approach to Determine Best-Consumed-By Dates to Control Exposure to <i>Listeria monocytogenes</i> in Delicatessen Meats	Todd, E.
MICL08366	Induced Acid Resistance of Pathogenic Bacteria in Food Matrices	Whittam, T.

Packaging (School of)

Phone: 353-4384



Sara J. Risch, Director

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Bix, Laura	14	0.25	0.00	0.75	Medical Packaging
Clarke, Robert H.	13	0.50	0.00	0.50	Manufacturing Operations
Mohanty, Amar K.	13	0.60	0.00	0.40	Materials Science
Rubino, Maria	14	0.25	0.00	0.75	Plastic Materials/Food & Medical Packaging
Singh, Sher Paul	12	0.20	0.00	0.80	Distribution/Transportation/Environmental Measuring/Packaging Dynamics
TOTALS:		1.80	0.00	3.20	

PROJECTS

MICL01735	Reusable Plastic Containers for the Fresh Produce Retail Distribution	Singh, S.
MICL01921	Radio Frequency Tagging for Track, Trace and Security Issues	Clarke, R.
MICL02069	Improving the Healthcare System Through the Use of Packaging	Bix, L.
MICL02079	Biobased/Green Materials and Nanotechnology for Packaging	Mohanty, A.
MICL02109	Sustainable Green Nano-Biocomposites from Wood Fibers and Polyhydroxyalkanoates (PHAS) Bioplastics	Mohanty, A.
MICL02111	Characterizing Packaging Systems Through the Assessment of Mass Transfer and Degradability of Biopolymers	Rubino, M.

Pathobiology & Diagnostic Investigation

Phone: 432-4685



Willie M. Reed, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Bolin, Carole A.	12	0.22	0.00	0.78	Infectious Diseases of Livestock & Companion Animals
Bolin, Steven R.	12	0.22	0.00	0.78	Infectious Diseases of Livestock & Companion Animals
Harkema, Jack	12	0.31	0.00	0.69	Toxicology
Meek, Katheryn	13	0.25	0.00	0.75	Molecular Immunology
Patterson, Jon S.	13	0.25	0.00	0.75	Veterinary Pathology/Infectious
Williams, Kurt	14	0.30	0.00	0.70	Comparative Pulmonary Pathology/Lung Injury & Repair
TOTALS:		1.55	0.00	4.45	

PROJECTS

MICL01776	Endotoxin/Ozone Co-Exposures and Airway Epithelial Remodeling	Harkema, J.
MICL01999	Diagnosis and Epizootiology of Emerging Infectious Diseases of Livestock and Poultry	Bolin, S.
MICL02012	Mechanisms of Protective Immunity in Bovine Leptospirosis	Bolin, C.

PROJECTS

MICL02054	Developing an Animal Model of Idiopathic Pulmonary Fibrosis, an Important Disease of Agricultural Workers	Williams, K.
MICL02083	West Nile Virus Infection in Animals	Patterson, J.
MICL02118*	Domestic Surveillance, Diagnosis, and Therapy of Transmissible Spongiform Encephalopathies	Bolin, S.
MICL06908	Equine Cushing's Disease: Changes in Immune System Function and in Epidermal Laminae with Laminitis	Bowker, R.
MICL06911	Defining Relevant Targets of the DNA Dependent Protein Kinase	Meek, K.

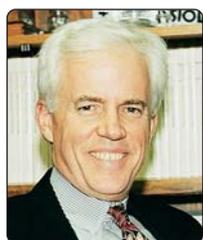


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The mission of the Department of Pathobiology and Diagnostic Investigation is to advance knowledge in biomedical sciences, develop cutting-edge diagnostic methods that address contemporary and emerging issues, and to provide exceptional professional training in the diverse fields of pathobiology for the betterment of animals and human health.

Physiology

Phone: 355-6475



William S. Spielman, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Jump, Donald B.	12	0.50	0.00	0.50	Molecular Endocrinology
TOTALS:		0.50	0.00	0.50	

PROJECTS

MICL01892	Dietary Fat Regulation of Hepatic Gene Expression	Jump, D.
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Plant Biology

Phone: 355-4683



Richard E. Triemer, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Adams, Gerard C.	13	0.20	0.00	0.80	Mycology/Plant Pathology
Allison, Richard F.	13	0.53	0.00	0.47	Plant Molecular Virology/Plant Transformation Methods
Last, Robert L.	12	0.25	0.00	0.75	Plant Biochemistry/Functional Genomics
Malmström, Carolyn	14	0.25	0.00	0.75	Ecosystem Dynamics/Ecological Role of Plant Pathogens

Plant Biology (continued)

FACULTY

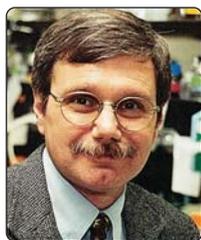
Ohlrogge, John B.	12	0.84	0.00	0.16	Plant Biochemistry/Molecular Biology/Plant Lipid Synthesis/Oilseeds
Osteryoung, Katherine W.	13	0.25	0.00	0.75	Plant Biochemistry/Molecular Biology/Cell Biology
Prather, L. Alan	13	0.25	0.00	0.75	Plant Systematics & Evolution
Sang, Tao	13	0.25	0.00	0.75	Genetics & Genomics of Plant Diversity
Sears, Barbara B.	12	0.25	0.00	0.75	Molecular Biology & Genetics of Plant Organelles
Turetsky, Merritt R.	14	0.20	0.00	0.80	Ecosystem Dynamics/Wetland Ecology/Biogeochemistry
TOTALS:		3.27	0.00	6.73	

PROJECTS

MICL01533	Genetic Engineering of Oilseed Crops	Ohlrogge, J.
MICL01679	Chloroplast Microsatellite Mutators	Sears, B.
MICL01808	Viral Transgene Recombination in Gene Silenced Virus Resistant Transgenic Plants	Allison, R.
MICL01896	Genetics of Adaptation of Wild Rice (<i>Oryza</i>)	Sang, T.
MICL01910	Molecular Biology of Plant-Bacterial Interactions	He, S.
MICL01912	Pathogen Ecology and Population Genetics as Tools in Developing Disease Control Strategies	Jarosz, A.
MICL01922	Plant Evolution and Conservation: The Role of Flower Form and Function	Prather, L.
MICL01988	Analysis of Chloroplast Division in Plants	Osteryoung, K.
MICL02029	Ecological Genetics of Adaptation in <i>Lobelia cardinalis</i>	Schemske, D.
MICL02055	The Effects of the Barley and Cereal Yellow Dwarf Viruses on the Dynamics of Natural Grasslands	Malmström, C.
MICL02123	Land Use Impacts on Nutrient Retention and Organic Matter Dynamics in Michigan Wetlands: A Biogeochemical Framework for Ecosystem Services	Turetsky, M.
MICL03423	Restructuring the Phylogeny and Taxonomy of the Euglenophyta	Triemer, R.
MICL08336	Polyester Synthetases for Polymerization of Omega-Hydroxy Fatty Acids.	Pollard, M.
MICL08343	Functional Relations Between Lignin Monomer Composition and Xylem Properties	Telewski, F.
MICL08361	Production and Utilization of Acetyl Glyceride Oils in Transgenic Oilseeds	Pollard, M.
MICL08365	Efficiency and Fluxes in the Metabolic Network of Developing Seeds	Shachar-Hill, Y.
MICL08376	Quantitating and Manipulating Seed Metabolic Networks	Shachar-Hill, Y.
MICL08388	Controlling Invasive Rangeland Weeds That Exploit and Expand Phenological Niches: Influence of Grazing and Burning on Rangeland Vulnerability	Malmström, C.

Plant Pathology

Phone: 353-8645



Raymond Hammerschmidt,
Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Adams, Gerard C.	13	0.33	0.27	0.40	Mycology, Forest Pathology, Nursery Diseases, Mushroom Identification & Cultivation
Allison, Richard F.	13	0.20	0.00	0.80	Plant Molecular Virology
Day, Robert Bradley	14	0.25	0.00	0.75	Plant-Pathogen Interactions
Fulbright, Dennis W.	12	0.83	0.00	0.17	Plant Pathology/Plant Pathogen Genetics/Christmas, Oak, and Nut Tree
Hao, Jianjun	14	0.80	0.00	0.20	Soilborne Disease/Soil Microbiology

Plant Pathology (continued)

FACULTY

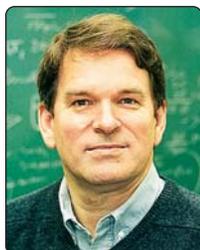
Hausbeck, Mary K.	12	0.40	0.60	0.00	Plant Pathology/Ornamentals, Vegetables & Greenhouse Crops
Jarosz, Andrew M.	13	0.30	0.00	0.70	Plant Pathology/Pathogen Epidemiology
Kirk, William W.	13	0.45	0.45	0.10	Plant Pathology/Vegetables/Potatoes/ Perennial Herbaceous Plants
Safir, Gene R.	12	0.78	0.00	0.22	Plant Pathology/Mycorrhizal Fungi
Schilder, Annemiek C.	13	0.45	0.45	0.10	Diseases of Small Fruit Crops/Mycology/ Integrated Disease Management
Sundin, George W.	13	0.50	0.50	0.00	Plant Pathology/Fruit Tree Crops/Phytopathology
Trail, Frances	13	0.27	0.00	0.73	Host Pathogen Interactions
Vargas, Joseph M. Jr.	12	0.26	0.49	0.25	Plant Pathology/Diseases/Sod & Turf
TOTALS:		5.82	2.76	4.42	

PROJECTS

MICL01499	Development and Yield Simulation of Crop and Crop Stresses (Disease/Water/Nutrient) Over Time at Expanded Spatial Scales	Safir, G.
MICL01662	Managing Tree Diseases in Michigan	Fulbright, D.
MICL01673	Biology and Control of Pathogens of Field Crops	Hart, L.
MICL01832	Management of Turfgrass Diseases	Vargas, J.
MICL01907	Development and Dispersal of Inoculum for the Wheat Head Scab Fungus, <i>Gibberella zeae</i>	Trail, F.
MICL01954	Integrated Management of Diseases of Small Fruit Crops	Schilder, A.
MICL01966	Integrated Management of Diseases of Potato, Field and Perennial Herbaceous Crops in Michigan	Kirk, W.
MICL02018	Oak Wilt Management in Michigan Using a Hypovirulent Strain of the Pathogen	Fulbright, D.
MICL02066*	Biological Improvement, Habitate Restoration, and Horticultural Development of Chestnut by Management of Populations, Pathogens, and Pests	Fulbright, D.
MICL02084	Bacterial Diseases of Tree Fruit Crops and Their Control	Sundin, G.
MICL02088	Mechanisms of Asexual Variation Resulting in Changes of Race and Fungicide Sensitivity in Emerging Plant Pathogens	Adams, G.
MICL02113*	Mycotoxins: Biosecurity and Food Safety	Trail, F.
MICL02122*	Biology, Ecology and Management of Emerging Pests of Annual Bluegrass on Golf Courses	Vargas, J.
MICL03377	Management of Diseases of Upland and Muck Vegetables, Ginseng, Vegetable Transplants, and Greenhouse Ornamentals	Hausbeck, M.
MICL03419	Physiology and Biochemistry of Resistance and Induced Resistance	Hammerschmidt, R.
MICL07679	Controlling Armillaria Root Rot of Cherry	Hammerschmidt, R.
MICL07690	Controlling Fire Blight Disease of Apple Trees	Sundin, G.
MICL07701	Controlling Fire Blight Disease of Apple Trees	Sundin, G.
MICL07705	Phytophthora Research, MI	Hausbeck, M.
MICL07710	Controlling Armillaria Root Rot of Cherry	Hammerschmidt, R.
MICL07711	Controlling Fire Blight Disease of Apple Trees	Sundin, G.
MICL08285	A Strategy to Advance IPM for Celery Growers in Michigan, California and Florida	Hausbeck, M.
MICL08305	Using Reduced Risk Fungicides and a Disease Forecaster to Manage Foliar Blights on Ginseng	Hausbeck, M.
MICL08307	Comparative Genomic Analysis of the <i>Pseudomonas syringae</i> Ppt23a Plasmid Family	Sundin, G.
MICL08341	A Partnership Among Eastern U.S. Carrot Stakeholders to Develop and Implement IPM	Hausbeck, M.
MICL08360	Development of Scouting- and Weather-Based Decision Guides for Disease Control in Blueberries	Schilder, A.
MICL08386	Managing Soilborne Pathogens in Midwest Melon and Eggplant Crops Using Methyl Bromide Alternatives and New Application Methods	Hausbeck, M.

Plant Research Laboratory (MSU-DOE)

Phone: 353-2270



Kenneth Keegstra, Director

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
He, Sheng Yang	12	0.25	0.00	0.75	Plant Pathology
Howe, Gregg A.	13	0.23	0.00	0.77	Plant/Insect Defense
Walton, Jonathan D.	12	0.23	0.00	0.77	Plant Pathology
TOTALS:		0.71	0.00	2.29	

PROJECTS

MICL01886	Mechanisms of Fungal Pathogenicity	Walton, J.
MICL01900	Molecular Genetics of Plant Defense Against Insects	Howe, G.
MICL08291	Regulation and Manipulation of Gibberellin Metabolism and Stem Growth in Long-Day Rosette Plants	Zeevaart, J.
MICL08293	Role of the HRP Pilus in Type III Secretion in <i>Pseudomonas syringae</i> Pathogenesis	He, S.
MICL08357	Disabling the Function of Type III Effectors for Inhibiting Bacterial Pathogenesis	He, S.

Political Science

Phone: 355-6590

PROJECTS

MICL03403	Brownfield Redevelopment in Michigan	Hula, R.
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Remote Sensing, GIS Research and Outreach Services

Phone: 353-7195

PROJECTS

MICL03404	Applications of Spatial Information Technologies to Management of Agriculture and Natural Resources	Groop, R.
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Social Work (School of)

Phone: 353-8616



Gary R. Anderson,
Director

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Riebschleger, Joanne	14	0.25	0.00	0.75	Family & Community Development
Seita, John R.	14	0.25	0.25	0.50	Youth Development
TOTALS:		0.50	0.25	1.25	

PROJECTS

MICL02056	A Study of Factors That Impact Transition for Young People Who Age Out of Foster Care	Seita, J.
MICL02125	Building Intervention Models for Children Living with a Family Member with a Serious Mental Illness	Riebschleger, J.

Sociology

Phone: 355-6632



Janet L. Bokemeier, Chair

FACULTY

	RANK	MAES	MSUE	JOINT	INTEREST
Busch, Lawrence M.	12	0.47	0.00	0.53	Food & Agricultural Standards/ Agricultural Research Policy/Technical Change in Agriculture
Harris, Craig K.	13	0.50	0.00	0.50	Social Dimensions of the Agrifoods System/Food Safety Environment
Jaffee, Daniel S.	14	0.30	0.00	0.70	Fair Trade/Environment Food/ Agriculture/Water Globalization, Latin America
Johnson, Nan E.	12	0.50	0.00	0.50	Sociology of Population/Sociology of Aging & the Life Course/Sociological Methodology
Montgomery, Alesia F.	14	0.25	0.00	0.75	Urban Issues
Ten Eyck, Tobias A.	13	0.50	0.00	0.50	Mass Media/Popular Culture/Food Safety
TOTALS:		2.52	0.00	3.48	

PROJECTS

MICL01874	Social Processes in Disability and Death for Nonmetro Americans	Johnson, N.
MICL01926	Tightly Coupled Social and Natural Systems in Agriculture, Food Safety, Fisheries, and Wildlife	Harris, C.
MICL01992*	Systems Analyses of the Relationships of Agriculture and Food Systems to Community Health	Ten Eyck, T.
MICL02005	Standards and Strategies in Commodity Subsector Organization	Busch, L.
MICL03412	Developing Sustainability Indicators	Dietz, T.
MICL04007*	Local Food Choices, Eating Patterns, and Population Health	Ten Eyck, T.

Telecommunication Information Studies & Media

Phone: 355-8372

PROJECTS

MICL08334	Closing the Rural Broadband Gap: A Field Experiment	LaRose, R.
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Water Research (Institute of)

Phone: 353-3744

PROJECTS

MICL02026*	Development and Evaluation of TMDL Planning and Assessment Tools and Processes	Bartholic, J.
MICL03420	Decision Support System to Produce Impact-Based Solutions and More Efficient Allocation of Resources	Bartholic, J.

Faculty Appointments

	MAES	MSUE	JOINT
GRAND TOTALS	129.28	39.37	136.67

- 1 Elton R. Smith Professor in Food and Agricultural Policy
- 2 C.S. Mott Distinguished Professor of Sustainable Agriculture
- 3 John A. Hannah Distinguished Professor
- 4 Homer Nowlin Chair of Water in Agricultural and Natural Resources Systems
- 5 Clinton E. Meadows Endowed Chair
- 6 Partnerships for Ecosystem Research and Management (PERM) positions with salary funded by the Michigan Department of Natural Resources

- 7 Homer Nowlin Chair of Consumer Responsive Agriculture
- 8 Meadow Brook Chair in Farm Animal Health and Well-being
- 9 Rachel Carson Chair in Ecological Sustainability
- 10 Matilda Wilson Chair
- 11 David J. Ellis Swine Professorship

Futures is the magazine of the Michigan Agricultural Experiment Station. If you live in the United States and would like to receive *Futures* free of charge, write to *Futures* Editor, MAES, 109 Agriculture Hall, MSU, East Lansing, MI 48824-1039, call 517-355-0123 or e-mail depolo@msu.edu. *Futures* also is available for viewing on the MAES Web site at www.maes.msu.edu/publications.htm.



**Winter 2006
Vol. 23 No. 4**

MAES Research Accomplishments and Impacts

The MAES name is steeped in history and tradition. The Michigan Agricultural Experiment Station at Michigan State University was established February 26, 1888, after the passage of the 1887 Hatch Act, which created a nationwide

network of agricultural experiment stations. The stations were charged with conducting research and development projects for farmers. In 1925, the Purnell Act added agricultural economics, rural sociology and home economics to the experiment stations' mission.

Today, the Michigan Agricultural Experiment Station sees its mission as generating knowledge through strategic research to enhance agriculture, natural resources, and families and communities in Michigan.

But the name "Michigan Agricultural Experiment Station" doesn't give those unfamiliar with its work an accurate picture of the breadth and depth of MAES research. In this issue of *Futures*, we present stories of wide-ranging research that have one thing in common: they illustrate the diversity of MAES scientists and the work they do, all focused on helping Michigan and its citizens.

It's no secret that the past several years have been very difficult for the Michigan economy. The slumping auto industry has deeply affected the state's finances, and downturns in other manufacturing sectors and record-high gasoline prices have pushed the situation from bad to worse. Researchers from all disciplines are pondering how to reverse the state's economic decline. Four MAES chemical engineering researchers think that part of the answer may be found in agriculture. By developing cost-effective and environmentally attractive means of generating fuels, chemicals, materials, foods and feeds from renewable plant biomass, MAES researchers want to shift the raw material basis of modern society away from fossil resources, particularly petroleum, and toward biomass.

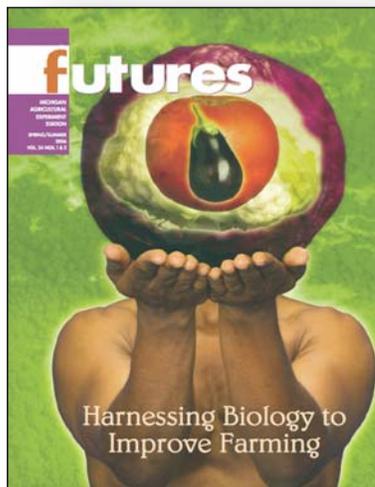
Honeybees around the world are under attack by a deadly parasite smaller than a grain of rice. *Varroa* mites, which invaded the United States from the eastern hemisphere in 1987, can kill an entire bee colony within 1 to 2 years if left untreated. MAES entomologist Zach Huang has invented a

chemical-free, inexpensive way to control deadly mites in bee colonies.

The Long-Term Ecological Research (LTER) site at the Kellogg Biological Station attracts internationally renowned scientists and provides a vast array of data and collaborative opportunities for researchers from a variety of disciplines.

Two rural high schools in mid-Michigan that are aggressively working to reduce and eliminate bullying are working with MSU researchers to document their students' experiences with gendered bullying and determine how it affects them.

To offer state policy-makers research and knowledge in the growing discipline of community revitalization, the MAES partnered with the MSU Office of the Provost to create the Community Vitality Program (CVP) in 2003. The CVP fosters collaboration across units and colleges at MSU based on input from community partners. The goal of the CVP is to use this research and knowledge to help communities improve living standards for current and future residents.



**Spring/Summer
2006**

Vol. 24 Nos. 1 & 2

Harnessing Biology to Improve Farming

In 1990, U.S. sales of fruits and vegetables classified as organic totaled less than \$250 million. By 2000, that number had skyrocketed to more than \$2.2 billion. In 2003, sales of all organic foods topped \$10

billion. This is only about 2 percent of all money spent on groceries, but the market for organic products is growing eight times faster than the grocery market as a whole.

Research on organic, low-input, integrated and sustainable production techniques always has been part of the MAES. When the C.S. Mott Foundation Distinguished Professor of Sustainable Agriculture chair was established in the MSU College of Agriculture and Natural Resources in 1991, it was the first endowed chair of its kind in the world. Its mission: to make Michigan agriculture more sustainable. Today, the Mott chair has evolved into the Mott Group for Sustainable Food Systems, reflecting the concept that growers' livelihoods depend on production systems that are healthy and sustainable — environmentally, ecologically and economically. The group's aim is to link farmers and consumers and offer benefits to both

groups. It's hoped that having Michigan farms feeding Michigan people will put more money into farmers' hands and more good food into the mouths of more Michigan people.

In this issue of *Futures*, you'll read about the efforts of scientists from a number of departments who are focused on one goal: improving farming so that all growers — whether certified organic, conventional or somewhere in between — have more options for producing healthy, nutritious food in cost-effective, environmentally sound ways.

To combat the worst apple pest in Michigan, the codling moth, MAES scientists have been studying using pheromones to disrupt moth mating for more than 15 years. Today, the scientists are working with cooperating growers on more than 2,500 acres to demonstrate the potential of areawide pheromone moth control.

The MSU Integrated Pest Management (IPM) Program has a 30-year history of studying innovative techniques to combat pests while preserving the environment. Scientists affiliated with the program provide a toolbox of options for growers and give them information on how they can implement research-based IPM techniques.

Tucked into 10 acres on south campus, the MSU Student Organic Farm offers students the opportunity to plan, grow and harvest a wide variety of food crops as well as participate in community-supported agriculture.

Since 1963, Interregional Research Project No. 4 (IR-4) has worked with growers and chemical companies to register existing chemical products for use on specialty crops and reregister older products. Today, about 70 to 80 percent of IR-4 research focuses on reduced-risk pesticides.



**Fall 2006
Vol. 24 No. 3
Growing
Michigan's
Bioeconomy**

In early 2006, gasoline prices skyrocketed, and Michigan's economy was reeling from several years of downturns. MSU President Lou Anna K. Simon knew her university had one of the country's top plant

science research programs, as well as extremely strong engineering programs. She also knew that the state had a strong

manufacturing base, as well as a strong agricultural base. It seemed a natural part of its land-grant mission that MSU should more formally unite the power of its research with the state's proven assets and develop sustainable solutions to the nation's dependence on petroleum-based products that would help boost the state's economy. So she created the MSU Office of Bio-based Technologies (OBT).

"If you think about what Michigan could be good at and what Michigan could be known for, then the bioeconomy arises as a real possibility," Simon said. "The question becomes how to combine Michigan's assets with the cutting-edge research being conducted at Michigan State University in ways that can make a real difference for the state. So the bioeconomy idea for Michigan emerged from an established, thoughtful understanding of Michigan's current strengths and active considerations of Michigan's future potential."

The terms "bioeconomy" and "bio-based economy" describe a future in which people rely more on renewable resources to meet society's needs for energy, chemicals and raw materials. Instead of an economy dependent on the planet's limited supply of nonrenewable resources, such as petroleum and coal, plant material and municipal and livestock waste — biomass — would be converted into electricity, fuels, plastics and the basic components of chemical processes.

Ethanol and biodiesel are two of the most well-known products of the bioeconomy, but the concept is much broader than biofuels.

"There is more to the bioeconomy than just fuel," said Steven Pueppke, director of both the OBT and the Michigan Agricultural Experiment Station (MAES). "The bioeconomy is about making crop plants more valuable and providing consumers with products from renewable resources."

In this issue of *Futures*, you can read about MAES scientists from various disciplines who are all working to enhance Michigan's economy and environment by creating products from plants and other renewable resources.

In an in-depth interview, President Simon talks about the importance of the bioeconomy, what it could mean for the state and MSU's role in shaping it.

MAES Contributors

July 1, 2005 to June 30, 2006

3 Tier Technologies LLC	Biosys Plant Extracts Ltd.	Cutting Edge Formulation Inc.
Access Business Group LLC	BioTepp Inc.	Cystic Fibrosis Foundation
Adjuvants Plus	Blaze Science Industries LLC	Detroit Edison Company
Affy Tapple LLC	Boston Scientific	Development Alternatives Inc.
Agency for International Development	C. Raker & Sons Inc.	Diamond V Mills Inc.
AgraQuest Inc.	California Cherry Advisory Board	Dilley, David & Marion
Agricultural Biotechnology Steward	California Polytechnic State University Foundation	Diversified Manufacturing Inc.
Agriliance LLC	Canadian Embassy	Dorsey & Whitney LLP
Agrimar Corporation	Canberra Corporation	Dove Acres LLC
Agriphar	Cardinal Health Medical Products and Services	Dow AgroSciences
Agro-Solutions	Celery Research Inc.	Dow Chemical Company
Akzo Nobel Surface Chemistry LLC	Cerexagri Inc.	DuPont Agricultural Products
Almond Board of California	Chelsea Milling Company	DuPont Crop Protection
American Chemistry Council	Cheminova	Early Bloom Inc.
American Chestnut Foundation	Chemonics International Inc.	Earth University Foundation
American Farmland Trust	Chemtura	EDEN Bioscience Corporation
American Floral Endowment	Cherry Marketing Institute	Edwards Lifesciences LLC
American Meat Institute Foundation	CIMMYT	Egerton University Nairobi Kenya
Amvac Chemical Corporation	City of West Palm Beach	Egyptian Cultural & Educational Bureau
Andersons Inc.	Clarke Mosquito Control	E. I. duPont de Nemours and Company
Aquatrols Corporation of America Inc.	Cleary Chemical Corporation	Electric Power Research Institute
Arborjet Inc.	Comet Product Corporation	Electrolux Home Products
Arvesta Corporation	ConAgra Foods	Entrix Inc.
Arysta Life Science Corporation	Confederated Tribes Umatilla Indian Reservation	Environmental Protection Agency
Association of Fish and Wildlife Agencies	Consumers Energy	Farmsaver.com
Ball Horticultural Company	Corn Marketing Program of Michigan	FMC Corporation
Bard	Cornell University	Food and Agriculture Organization of the United Nations
BASF Corporation	Council for Agriculture, Science & Technology	Foundation for Agronomic Research Inc.
Bayer Crop Science	Crompton Manufacturing Company Inc.	Frederick Cancer Research Facility
Bayer Environmental Science	CRTI	Frito-Lay Inc.
Biocor Animal Health Inc.		Georg Utz Inc.
BioEnergy Capital Consultants		

Georgia Pacific Corporation
 Gerber Products Company
 Gowan Company
 Great Lakes Environmental Center
 Great Lakes Fisheries Commission
 Great Lakes Fishery Trust
 Great Lakes Indian Fish & Wildlife
 Commission
 Great Lakes Roses
 Griffin Industries
 Guidant Corporation
 Haifa NutriTech Inc.
 Harris Moran Seed Company
 Hendrix and Dail Inc.
 Henry Mast Greenhouses Inc.
 Herculite Products Inc.
 Honeywell Corporation
 HTSPE
 Humane Society International
 Idaho Public Utilities Commission
 Iezzoni, Amy
 International Dwarf Fruit Tree
 Association
 International Food Policy Research
 Institute
 International Packaging Company
 Iowa State University
 Isagro USA Inc.
 ISCA Technologies Inc.
 ISK Biosciences Corporation
 J. Frank Schmidt Family Charitable
 Foundation
 Kalamazoo Valley Plant Growers
 Cooperative
 Kenneth Scott Charitable Trust



"We focus on the needs and interests of the Michigan farmer" says Mike Brewer, MAES entomology scientist and IPM coordinator. "Each crop has different pest issues and our resources help growers identify and manage insects, diseases, weeds and nematodes."

K-I Chemical U.S.A. Inc.
 King Milling Company
 LABServices
 Lesco Inc.
 Little River Band of Ottawa Indians
 Louisiana State University
 Loveland Industries Inc.
 MakhteshimAgan of North
 America Inc.
 MBG Marketing
 McDonough, Maureen H.
 Mead Westvaco Corporation
 Metropolitan Detroit Flower
 Growers Association
 Michiana Golf Course
 Superintendents Association
 Michigan Apple Research
 Committee
 Michigan Asparagus Advisory Board
 Michigan Asparagus Research
 Committee
 Michigan Asparagus Research Inc
 Michigan Beekeepers Association
 Michigan Blueberry Growers
 Association
 Michigan Career Development
 Michigan Carrot Committee
 Michigan Cherry Committee
 Michigan Christmas Tree
 Association
 Michigan Community Health
 Michigan Corn Growers
 Association
 Michigan Crop Improvement
 Association
 Michigan Department Natural
 Resources
 Michigan Department of Agriculture
 Michigan Environmental Quality
 Michigan Forestry & Park
 Association
 Michigan Labor Economic Growth
 Michigan Lakes and Streams
 Association
 Michigan Natural Heritage Small
 Grants Program



An MAES scientist uses geospatial tools to help MDOT and Ottawa County residents impartially assess the impact of a highway bypass.

Michigan Nursery and Landscape Association

Michigan Onion Committee

Michigan Onsite Wastewater Recycling Association

Michigan Peach Sponsors

Michigan Pickle and Pepper Research Council

Michigan Plum Advisory Board

Michigan Potato Industry Commission

Michigan Sea Grant College Program

Michigan Soybean Promotion Committee

Michigan State Horticultural Society

Michigan State Millers Association

Michigan Sugar Company

Michigan Sugarbeet Advancement

Michigan Turfgrass Foundation

Michigan Vegetable Council

Mid-America Food Processors Association

Miller Chemical & Fertilizer Corporation

Ministry of Agriculture and Rural Development; Mozambique

Mink Farmers Research Foundation

Monroe County

Monsanto Company

Montana Microbial Products LLC

MSU Extension Lapeer County

Muskegon County

National Aeronautics and Space Administration (NASA)

National Association of College and University Business Officers

National Association of State Departments of Agriculture

National Cattlemen's Beef Association

National Council for Air and Stream Improvement Inc.

National Grape Cooperative Association

National Institutes of Health — NIH/PHS

National Marine Bankers Association

National Park Service

National Pork Board

National Potato Promotion Board

National Science Foundation

National Wildlife Federation

Nature's Lawn & Garden Inc.

NFT Industries LLC

NOAA Undersea Research Program

North American Strawberry Growers Association

North Central Soybean Research Program

Nufarm Americas Inc.

Nu-Gro Technologies Inc.

Nutramax Laboratories Inc.

Nutrition Physiology Corporation

N-Viro International

Occidental College

Ohio State University

ORO Agri Inc.

Pacific Biocontrol Corporation

Pennsylvania State University

Perennial Plant Association

Perfecseal

PFI International Inc.

Pfizer Inc.

PGA Tour Inc.

Pickle Packers International Inc.

Pickle Seed Research Fund

Post Gardens

Princeton University

Publix Super Markets

Pursell Technologies Inc.

QLM Consulting Inc.	Turflin Inc.	Virginia Technology
QVC Inc.	U.S. Department of Agriculture	W.K. Kellogg Company
Rainbow Treecare	U.S. Department of Energy	W.K. Kellogg Foundation
Raytheon Company	U.S. Department of Geological Services	Washington State Tree Fruit Research Committee
Recmix of Pennsylvania Inc.	U.S. Department of Health and Human Services	Washington State University
Rockefeller Foundation	U.S. Fishery & Wildlife Service	Wayne State University
Rutgers, The State University of New Jersey	U.S. D. A. Forest Service	Western Michigan Greenhouse Association
S.E. Michigan Resource Conservation & Development Council	U.S. Geological Survey	Whitetails Unlimited Inc.
Saatzucht Steinach GmbH	U.S.-Egypt Joint Board	Wilbur Ellis Company
Saginaw County	Uniroyal Chemical	Wildlife Management Institute
Scentry Biologicals Inc.	United Feeds	World Bank
Scotts Company	University of California	World Food Programme
Secchia Family Foundation	University of California - Davis	Yale University
Shaklee Corporation	University of Freiburg	York Partners LLC
Sipcam Agro USA Inc.	University of Idaho	
Society for College and University Planning	University of Illinois	
Spectrum Enterprises LLC	University of Michigan	
Spring Meadow Nursery Inc.	University of Minnesota	
Star of the West Milling Company	University of Nebraska	
State of Ohio	University of Nebraska - Lincoln	
Stoller Enterprises Inc.	University of North Carolina	
Student and Youth Travel Association of North America	University of Notre Dame	
Summerdale Inc.	University of Rhode Island	
Suterra LLC	University of Toronto	
Sylvite Sales (USA)	University of Washington	
Syngenta Biotechnology Inc.	University of Wisconsin	
Syngenta Crop Protection Inc.	University of Wisconsin - Madison	
Syngenta Inc.	USDA	
Temple-Inland Container Corporation	Utah State University	
Thies Technology	UTZ Quality Foods Inc.	
	Valent	
	Valent Biosciences Corp	
	Valent USA Corporation	

In Memorium: C. Gerald “Jerry” Haarer

AN AGRICULTURAL LEGACY AT MSU



Jerry Haarer, 71, the first director of the Land Management Office at Michigan State University, passed away in Naples, Fla. on Feb. 17, 2006.

Mr. Haarer’s prodigious contributions to Michigan agriculture, to MSU and to the Michigan Agricultural Experiment Station ensure that he will be remembered as a true visionary. He was a man of great humility who, throughout his 21 years at MSU, earned a reputation for unimpeachable integrity and institutional loyalty. Mr. Haarer was the consummate team player — a man who embodied the land-grant ethos not only in his work, but in the manner in which he conducted his entire life. His outstanding legacy will endure for decades to come.

Mr. Haarer pushed for and oversaw the construction of the MSU Pavilion, which opened in 1997. The massive building at Farm Lane and Mount Hope Road, built for \$14.5 million, is now a staple of Spartan life, hosting hundreds of rodeos, shows, auctions and tournaments each year.

He also enhanced the university’s off-campus properties and facilities. As land management director, Mr. Haarer was in charge of research facilities at 44 sites encompassing more than 20,000 acres in 28 counties.

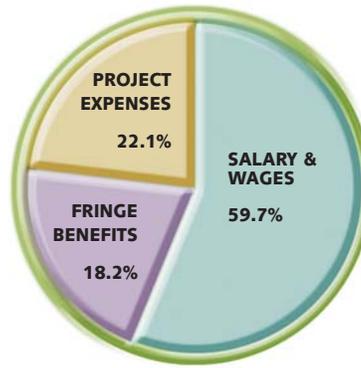
Mr. Haarer came to Lansing to study at MSU, where he was a member of the livestock judging team, after graduating from Saline High School in 1952. In 1957, he started a small meat processing plant with his father and brother. He later formed Mahogany Farms, which developed into Premier Cattle Corp., and then Manor Hill Farms, featuring an Angus cattle breeding program and Arabian horses. He became the first land management director at MSU in 1979.

“Jerry’s great impact was that he saw each of the MSU locations as a reflection of the university,” said Roger Wilkinson, the former MSU vice president of finance, who worked with Mr. Haarer for 12 years. “He had a major responsibility and was a wonderful man to work with.”

Financial Report

July 1, 2005 to June 30, 2006

DISTRIBUTION OF APPROPRIATED FUNDS



INCOME:

Federal Appropriations		
Hatch	\$	3,855,621
McIntire-Stennis	\$	211,330
Hatch RRF	\$	918,970
Hatch Animal and Disease, Section 1433	\$	99,870
Total Federal Appropriations	\$	5,085,791
State Appropriations	\$	33,163,800
TOTAL APPROPRIATIONS	\$	38,249,591
Grants — Federal, State and Private*	\$	52,384,710
TOTAL INCOME		<u><u>\$90,634,301</u></u>

EXPENSES:

Salaries	\$	22,825,886
Fringe Benefits	\$	6,969,256
Project Expenses	\$	8,454,449
Grants — Federal, State and Private*	\$	52,384,710
TOTAL EXPENSES		<u><u>\$90,634,301</u></u>

Personnel

(Full-time Equivalents Funded From Appropriated Funds)

Research Staff	
Professors	66.73
Associate Professors	32.00
Assistant Professors	17.18
Research Associates and Specialists	12.12
TOTAL RESEARCH STAFF**	128.03
Support Staff	
Administrative Professionals	66.24
Supervisors	25.59
Clerical	25.75
Technicians	4.22
TOTAL SUPPORT STAFF	121.80

* Grants are reported using most recent three-year average

** Does not include department chairpersons and unit administrators

MICHIGAN AGRICULTURAL EXPERIMENT STATION

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